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In case of any further questions,
please contact your local supplier.

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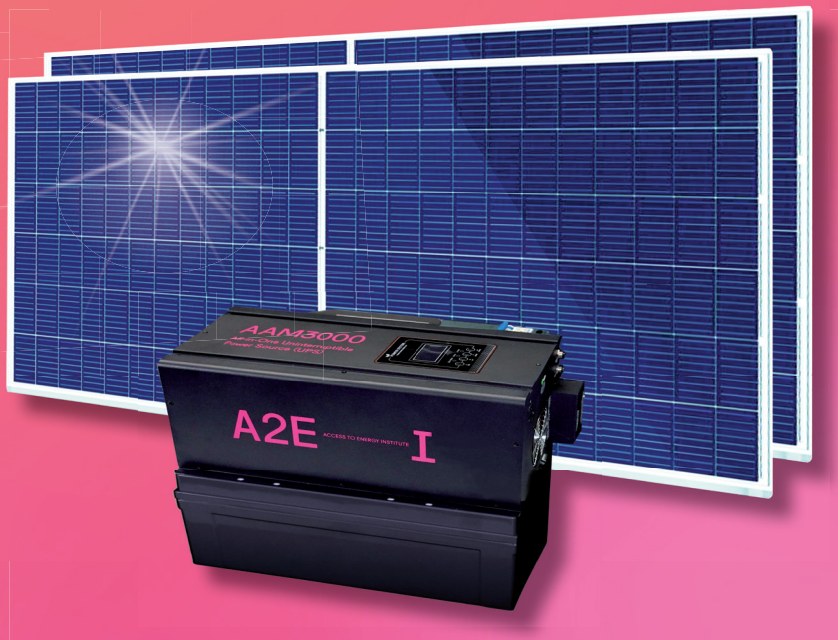
OWNER'S MANUAL

AAM3000

ALL-IN-ONE UNINTERRUPTIBLE POWER SOURCE (UPS)



CONTENT

5. MAINTENANCE

WARNING: Risk of electric shock!

Make sure that all the power is turned off before below-mentioned operations, and then follow the corresponding inspections and operations.

THE FOLLOWING INSPECTIONS AND MAINTENANCE TASKS ARE RECOMMENDED AT LEAST TWO TIMES PER YEAR FOR BEST PERFORMANCE.

- Make sure the system is installed in a clean and dry ambient.
- Make sure there is no block of air-flow around the MPPT charge controller and the ventilation system of the inverter. Clean up any visible dirt.
- Check all the visible wires to make sure insulation is not damaged due to irradiation, frictional wear, dryness, insects or rats etc. Repair or replace some wires if necessary.
- Tighten all the terminals. Inspect for loose, broken, or burnt wire connections.
- Check and confirm that LEDs and display indicate a faultless operating state. Pay attention to any troubleshooting or error indication. Take corrective action if necessary.
- Confirm that all the system components are ground connected tightly and correctly.
- Confirm that all the terminals do not show signs of corrosion, damaged insulation, molten/burnt or discolored state and tighten terminal screws to the suggested torque.
- Check for dirt, nesting insects and corrosion. If so, clear up in time.

4.2 MPPT CHARGE CONTROLLER

FAULTS	POSSIBLE REASON	TROUBLESHOOTING
Charging LED indicator off during daytime when sunshine falls on PV modules properly	PV array disconnection	Confirm that PV and battery wire connections are correct and tight
Wire connection is correct, LED indicator off	1. Battery voltage is lower than 9V 2. PV voltage is less than battery voltage	1. Please check the voltage of battery. At least 9V voltage to activate the controller 2. Check the PV input voltage which should be higher than battery voltage
Battery LED indicator green; fast blink	Battery voltage higher than over voltage disconnect voltage (OVD)	Check if the battery voltage is too high, and disconnect the solar module
Battery LED indicator orange	Battery under voltage	Charging LED indicator will return to green automatically when fully charged
Battery LED indicator red	Battery low voltage disconnect	LED indicator will return to green automatically when fully charged
All the LED indicators blink. (battery indicator orange blink)	Too high temperature of controller	When heat sink of the controller exceeds 85°C, the controller will automatically cut input and output circuit. When the temperature decreases below 75°C, the controller will resume to work
All the LED indicators blink. (battery indicator red blink)	System voltage error	Check whether the battery voltage matches the controller working voltage. Please change to a suitable battery or reset the working voltage. Remove all faults and click the button to resume to work

1. 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 wirings 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. 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.
8. Please strictly follow installation procedure when you want to disconnect AC or DC terminals. Please refer to INSTALLATION section of this m annual for the details.
9. GROUNDING INSTRUCTIONS – This system should be connected to a permanent grounded wiring system. Be sure to comply with local requirements and regulation to install this inverter.
10. NEVER short circuit AC output and DC input. Do NOT connect to the mains when DC is short circuited.
11. WARNING – Only qualified service personnel are able to service this device. Please contact local dealer or service center for maintenance instructions.
12. Place system indoors (except panels). Prevent exposure to the elements and do not allow water to enter the controller.
13. Install the system in well ventilated places. Some components, especially heat sink, may become very hot during operation.

DANGER

DANGER TO LIFE DUE TO ELECTRIC SHOCK WHEN LIVE COMPONENTS ARE TOUCHED

- When exposed to sunlight, the PV modules generate high DC voltage which is present in the DC conductors.
- Disconnect the product from voltage sources and make sure it cannot be reconnected before working on the device.
    - Disconnect the grid input.
    - Switch off the PV circuit breaker.
- Do not touch non-insulated parts or cables.
- Wear suitable personal protective equipment for all work on the product.

DANGER

DANGER TO LIFE DUE TO ELECTRIC SHOCK WHEN TOUCHING LIVE SYSTEM COMPONENTS IN CASE OF A GROUND FAULT

If a ground fault occurs, parts of the system may still be live. Touching live parts and cables results in death or lethal injuries due to electric shock.

- Disconnect the product from voltage sources and make sure it cannot be reconnected before working on the device.
    - Disconnect the grid input.
    - Switch off the PV circuit breaker.
- Touch the cables of the PV array on the insulation only.
- Do not touch any parts of the substructure or frame of the PV array.
- Do not connect PV strings with ground faults to the inverter.
- Ensure that no voltage is present and wait five minutes before touching any parts of the PV system or the product.

WARNING

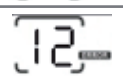
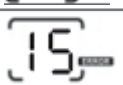
DANGER TO LIFE DUE TO FIRE OR EXPLOSION

Despite careful construction, a fire or explosion may occur in electrical devices. Death or lethal injuries due to fire or flying debris can result.

- Wear suitable personal protective equipment for all work on the product.
- Do not mount the product in areas containing highly flammable materials or gases.
- Do not mount the product in potentially explosive atmospheres.
- Ensure that unauthorized persons have no access to the product.
- In case of error, only carry out corrective measures specified in section "Troubleshooting". If no corrective measures are specified, do not perform any actions on the product. Contact service.

4. TROUBLESHOOTING

4.1. INVERTER

WARNING/ FAULT CODE	WARNING EVENT	ICON
02	Heat sink over temperature	
03	Battery voltage is too high	
04	Battery voltage is too low	
05	Inverter over temperature/Output short circuit	
06	Output is too high or too low	
07	Inverter over load	
12	PV input voltage is too low	
13	PV input voltage is too high	
14	PV over current	
15	PV over temperature	
88	Transformer phase reversal	
89	Frequency is out of range	
97	Inverter fail to communicate with MPPT	
99	Inverter fail to slow start	

3.2 MPPT CHARGE CONTROLLER

LED INDICATION			STATUS
PV LED	Green	On solid	PV connection normal but low voltage (irradiance) from PV, no charging
	Green	Slowly flashing (1Hz)	Charging
	Green	OFF	No PV voltage (night time) or PV connection problem
BAT LED	Green	On solid	Normal
	Green	Slowly Flashing (1Hz)	Full
	Green	Fast Flashing (4Hz)	Over voltage
	Orange	On solid	Under voltage
	Red	On solid	Over discharge
	Red	Flashing	Batter overheating
Charging (green), battery (orange) and load (red) indicator flashing simultaneously			System voltage error
Charging (green) and battery indicator (orange) flashing simultaneously			Controller overheating

⚠ CAUTION

RISK OF INJURY DUE TO WEIGHT OF PRODUCT

Injuries may result if the product is lifted incorrectly or dropped while being transported.

- Transport and lift the product carefully. Take the weight of the product into account.
- Wear suitable personal protective equipment for all work on the product.

⚠ CAUTION

RISK OF BURNS FROM HOT SURFACES

Some surfaces of the solar system can get very hot. Touching the surface can result in burns.

- Do not touch hot surfaces.
- Wait 30 minutes for the surface to cool sufficiently.
- Observe the safety messages on the inverter.

⚠ NOTICE

DAMAGE TO THE PRODUCT DUE TO SAND, DUST AND MOISTURE INGRESS

Sand, dust and moisture penetration can damage the product and impair its functionality.

- Only open the product if the humidity is within the thresholds and the environment is free of sand and dust.
- Do not open the product during a dust storm or precipitation.

⚠ NOTICE

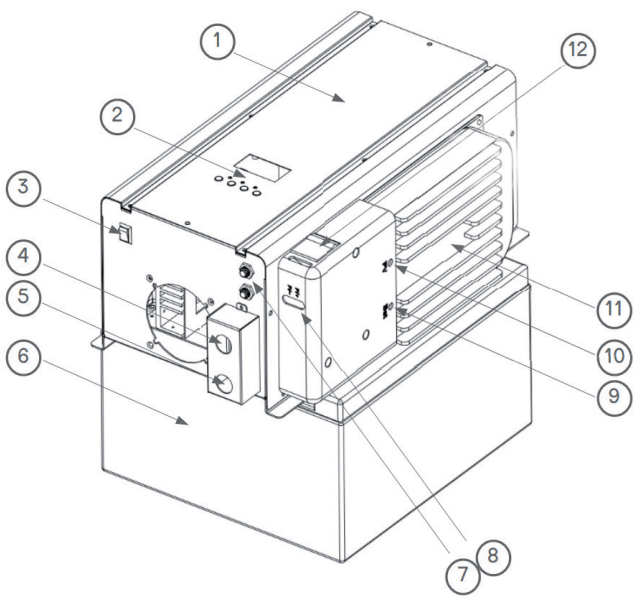
DAMAGE TO THE PRODUCT DUE TO ELECTROSTATIC DISCHARGE

Touching electronic components can cause damage to or destroy the product through electrostatic discharge.

- Ground yourself before touching any component.

2. INTRODUCTION
2.1. OVERVIEW

The AAM3000 is a hybrid uninterruptible power supply that offers a clean, reliable and cost-effective power supply, combining LCD user interface, photovoltaic solar modules, battery storage and the functions of AC inverter, MPPT solar charger, switch over and AC battery charger.



Item	Description
1	Inverter
2	Operation and Display Panel
3	ON/OFF Switch
4	AC Input
5	AC Output
6	Batteries

Item	Description
7	Resettable Fuses
8	PV Input
9	Battery Indication LED
10	PV Indication LED
11	MPPT Charge Controller
12	PV Input Circuit Breaker

27	Float charge voltage	26.8 V
	Battery low voltage open charging (for lithium batteries)	n/a
29	Low DC cut-off voltage	23.4V
91	n/a	not applicable
92	n/a	not applicable
93	Frequency input range	**Alt** – Range: 40Hz to 70Hz
		GEN – Range: 45Hz to 55Hz
94	Selection of battery type	**WARNING** Wrong settings may lead to destruction of the battery. Only use recommended settings!
		Alb – Lithium battery
		OtP – Other battery
95	Battery high voltage trip	00 – not applicable
96	Battery low voltage trip	00 – not applicable
97	Dry contact control	**dCd**
		dCE
98	Low battery alarm (Low cut-off voltage + 1V)	24.4 V
99	Output voltage setting	230 V

07	Auto restart when over temperature occurs	**Ltd** – Disable
		LtE – Enable
09	Output frequency	**50Hz**
		60Hz
11	Maximum grid charging current	Range: 0A to 50A, selectable in 5A steps
		Default: 10A
12	Low battery voltage inverter transfer to grid	00 – not applicable in grid priority
13	High battery voltage recovery	00 – not applicable in grid priority
18	Alarm control	**BON** – Alarm on
		bOF – Alarm off
19	Auto return to default display screen	**ESP** – Return to default display screen
		EEP – Stay at latest screen
20	Backlight control	**LON** – Backlight on
		LOF – Backlight off
22	Beeps while primary source is interrupted	**AON** – Alarm on
		AOF – Alarm off
25	Record Fault code	**FEN** – enabled
		FdS – disabled
26	Bulk charging voltage	28.6V
	Maximum charging voltage for lithium battery	n/a

2.2. PRODUCT FEATURES

Photovoltaic Module

- Monocrystalline module
- High efficiency due to half-cut cells & PERC technology
- High reliability ideal for harsh environments
- Excellent IAM and low light performance

Charge Regulator

- Advanced Maximum Power Point Tracking (MPPT) technology, with efficiency no less than 99.5%
- High quality components, perfecting system performance, with maximum conversion efficiency of 98%
- Ultra-fast-tracking speed and guaranteed tracking efficiency
- Accurately recognizing and tracking of multiple power points
- Reliable automatic limit function of maximum PV input power, ensuring no overload under any circumstance
- Wide MPP operating voltage range
- Die-cast aluminium design, ensuring excellent heat dissipation characteristic
- Battery temperature compensation function
- Real-time energy statistics function
- Support software upgrade

Battery

- Lead Carbon Technology
- Very long life according to EUROBAT Classification
- More than 3000 cycles at 70% DOD
- Special negative active material formula, improves charge acceptance ability and reduces negative plate sulfation
- More suitable for the partial state of charge (PSOC) application
- Fast recovery from deep discharge
- Excellent charge retention
- Free from orientation constraints

Inverter

- Robust LF low frequency topology
- Pure sine wave output for sensitive and motor loads
- High efficiency design up to 89%, energy saving mode
- High power factor up to 1
- Automatically controlled cooling fan
- LCD display with smart settings options (Working modes, Charge Current, Charge Voltage, etc.)
- Auto switch between Grid and Battery with minimum 10 millisecond as UPS
- Manual switch priority power source among Utility and Battery
- Wide AC input range
- Excellent loads with 3x rated start power
- AC charger with multiple-stage charge mode
- Optimize battery by equalization function
- Protections:
  - AC input: overvoltage and undervoltage
  - DC input: overvoltage and undervoltage
  - AC output: short-circuit
  - Overtemperature
  - Overload

PAYGO Functionality

Product supports Pay-as-you-go functionality. For further details, please refer to your local supplier.

3.1.4. INVERTER/CHARGER SETTINGS

HIGHLIGHTED	cells depict the recommended default settings.

PROGRAM	DESCRIPTION	SELECTABLE OPTION			
00	Exit setting mode	**ESC** – Escape			
01	Output source priority	**UtI** – Grid will provide power to the load as first priority. Battery will provide power to the loads only when grid power is not available			
		SbU – Battery will provide power to the load as first priority. Grid will provide power to the loads only when battery voltage drops to either low-level warning voltage or the setting point in program 12			
03	Input voltage range	**APL** – Wide grid input range: -23% to +15%			
		UPS – Narrow (default) grid input range: -15% to +15%			
04	Power saving mode	**SdS** – (Default) Disabled: if disabled, no matter if the connected load is low or high, the on/off status of the inverter output will not be affected			
		SEN – If enabled, the output of the inverter will be off when connected load is low or not detected			
05	Battery type	⚠ **WARNING** Wrong settings may lead to destruction of the battery. Only use recommended settings!			
		TYPE OF BATTERY		BULK V	FLOATING V
		b-1	**Gel U.S.A**	14.0	13.7
		b-2	**AGM 1**	14.1	13.4
		b-3	**AGM 2**	14.6	13.7
		b-4	**Sealed lead acid**	14.4	13.6
		b-5	**Gel euro**	14.4	13.8
		b-6	**Open lead acid**	14.8	13.8
		b-7	**Calcium**	15.1	13.6
		b-8	**Desulfation**	15.5 for 4 hours	
		b-L	**Lithium**	When the battery voltage reaches 14.7V, UPS stops charging until the voltages drops to 12.5V	
		b-0	**User defined**	User can set the battery type in program 94	

OUTPUT INFORMATION	
	Indicate output voltage, output frequency, load percent, load in VA, load in Watt and discharging current
BATTERY INFORMATION	
	Indicates either ... ...battery level in battery mode ...charging status in grid mode
LOAD INFORMATION	
	Indicates overload
	Indicates the load level
MODE OPERATION INFORMATION	
	Indicates unit connects to the grid
	Indicates unit connects to the PV panel
	Indicates load is supplied by the grid
	Indicates the grid charger circuit is working
	Indicates the DC/AC inverter circuit is working
MUTE OPERATION	
	Indicates unit alarm is disabled

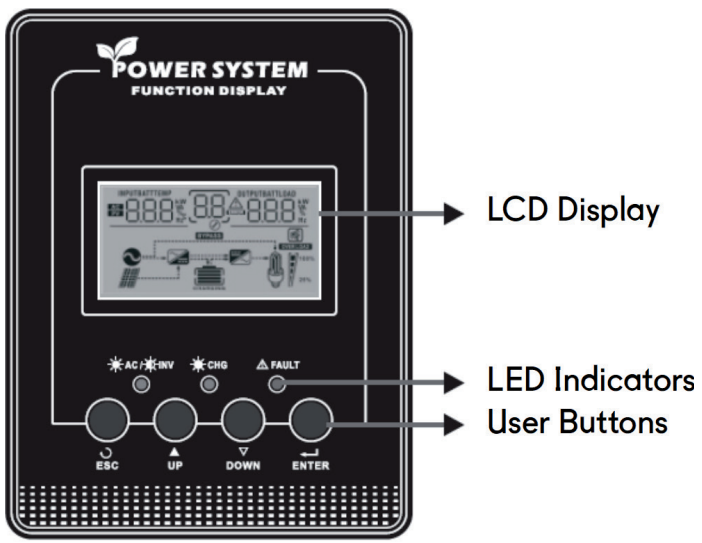
2.3. TECHNICAL PARAMETERS

DC system voltage	24VDC
PV Input Power	800W
PV Input Voltage Range	2 - 108V
Max. PV Open Circuit Voltage	138V (25°C)
AC Output Power	3000W
AC Surge Power	9000W
Output Frequency	50Hz ± 5%
Output Waveform	True sine wave (THD < 5%)
Output Voltage	220/230/240 VAC ± 5%
Power Factor	0.8 - 1
Transfer Time between Grid & Battery	< 15ms
Input Voltage Range	190~245VAC
Input Frequency	45~70Hz
Inverter Certificate	Safety: UL458; LVD(EN60950) EMC: FCC Part15 Class A; CE (EN55022:2006+A1:2007)
Grid Charge Current	35A
PV Charge Current	35A
Battery Voltage Levels	Boost: 28.8V Float: 27.0V End-of-Discharge: 23.4V
Battery Capacity	1200Wh (50Ah, 24V)
Inverter Efficiency	86 – 89%
Charge Regulator Efficiency	98%
Self-Discharge (25°C)	< 1% per month
Working Temperature	-20°C ~ 50°C
Protective Functions	Output Overload: Output off, manual restart necessary Output Short Circuit: Output off, manual restart necessary Over Temperature: 60°C ±5

3. OPERATION AND DISPLAY

3.1. INVERTER

The operation and display panel of the inverter (as shown in below figure) is located on the top panel of the system. It includes an LCD display, four user buttons and three indication LEDs. It displays the operating status and input/output information.



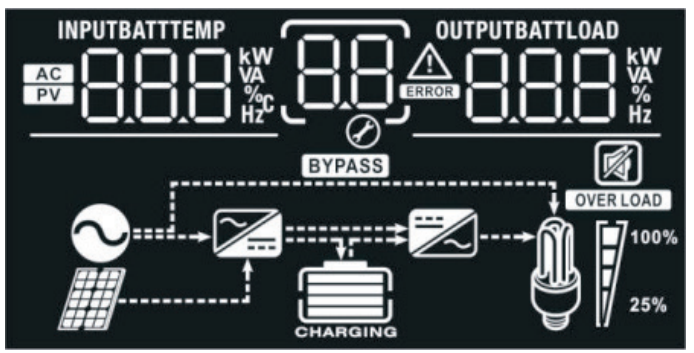
3.1.1. LED INDICATORS

LED INDICATION			STATUS
AC / INV	Green	Solid On	Output is powered by grid in grid mode.
		Flashing	Output is powered by battery or PV in battery mode.
CHG	Green	Solid On	Battery is fully charged.
		Flashing	Battery is charging.
FAULT	Red	Solid On	Fault occurs in the inverter.
		Flashing	Warning condition occurs in the inverter.

3.1.2. USER BUTTONS

USER BUTTON	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

3.1.3. LCD DISPLAY ICONS



ICON	FUNCTION DESCRIPTION
INPUT SOURCE INFORMATION	
AC	Indicates the AC input
PV	Indicates the PV input
INPUTBATT 888 kW VA % °C Hz	Indicate input voltage, input frequency, PV voltage, battery voltage and charge current
CONFIGURATION PROGRAM AND FAULT INFORMATION	
88	Indicates the setting programs
88 ERROR	Indicates the warning and fault codes Warning: 88 flashing with warning code Fault: 88 lighting with fault code