USER MANUAL

3.5KW/5.5KW SOLARE INVERTER/CHARGER

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ABOUT THIS MANUAL

Purpose

This manual describes the assembly, installation, operation and troubleshooting of this unit. Please read this manual carefully before installations and operations. Keep this manual for future reference.

Scope

This manual provides safety and installation guidelines as well as information on tools and wiring.

The following cases are not within the scope of warranty.

- 1. Out of warranty.
- 2. Series number was changed or lost.
- 3. Battery capacity was declined or external damaged.
- 4. Inverter was damaged caused by transport shift, remissness, etc external factor
- 5. Inverter was damaged caused by irresistible natural disasters.
- 6. Not in accordance with the electrical power supply conditions or operate environment caused damage.

SAFETY INSTRUCTIONS



WARNING: This chapter contains important safety and operating instructions. Read and keep this manual for future reference.

- 1. Before using the unit, read all instructions and cautionary markings on the unit the batteries and all appropriate sections of this manual.
- 2. **CAUTION** --To reduce risk of injury charge only deep-cycle lead acid type rechargeable batteries. Other types of batteries may burst, causing personal injury and damage.
- 3. Do not disassemble the unit. Take it to a qualified service center when service or repair is required. Incorrect re-assembly may result in a risk of electric shock or fire.
- 4. To reduce risk of electric shock, disconnect all wires before attempting any maintenance or cleaning. Turning off the unit will not reduce this risk.
- 5. CAUTION -- Only qualified personnel can install this device with battery.
- 6. NEVER charge a frozen battery.
- 7. For optimum operation of this inverter/charger; please follow required spec to select appropriate cable size. It is very important to correctly operate this inverter/charger.
- 8. Be very cautious when working with metal tools on or around batteries. A potential risk exists to drop a tool to spark or short circuit batteries or other electrical parts and could cause an explosion.
- 9. Please strictly follow installation procedure when you want to disconnect AC or DC terminals. Please refer to **INSTALLATION** section of this manual for the details.
- 10. Fuses (1 piece of 150A, 63VDC for 3kW~ 5kW) are provided as over-current protection for the battery supply.
- 11. **GROUNDING INSTRUCTIONS** This inverter/charger should be connected to a permanent grounded wiring system. Be sure to comply with local requirements and regulation to install this inverter.
- 12. NEVER cause AC output and DC input short circuited. Do NOT connect to the mains when DC input short circuits.
- 13. **Warning!!** Only qualified service persons are able to service this device. If errors still persist after following trouble shooting table, please send this inverter/charger back to local dealer or service center for maintenance.

INTRODUCTION

This is a multi-function inverter/charger; combining functions of inverter; solar charger and battery charger to offer uninterruptible power support with portable size. Its comprehensive LCD display offers user-configurable and easy-accessible button operation such as battery charging current, AC/solar charger priority, and acceptable input voltage based on different applications.

Features

Pure sine wave inverter

Configurable input voltage range for home appliances and personal computers via LCD setting

Configurable battery charging current based on applications via LCD setting

Configurable AC/Solar Charger priority via LCD setting

Compatible to mains voltage or generator power

Auto restart while AC is recovering

Overload/ Over temperature/ short circuit protection

Smart battery charger design for optimized battery performance

Cold start function

Basic System Architecture

The following illustration shows basic application for this inverter/charger. It also include following devices to have a complete running system:

Generator or Utility

PV modules (option)

Consult with your system integrator for other possible system architectures depending on your requirements.

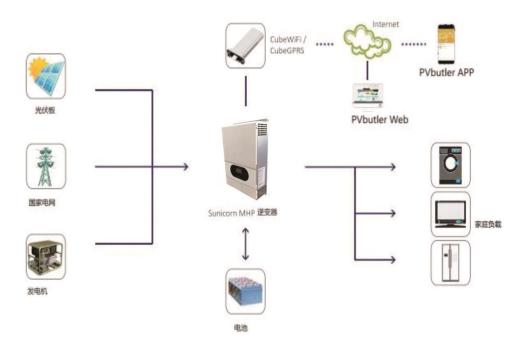
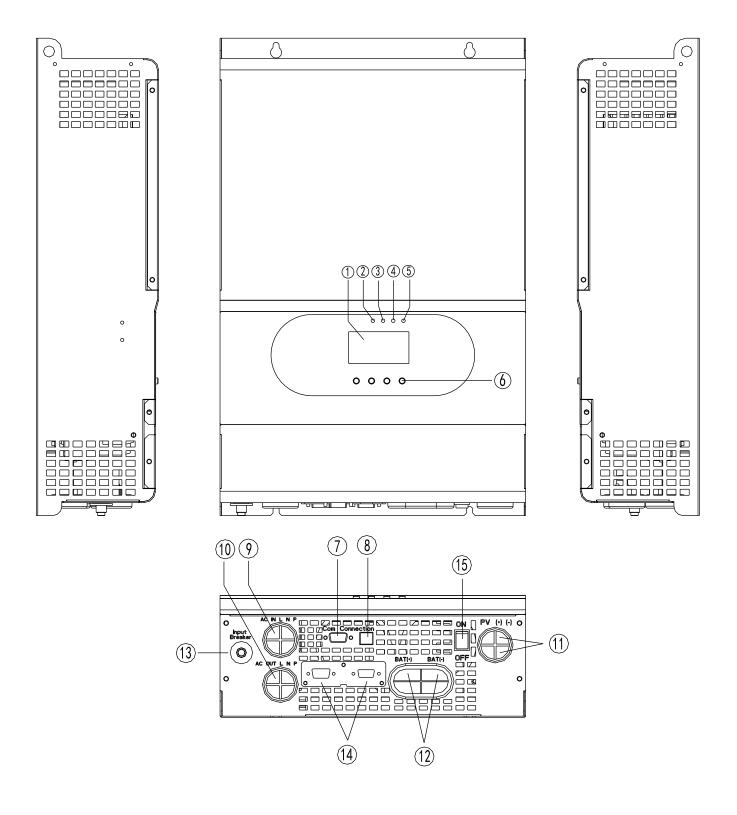


Figure 1 Hybrid Power System

Product Overview



- 1. LCD display
- 2. Line indicator
- 3. INV indicator

4. Battery indicator

- 5. Fault indicator
- 6. Function button
- 7. RS232 port

8. USB port

- 9. AC input
- 10. AC output
- 11. PV input

12. Battery input

- 13. Input over current protection
- 14. Parallel communication port (only for models with parallel function)
- 15. Power on/off switch
- 16. Installation kit

INSTALLATION

Unpacking and Inspection

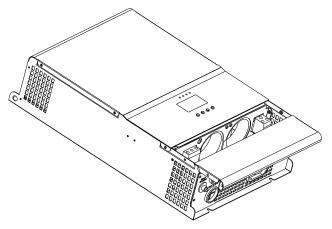
Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. You should have received the following items inside of package:

The unit x 1

User manual x 1

Preparation

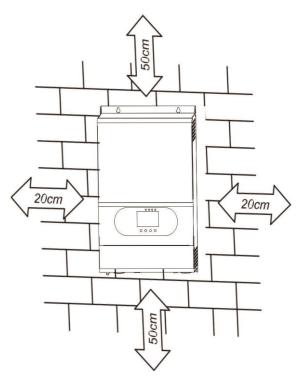
Before connecting all wires, please Remove two screws as shown below.



Mounting the Unit

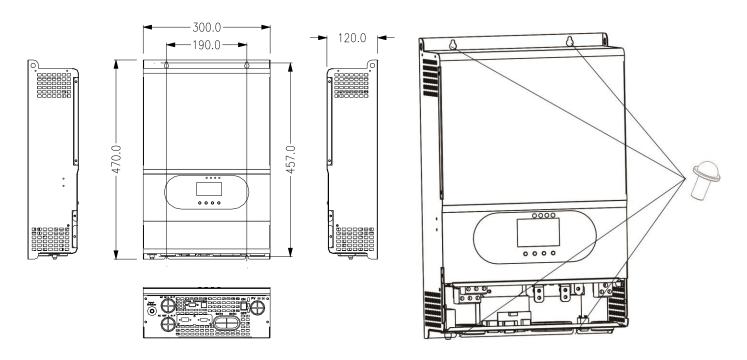
Consider the following points before selecting where to install:

- 1. Do not mount the inverter on flammable construction materials.
- 2. Mount on a solid surface.
- 3. Install this inverter at eye level in order to allow the LCD display to be read at all times.
- 4. For proper air circulation to dissipate heat, allow a clearance of approx. 200 mm to the side and approx. 300 mm above and below the unit.
- 5. The ambient temperature should be between 0c and 55 $^{\circ}$ C to ensure optimal operation.
- 6. The recommended installation position is to be adhered to the wall vertically.
- 7. Be sure to keep other objects and surfaces as shown in the diagram to guarantee sufficient heat dissipation and to have enough space for removing wires.





Install the unit by screwing four screws.



Battery Connection

CAUTION: For safety operation and regulation compliance, it's requested to install a separate DC over-current protector or disconnect device between battery and inverter. It may not be requested to have a disconnect device in some applications, however, it is still requested to have over-current protection installed. Please refer to typical amperage in below table as required fuse or breaker size.

WARNING! All wiring must be performed by a qualified personnel.

WARNINGI It's very important for system safety and efficient operation to use appropriate cable for battery connection.

To reduce risk of injury, please use the proper recommended cable and terminal size as below.

Ring terminal:

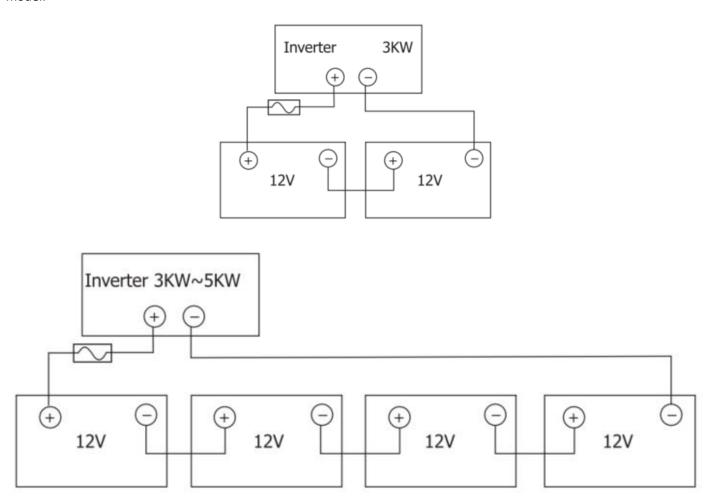


Recommended battery cable and terminal size:

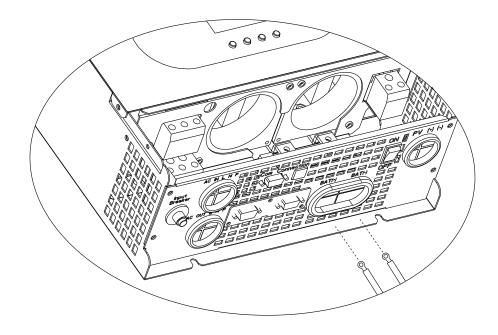
Model	Typical Amperage	Wire Size	Cable mm ²	Ring Terminal		Torque Value
				Dimensions		
				D (mm)	L (mm)	
3kW DC24V	118A	1*2AWG	38	8.4	39.2	
3kW DC48V	71A	1*6AWG	14	8.4	39.2	5Nm
5kW DC48V	118A	1*2AWG	38	8.4	39.2	

Please follow below steps to implement battery connection:

- 1. Assemble battery ring terminal based on recommended battery cable and terminal size.
- **2.** Connect all battery packs as units requires. It's suggested to connect at least 200Ah capacity battery for 3kW~5kW model.



3. Insert the ring terminal of battery cable flatly into battery connector of inverter and make sure the bolts are tightened with torque of 2-3 Nm. Make sure polarity at both the battery and the inverter/charge is correctly connected and ring terminals are tightly screwed to the battery terminals.





WARNING: Shock Hazard

Installation must be performed with care due to high battery voltage in series.



CAUTION!! Do not place anything between the flat part of the inverter terminal and the ring terminal. Otherwise, overheating may occur.

CAUTION!! Do not apply anti-oxidant substance on the terminals before terminals are connected tightly. CAUTION!!Before making the final DC connection or closing DC breaker/dis-connector; be sure positive (+) must be connected to positive (+) and negative (-) must be connected to negative (-).

AC Input/Output Connection

CAUTION!! Before connecting to AC input power source, please install a separate AC breaker between inverter and AC input power source. This will ensure the inverter can be securely disconnected during maintenance and fully protected from over current of AC input. The recommended spec of AC breaker is 32A for 3kW and 50A for 5kW.

CAUTION!! There are two terminal blocks with "IN" and "OUT" markings. Please do not invert input and output connectors.

WARNING! All wiring must be performed by a qualified personnel.

WARNING! It's very important for system safety and efficient operation to use appropriate cable for AC input connection, lb reduce risk of injury, please use the proper recommended cable size as below.

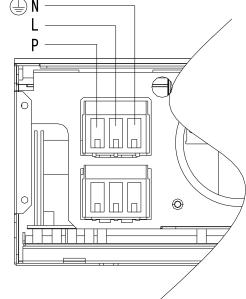
Suggested cable requirement for AC wires

Model	Gauge	Torque Value
3KW DC24V	12 AWG	1.2~ 1.6Nm
3KW DC48V	12 AWG	1.4~ 1.6Nm
5KW DC48V	10 AWG	1.4~ 1.6Nm

Please follow below steps to implement AC input/output connection:

- 1. Before making AC input/output connection, be sure to open DC protector or dis-connector first.
- 2. Remove insulation sleeve 10mm for six conductors. And shorten phase L and neutral conductor N 3mm.
- 3. Insert AC input wires according to polarities indicated on terminal block and tighten the terminal screws. Be sure to connect PE protective conductor @) first.
 - 4. PE→Ground (Yellow -Green)
 - 5. L→Line (brown or black)
 - 6. N→Neutral (blue)







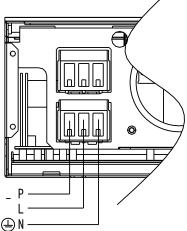
WARNING:

Be sure to that AC power source is disconnected before attempting to hard-wire it to the unit.

4. Then, insert AC output wires according to polarities indicated on terminal block and tighten terminal screws. Be sure to connect PE protective conductor @)first.



PE→Ground (Yellow -Green) L→Line (brown or black) N→Neutral (blue)



5. Make sure the wires are securely connected.

CAUTION: Important

Be sure to connect AC wires with correct polarity. If L and N wires are connected reversely, it may cause utility short-circuited when these inverters are worked in parallel operation.

CAUTION: Appliances such as air conditioner are required at least 2~3 minutes to restart because it is required to have enough time to balance refrigerant gas inside of circuits. If a power shortage occurs and recovers in a short time, it will cause damage to your connected appliances. To prevent this kind of damage, please check manufacturer of air conditioner if it is equipped with time-delay function before installation. Otherwise, this inverter/charger will trig overload fault and cut off output to protect your appliance but sometimes it still causes internal damage to the air conditioner.

PV Connection

CAUTION: Before connecting to PV modules, please install separately a DC circuit breaker between inverter and PV modules.

WARNING! All wiring must be performed by a qualified personnel.

WARNING! It's very important for system safety and efficient operation to use appropriate cable for PV module connection.

To reduce risk of injury; please use the proper recommended cable size as below.

Model	Typical Amperage	Cable Size	Torque
3kW	60A	8AWG	2.0-2.4 Nm
5kW	80A	8AWG	2.0-2.4 Nm

PV Module Selection:

When selecting proper PV modules, please be sure to consider below parameters:

- 1. Open circuit Voltage (Voc) of PV modules not exceeds max. PV array open circuit voltage of inverter.
- 2. Open circuit Voltage (Voc) of PV modules should be higher than min. battery voltage.
- 3. Max. Power Voltage (Vmpp) of PV modules should be close to best Vmp of inverter or within Vmp range to get best performance. If one PV module can not meet this requirement, it's necessary to have several PV modules in series

connection. Refer to below table.

Note:* Vmp: panel max power point voltage.

The PV charging efficiency is maximized while PV system voltage is close to Best Vmp.

Maximum PV module numbers in Series: Vmpp of PV module*X pcs = Best Vmp of Inverter or Vmp range

PV module numbers in Parallel: Max. charging current of inverter/Impp

Total PV module numbers=maximum PV module numbers in series*PV module numbers in parallel.

Solar Charging Mode				
INVERTER MODEL	3KW DC24V	3KW DC48V	5KW DC48V	
Rated Power	3000W	3000W	5000W	
MPPT charger				
solar charging current	60A	80A 80A		
Max.PV Array Power	1500W	5500W		
Max. PV Array Open Circuit Voltage	145Vdc	450Vdc		
PV Array MPPT Voltage Range	30~115Vdc	115Vdc 120~430Vdc		
Min. battery voltage for PV charge	30Vdc	30Vdc 120Vdc		
AC INPUT charger				
AC charging current	60A	60A 80A 80A		
Operating Voltage Range		90~280Vac		

PV module configuration

Recommended module specification

Maximum Power (Pmaxl)	250W
Max. Power Voltage Vmpp(V)	30.9V
Max. Power Current Impp(A)	8.42A
Open Circuit Voltage Voc(V)	37.7V
Short Circuit Current Isc(A)	8.89A

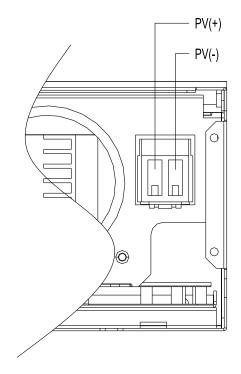
Recommended PV module configuration

Model	Solar Input	Qty of Panels	Total Input Power
3000W DC24V	3 pcs in series and 2 set in parallel	6 pcs	1500W
3000W DC48V	6 pcs in series	6 pcs	1500W
5000W DC48V	8 pcs in series	8 pcs	2000W
	12 pcs in series	12 pcs	3000W
	13 pcs in series	13 pcs	3250W
	8 pcs in series and 2 set in parallel	16 pcs	4000W
	10 pcs in series and 2 set in parallel	20 pcs	5000W

Please follow below steps to implement PV module connection:

- 1. Remove insulation sleeve 10 mm for positive and negative conductors
- 2. Check correct polarity of connection cable from PV modules and PV input connectors. Then, connect positive pole (+) of connection cable to positive pole (+) of PV input connector. Connect negative pole (-) of connection cable to negative pole (-) of PV input connector.

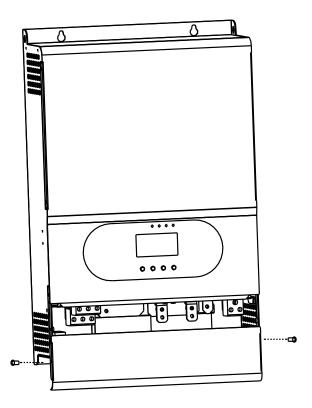




3. Make sure the wires are securely connected.

Final Assembly

After connecting all wires, please put bottom cover back by screwing two screws as shown below.



Communication Connection

Please use supplied communication cable to connect to inverter and PC. Insert bundled CD into a computer and follow on-screen instruction to install the monitoring software. For the detailed software operation, please check user manual of

software inside of CD.

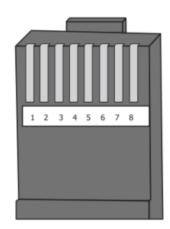
WARNING: It is forbidden to use network cable as the communication cable to directly communicate with the PC port.

Otherwise, the internal components of the controller will be damaged.

WARNING: RJ45 interface is only suitable for the use of the company's supporting products or professional operation.

Below chart show RS45 pins definition.

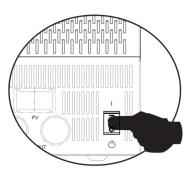
The chart show no is pins demination.		
Pin	Definition	
1	RS-485-B	
2	RS-485-A	
3	GND	
4		
5	CANL	
6	CANH	
7		
8		



OPERATION

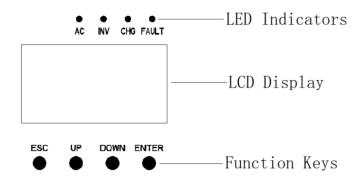
Power ON/OFF

When the inverter works in AC mode, output is powered on or off by the button. If powering the inverter to battery mode, must first switch on the button.



Operation and Display Panel

The operation and display panel, shown in below chart, is on the front panel of the inverter. It includes three indicators, four function keys and a LCD display, indicating the operating status and input/output power information.



LED Indicator

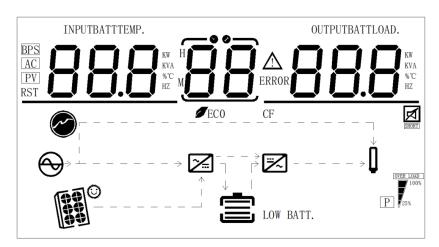
LED Indicator			Messages
		On	AC input is normal and working in AC Mode
AC	Green	Flash	AC input is normal, but not working in AC Mode
		Off	AC input is abnormal.
INIX	Yellow	On	Working in Battery Mode
INV	reliow	Off	Not working in Battery Mode

		On	Battery is in float charge.
BAT	Yellow	Flash	Battery is in constant voltage charge.
		Off	Not in charge
		On	Fault occurs.
FAULT	Red	Flash	Warning occurs.
		Off	No fault or alarm

Function keys

Function Keys	Description
ESC	Return to previous level.
UP	Increase the setting value.
DOWN	Decrease the setting value.
ENTER	Enter setting mode and confirm the selection in setting mode go to next

LCD Display ICONS



Icon	Function Description
Input Source Information	n and Output Information
\sim	Indicates the AC information
	Indicates the DC information
88.8	Indicate input voltage, input frequency, PV voltage, battery voltage and charger current. Indicate output voltage, output frequency, load in VA, load in Watt and
	discharging current.
Configuration Program a	nd Fault Information
<u>88</u>	Indicates the setting programs
A CARPOR	Indicates the warning and fault codes. Warning: flashing with warning code. Fault: lighting with fault code.
Battery Information	

_	Indicate battery leve	el by 0-24%. 25%-4	.9%, 50-74% and 75-1009	% in battery mode
	and charging status in line mode			
In AC mode, it will present ba	ttery charging status			
Status	Battery voltage		LCD Display	
Constant Current	<2V/cell		4 bars will flash in turns	
mode/Constant Voltage mode	2V/cell~2.083V/cell		Bottom bar will be on a	nd the other three
			bars will flash in turns.	
	2.083v/cell~2.167v/	cell	Bottom two bars will be two bars will flash in tur	
	>2.167V/cell		Bottom three bars will bar will flash.	pe on and the top
Batteries are fully charged.			4 bars will be on.	
In battery mode, it will prese	ent battery capacity	1		
Load Percentage	Battery Voltage		LCD Display	
Load >50%	<1.717V/cell			
	1.717V/cell~1.8V/c	ell		
	1.8V/cell~1.883V/cell			
	>1.883 V/cell			
50%> Load>20%	<1.817V/cell			
	1.817V/cell~1.9V/cell			
	1.9 V/cell ~1.983V/			
	>1.983 V/cell			
Load<20%	<1.867V/cell			
	1.867V/cell~i.95V/cell			
	1.95V/cell~2.033V/cell			
	>2.033 V/cell			
Load Information	1	I		
OVER LOAD	Indicates overload.			
100%	Indicates the load level by 0-24%, 25-49%, 50-74% and 75-10			0%.
	0%~24%	25%~49%	50%~74%	75%~100%
P 725%	P 725%	7 100% P 25%	P \(\frac{100\%}{25\%} \)	P V25%
Mode Operation Information	1 1/ 25/0	1 // 20/0	1 // 20.0	1 9 20%
ivioue Operation information				

Θ	Indicates unit connects to the mains.
	Indicates unit connects to the PV panel.
	Indicates load is supplied by utility power.
<u>~</u>	Indicates the solar charger circuit is working.
\blacksquare	Indicates the DC/AC inverter circuit is working.
Mute Operation	
	Indicates unit alarm is disabled.

LCD Setting

After pressing and holding "ENTER" button for 2 seconds, the unit will enter setting mode. Press "UP" or "DOWN" button to select setting programs. And then, press "ENTER" or "ESC" button to confirm the selection and exit.

Setting Programs:

Program	Description	Select-able option			
01	Output voltage NOTE: When the output voltage is set		208	220V	550°
	to 208V, the output needs to be derated to 90%.	230V (default)	230°		540·
02	Output frequency	50Hz (default)	50 _{Hz}	OPF 02	5 0 Hz
03	priority: To configure load power source as first priority. Solar and batte power to the lo		Utility will provide po as first priority. Solar and battery en power to the loads of power is not available	ergy will provide only when utility	
	OPP OŠ	ρυ	Solar energy provide loads as first priority If solar energy is not power all connected energy will supply po at the same time.	sufficient to loads, Utility	
		OPP OŠ	P65	Solar energy provide loads as first priority If solar energy is not power all connected energy will supply poat the same time.	sufficient to loads, battery

					only when either low	battery vo level warr	er to the loads oltage drops to ning voltage or program 15.
04	AC input voltage	uOd	ΩŸ	999	oltage rar 90-280VAC	nge will be	le AC input within
		uDd	ΩŮ	UP5	If selected voltage ran	nge will be	le AC input within
05	Charger source priority :To configure charger source priority	[XP	OŠ	ס ביי	Solar energ battery at		ity will charge time.
		[XP	OŠ	(1) (1)			the only charger lity is available or
		[HP	ØŠ	다	priority.	gy charge	ttery as first battery only when e.
		[HP	ØŠ	70	first priorit	charge ba	rge battery as ttery only when vailable.
06	Maximum utility charging current 3/5KVA:1-60A	RCC	OŠ	50 ·	smaller that the inverte	an that in per will appl	e in program 07 is program in 06, ly charging m 07 for utility
07	Maximum charging current: To configure total charging current for solar and utility chargers	n[[ר [®] ם		current. 3KW 24VD 2/10/20/3 80/90/100 3KW 48VD	urrent + sc OC: 0/40/50/6 0/110/120/ OC/ 5KW 48	olar charging 0/70/
08	Auto return to default display screen		witch display tically return en (Input vol	screen, it			display screen een user finally
		ndF	Ø8		ndF	Ø8	OFF
09	Auto restart when overload occurs	Restart disa			Restart en	able	
		175	09	OFF	L ₂ - 5	ß	

	Auto restart when	Dostant disable (default)	Doctout analys
10	Auto restart when over temperature occurs	Restart disable (default)	Restart enable
11	Beeps while primary source is interrupted	Alarm on (default)	Alarm off Alarm off Alarm off Alarm off
12	Low power power saving	Power Saving OFF (default)	Power Saving ON Pus 2 III
13	Overload bypass: When enabled, the unit will transfer to line mode if overload occurs in battery mode.	Bypass disable (default)	Bypass enable
14	Buzzer mute setting	Buzzer on (default)	Buzzer off
15	Low DC cut-off voltage: If battery power is only power source available, inverter will shut down. If PV energy and battery power are available, inverter will charge battery without AC output. If PV energy, battery power and utility are all available, inverter will transfer to line mode and provide output power to loads.	When the battery definition mode is Cosetting point in program 17. 3KW 24VDC Default setting: 23.0V Set Range: 22-26V When the battery definition mode is A (water injection battery type) mode:the setting: 23.0V Set Range: 22-26V When the battery definition mode is Usetting point in program 17. 3KW 24VDC Default setting: 23.8V Set Range: 20-25V Set Range: 20-25V	3KW 48VDC/5KW 48VDC Default setting: 46.0V Set Range: 44-52V GM (lead-acid battery type), FLD te setting point in program 17. 3KW 48VDC/5KW 48VDC Default setting: 46.0V Set Range: 44-52V
16	Setting voltage point back to battery	When the battery definition mode is C setting point in program 17.	US (customer set type) mode: the
	mode when selecting "OPP" (OPP " priority) in program 03.	3KW 24VDC Default setting : 26.0V Set Range : 24-29V	3KW 48VDC/5KW 48VDC Default setting : 54.0V Set Range : 48-58V

		When the battery definition mode is AG	
		(water injection battery type) mode:the 3KW 24VDC Default setting: 26.0V Set Range: 24-29V	3KW 48VDC/5KW 48VDC Default setting: 52.0V Set Range: 48-58V
		6 26.0°	62.0°
		When the battery definition mode is LIB setting point in program 17.	(lithium battery type) mode: the
		3KW 24VDC default setting : 27.2V Set Range : 23-29V	3KW 48VDC/5KW 48VDC Default setting : 54.4V Set Range : 46-58V
		65 P. 18 19 19 19 19 19 19 19 19 19 19 19 19 19	66 544°
17	Battery Type	Lead-acid batteries (default): "AGM"	Water-filled battery : "FLD"
		686 13 85A	bAt in CUS
		Lithium battery: "LIB"	Customer Setup Type : "CUS"
		BAE in Lib	BAE in EUS
18	Battery low voltage	When the battery definition mode is CU setting point in program 17.	S (customer set type) mode: the
	alarm point	3KW 24VDC Default setting : 22.0V Set Range : 21-27V	3KW48VDC/5KW48VDC Default setting : 44.0V Set Range : 42-54V
		P8F 18 550.	BAL ® YYD
		When the battery definition mode is LIB setting point in program 17.	(lithium battery type) mode: the
		3KW 24VDC Default setting : 23.8V Set Range : 20.6-25V	3KW48VDC/5KW48VDC Default setting : 47.6V Set Range : 41.2-50V
		P8F 18 532	68L 18 47.5°
19	Battery low voltage	When the battery definition mode is CU setting point in program 17.	S (customer set type) mode: the
	shutdown point	3KW 24VDC Default setting : 21.0V Set Range : 20-24V	3KW 48VDC/5KW 48VDC Default setting : 42.0V Set Range : 40-48V
		P80 13 5 10.	68U (§ 420)
		When the battery definition mode is LIB setting point in program 17.	(lithium battery type) mode: the
		3KW 24VDC Default setting : 23.0V Set Range : 20-24V	3KW 48VDC/5KW 48VDC Default setting : 46.0V Set Range : 40-48V
		68U 18 230	680 iš 460

20	Battery Constant	When the battery definition mode is CUS (o setting point in program 17.	customer set type) mode: the
	Voltage	3KW 24VDC Default setting : 28.2V Set Range : 28-29V	3KW48VDC/5KW48VDC Default setting : 56.4V Set Range : 48-60V
		P[n Sp 585	65 30 584
		When the battery definition mode is LIB (lift setting point in program 17.	thium battery type) mode: the
		3KW 24VDC Default setting : 28.2V Set Range : 25-29V	3KW48VDC/5KW48VDC Default setting : 56.4V Set Range : 48-56V
		PCn SQ 585.	60 20 554°
21	Floating Charging Voltage	When the battery definition mode is CUS (o setting point in program 17.	customer set type) mode: the
		3KW24VDC Default setting : 27.6V Set Range : 26.6-27.8V	3KW48VDC/5KW48VDC Default setting : 54.0V Set Range : 48-60V
		6FL 2°: 276	bfl zºi 540°
		When the battery definition mode is LIB (lit setting point in program 17.	hium battery type) mode: the
		2KW24VDC/3KW24VDC Default setting : 27.6V Set Range : 24-28V	3KW48VDC/5KW48VDC Default setting : 55.2V Set Range : 50-58V
		6FL 2°1 276	6FL 2°1 552
22	Line Low Voltage	The setting point in program 04 APP mode default setting: 154V Set Range: 90-154V	The setting point in program 04 UPS mode default setting: 185V Set Range: 170-200V
		FF 55 124	U j5
23	Line High Voltage	The setting point in program 04 APP mode default setting :264V Set Range : 264-280V	UPS mode default setting : 264V Fixed value, cannot be changed.
		<u> </u>	
24	Low Watt Discharge	Set Range : 1-8 Hours	In battery mode, after the continuous discharge time
		When the battery voltage exceeds 13.2V (single cell voltage) for more than 30s, this	exceeds this set value, the battery voltage shutdown point
		discharge time will be reset.	will be modified to 11V (single cell voltage) before reaching the
		rng 54 8	battery shutdown point. Alarm for 1 minute and then shut down.
25	Soft Relay Enable	OFF(default) When set to OFF, the output switch will not be closed until the inverter voltage	ON When set to ON, the inverter output gradually increases from
		rises to the rated output.	0 to the target voltage value.
		576 25 UFF	SHE 25 ON
26	Set Default (Reset all settings to default	Before setting, this interface is displayed system will restore the default settings. A	

values)	interface will display OFF again.
	Setting conditions: It can be set in mains mode and standby (standby: no output but bright screen state). It cannot be set in battery mode.
	Std 26 OFF

Fault Reference Code

Fault: The inverter enters the fault mode, the LED red light is always on, and the LCD displays the fault code.

The alarm code ALA flashes and the buzzer beeps for Is and stops for 1 minute. The fault indicator code is always on, the buzzer stops after IOS long beeping, the fault is eliminated after the stop, try to restart the machine, if it fails to restart three times, it will continue in the fault state. A complete power off (screen off) is required before the machine can be restarted.

Fault Code	Fault Cause	LCD Indication	
1	Bus soft start failed	RLR	1
2	Bus high	RLR	2
3	Bus low	RLR	3
5	Inverter transformer over temperature	ALA	5
6	Battery voltage is too high	RLR	Б
7	Bus soft failed	RLR.	7
8	Bus short Fault	RLR	8
9	INV short Fault	RLR	9
10	INV over voltage	ALA	10
11	INV under voltage	RLR	11
12	INV short	ALA	15
13	Negative power	RLR	13
14	Over load fault	ALA	14
15	Model fault	ALA	/ 5
16	No boot loader	RLR	15

Warning Indicator

(Warning) Alarm: The inverter does not enter the fault mode, the red LED flashes, and the LCD displays the alarm code.

Warning Code	Warning Event	Icon Flashing
50	Battery terminal	RLR SO
51	Battery under	RLR 5:
52	Battery low	ALA 52
53	Battery charge short	RLR 53
55	Battery over charge	ALA SS
57	Over temperature	ALA 57
58	Fan fault	ALA 58
59	EEPROM Fault	RLR SS
60	Over load warning	RLR 60
62	PV energy weak	RLR 62

Operating Mode Description

Operating Mode	Description	LCD display
Standby mode/ Power saving	No output is supplied by the unit,	Charged by utility and PV energy.
mode	but it still can charge batteries.	
Note:		
Standby mode: The inverter is		////
not turned on, but at this time,		CHARGING
the inverter can charge battery		
without AC output.		Charged by utility.
Power saving mode: If enabled,		
the output of inverter will be		<u>-</u>
off when connected load is		
pretty low or not detected.		CHARGING
		Charged by PV energy.
		 ,
		CHARGING
Fault mode	PV energy and grid can charge	Charged by utility and PV energy.
Note:	batteries.	

Fault mode: Errors are caused by inside circuit error or external reasons such as over temperature, output short circuited and so on. Charged by utility. Charged by PV energy. No charging. Line Mode The unit will provide output power Charged by utility and PV energy. from the mains. It will also charge BYPASS the battery at line mode. Charged by utility. If "solar first" is selected as output source priority and solar energy is not sufficient to provide the load, solar energy and the utility will provide the loads and charge the battery at the same time. If "solar first" is selected as output source priority and batteries are not connected, solar energy and the utility will provide the loads. Power from utility.

		EYPASS 100% 25%
Battery Mode	The unit will provide output power	Power from battery and PV energy.
	from battery and PV power.	CHARGING 25%
		PV energy will supply power to the loads and
		charge battery at the same time.
		100% CHARGING 25%
		Power from battery only.
		25%
		Power from PV energy only.
		25%

Display Setting

The LCD display information will be switched in turns by pressing "UP" or "DOWN" key. The selectable information is switched as below order: battery voltage, battery current, inverter voltage, inverter current, grid voltage, grid current, load in Watt, load in VA, grid frequency, inverter frequency; PV voltage, PV charging power; PV charging output voltage, PV charging current.

Selectable information	LCD display	
Battery voltage/DC discharging current	52.0 v	480.
Inverter output voltage/Inverter output current	229·	A A
Grid voltage/Grid current	229·	GRID A
Load in Watt	KW	LOAD VA
Grid frequency/1nverter frequency	INPUT Hz	SOO HZ

PV voltage and power	120	2.00 kw	
PV charger output voltage and PV charging current	5 (0)	OUTPUT A	

SPECIFICATIONS

Table 1 Line Mode Specifications

INVERTER MODEL	3kW/5kW	
Input Voltage Waveform	Sinusoidal (utility or generator)	
Nominal Input Voltage	230Vac	
Low Loss Voltage	90Vac±7V(APP);	
	170Vac±7V(UPS)	
Low Loss Return Voltage	100Vac±7V(APP);	
	180Vac±7V(UPS)	
High Loss Voltage	280Vac±7V(UPS,APP)	
High Loss Return Voltage	270Vac±7V(UPS,APP)	
Max AC Input Voltage	300Vac	
Nominal Input Frequency	50Hz/60Hz(Auto detection)	
Low Loss Frequency	40Hz±1Hz(UPS/APP),50Hz;	
	50Hz±l Hz(UPS,APP),60Hz;	
Low Loss Return Frequency	43.5Hz±1Hz(UPS),40.5Hz±1Hz(APP),50Hz;	
	53.5Hz±1Hz(UPS, 50.5Hz± 1 Hz(APP),60Hz;	
High Loss Frequency	60Hz±1Hz(UPS),70HZ±1Hz(APP),50HZ;	
	70Hz±1Hz(UPS),70HZ±1Hz(APP) _z 60HZ;	
High Loss Return Frequency	56.5Hz±1Hz(UPS),69.5Hz±1Hz(APP),50HZ;	
	66.5Hz±1Hz(UPS),69.5Hz±1Hz(APP),60Hz;	
Output Short Circuit Protection	Line mode: Circuit Breaker	
	Battery mode: Electronic Circuits	
Transfer Time	10ms typical (UPS,APP)	
Output power derating:	230Vac model:	
When AC input voltage drops to 95V or 170V	Output Power	
depending on models, the output power will be	Output Power	
derated.		
	Rated Power	
	50%	
	Power	
	90V 170V 280V	

Table 2 Inverter Mode Specifications

INVERTER MODEL	3KW DC24V	3KW DC48V	5KW DC48V
Rated Output Power	3000W	3000W	5000W
Output Voltage Waveform		Pure Sine Wave	
Output Voltage Regulation		230Vac±5%	
Output Frequency		60Hz or 50Hz	
Peak Efficiency	>93%		
Overload Protection	60S@102%~110% load; 10S@110%~130% load; 3s@130%~150 load; 200ms@>150% load;		
Surge Capacity	2 x rated power for 5 seconds		
Nominal DC Input Voltage	24Vdc	48Vdc	48Vdc
Cold Start Voltage	23.0Vdc	46.0Vdc	46.0Vdc
Low DC Warning Voltage	22.0Vdc	44.0Vdc	44.0Vdc
Low DC Cut-off Voltage	21.0Vdc 42.0Vdc 42.0Vdc		42.0Vdc
High DC Recovery Voltage	27Vdc	58Vdc	58Vdc
High DC Cut-off Voltage	32Vdc	61VdC	61VdC

Table 3 Charge Mode Specifications

INVERTER MODEL		3KW DC24V	3KW DC48V	5KW DC48V
Charging Curr	ent @ Nominal Input Voltage	1~120A	1~80A	1~80A
Absorption	AGM / FLD/LIB/CUS Battery	25Vdc	50Vdc	50Vdc
Voltage	Flooded battery	25Vdc	50Vdc	50Vdc
Floating	AGM / FLD/LIB/CUS Battery	27.4Vdc	54.8Vdc	54.8Vdc
charging	Flooded battery			
voltage		27.4Vdc	54.8Vdc	54.8Vdc
Bulk	AGM / FLD/LIB/CUS Battery	28.8Vdc	57.6Vdc	57.6Vdc
charging	AGM / FLD/LIB/CUS Battery			
voltage (C.V		28.4Vdc	56.8Vdc	56.8Vdc
voltage)				
Charging Algo	rithm	17-Step(E	attery Type , AGM/FLD/U	B/CUS Battery)
Solar Chargin	g Mode			
INVERTER MC	DDEL	3KW DC24V	3KW DC48V	5KW DC48V
Rated Power		3000W	3000W	5000W
MPPT charge	r			
solar charging	g current	60A	80A	80A
Max.PV Array	Open Circuit Voltage	145Vdc max	450Vdc max	450Vdc max
PV Array MPP	T Voltage Range	30~115Vdc	120~430Vdc	120~430Vdc
Min battery v	oltage for PV charge	30Vdc	120Vdc	120Vdc
Standby Powe	er Consumption		2W	
Line mode ch	arger			
charging curre	ent	60A	60A	60A
Line Voltage Range		90~280VAC(APP mode); 170~280VAC(UPS mode)		
Battery Voltage Accuracy		+/-0.3%		
Voltage Accuracy			+/-2V	

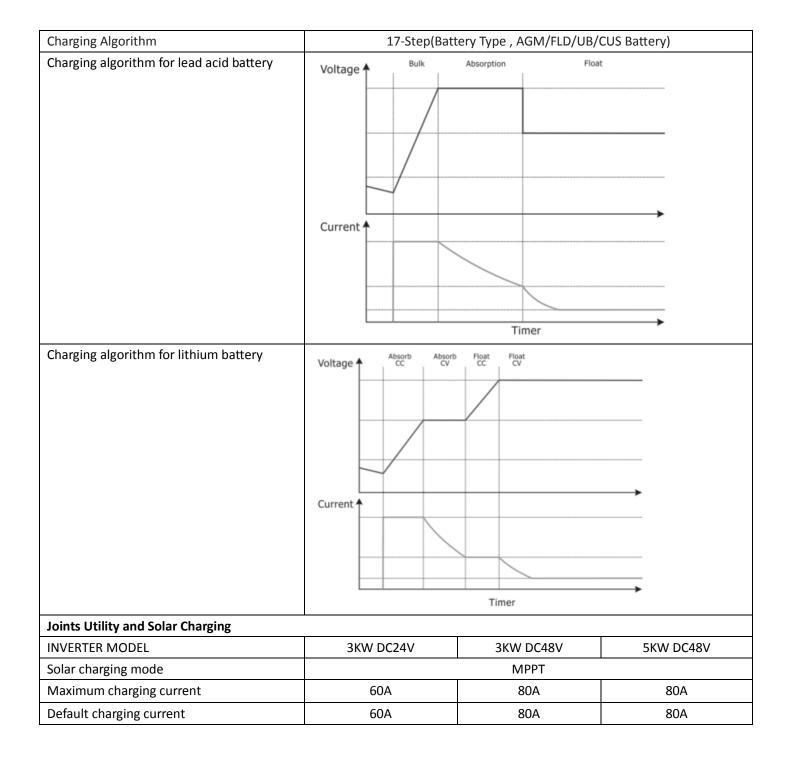


Table 4 General Specifications

INVERTER MODEL	3KW DC24V	3KW DC48V	5KW DC48V
Safety Certification	CE		
Operating Temperature Range	-10°C to 50°C		
Storage temperature	-15°C~ 60°C		
Dimension (D*W*H) mm	155x335x507		
Net Weight (kg)	7.0	8.5	9.0

Trouble shooting

Problem	LCD/LED/Buzzer	Explanation / Possible cause	What to do
Unit shuts down	LCD/LEDs and buzzer will	The battery voltage is too low (<	1. Re-charge battery.
automatically during startup process.	be active for 3 seconds and then complete off.	1.91V/Cell)	2. Replace battery.
No response after powering on.	No indication	 The battery voltage is far too low (<1.4V/Cell) Battery polarity is connected reversed. Input protector is tripped 	 Check if batteries the wiring are connected and well. Re-charge battery. Replace battery.
Mains exist but the unit works in battery mode.	Input voltage is displayed as 0 on the LCD and green LED is flashing.	Input protector is tripped	Check if AC breaker is tripped and AC wiring is connected well.
	Green LED is flashing.	Insufficient quality of AC power (Shore or Generator)	1. Check if AC wires are too thin and/or too long.
		(Shore of Generator)	2. Check if generator (if applied) is working well or if input voltage range setting is correct. (Applia nee=> wide)
When the unit is turned on, internal relay is switched on and off repeatedly.	LCD display and LEDs are flashing	Battery is disconnected.	Check if battery wires are connected well.
Buzzer beeps continuously and red LED is on.	Fault code 14	Overload error. The inverter is overload 110% and time is up.	Reduce the connected load by switching off some equipment.
	Fault code 12	Output short circuited.	Check if wiring is connected well and remove abnormal load.
	Fault code 5	Internal temperature of inverter component is over 90 $^{\circ}$ C.	Check whether the air flow of the unit is blocked or whether the ambient temperature is too high.
	Fault code 6	Battery is over-charged.	Return to repair center.
		The battery voltage is too high.	Check if spec and quantity of batteries are meet requirements.
	Fault code 10/11	Output abnormal (Inverter voltage below than 202Vac or is higher than 253Vac)	 Reduce the connected load. Return to repair center
	Fault code 1/7/8/9/15/16	Internal components filed.	Return to repair center
	Fault code 51	Over current or surge	Restart the unit, if the error
	Fault code 2/3	Bus voltage is too high/too low	happens again, please return to repair center.
	Fault code 15	Model fault	. ctain to repair center.
Buzzer beeps and red LED	Fault code 58	Fan fault	Fan fault
is flashing.	Fault code 50/51/52	Battery is not connected well or fuse is burnt.	If the battery is connected well, please return to repair center.

Appendix: Approximate Back-up Time Table

Model	Load(W)	Backup Time@24Vdc 100Ah(min)	Backup Time@24Vdc 200Ah(min)
3KW	300	449	1100
	600	222	525
	900	124	303
	1200	95	227
	1500	68	164
	1800	56	126
	2100	48	108
	2400	35	94
	2700	31	74
	3000	28	67

Model	Load(W)	Backup Time@48Vdc 100Ah(min)	Backup Time@48Vdc 200Ah(min)
3KW	300	1054	2107
	600	491	1054
	900	291	668
	1200	196	497
	1500	159	402
	1800	123	301
	2100	105	253
	2400	91	219
	2700	71	174
	3000	63	155
5KW	500	613	1288
	1000	268	613
	1500	158	402
	2000	111	271
	2500	90	215
	3000	76	182
	3500	65	141
	4000	50	112
	4500	44	100
	5000	40	90

Note: Backup time depends on the quality of the battery; age of battery and type of battery. Specifications of batteries may vary depending on different manufacturers.

Product are subject to change without notice.