



Manual **EN**

Ares Series With Charge Inverter

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1. ABOUT THIS MANUAL

1.1 Purpose

This manual describes how to assemble, install, operate the units and how to troubleshoot of this unit. Please read this manual carefully before installation and operation, Keep this manual for future reference.

1.2 Scope

This manual provides safety guidelines of installation, and the information on tools and wiring.

1.3 SAFETY INSTRUCTIONS



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

1. Read and follow all installation, operation, and maintenance information carefully before using the product.

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 personally. Take it to a qualified service center to repair.

4. To reduce risk of electric shock, disconnect all wiring before attempting any maintenance or cleaning, turning off the unit will not reduce this risk.

5. **WARNING :** Disconnecting all power supply before any maintaining or cleaning, please noted that if you only turn off the unit are not safe enough.

6. **WARNING:** Only qualified service persons are allowed to operate this product. If fault not solved after following troubleshooting table, please send this inverter back to local dealer or service center for maintenance.

2. INTRODUCTION

This is a multi function inverter, combining various function of inverter, battery charger, supply uninterruptible electricity energy to loads. Its easy accessible comprehensive LCD touch screen display allowed user setting the various date according to user requirements, such as battery charging current, setting different input voltage based on different applications.

2.1 Features

1. AC charge current up to 60Amp
2. AC input range 170VAC-280VAC
3. Transfer time <10MS
4. Support "inverter priority" or "Grid Priority"
5. Touch screen display to setup parameters
6. Support AGM/GEL and Lifepo4 battery(BMS)

2.2 Basic System Architecture

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

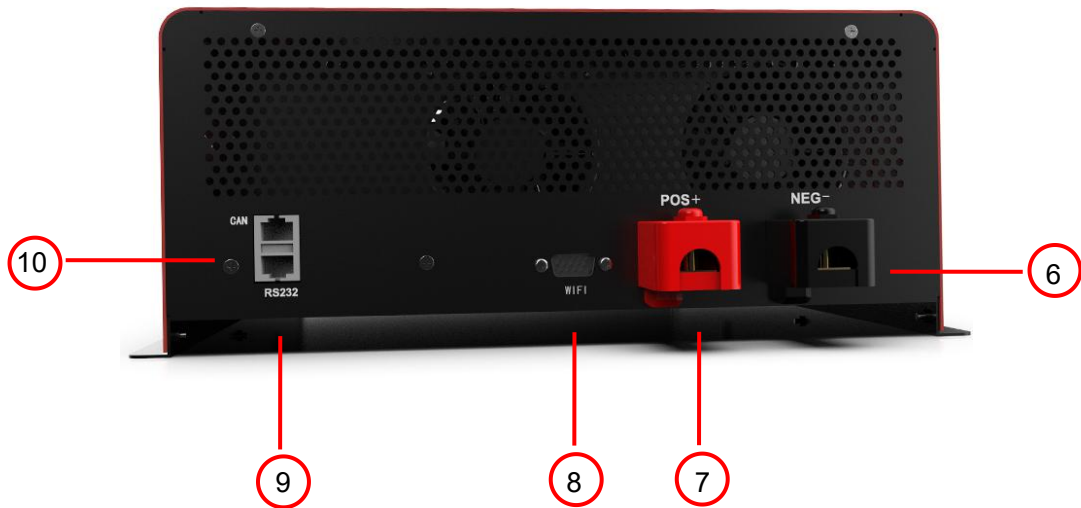
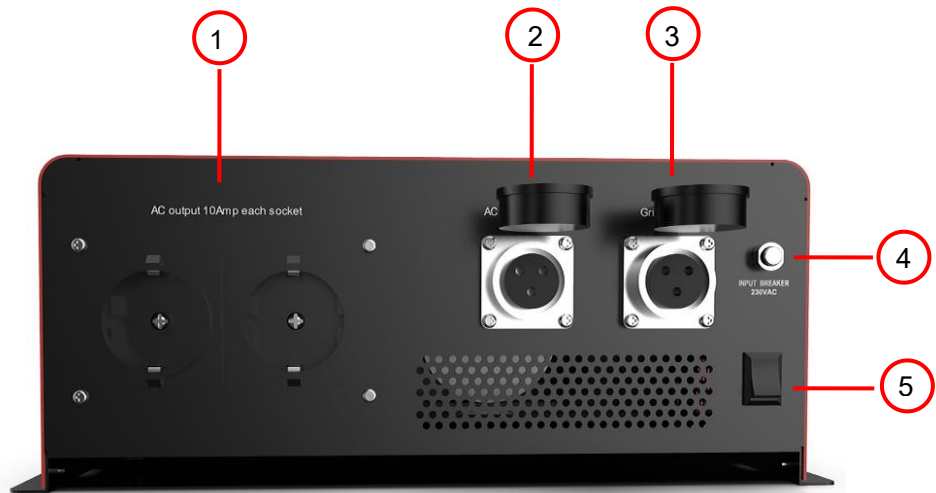
Consult with the integrator who provide you system about architectures as you request. This inverter can supply power to all kinds of appliances in home or office, including motor type appliances, such as tube light, fan, refrigerator, air-conditioner and so on.



Figure 1 Application Example

2.3 Product Overview





- | | |
|------------------------|----------------|
| 1. AC Output | 6. NEG- Port |
| 2. AC Input | 7. POS+ Port |
| 3. Grid Input | 8. WIFI Port |
| 4. Input Breaker Port | 9. CAN Port |
| 5. Power on/off switch | 10. RS232 Port |

3. INSTALLATION

3.1 Unpacking and Inspection

Before installation, please inspect the unit. Be sure that everything in the package is not damaged. The following items inside of package would be received.

The inverter x1
User manual x 1
Communication cable x 1

3.2 Preparation

Please remove the two screws on the back cover of the device before opening it.

3.3 Installation sites selection

Consider the below points before selecting where to install:

1. Do not mount the inverter on the surface of flammable construction materials.
2. Mount on the surface of solid material.
3. Install this inverter at a visible place in order to allow the LCD display to be read at all times.
4. For proper air circulation and heat dissipation, make sure there is 20 cm distance from the two sides, 50 cm distance from bottom of the unit.
5. The ambient temperature should be between 0°C and 55°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 collecting wires.

Suitable for mounting on concrete or other non-combustible surface only.

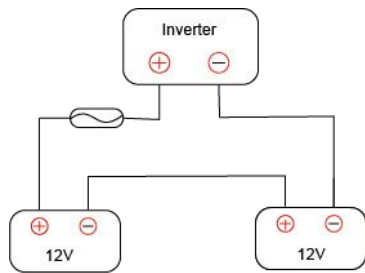
3.4 Battery Connection

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

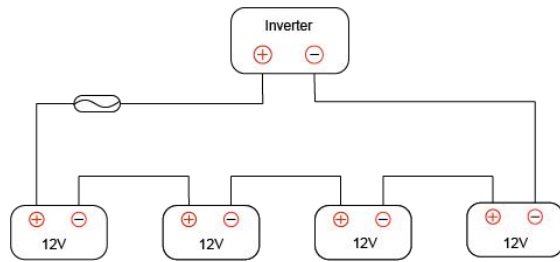
WARNING! All wiring must be performed by a qualified personnel.

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

24VDC battery connection diagram



48VDC battery connection diagram



CAUTION! Before making the final DC connection or closing DC breaker/disconnector, be sure positive (+) must be connected to positive (+) and negative (-) must be connected to negative (-).

3.5 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 3KVA and 50A for 5KVA. There are two terminal blocks with “IN” and “OUT” markings. Please do NOT connect input and output connectors wrong.

WARNING! All wiring must be performed by a qualified personnel. It's very important for system safety and efficient operation to use appropriate cable for AC input connection. To reduce risk of injury, please use the proper recommended cable size as below.

Model	Gauge	Cable (mm ²)	Torque Value
3KVA	12 AWG	4	1.2 Nm
5KVA	10 AWG	6	1.2 Nm

CAUTION! Please install the Current Transformer in the direction of the Current Transformer in the picture as below .Wrong direction, Current Transformer will not work properly.

3.6 Final Assembly

After connecting all wires, please put bottom cover back by screwing screws.

3.7 Communication Connection

Please use supplied communication cable to connect inverter and PC, follow the instructions on the screen to install the monitoring software. For the detailed software operation, please check user manual.

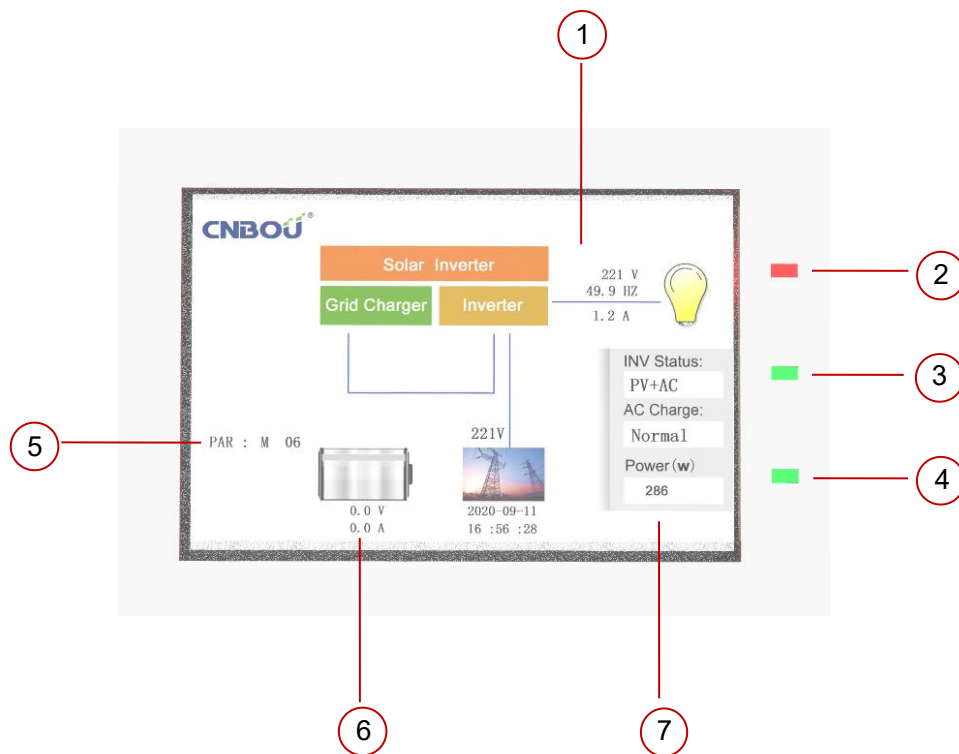
4. OPERATION

4.1 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.

4.2 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.



1. AC Output information
2. AC/INV indicator
3. Charging indicator
4. Fault indicator

5. Operation information
6. Battery information
7. Status display

4.3 LCD Setting

After press function button, the unit will enter setting mode. Set password:1155

Button	Function	Illustrate
Diagrm	Main display interface	Return to the default display screen
Set up	Language	Chinese: Chinese display English: English Display
	Working mode	AC(default): AC will provide power to the loads as the first priority.
		Battery: Battery provides power to the loads as the first priority. AC provides power to the loads when battery voltage drop to low-level warning voltage or setting point, and the AC power will charge the battery. When the battery is fully charged, battery provides power to the loads again.
	Input	AC Width Range: (Default) 120-280Vac AC narrow range: 170-280Vac
	Output	Output Voltage: 220Vac、230Vac(default) 、240Vac Output frequency: 50Hz (default)、60Hz Note: after modify the output voltage and frequency,the device must be restarted.
Battery	Battery Type: Lead acid battery(default), Lithium battery, No Bat, User	

Set up	Battery	User	<p>Bulk charging voltage: 24v mode:28.0vdc(default) setting range:24V to 30V 48v mode:56.0vdc(default) setting range:48V to 60V Floating charge voltage: 24v mode:27.0vdc(default) setting range:24V to 30V 48v mode:54.0vdc(default) setting range:48V to 60V setting increase or decrease of 0.1V.</p> <p>Please note: if you need set this, please select user-defined first in battery working mode.</p>
		Cut off vol	<p>Low Vol Disconnect: 24v mode :22.0vdc(default) Setting range:18v to 25v 48v mode :44.0vdc(default) Setting range:36v to 50v setting increase or decrease of 0.1V.</p>
			<p>Shutdown Vol: 24v mode :21.0vdc(default) Setting range:18v to 25v 48v mode :42.0vdc(default) Setting range:36v to 50v setting increase or decrease of 0.1V.</p>
			<p>High Vol Reconnect: 24V model: 27.0Vdc(default) setting range :20V to 29V 48V model: 54.0Vdc(default) setting range :40V to 58V setting increase or decrease of 0.1V. NOTE: Setting voltage point to battery mode When selecting "Battery priority" in program 01.</p>
	Lithium	<p>After the lithium battery pack and the inverter are connected through the CAN port, you can view the lithium battery BMS management information, including battery voltage, charging current, discharging current, discharging voltage, battery temperature.</p>	
	Charge current	<p>Total Charge: (default 60A) setting range is 10A to 60A, the increment or decrement is 10A per click. AC Charge: (default 30A) setting range is 0A to 60A, the increment or decrement is 10A per click. Note:The battery and the load is powered by utility, and the grid-tie function is not available.</p>	

	Date &Time setting	You can set the local date and time in your country
	Peak and Valley	No charge1: optional No charge2: optional NOTE: when peak valley no charging, utility will stop charging.
	Other	Beep: optional buzzer sound Factory: Optional factory reset Please note: The direction of the CT must be right. (CT is connected in input side)
History	Generation	Generated energy diagram display for per Day/Month/Year
	Event	History record for faulty date or others
	Help	Some solutions to failures and warnings
About	Version data	Version data display for LCD/inverter control board/MPPT program and machine model

4. 4 Fault Reference Code

Fault code	Fault event
01	Bus voltage is too high
02	Inverter voltage is too high
03	Inverter voltage is too low
04	Bus soft start failure
05	Overload fault
06	Output short circuited
07	Battery voltage is too low
08	Inverter soft start failure
09	Bus voltage is too low
10	Parallel fault
11	Over temperature
12	Battery voltage is too high
13	Output different

4. 5 Warning Indicator

Warning code	Warning Event
01	Battery voltage is too low
02	Input voltage is too low
03	Input voltage is too high
04	Overload
05	Over temperature
06	Fan is locked when inverter is on
07	Battery low voltage shutdown

5. TROUBLE SHOOTING

Problem	LCD/LED/Buzzer	Possible cause	What to do
Unit shuts down automatically during start up process	LCD/LED and buzzer will be active then complete off	The battery voltage is too low	1.Re-charge battery. 2. Replace battery.
No response after power on	No indication	1.The battery voltage is too low. 2. Internal fuse tripped	1. Contact repair center for replacing the fuse. 2. Re-charge battery. 3. 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 triggered	Check if AC breaker is turned on and AC wiring is connected well.
	LED is flashing	Insufficient quality of AC power	1. Check if AC wires are too thin and/or too long. 2. Check if generator (if applied) is working well or if input voltage range setting is correct. (UPS Appliance)Change output source
When the unit is turned on, internal relay is switched on and off repeatedly	LCD display and LED flashing	Battery is disconnected	Check if battery wires are connected well
Buzzer beeps continuously and red LED is on	warning code 06	Fan fault	Replace the fan
	warning code 05	Internal temperature of inverter component is over 85°C	Check whether the environment around the equipment well ventilated
	warning code 07	The battery voltage is too high	Check if spec and quantity of batteries are meet requirements

		Battery is over-charged	Return to repair center
	Fault code 06	Output short circuited	Check if wiring is connected well and remove abnormal load
	warning code 05	Overload error, the inverter is overload 100% and overload time reaches the upper limit	Reduce the connected load by switching off some equipment
	Fault code 02/03	Output abnormal (Inverter voltage below than 180Vac or is higher than 260Vac)	1. Reduce the connected load 2. Return to repair center
	Fault code 01/04/06/08	Internal components failed	Return to repair center
	Fault code 23	Over current or surge	Remove abnormal load
	Fault code 01	Bus voltage is too high	Restart the unit if the error happens again please return to repair center
	Fault code 09	Bus voltage is too low	
	Fault code 02/03	Output voltage is unbalanced	
	Fault code 11	Internal temperature of inverter component is over 85°C	check whether the environment around the equipment well ventilated
	Fault code 12	The battery voltage is too high	Check if spec and quantity of batteries are meet requirements
		Battery is over-charged	Return to repair center
	Fault code 16	Output different	Check whether the output voltage and frequency of each inverter are set the same

6. SPECIFICATIONS

Table 1 Line Mode Specifications

Input Voltage Waveform	Pure sine wave (utility or generator)
Normal Input Voltage	230VAC
Low Loss Voltage	120VAC±7V (wide range) 170VAC±7V(narrow range)
Low Loss Return Voltage	130VAC±7V (wide range) 180VAC±7V(narrow range)
High Loss Voltage	280VAC±7V
High Loss Return Voltage	270VAC±7V
Max AC Input Voltage	300VAC
Normal Input Frequency	50Hz / 60Hz (Auto detection)
Low loss Frequency	40±1Hz
Low loss Return Frequency	42±1Hz
High loss Frequency	70±1Hz
High loss Return Frequency	69±1Hz
Output short circuit protection	Circuit Breaker
Efficiency (Line Mode)	<92% (Rated R load, battery full charged)
Communication	USB or RS232 or WIFI
Humidity	0-90% RH(No-condensing)
Operation temperature	0-50°C

Table 2 Charge Mode Specifications

INVERTER MODEL	3KVA	5KVA
Charging Algorithm	3-Step	
Charging Mode		
Charging Current	10/20/30/40/50/60Amp (@V _{I/P} =230Vac)	
Bulk Charging Voltage	24.0-30.0vdc (Default:28 vdc)	48.0-60.0vdc (Default:56 vdc)
Floating Charging Voltage	24.0-30.0vdc (Default:27vdc)	48.0-60.0vdc (Default:54vdc)
Charging Curve	<p>The graph plots Battery Voltage (per cell) on the left y-axis and Charging Current (%) on the right y-axis against Time on the x-axis. The voltage curve (black) starts at 2.25Vdc, rises linearly to 2.43Vdc (2.35Vdc) during the Bulk phase (T₀), remains constant during the Absorption phase (T₁), and then slightly drops during the Maintenance phase. The current curve (red) starts at 100% during the Bulk phase, drops to 0% at the start of the Absorption phase, and remains at 0% through the Maintenance phase. The Absorption phase duration is defined as T₁ = 10 * T₀, with a minimum of 10 minutes and a maximum of 10 hours.</p>	
Max. charging current	60A	60A
Over-charging voltage	30vdc	60vdc

Table 3 Inverter Mode Specifications

Model	Ares-243C	Ares-483CP	Ares-485CP
Item	Parameter		
Continuous Power	3000W	3000W	5000W
Peak Power	6000W	6000W	10000W
AC Output	220V/230V/240V		
AC Input Range	170V-280V		
Output Frequency	50HZ/60HZ (adjustable)		
DC Voltage	24V	48V	48V
DC Input Range	21V-30V	40V-62V	40V-62V
AC Charge Current	60A		
Output Efficiency	≤92%		
Wave Form	Pure Sine Wave		
AC Regulation	THD<3%		
Transfer Time	< 10MS		
Non-load Current	1.2A		
Protection	Low/Over Voltage		
	Over load		
	Over Temperature		
	Short Circuit		
	Anti-reverse protect		
Product Size (mm)	470*330*130		
N.W (KG)	10.25		



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