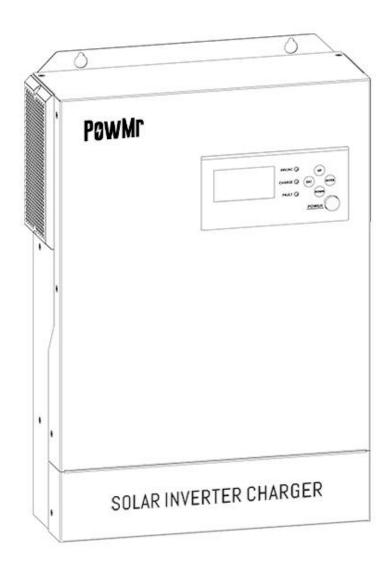
Product Model POW-HVM5.5K-48V-N



POWMC

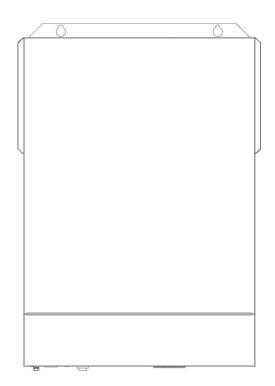
SOLAR INVERTER CHARGER
User Manual

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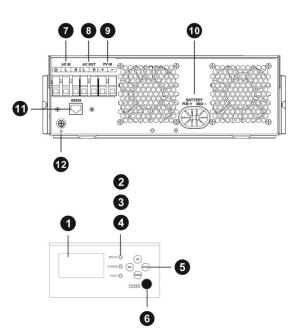
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PRODUCT OVERVIEW





- 1. LCD display
- 2. Status indicator
- 3. Charging indicator
- 4. Fault indicator
- 5. Function buttons
- 6. Power on/off switch
- 7. AC input
- 8. AC output
- 9. PV input
- 10. Battery input
- 11. RS232 communication port
- 12. Grounding



INSTALLATION

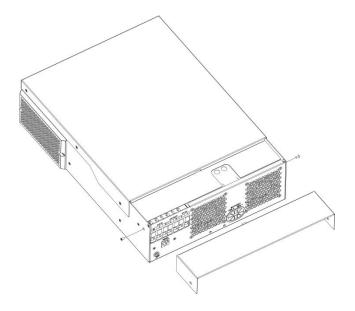
Unpacking and Inspection

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:

- 1. The unit x 1
- 2. User manual x 1

Preparation

Before connecting all wirings, please take off bottom cover by removing two screws as shown below.



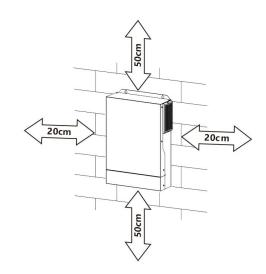
Mounting the Unit

Consider the following points before selecting where to install:

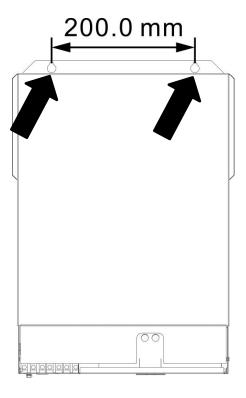
- 1. Do not mount the inverter on flammable construction materials.
- 2. Mount on a solid surface
- 3. Install this inverter at eye level in order to allow the LCD display to be read at all times.
- 4. The ambient temperature should be between 0°C and 55°C to ensure optimal operation.
- 5. The recommended installation position is to be adhered to the wall vertically.
- 6. Be sure to keep other objects and surfaces as shown in the right diagram to guarantee sufficient heat dissipation and to have enough space for removing wires.



SUITABLE FOR MOUNTING ON CONCRETE OR OTHER NON-COMBUSTIBLE SURFACE ONLY.

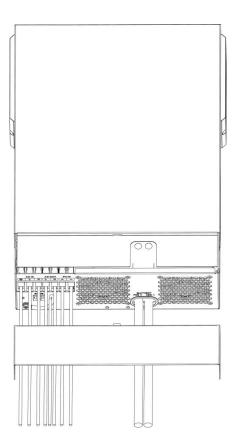


Install the unit by screwing three screws. It's recommended to use M4 or M5 screws.



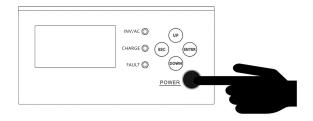
Final Assembly

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



OPERATION

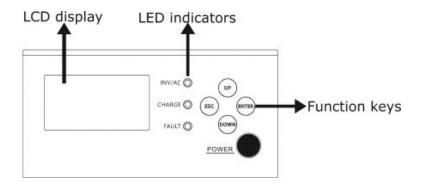
Power ON/OFF



Once the unit has been properly installed and the batteries are connected well, simply press On/Off switch (located on the button of the case) to turn on the unit.

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
INV/AC	Green	Solid On	Output is powered by utility in Line mode.
INV/AC	Green	Flashing	Output is powered by battery or PV in battery mode.
CHARGE	Croon	Solid On	Battery is fully charged.
CHARGE Green Flashing		Flashing	Battery is charging.
FALLE	Solid Or		Fault occurs in the inverter.
FAULT Red FI		Flashing	Warning condition occurs in the inverter.

Function Keys

Function Key	Description
ESC	To exit setting mode
UP	To go to previous selection
DOWN	To go to next selection
ENTER	To confirm the selection in setting mode or enter setting mode

LCD Setting

After pressing and holding ENTER button for 3 seconds, the unit will enter setting mode. Press "UP" or "DOWN" button to select setting programs. And then, press "ENTER" button to confirm the selection or ESC button to exit.

Setting Programs:

Program	Description	Selectable option	
		Solar first	Solar energy provides power to the loads as first priority. If solar energy is not sufficient to power all connected loads, battery energy will supply power the loads at the same time. Utility provides power to the loads only when any one condition happens: - Solar energy is not available - Battery voltage drops to either low-level warning voltage or the
	Output source priority: To configure load power source priority	Utility first (default)	setting point in program 12. Utility will provide power to the loads as first priority. Solar and battery energy will provide power to the loads only when utility power is not available.
01		SBU priority SBU priority	Solar energy provides power to the loads as first priority. If solar energy is not sufficient to power all connected loads, battery energy will supply power to the loads at the same time. Utility provides power to the loads only when battery voltage drops to either low-level warning voltage or the setting point in program 12.
		SUB priority	Solar energy is charged first and then power to the loads. If solar energy is not sufficient to power all connected loads, Utility energy will supply power to the loads at the same time.

	1		1
		10A ^	20A 02
02	Maximum charging current: To configure total charging current for solar and utility chargers.	30A 02 <u>30 ^</u>	40A 02 40^
02	(Max. charging current = utility charging current + solar charging current)	50A 02 <u>50^</u>	60A (default)
	charging current)	70A	80A 02 80^
		Appliances (default)	If selected, acceptable AC input voltage range will be within 90-280VAC.
		UPS UPS	If selected, acceptable AC input voltage range will be within 170-280VAC.
03	AC input voltage range	Generator	If selected, acceptable AC input voltage range will be within 170-280VAC and compatible with generators.
			Note: Because generators are unstable, maybe the output of inverter will be unstable too.
04	Power saving mode	Saving mode disable (default)	If disabled, no matter connected load is low or high, the on/off status of inverter output will not be effected.
	enable/disable	Saving mode enable	If enabled, the output of inverter will be off when connected load is pretty low or not detected.
		AGM (default)	Flooded FLd
05	Battery type	User-Defined USE	If "User-Defined" is selected, battery charge voltage and low DC cut-off voltage can be set up in program 26, 27 and 29.
06	Auto restart when overload occurs	Restart disable (default)	Restart enable
07	Auto restart when over temperature occurs	Restart disable (default)	Restart enable

08	Output voltage	220V 0 <u>8</u> 220°	230V (default) 08 230°
	output voltage	240V 08 240°	
09	Output frequency	50Hz (default)	60Hz 0960 _{Hz}
10	Auto bypass When selecting "auto", if the mains power is normal, it will automatically bypass, even if the switch is off.	manual(default)	auto
		^{2A}	10A
		20A 	30A (default)
11	Maximum utility charging current	40A <u>40A</u> <u> </u>	50A <u>50R</u>
		60A 	
		max setting value must b	0V to 57.2V for 48v model, but The pe less than the value of program13.
	Setting voltage point back to utility source when selecting "SBU priority" or "Solar first" in program 01.	44V 	45V
		46V (default) ☐ ☐ ☐ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	47V
12		48V 	49V
		50V	51V
		52V	53V
		54V 	55V

		Available options in 24V models: Setting range is from 22.0V to 28.6V for 24v model, but The		
			e less than the value of program13. 23V (default) 24 V	
			12 230 V Geradity 24 V	
		25 V	26V 27 V 27 V 27 V 27 V	
			nodels: to full (the value of program26- g value must be more than the value	
		Battery fully charged (default)	48V BATT V	
		49V	50V	
	Setting voltage point back	51V BATT V	52V BATT V	
13	to battery mode when	53V BATT V	54V BATT V O O O O O O O O O O O O	
		55V BATT V	56V BATT V	
		57V	58V	
		59V	60V BATT V	
		61V BATT V	62V BATT V	

			24V 24V BATT 26V BATT 28V BATT BATT V
16	Charger source priority: To configure charger source priority	Solar first Utility first Solar and Utility (default) Only Solar If this inverter/charger is saving mode, only solar en	working in Line, Standby or Fault be programmed as below: Solar energy will charge battery as first priority. Utility will charge battery only when solar energy is not available. Utility will charge battery as first priority. Solar energy will charge battery only when utility power is not available. Solar energy and utility will charge battery at the same time. Solar energy will be the only charger source no matter utility is available or not. working in Battery mode or Power nergy can charge battery. Solar if it's available and sufficient.

		M 1 - 1			
		Mode1	18	nd l	Buzzer mute
		Mode2	18	nd2	The buzzer sounds when the input source changes or there is a specific warning or fault
18	Buzzer mode	Mode3	IB Ø	nd3	The buzzer sounds when there is a specific warning or fault
		Mode4(defau	ılt)	nd4	The buzzer sounds when there is a fault
19	Auto return to default display screen	Return to de screen (defa	ult)	play	If selected, no matter how users switch display screen, it will automatically return to default display screen (Input voltage /output voltage) after no button is pressed for 1 minute.
		Stay at lates	t screen		If selected, the display screen will stay at latest screen user finally switches.
20	Backlight control	Backlight on	Backlight on (default)		Backlight off
23	Overload bypass: When enabled, the unit will transfer to line mode if overload occurs in battery mode.	Bypass disab	ole (defa	ult) -	Bypass enable Bypass enable
25	Modbus ID Setting	Modbus ID Setting Range: 001(default)~247			(default)~247
26	Bulk charging voltage (C.V voltage)	48V models default setting: 56.4V 24V models default setting: 28.2V BATT 24V models default setting: 28.2V If self-defined is selected in program 5, this program can be set up. Setting range is from 24.0V to 31.0V for 24v model and			
			al the va	ue of progra	ut the setting value must be more am27. Increment of each click is
27	Floating charging voltage	FLL	_ 5°		<u> </u>

		24V models default setting: 27.0	I	
		_ L [n 5] 5∭	v	
		If self-defined is selected in progup. Setting range is from 24.0V t model and 48.0V to the value of Increment of each click is 0.1V.	o the value of program 26 for 24v	
		48V models default setting: 42.0	V	
			<u>D*</u>	
		24V models default setting: 21.0	ı	
29	Low DC cut-off voltage	5 <u>8</u> 5∭	v	
		Setting range is from 20.0V to 27 54.0V for 48v model. The setting of program12. Increment of each	ram 5, this program can be set up. 7.0V for 24v model and 40.0V to value must be less than the value of click is 0.1V.Low DC cut-off voltage matter what percentage of load is	
		Automatically (Default):	If selected, inverter will judge this charging time automatically.	
32	Bulk charging time (C.V stage)	5 min 32 5 900 min 32 900	The setting range is from 5 min to 900 min. Increment of each click is 5 min.	
		If "USE" is selected in program 05	this program can be set up	
33	Battery equalization	Battery equalization If "Flooded" or "User-Defined" is	Battery equalization disable (default)	
		program can be set up.		
		48V models default setting is 58.4V. Setting range is from 48V ~ 64V. Increment of each click is 0.1V.		
34	Battery equalization voltage	24V models default setting is 29.2V. Setting range is from 24V 32V. Increment of each click is 0.1V.		
			-	

35	Battery equalized	60min (default)	Setting range is from 5min to 900min. Increment of each	
	time		click is 5min.	
	Battery equalized	120min (default)	Setting range is from 5min to	
36	timeout	3 <u>6</u> 150	900 min. Increment of each click is 5 min.	
		30days (default)	Setting range is from 0 to 90 days.	
37	Equalization interval	33 384	Increment of each click	
		<u> </u>	is 1 day	
		Enable	Disable (default)	
		3 <u>9 AEN</u>	3 <u>9 AdS</u>	
	Equalization activated		l in program 33, this program can be this program, it's to activate battery	
39 immediately		equalization immediately and LCD main page will shows " = ". If		
		"Disable" is selected, it will cancel equalization function until next activated equalization time arrives based on program 37 setting. At		
		this time, "[]" will	is based on program 37 setting. At	
		not be shown in LCD main page.		

Fault Reference Code

Fault Code	Fault Event	Icon on
01	Over temperature of inverter module	
02	Over temperature of DC/DC module	
03	Battery voltage is too high	
04	Over temperature of PV module	
05	Output short circuited.	
06	Output voltage is too high.	
07	Overload time out	
08	Bus voltage is too high	
09	Bus soft start failed	
10	PV over current	
11	PV over voltage	
12	DC/DC over current	
13	Over current or surge	
14	Bus voltage is too low	
15	Inverter failed (Self-checking)	
16	Over DC voltage in AC output	
17	Reserved	
18	Op current offset is too high	
19	Inverter current offset is too high	
20	DC/DC current offset is too high	
21	PV current offset is too high	
22	Output voltage is too low	
23	Inverter negative power	

Warning Indicator

Warning Code	Warning Event	Audible Alarm	Icon flashing
02	Temperature is too High	Beep three times every second	<u>~</u> 50
04	Low battery	Beep once every second	
07	Overload	Beep once every 0.5 second	OVER LOAD 25%
10	Output power derating	Beep twice every 3 seconds	[10]^
15	PV energy is low	Beep twice every 3 seconds	[15]4
19	Lithium Battery communication is failed	Beep once every 0.5 second	
20	Battery low and it isn't up to the setting value of program 13	Beep twice every 3 seconds	<u>20</u> 4
E 9	Battery equalization	None	[E9]A
5P	Battery is not connected	None	[6P_A

Setting for lithium battery without communication

This suggestion is used for lithium battery application and avoid lithium battery BMS protection without communication, please finish the setting as follow:

- 1.Before starting setting, you must get the battery BMS specification:
- A. Max charging voltage
- B. Max charging current
- C. Discharging protection voltage

2.Set battery type as"USE" (user-defined)

		AGM (default)	Flooded FLd
05	Battery type	User-Defined	If "User-Defined" is selected, battery
		185 1155	charge voltage and low DC cut-off
		<u></u>	voltage can be set up in program 26,
			27 and 29.

3. Set C.V voltage as Max charging voltage of BMS-0.5V.

- 1		3	Ť
			default setting: 56.4V
	26	Bulk charging voltage (C.V voltage)	2 <u>65<u>6</u>4_*_</u>
		`	If self-defined is selected in program 5, this program can be set up. Setting range is from 24.0V to 31.0V for 24v model and 48.0V to 62.0V for 48v model. But the setting value must be more than or equal the value of program27. Increment of each click is 0.1V.

4. Set floating charging voltage as C.V voltage.

		default setting: 54.0V
27	Floating charging voltage	_F[u_2]_540 <u>~</u>
		If self-defined is selected in program 5, this program can be set up. Setting range is from 24.0V to the value of program 26 for
		24v model and 48.0V to the value of program 26 for 48v
		model. Increment of each click is 0.1V.

5. Set Low DC cut-off voltage ≥discharging protection voltage of BMS+2V.

		default setting: 42.0V
29	Low DC cut-off voltage	If self-defined is selected in program 5, this program can be set up. Setting range is from 20.0V to 27.0V for 24v model and 40.0V to 54.0V for 48v model. The setting value must be less than the value of program12. Increment of each click is 0.1V.Low DC cut-off voltage will be fixed to setting value no matter what percentage of load is connected.

6. Set Max charging current which must be less than the Max charging current of BMS.

	narging carreine winder mase				Carrent or Brion
		10A		20A	
		0\$_	10 ^	0\$_	<u> 20^</u>
	Maximum charging currents	30A		40A	
02	Maximum charging current: To configure total charging current for solar and utility	05_	30 ^	0\$_	40 ^
02	chargers.	50A		60A (defa	ault)
	(Max. charging current = utility charging current + solar charging current)	05 _	<u>50^</u>	05_	<u>60^</u>
		70A		80A	
		02_	70 ^	05_	80^

7. Setting voltage point back to utility source when selecting "SBU priority" or "Solar first" in program 01. The setting value must be \geq Low DC cut-off voltage +1V, or else the inverter will have a warning as battery voltage low.

	Setting voltage point back	Available options in 48V models: 46V (default)
12	to utility source when selecting "SBU priority" or "Solar first" in program 01.	Available options in 24V models: 23V (default)

Remark:

- 1.you'd better to finish setting without turn on the inverter(just let the LCD show, no output);
- 2.when you finish setting, please restart the inverter.

SPECIFICATIONS

Table 1 Line Mode Specifications

INVERTER MODEL	3.5KVA 5.5KVA		
Input Voltage Waveform	Sinusoidal (utility or generator)		
Nominal Input Voltage	230Vac		
Low Loss Voltage	170Vac±7V (UPS)		
Low Loss Voltage	90Vac±7V (Appliances)		
Low Loss Return Voltage	180Vac±7V (UPS);		
_	100Vac±7V (Appliances)		
High Loss Voltage	280Vac±7V		
High Loss Return Voltage	270Vac±7V		
Max AC Input Voltage	300Vac		
Nominal Input Frequency	50Hz / 60Hz (Auto detection)		
Low Loss Frequency	40±1Hz		
Low Loss Return Frequency	42±1Hz		
High Loss Frequency	65±1Hz		
High Loss Return Frequency	63±1Hz		
Output Short Circuit Protection	Line mode: Circuit Breaker		
Cutput Short Choult Focustion	Battery mode: Electronic Circuits		
Efficiency (Line Mode)	>95% (Rated R load, battery full charged)		
Transfer Time	10ms typical (UPS);		
Transfer Time	20ms typical (Appliances)		
	Output Power		
Output power derating: When AC input voltage drops to 95V or 170V depending on models, the output power will be derated.			

Table 2 Inverter Mode Specifications

INVERTER MODEL	3.5KVA	5.5KVA
Rated Output Power	3.5KVA/3.5KW	5.5KVA/5.5KW
Output Voltage Waveform	Pure Si	ine Wave
Output Voltage Regulation	230V	ac±5%
Output Frequency	60Hz	or 50Hz
Peak Efficiency	9	4%
Overload Protection	5s@≥140% load; 10	0s@100%~140% load
Surge Capacity	2* rated power	er for 5 seconds
Nominal DC Input Voltage	24Vdc	48Vdc
Cold Start Voltage	23.0Vdc	46.0Vdc
Low DC Warning Voltage @ load < 20% @ 20% ≤ load < 50% @ load ≥ 50%	22.0Vdc 21.4Vdc 20.2Vdc	44.0Vdc 42.8Vdc 40.4Vdc
Low DC Warning Return Voltage @ load < 20% @ 20% ≤ load < 50% @ load ≥ 50%	23.0Vdc 22.4Vdc 21.2Vdc	46.0Vdc 44.8Vdc 42.4Vdc
Low DC Cut-off Voltage @ load < 20% @ 20% ≤ load < 50% @ load ≥ 50%	21.0Vdc 20.4Vdc 19.2Vdc	42.0Vdc 40.8Vdc 38.4Vdc

Table 3 Charge Mode Specifications

Utility Charging Mode INVERTER MODEL 3.5KVA 5.5KVA Max Charging Current (PV+AC) (@ V _{I/P} =230Vac) Max Charging Current (AC) (@ V _{I/P} =230Vac) Max Charging Current (AC) (@ V _{I/P} =230Vac) Bulk Charging Bulk Charging Voltage Battery AGM / Gel Battery AGM / Gel Battery AGM / Gel Battery Battery Floating Charging Voltage 27.Vdc 54.Vdc Charging Algorithm 3-Step Battery Charging Algorithm 3-Step Charging Curve Charging Curve Solar Input INVERTER MODEL 3.5KVA Absorption (Constant Voltage) Maintenance (Constant Voltage) Solovdc Solovdc Time Solovdc PV Array Open Circuit Voltage PV Array MPPT Voltage Range Max. Input Current 15A 18A Max. Charging Current(PV)						
Max Charging Current (PV+AC) 100Amp (@ V _{I/P} =230Vac) 60Amp (AC) 60Amp (@ V _{I/P} =230Vac) 58.4Vdc 60Amp (AC) 60Amp (AC)						
(@ V _{I/P} =230Vac) Max Charging Current (AC) GOAmp	INVERTER MODEL					
CAC (@ V _{1/P} =230Vac)		g Current	·			
Bulk Charging Voltage AGM / Gel Battery AGM / Gel Battery Floating Charging Voltage Overcharge Protection Charging Algorithm Battery Voltage, per cell Charging Curve Bulk Constant Current INVERTER MODEL Rated Power Max. PV Array Open Circuit Voltage PV Array MPPT Voltage Range Max. Input Current PSALTON SS. 4Vdc S6.4Vdc 56.4Vdc 63Vdc 64Vdc 6		g Current	• • • • • • • • • • • • • • • • • • •			
Solar Input Solar Input Solar Provided Solar Input Solar Provided Solar Input Solar Provided Solar Input Solar Input Solar Provided Solar Input Solar Provided Solar Input Solar Provided Solar Input Solar Inpu	Bulk		29.2Vdc	58.4Vdc		
Floating Charging Voltage Overcharge Protection Charging Algorithm 3-Step Battery Voltage, per cell Charging Curve Time Solar Input INVERTER MODEL 3.5KVA 5.5KVA Rated Power 4000W 5500W Max. PV Array Open Circuit Voltage PV Array MPPT Voltage Range Max. Input Current 15A 18A	Voltage	AGM / Gel	28.2Vdc	56.4Vdc		
Charging Curve Battery Voltage, per cell Charging Curve Charging Curve Charging Curve Charging Curve Charging Curve Charging Curve Time Solar Input INVERTER MODEL Rated Power 4000W Solovdc Max. PV Array Open Circuit Voltage PV Array MPPT Voltage Range Range Max. Input Current 15A 18A	Floating Cha		27Vdc	54Vdc		
Charging Curve Battery Voltage, per cell Charging Curve Charging Curve Charging Curve Charging Curve Charging Curve Charging Curve Absorption (Constant Current) INVERTER MODEL Rated Power 4000W 5500W Max. PV Array Open Circuit Voltage PV Array MPPT Voltage Range Range Max. Input Current 15A 18A	Overcharge I	Protection	33Vdc	63Vdc		
Charging Curve Time Charging Curve Time Charging Curve Time Solar Input INVERTER MODEL 3.5KVA 5.5KVA Rated Power 4000W 5500W Max. PV Array Open Circuit Voltage PV Array MPPT Voltage Range Range Max. Input Current 15A 18A			3-S	itep		
INVERTER MODEL 3.5KVA 5.5KVA Advantage PV Array MPPT Voltage Range Max. Input Current 3.5KVA 5.5KVA 500Vdc 500Vdc 120Vdc~450Vdc 18A			2.43vdc (2.35vdc) 2.25vdc T0 T1 T1 = 10* T0, minimum 10mins, maximum 8th	Voltage 100% 50% Time Maintenance		
Rated Power 4000W 5500W Max. PV Array Open Circuit Voltage PV Array MPPT Voltage Range Max. Input Current 15A 18A	-					
Max. PV Array Open Circuit Voltage PV Array MPPT Voltage Range Max. Input Current 15A 18A	INVERTER MODEL					
Voltage PV Array MPPT Voltage Range Max. Input Current 15A 18A				5500W		
Range 120Vdc~450Vdc Max. Input Current 15A 18A			500Vdc			
•	•		120Vdd	c~450Vdc		
Max. Charging Current(PV) 100A			15A	18A		
	Max. Charging Current(PV)		100A			

Table 4 General Specifications

INVERTER MODEL	3.5KVA	5.5KVA	
Safety Certification	CE		
Operating Temperature Range	-10°C to 55°C		
Storage temperature	-15°C~ 60°C		
Humidity	5% to 95% Relative Humidity (Non-condensing)		
Dimension (D*W*H), mm	448x295x105		
Net Weight, kg	6.8	8.5	

TROUBLE SHOOTING

Problem	LCD/LED/Buzzer	Explanation / Possible cause	What to do	
Unit shuts down automatically during startup process.	LCD/LEDs and buzzer will be active for 3 seconds and then complete off.	The battery voltage is too low	Re-charge battery. Replace battery.	
No response after power on.	No indication.	 The battery voltage is far too low. Battery polarity is connected reversed. 	Check if batteries and the wiring are connected well. Re-charge battery. Replace battery.	
	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.	
Mains exist but the unit works in battery mode.	Green LED is flashing.	Insufficient quality of AC power. (Shore or Generator)	 Check if AC wires are too thin and/or too long. Check if generator (if applied) is working well or if input voltage range setting is correct. (UPS→Appliance) 	
	Green LED is flashing.	Set "Solar First" as the priority of output source.	Change output source priority to Utility first.	
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.	
	Fault code 07	Overload error. The inverter is overload 110% and time is up.	Reduce the connected load by switching off some equipment.	
	Fault code 05	Output short circuited.	Check if wiring is connected well and remove abnormal load.	
	Fault code 02	Internal temperature of inverter component is over 100°C.	Check whether the air flow of the unit is blocked or whether the ambient temperature is too high.	
		Battery is over-charged.	Return to repair center.	
Buzzer beeps continuously and	Fault code 03	The battery voltage is too high.	Check if spec and quantity of batteries are meet requirements.	
red LED is on.	Fault code 06/22	Output abnormal (Inverter voltage below than 190Vac or is higher than 260Vac)	Reduce the connected load. Return to repair center	
	Fault code 08/09/15	Internal components failed.	Return to repair center.	
	Fault code 13	Over current or surge.	Restart the unit if the orror	
	Fault code 14	Bus voltage is too low.	Restart the unit, if the error happens again, please return	
	Fault code 16	Output voltage is unbalanced.	to repair center.	
	Another fault code		If the wires is connected well, please return to repair center.	

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