User Manual

ARES PLUS-ECO 1~3 kVA

100/110/120/125V Online UPS

This manual contains important instructions that you should follow during installation and maintenance of the UPS and batteries. Please read all instructions before operating the equipment and save this manual for future reference.

Content

Chapter 1 Safety and EMC Instructions

Please carefully read the following user manual and the safety instructions before installing or operating the unit!

1.1 Installation

★ See installation instructions before connecting to mains power.

★ Condensation may occur if the UPS is moving directly from a cold to a warm environment. The UPS must be dry before being installation. It is recommended to have an acclimatization time at least two hours.

★ Do not install the UPS near water or in damp environment.

★ Do not install the UPS where it would be exposed to direct sunlight or near heat.

★ Do not connect appliances or items of equipment which would overload the UPS (e.g. laser printers, etc.) to the UPS output.

★ Place cables properly to avoid being treaded or tripped.

★ Assure to connect with the earth reliably.

★ Connect the UPS only to a socket outlet which is earthed shockproof type.

★ The building wiring socket outlet (shockproof socket outlet) must be easily accessible to close to the UPS.

★ With the installation of the equipment, the sum of the leakage current of the UPS and the connected load does not exceed 3.5mA.

★ Do not block ventilation openings on the UPS's housing. Ensure the air vents on the front, side and rear of the UPS are not blocked. Recommended at least 25cm of space on each side. The air flow diagram is shown as below:

★ This UPS receives power from more than one
source-disconnection of AC source and the DC source is required to de-energize this unit before servicing.

★ For PERMANENTLY CONNECTED EQUIPMENT, a readily accessible disconnect device shall be incorporated external to the equipment.

★ For PLUGGABLE EQUIPMENT, the socket-outlet shall be installed near the equipment and shall be easily accessible.

★ CAUTION: To reduce the risk of fire, connect only to a circuit provided with 20A for 1K/1KS/2K/2KS, 40A for 3K/3KS maximum branch circuit overcurrent protection in accordance with the National Electrical Code, ANSI/NFPA 70.

1.2 Operation

★ For safety consideration, do not disconnect the mains cable on the UPS or the building wiring socket (grounded shockproof socket) during operation, the grounding for the UPS and all loads connected will be disconnected.

★ The UPS features its own, internal current source (batteries). You may be electric shocked when you touch the UPS output sockets or output terminal block even if the UPS is not connected to the building wiring socket.

★ In order to fully disconnect the UPS, first press the OFF button to turn off the UPS, and then disconnect the mains lead.

★ Ensure that no liquid or other external objects can enter the UPS.

★ Do not remove the enclosure. This system is to be serviced by qualified service person only. There are NO USER SERVICEABLE PARTS inside the UPS.

★ Remove the protective panel only after disconnecting the terminal connections.

1.3 Maintenance, servicing, and faults

★ The UPS operates with hazardous voltages. Repairs may be carried out only by qualified maintenance/service person.

★ Caution - risk of electric shock. Even after the unit is disconnected from the mains power supply (building wiring socket), components inside the UPS are still connected to the battery which are potentially dangerous.

★ Before carrying out any kind of service and/or maintenance, disconnect the batteries. Verify that no current is present and no hazardous voltage exists in the capacitor or BUS capacitor terminals.

★ Batteries must be replaced only by qualified person.

★ Caution - Risk of Energy hazard, 24/36/48/72V, 7/9AH battery. Before replacing batteries, remove conductive jewelry such as chains, wrist watches, and rings, High energy through conductive material could cause severe burns

★ Caution - risk of electric shock. The battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground. Verify that no voltage is present before servicing!

★ CAUTION: A battery can present a risk of electrical shock and high short-circuit current. Contact with any part of a grounded battery can result in electrical shock. The following precautions should be observed when working on batteries:

a) Remove watches, rings, or other metal objects

b) Use tools with insulated handles

c) Wear rubber gloves and boots.

d) Do not lay tools or metal parts on top of batteries.

e) Disconnect charging source and load prior to installing or maintaining the battery.

f) Remove battery grounds during installation and maintenance to reduce likelihood of shock. Remove the connection from ground if any part of the battery is determined to be grounded.

★ When changing batteries, replace with the same quantity and the same type of batteries.

★ Do not attempt to dispose of batteries in a fire. It could cause explosion.

★ Do not open or mutilate batteries. released electrolyte is harmful to the skin and eyes. It may be toxic.

★ Please replace the fuse only by a fuse of the same type and of the same amperage to avoid fire hazards.

★ Do not dismantle the UPS, except the qualified maintenance person.

1.4 Transport

★ Please transport the UPS only in the original packaging (to protect against shock and impact).

1.5 Storage

★ The UPS must be stockpiled in the room where it is ventilated and dry

NOTE:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense

Chapitre 1 Instructions de sécurité et CEM(French)

Veuillez lire attentivement le manuel d’utilisation suivant et les consignes de sécurité avant d’installer ou d’utiliser le produit!

1.1 Installation

★ Consultez les instructions d’installation avant de brancher l’alimentation secteur.

★ De la condensation peut se produire si l’onduleur passe directement d’un environnement froid à un environnement chaud. L’onduleur doit être absolument sec avant d’être installé. Il est recommandé d’avoir un temps d’acclimatation d’au moins deux heures.

★ N’installez pas l’onduleur près de l’eau ou dans un environnement humide.

★ N’installez pas l’onduleur à un endroit où il serait exposé à la lumière directe du soleil ou à la chaleur.

★ Ne connectez pas d’appareils ou d’équipements qui surchargeraient l’onduleur (par exemple, imprimantes laser, etc.) à la sortie de l’onduleur.

★ Placez les câbles correctement pour éviter d’être foulés ou trébuchés.

★ S'assurer que la terre de protection est connectée de manière fiable.

★ Connectez l’onduleur uniquement à une prise de courant de type antichoc.

★ La prise de câblage du bâtiment (prise antichoc) doit être facilement accessible à proximité de l’onduleur.

★ Avec l’installation de l’équipement, la somme du courant de fuite de l’onduleur et de la charge connectée ne dépasse pas 3,5 mA

★ Ne bloquez pas les ouvertures de ventilation sur le boîtier de l’onduleur. Assurez-vous que les bouches d’aération à l’avant, sur les côtés et à l’arrière de l’onduleur ne sont pas obstruées. Recommandé au moins 25cm d’espace de chaque côté.

★ Cet onduleur est alimenté par plus d’une source, la déconnexion de la source CA et la source CC est nécessaire pour mettre cet appareil hors tension avant l’entretien.

★ Pour les ÉQUIPEMENTS RACCORDÉS EN PERMANENCE, un dispositif de déconnexion facilement accessible doit être incorporé à l’extérieur de l’équipement.

★Pour les ÉQUIPEMENTS enfichables, la prise de courant doit être installée à proximité de l'équipement et être facilement accessible.

★ ATTENTION : Pour réduire les risques d'incendie, ne branchez l'appareil que sur un circuit équipé d'une protection contre les surintensités de 20A pour 1K/1KS/2K/2KS, 40A pour 3K/3KS, conformément au Code national de l'électricité, ANSI/NFPA 70.

1.2 Opération

★ Pour des raisons de sécurité, ne débranchez pas le câble secteur de l'onduleur ou de la prise de câblage du bâtiment (prise antichoc mise à la terre) pendant le fonctionnement, la mise à la terre de l'onduleur et toutes les charges connectées seront déconnectées.

★ L'onduleur dispose de sa propre source de courant interne (batteries). Vous pouvez subir un choc électrique lorsque vous touchez les prises de sortie de l'onduleur ou le bornier de sortie même si l'onduleur n'est pas connecté à la prise de câblage du bâtiment.

★Pour déconnecter complètement l'onduleur, appuyez d'abord sur le bouton OFF pour éteindre l'onduleur, puis débranchez le câblage secteur..

★ Assurez-vous qu'aucun liquide ou autre objet externe ne peut pénétrer dans l'onduleur.

★ Ne retirez pas le boîtier. Ce système ne doit être entretenu que par une personne de service qualifiée. Il n'y a AUCUNE PIÈCE RÉPARABLE PAR L'UTILISATEUR à l'intérieur de l'onduleur.

★ Retirez le panneau de protection uniquement après avoir déconnecté les connexions de la borne.

1.3 Maintenance, entretien et pannes

★L'onduleur fonctionne avec des tensions dangereuses.Les réparations ne peuvent être effectuées que par un technicien d'entretien ou de service qualifié.

★ Attention - risque de choc électrique. Même après que l'unité est déconnectée de l'alimentation secteur (prise de câblage du bâtiment), les composants à l'intérieur de l'onduleur sont toujours connectés à la batterie qui sont potentiellement dangereux.

★ Avant d'effectuer tout type d'entretien et/ou d'entretien, débranchez les batteries. Vérifiez qu'aucun courant n'est présent et qu'aucune tension dangereuse n'existe dans les bornes du condensateur ou du condensateur BUS.

★ Les piles ne doivent être remplacées que par une personne qualifiée.

★ Attention - Risque d'énergie, batterie 24/36/48/72V, 7/9AH. Avant de remplacer les piles, retirez les bijoux conducteurs tels que les chaînes, les montres-bracelets et les bagues. Une énergie élevée à travers un matériau conducteur peut provoquer de graves brûlures.

★ Attention - risque de choc électrique. Le circuit de la batterie n'est pas isolé de la tension d'entrée. Des tensions dangereuses peuvent se produire entre les bornes de la batterie et la terre. Vérifiez qu'aucune tension n'est présente avant l'entretien!

★ ATTENTION : Une batterie peut présenter un risque d'électrocution et un courant de court-circuit élevé. Tout contact avec une partie d'une batterie mise à la terre peut entraîner un choc électrique. Les précautions suivantes doivent être observées lorsqu'on travaille sur des batteries:

a) Retirer les montres, bagues ou autres objets métalliques

b) Utiliser des outils avec des poignées isolées

c) Porter des gants et des bottes en caoutchouc.

d) Ne pas poser d'outils ou de pièces métalliques sur les batteries.

e) Débrancher la source de charge et la charge avant d'installer ou d'entretenir la batterie.

f) Retirer la mise à la terre de la batterie pendant l'installation et l'entretien pour réduire le risque de choc. Retirer la connexion de la terre si une partie de la batterie est mise à la terre

★ Lorsque vous changez les piles, remplacez-les par la même quantité et le même type de piles.

★ N'essayez pas de jeter les piles au feu. Cela pourrait provoquer une explosion.

★ Ne pas ouvrir ou mutiler les piles. L'électrolyte libéré est nocif pour la peau et les yeux. Il peut être toxique.

★ Veuillez remplacer le fusible uniquement par un fusible du même type et de même ampérage afin d'éviter les risques d'incendie

★ Ne démontez pas l'onduleur, sauf le préposé à l'entretien qualifié.

1.4 Transport

★ Veuillez transporter l'onduleur uniquement dans son emballage d'origine (pour vous protéger contre les chocs et les chocs).

1.5 Stockage

★ L'onduleur doit être stocké dans la pièce où il est ventilé et sec

NOTE:

Cet équipement a été testé et jugé conforme aux limites d'un appareil numérique de classe A, conformément à la partie 15 des règles de la FCC. Ces limites sont conçues pour fournir une protection raisonnable contre les interférences nuisibles lorsque l'équipement est utilisé dans un environnement commercial. Cet équipement génère, utilise et peut émettre de l'énergie radiofréquence et, s'il n'est pas installé et utilisé conformément au manuel d'instructions, peut causer des interférences nuisibles aux communications radio. L'exploitation de cet équipement dans une zone résidentielle est susceptible de provoquer des interférences nuisibles, auquel cas l'utilisateur sera tenu de corriger les interférences à ses frais

Chapter 2 Product Introduction

2.1 Introduction

The ARES PLUS ECO On-Line-Series is an uninterruptible power supply incorporating double-converter technology. It provides perfect protection specifically for computer equipment, communication systems and industry control systems.

The double-converter principle eliminates all mains power disturbances. A rectifier converts the alternating current from the socket outlet to direct current. This direct current charges the batteries and powers the inverter.

Based on this DC voltage, the inverter generates a pure sinusoidal AC voltage, which permanently supplies the loads. Computers and periphery are thus powered entirely by the mains voltage. In the event of power failure, the maintenance-free batteries power the inverter. In the event of inverter failure/Overload, UPS transfer to bypass mode, after the failure/overload remove, UPS transfer to inverter mode continue supplies the loads.

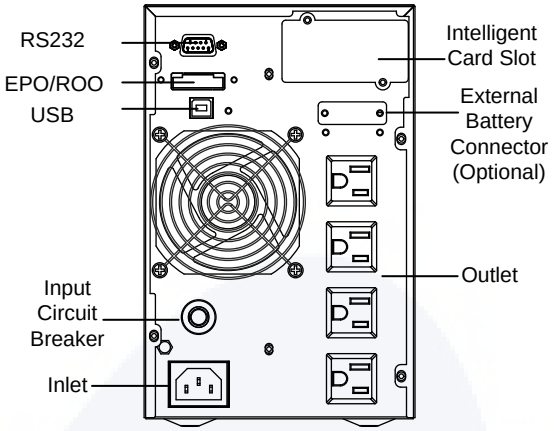
This manual covers the UPS listed as follows. Please confirm whether it is the model you intend to purchase by performing a visual inspection of the Model No. on the rear panel of the UPS.

2.2 Product Model List

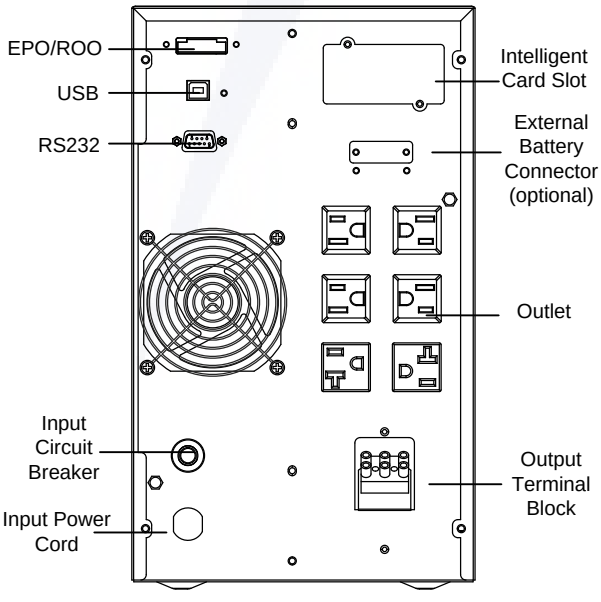
Product type and Capacity		Model Name	Remark
Model	1KVA	ARPLUS-ECO1000	Tower model with 2pcs batteries and 1A internal charger
	2KVA	ARPLUS-ECO2000	Tower model with 4pcs batteries and 1A internal charger
	3KVA	ARPLUS-ECO3000	Tower model with 6pcs batteries and 1A internal charger
	1KVA	ARPLUS-ECO1000RT	Rack model with 2pcs batteries and 1A internal charger
	2KVA	ARPLUS-ECO2000RT	Rack model with 4pcs batteries and 1A internal charger
	3KVA	ARPLUS-ECO3000RT	Rack model with 6pcs batteries and 1A internal charger

2.3 UPS Outlook

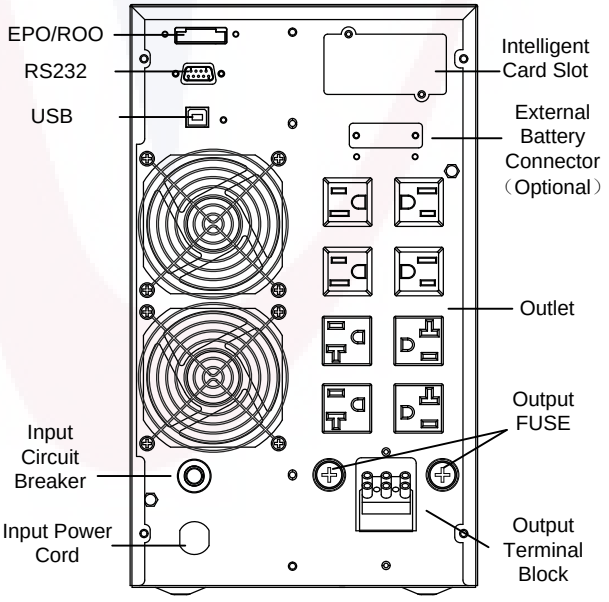
2.3.1 Rear View



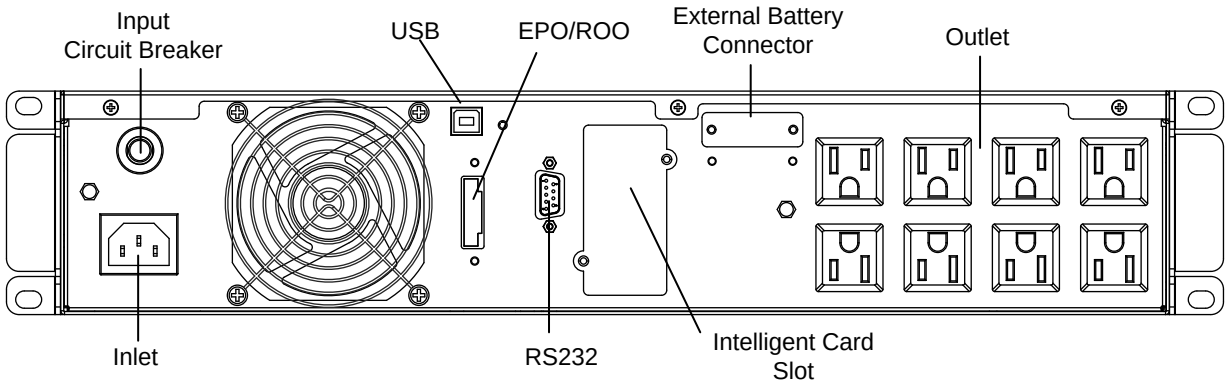
ARPLUS-ECO1000 Rear Panel



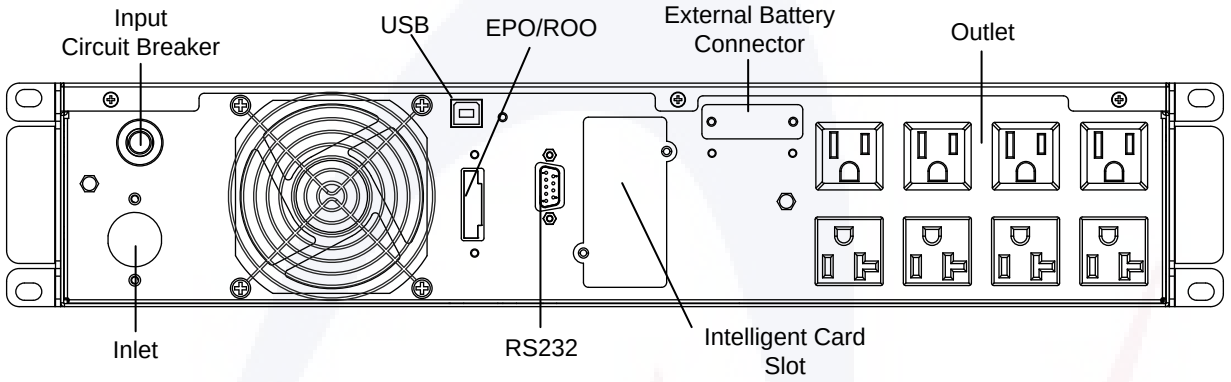
ARPLUS-ECO2000 Rear Panel



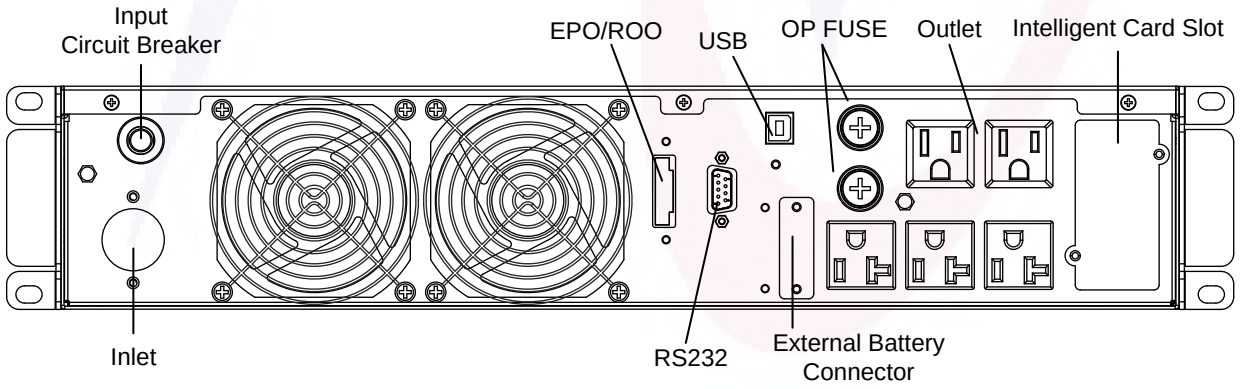
ARPLUS-ECO3000 Rear Panel



ARPLUS-ECO1000RT Rear Panel



ARPLUS-ECO2000 Rear Panel



ARPLUS-ECO3000 Rear Panel

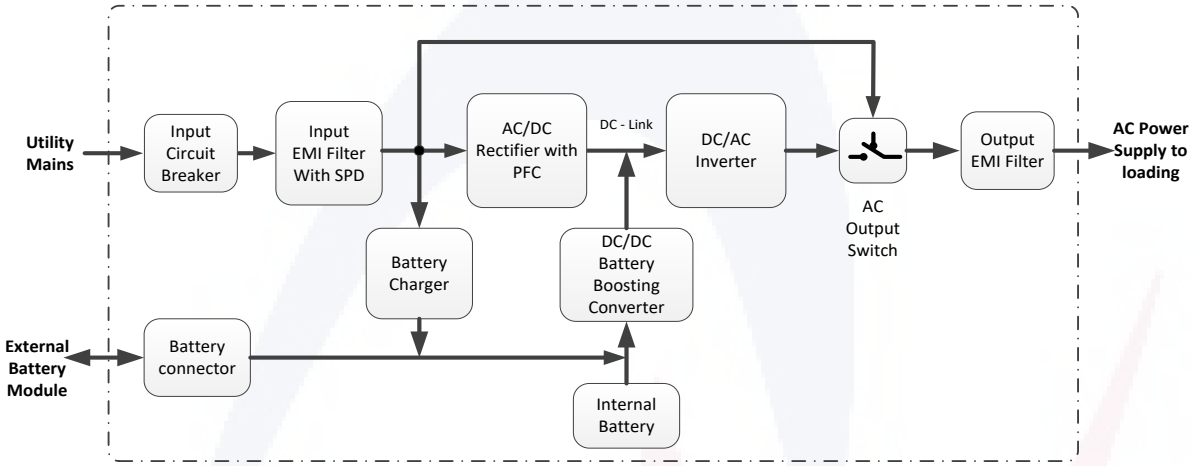
Note:

1. The socket and terminal configuration on the rear panel may be slightly different for countries or regions according to order.
2. External battery connectors available only for long backup type UPS
3. Note: It is recommended that the UPS output line is not more than 10m, the external communication

line, and the machine line and the temperature detection line is not more than 3m, otherwise it may need to take installation restrictions or additional measures to suppress interference.

2.4 Internal circuit configuration

The present UPS product is a typical double conversion ONLINE UPS with internal bypass, as shown in below figure, a push-button AC circuit breaker at the front end is used for over current protection, and then an input EMI filter for filtering out noise interference. AC power pass through EMI is fed to a PFC rectifier and convert to stable high voltage DC power and supply to the DC link. At the output of the DC link, a DC/AC Inverter converts the high voltage DC power to clean and stable AC power for protecting the mission critical loading. Another branch of AC power is converted to low voltage DC power to recharge the battery. The battery powers the DC link and inverter through the DC/DC battery boosting converter in case AC mains is abnormal. During transient between AC input power and battery power, the output is sustained and smoothed by the DC link, which result in true zero interruption on AC output end. An internal automatic bypass provides a backup power supply in case overload or other unexpected abnormal situation occurs to the UPS.



Internal circuit configuration of present UPS product

Inside the UPS, input Neutral is not bonded with PE, and grounding subject to input power distributing system, the product compatible with TN, IT, TT power distributing system, with Line, Neutral and PE of 100/110/120/125V 50/60Hz nominal voltage.

The AC or battery power are connected to the UPS via the dedicated port, correct wiring is essential for the UPS function normally, detailed information about wiring can be found in later sections.

Chapter 3 Installation

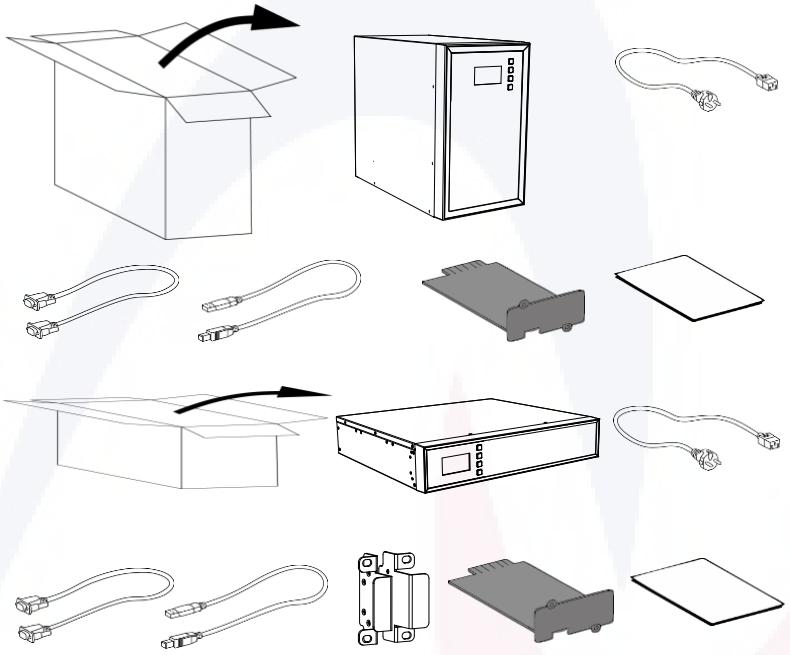
3.1 Product inspection

- Unpacking the cabinet, Open the outer carton and remove the accessories Packed in the cabinet
- Carefully lift the cabinet out of the outer carton. Note the UPS mode with internal battery is heavy, two person or proper tools should be used to take the equipment out
- Inspection equipment

Check the product appearance, display, terminal block, socket, connector, NO contamination and deformation should be found

Checking accessories according to below of shipping list.

Please contact the distributor if damages or lack of accessories are found.



UPS accessories of shipping list:

Accessory	Quantity	Unit
User manual	1	PCS
Input Power Cord	1	PCS
RS232 Cable (optional)	1	PCS
USB Cable(optional)	1	PCS
Communication card (optional)	1	PCS
Rack ears (Only for Rack Type)	2	PCS

3.2 Installation

Because of heavy weight, a steady space needed to install the UPS. Cool, good ventilation,

less humidity and dust are required for safe and reliable operation of the UPS.

Always keep 200 mm of free space behind the UPS rear panel.

Check that the indications on the name plate located on the top cover of the UPS meets to the AC-power source and the true electrical consumption of the total load

3.3 Wiring

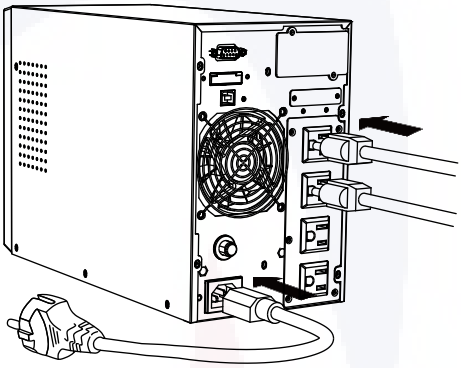
NOTE:

Do not apply power to the UPS until installation is totally completed.

Do not make unauthorized changes to the UPS; otherwise, damage may occur to your equipment and void your warranty.

3.3.1 Input Wiring

Ares Plus Eco 1, 2, 3 kVA (100V/110V120/125V) comes with input cable with plug. Plug the input cable to appropriate mains supply socket.



Installation of product with Power cord with plug end

Note the voltage and current rating of the product. Refer to below table for input wiring

Model	Nominal Input Voltage	Rated Input Current	Input Cable AWG/Cross-section Area	Terminal Block Tightening Torque
1K	100/110/120/ 125Vac	10/10/9.6/9.3A	Standard cable with plug	NA
2K		16/16/16/16A		
3K		24/24/24/24A		

Even internal over current protection breaker is embedded in the product, external switchable circuit breaker should be installed at upstream of the UPS product for safe installation and maintenance of product.

3.3.2 Output Wiring

The input of the equipment needs to be protected by UPS should connect to the UPS output.

Outlet and terminal block are available for output connection from UPS, with refer to figure in section 2.3.2：

Model	Rating Capacity	Quantity of output socket	Output terminal block & wiring cable AWG/Cross-section Area	Terminal Block Tightening Torque
1K	1kVA	4 x NEMA5-15R	NA	NA
2K	2kVA	4 x NEMA5-15R +2 x NEMA5-20R	14 AWG for TB output L/N 12 AWG for bonding Use 75℃ copper wire	0.5 Nm (4.4 Lb. In)
3K	3kVA	4 x NEMA5-15R +4 x NEMA5-20R	10 AWG for output L/N 10 AWG for bonding Use 75℃ copper wire	

Please find rated output capacity of product , avoid overload and used wire with sufficient current rating, with refer to below table.

Model	Nominal Output Voltage	Rated output Current	Wire for terminal	Tightening Torque
1K	100/110/120/125 Vac	9.0/9.1/8.4/8.1A	>14 AWG/2mm^2 Use 75℃ copper wire	0.5Nm (4.4 Lb In)
2K		18.0/18.1/16.6/16.0A	>12AWG/4mm^2 Use 75℃ copper wire	
3K		24.4/24.5/25/24A		

Procedure for output wiring:

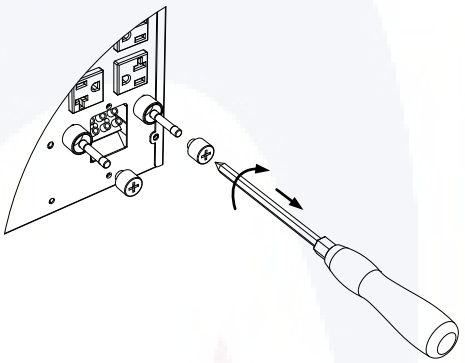
1. Plug the AC input cord of the equipment needs UPS protection to the Outlet of the UPS.
2. To connect more equipment than available Outlet number, please use extension cord, connect
3. to the Outlet or output terminal block, mind the total consumption current must not exceed rated
4. current capacity of the product.
5. The output terminal is protected by a cover, uncover the terminal , use appropriate connecting

6. terminal, prepare well the wire.

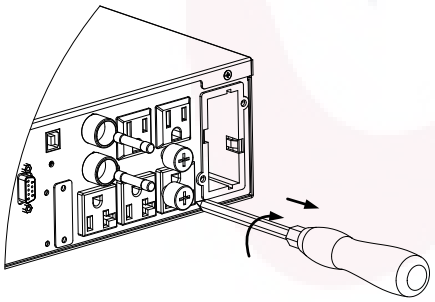
7. Fix the prepared wired to the terminal block, find the silkscreen marking for polarity of the wiring.

3.3.3 Output FUSE

Subject to safety regulation, the 3K model equipped with output Fuse, the UPS provide comprehensive overcurrent protection to avoid tripped the output FUSE, however, in ultimate case, for example, short-circuit occurs to downstream loading equipment while UPS in bypass mode, the fuse might blow to protect the output socket and downstream loading equipment, in this such situation, a new fuse of 20A with UL289-14 certification needed to replace the blown one, refer to below figure, before replace the fuse, make sure cut off all power input and the UPS in OFF state:



Replacement of Tower 3K output fuse



Replacement of Rack 3K output fuse

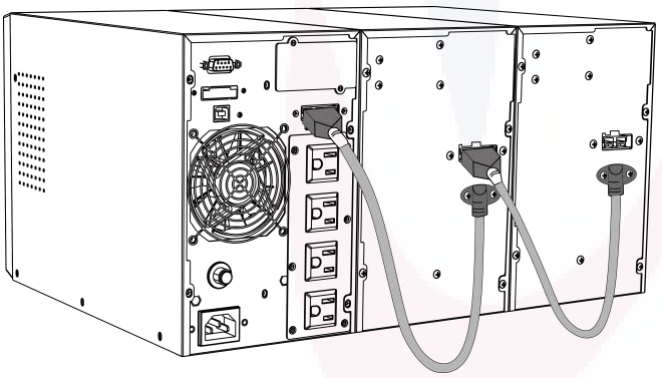
3.3.4 External Battery Module

Connection of external battery is **ABSOLUTELY CRITICAL.** Any mistake may result in serious injure of electric shock or fire, damage of product: below steps must be strictly followed:

Nominal Battery voltage

Model	Nominal Battery Voltage	Rated Battery Current	Recommended Wiring cable for non-standard EBM
1K	24V	45A	>10AWG/6mm^2
2K	48V	45A	>10AWG/6mm^2
3K	72V	45A	>10AWG/6mm^2

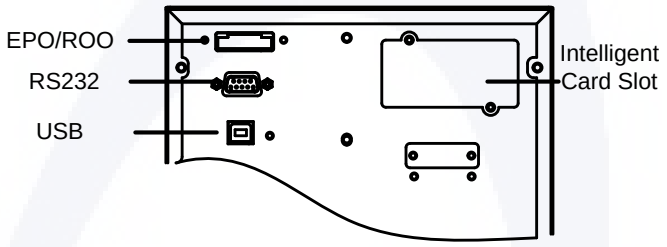
- The external battery bank must be in accordance with UPS rated battery voltage, find UPS rated battery voltage in model plant on the rear panel of the product
- Standard external battery module has an extending port, which is used to extend external battery capacity, just plug battery cable to the extending port of adjacent model and battery cable of the last module connect to the UPS battery connector on the rear panel of the UPS,



- For non-standards battery module, The external battery bank must have a cut-off device, like circuit breaker or switch with fuses.
- **TURN OFF** the cut-off device , make sure no harmful voltage can be touched on the connector.
- Use only battery bank of correct voltage, check the product rating label for correct information.
- Choose Wire with sufficient current rated, prepared well the terminal

- **CHECK THE POLARITY** of battery bank, fix wires of correct polarity to the battery bank with proper color and clear label for distinguish the polarity.
- Securely Plug / Fix the other end of the cable to UPS
- Check the polarity of the wiring and fastness of the connection
- Powered the UPS by turning on the cutoff device
- This UPS may work with a maximum of 4 extension battery cabinets.

3.3.5 Communication Cable



RS232 : Connect UPS computer Interface (RS232) and monitor equipment through communication cable.

Intelligent Card Slot is used to install NMC (Network Management Card), AS400 Card , CMC(Centralized Monitoring Card), to implement Network Monitoring, RS485 based ModBUS protocol monitoring.

The USB port is a serial port emulator will allow you to create virtual RS232 ports linked via a USB Port, the UPS could be managed through the same management software, while does not support HID USB Power part operating mode.

The Product also provide optional Modbus Port, Relay Dry contact card, refer to optional port user manual for application.

3.3.6 Software

Free Software Download – WinPower

WinPower is brand new UPS monitoring software, which provides user-friendly interface to monitor and control your UPS. This unique software provides safely auto shutdown for multi-computer systems while power failure. With this software, users can monitor and control any UPS on the same LAN no matter how far from the UPS.

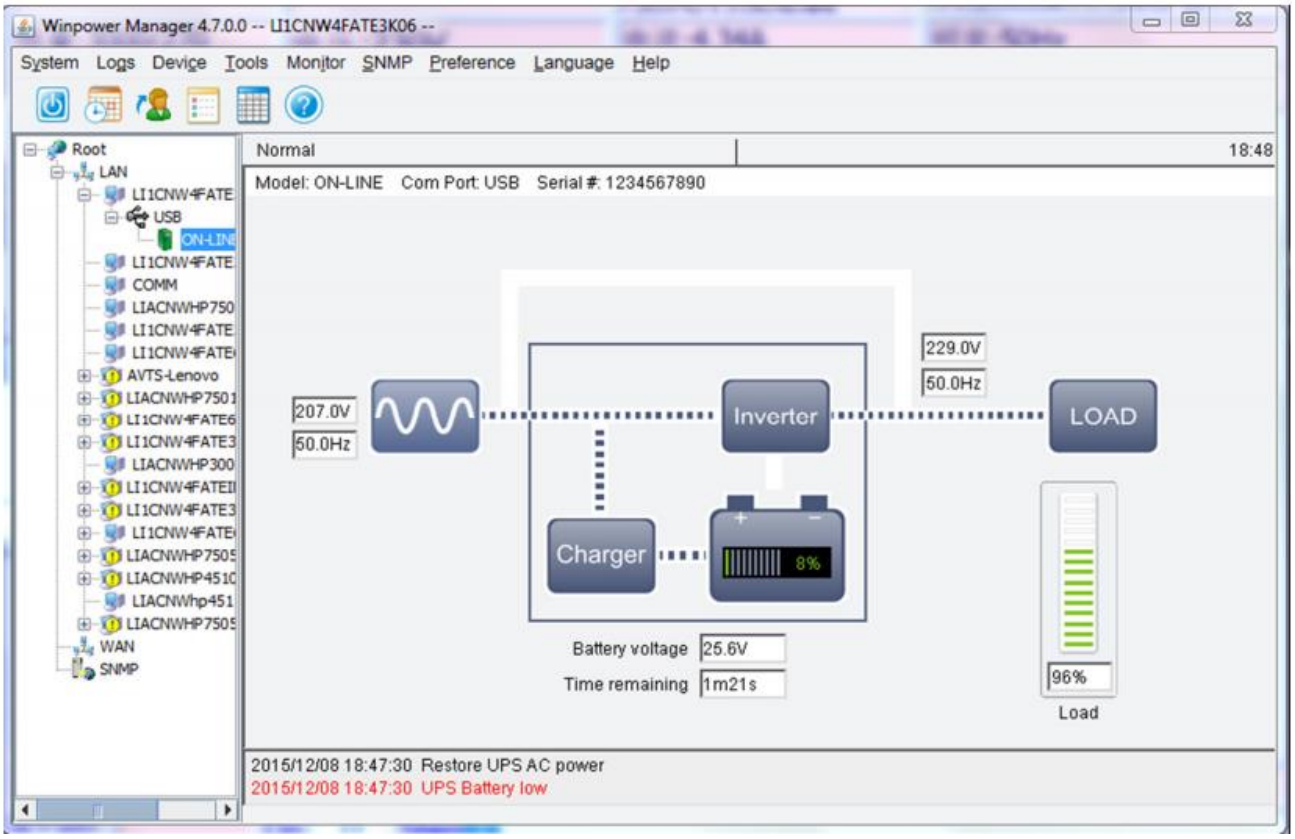
Installation procedure:

Visit website for downloading the management software: http://www.ups-software-download.com

Choose the operation system you need and follow the instruction described on the website to download the software

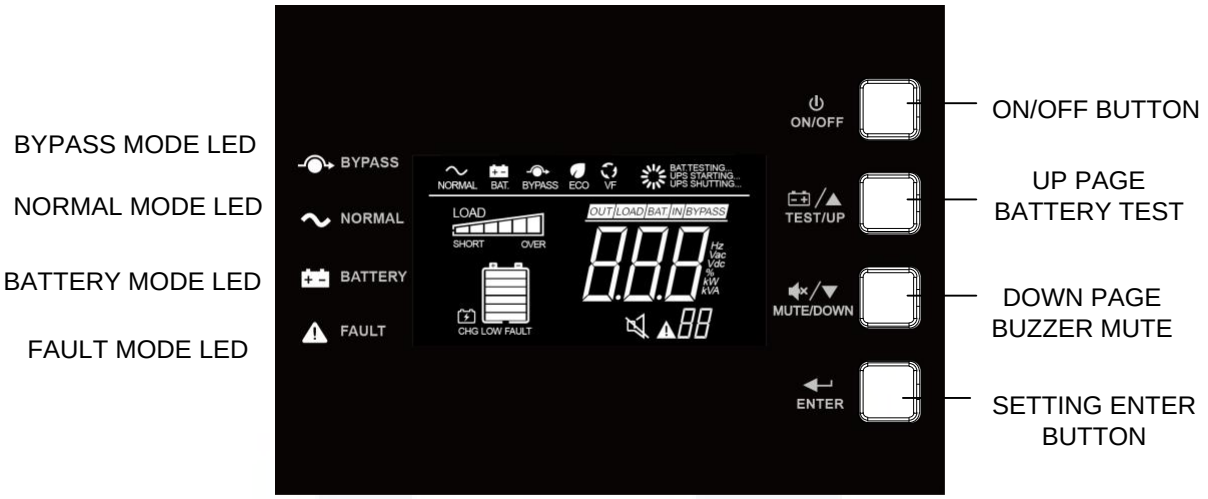
When downloading all required files from the internet, enter the serial No: 511C1-01220-0100-478DF2A to install the software.

When your computer restarts, the WinPower software will appear as a green plug icon located in the system tray, near the clock



Chapter 4 Panel & Operation Guide

4.1 Display panel



LCD Display Panel

4.1.1 ON/OFF Button

ON/OFF Button is used to turn on/off the UPS

4.1.2 Setting Enter button

Enter button is used to enter setting mode and confirm change of the setting

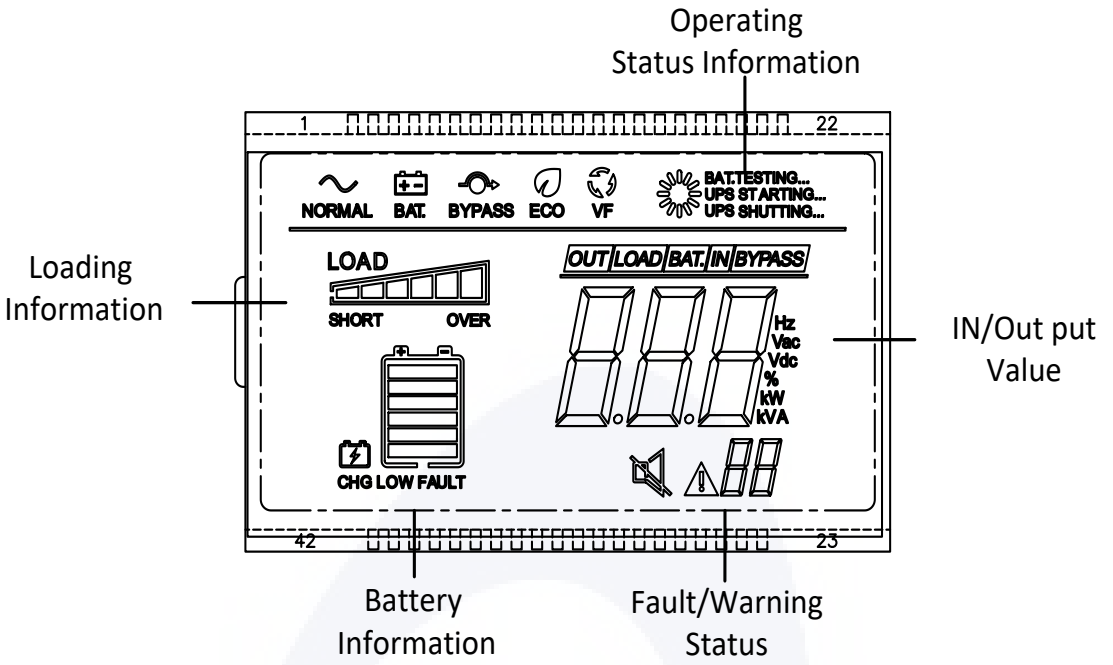
4.1.3 Up Page/ Battery Self-test Button

The Up page Button is used to switch the display the LCD display information, and activate the battery self-test function

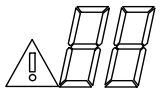
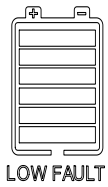
4.1.4 Down Page/Buzzer Muting function

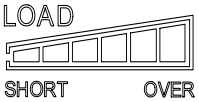
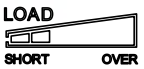
The Down Page Button can also used to switch the display the LCD display information, and muted/recover the buzzer alarm function

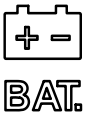
4.1.5 LCD Display



icon	Function description
Input Source Information	
IN	Indicates the AC input.
Hz Vac Vdc % kW kVA	Indicate input voltage, input frequency, battery voltage.
AC Output Information	
OUT	Indicates the AC Output.
Hz Vac Vdc % kW kVA	Indicate output voltage, frequency, loading percent.
Fault Information	

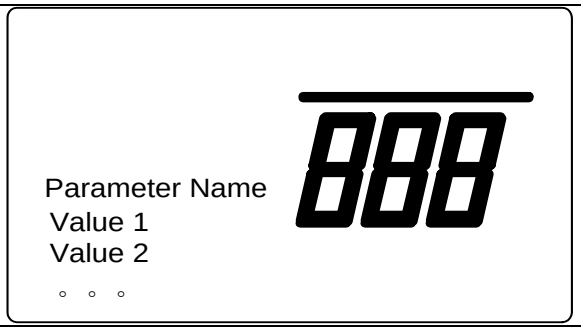
	Indicates the warning or fault Status occurs to the UPS. Warning: flashing with warning code at output digit. Fault: lighting with fault code at output digit.
Battery Information	
	Indicates battery level by 0-20%, 21-40%, 41-55% ,56-70%, 71-85% and 86-100% in battery mode . LOW: Indicates low voltage of the battery. FAULT: Indicates that the UPS is faulty.
Battery Charge Information	
	Indicates charging status in line mode.
Silent mode	
	Indicates that the UPS has been enabled in silent mode

Load Information		
	Indicates overload.	
	Indicates the load level by 0-15%, 16-30%, 31-45%, 46-60%, 61-80% and 81-100%. SHORT: Indicates with a small load. OVER: Indicates overload.	
	0-15%	16-30%
		
	31-45%	46-60%
		
	61-80%	81-100%

		
Mode Operation Information		
	Online mode	
	On battery mode, AC Mains is abnormal, Battery supply inverter output	
	On ECO mode	
	On bypass Mode, the load is not protected by the UPS	
	On CVCF (constant voltage, constant frequency) Mode	
	Battery Testing Ongoing	
	UPS is turning On	
	UPS is turning Off	

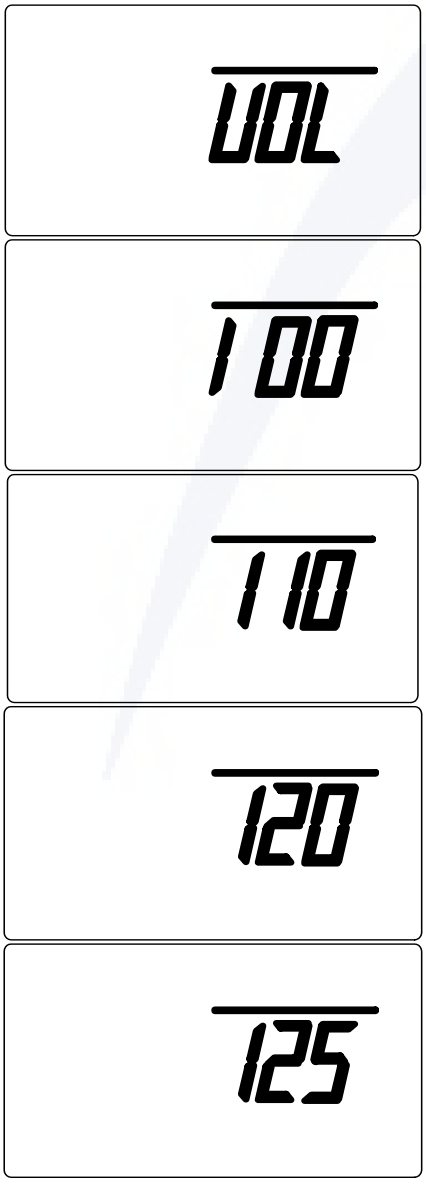
4.1.6 Parameter Setting

On bypass/standby mode, long press the Enter Key for 2 seconds, the UPS Enter Parameter Setting mode, and the LCD display as follow

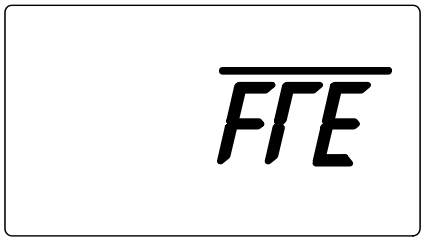
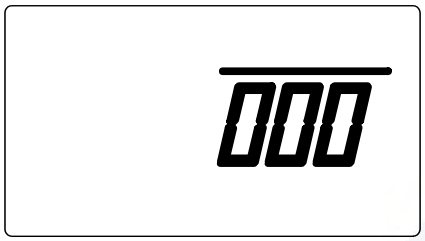
	Parameter name indicate the parameter item to set 。 The value is the target setting value Use “Upward” or “Downward” to choose the item to set and setting value

The Parameter is saved only when the UPS is completely shut down under battery mode. Means that battery need to be connected to complete parameter setting, after finish parameter setting, cut off mains input and wait about 1min until the UPS automatically shut down and save the change to the memory. New Parameter value will take effect in next turn-on.

- **01: Output Voltage**

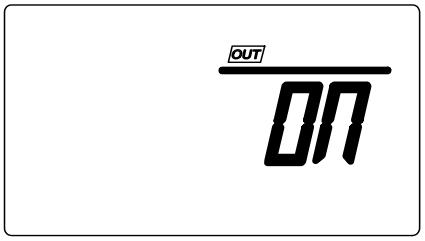
Display	Value
	**Parameter Item: Output Voltage** **100:** means output voltage will be 100Vac **110:** means output voltage will be 110Vac **120:** means output voltage will be 120Vac **125:** means output voltage will be 125Vac Use “UP Page” or “Down Page” Button to find desired voltage value , then Use “ENTER” button to activate the value, once the value is active, there is “Vac” icon shown behind the value Example: 

- **02: Output frequency**

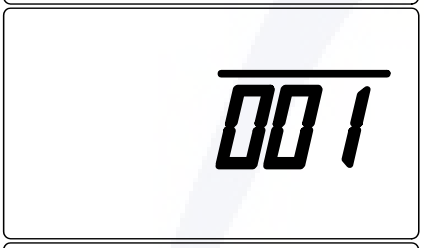
Display	Value
   	**Parameter Item: Output frequency** **000:** auto adaptive, the UPS will automatically detect the mains frequency to determined it output frequency when it wakes up by mains power on **050:** Fixed 50Hz rated frequency **060:** Fixed 60Hz rated frequency Use "UP Page" or "Down Page" Button to find desired voltage value , then Use "ENTER" button to activate the value, once the value is active, there is "Hz" icon shown behind the value Example: 

- **03: Auto turn on upon mains power on**

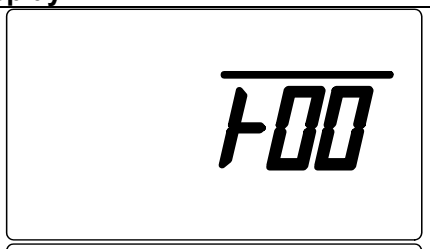
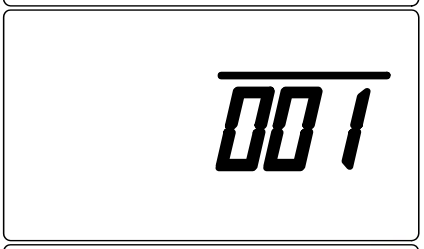
Display	Value
	**Auto turn ON Function setting** **ON：** Enable auto turn on function, when the UPS wake by AC mains apply , the UPS will automatically turn on and run in line mode **OFF：** Disable auto turn on function, the UPS will stay on standby mode /bypass mode until manual turn on operation Use "UP Page" or "Down Page" Button to find desired voltage value, then Use "ENTER" button to activate the value, once the value is active, there is "OUT" icon shown above the value

 	Example: 

- **04: EPO Setting**

Display	Value
    	**Emergency Power OFF (EPO) switch response setting** **001: Enable EPO** **000: Disable EPO** **0n1: EPO activated for EPO switch open** **0n0: EPO activated for EPO switch close** Use “UP Page” or “Down Page” Button to find desired voltage value , then Use “ENTER” button to activate the value, once the value is active, there is “OUT” icon shown above the value Example: 

- **05: ROO Setting**

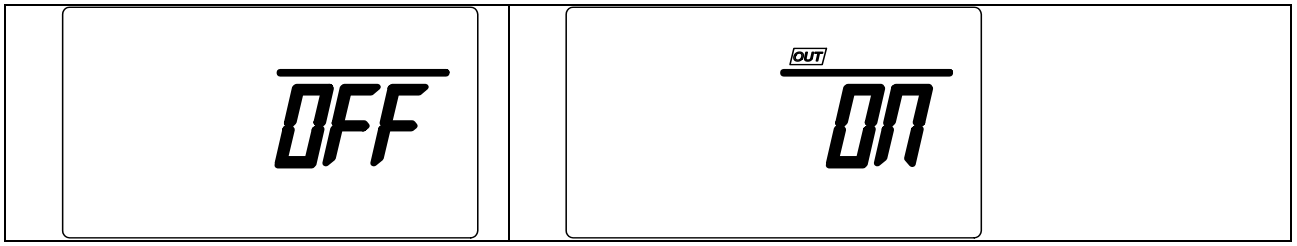
Display	Value
    	**Remote On OFF (ROO) switch response setting** **001: Enable ROO** **000: Disable ROO** **0n1: ROO activated (Turn on UPS) for ROO switch open** **0n0: ROO activated (Turn on UPS) for ROO switch close** Use “UP Page” or “Down Page” Button to find desired voltage value , then Use “ENTER” button to activate the value, once the value is active, there is “OUT” icon shown above the value Example: 

- **06: Bypass Setting**

Display	Value
  	Entity Bypass setting, this item it to set bypass output when UPS is not on inverter output mode(line mode / battery mode), if the setting is disable bypass output is turn OFF when UPS is not on inverter output mode(line mode / battery mode) , on the contrary, if the setting is enable , the bypass output is turn ON when UPS is not on inverter output mode(line mode / battery mode) if only mains input is normal, please note the UPS should be turn on if the load need to be protected by the UPS when this setting is enable. **ON： Enable bypass mode** **OFF：Disable bypass mode** Use “UP Page” or “Down Page” Button to find desired voltage value , then Use “ENTER” button to activate the value, once the value is active, there is “OUT” icon shown above the value Example: 

- **07: ECO MODE**

Display	Value
 	**Economic (ECO) Mode Enable /Disable setting** **ON: Enable Economy (ECO) mode** **OFF: Disable Economy (ECO) mode** Use “UP Page” or “Down Page” Button to find desired voltage value, then Use “ENTER” button to activate the value, once the value is active, there is “OUT” icon shown above the value Example:



4.2 UPS Working Mode

4.2.1 Normal mode

Turn on the UPS, if the mains supply is normal, UPS will work in Normal mode (Line mode) and converse and filter the mains input for clean and stable AC output. The indicators display will show the operating mode. .

If loading level is over 100% rated capacity, the buzzer beeps to remind you overloaded that you must reduce unnecessary load until the UPS loading level is less than 100%.

If the battery indicator blinks cyclically, it shows the UPS disconnect from battery or the battery con diction is abnormal. Please check the battery connection and battery condition for prevent UPS output unexpected interruption upon mains supply power losses.

4.2.2 Battery mode

When mains utility power is abnormal condition, such as blackout or fluctuation in voltage, frequency as well as waveform, UPS will automatically switch to run in battery mode, in which the battery work as energy source, and maintain the stable AC power supply at the output side of the UPS product.

In the Battery mode, UPS will beep once every 4s. the user can mute the buzzer beep by the down page(mute) button.

If the battery capacity is very low, the UPS will beep once every 1S. It is alarm to take off the load as soon as possible.

Backup function can be tested through battery self-test via Up Page (battery test) button

4.2.3 Bypass mode

The ups work on bypass mode when the UPS start up or abnormal situation occurs to the converters and cannot work properly. The mains power is fed to the load through the bypass circuit in such mode without

protection. Please note that when UPS running in bypass mode, UPS has no backup function either, because load power is supplied by the utility power directly.

4.3 Operation

4.3.1 Turn on UPS

Turning on with utility power

Connect the mains input to the UPS, press and hold the ON/OFF button for more than 3 seconds until the buzzer beeps. the UPS begins to conduct self-test, seconds later, utility power icon and the Inverter icon shown and the UPS begins to output supply and operate under the Normal mode. If the utility power is abnormal, the UPS will work under the Battery mode.

Turning on without utility power

With no mains input to feed the UPS, press, and hold the ON/OFF for than 3 seconds, the UPS response with a buzzer beep. In the turn on process, the UPS has the same operation as if it is connected to utility power that the utility power icon will not show, instead the battery icon shown.

4.3.2 Turn off UPS

The operation of powering down contains: Power down under Normal mode and Battery mode

Turn off UPS under the Normal mode

Press and hold the ON/OFF button for more than 3 second to turn off UPS. If bypass mode is enabled, the bypass indicator will be turned on to indicate that UPS is working in bypass mode. To cut off the output of the UPS, simply cut off the utility power. Finally, not any display is shown on the front panel and no output is available from the UPS outlets.

Turn off UPS under the Battery mode

Press and hold the “ON/OFF” for 3 second to turn off the UPS. The UPS cut off UPS output supply, and the UPS totally turn off after approximately 1 minute.

4.3.3 Enter Setting Mode

When UPS Work on Bypass or Standby Mode, Press the Setting Enter Button for 5 seconds, the UPS enter

setting mode, accept setting of output voltage, frequency, battery number, bypass enable/disable, ECO mode enable /disable ,EPO function ON/OFF.

Use Up page and down Page to change the setting. and short press the setting for confirm the change

After setting, turn off the mains power supply, wait the UPS turn off under battery mode until display if total off , turn on the UPS again to activate the setting change.

4.3.4 Battery Self-test

In Normal mode, press the Up Page Button for more than 4 seconds until the buzzer beeps. he UPS switch to battery test mode, to check the status of the battery, the UPS exit the battery test mode if the battery abnormal and present alarm with the battery icon flashing. If test mode ends up with normal, the UPS switch to normal mode automatically

4.3.5 Buzzer Mute

When UPS is on battery or bypass mode, UPS will warn with warning tone (Battery mode four seconds one tone: Bypass mode two minutes. You can disable or enable the buzzer tone manually.

In the battery and bypass mode, push Down Page button for about 4 seconds until you here a buzzer beep. the buzzer alarm can be muted. Press the button for 4seconds again to recover the buzzer alarm function.

The Buzzer Muting is valid only in battery mode, and invalid for any other UPS alarm.

Chapter 5 Maintenance

5.1 Routine Maintain

To make sure UPS work normal, appropriate maintenance should be schedule periodically, below items should be checked:

Check UPS running status.

If the utility power is normal, UPS should work in line mode or in battery mode. And there is no warning or fault indication.

Check UPS running mode switch.

Cut off the line input to simulate the utility power interrupt, UPS should transfer to battery mode, and connect the line input, UPS return to line mode again.

Check UPS panel.

Check UPS panel display if it is consistent with UPS running mode.

5.2 Battery Maintain

Typical life span of a lead acid battery is 300 cycle or 2~3years in an environment of 15-25℃ ambient temperature.

Battery is a very important part in the UPS system. The life of battery affected by the environment temperature and cycling use times, high temperature and deep discharge will decrease the battery life.

Battery test can find out battery most problem in battery. for external battery bank, voltage of each battery unit can be an indicator for the battery health status, under not charged condition, battery voltage of in bad unit condition will drop quickly, or significantly stray from that of the rest unit in the same battery bank . Professional battery check is to test battery with battery diagnostic instrument , in which battery impedance is measure,

If UPS is not used, it is suggested to charge the battery once every 6 months.

Normally, the battery should be discharged once every 4 to 6 months.

The battery replacement should be done by qualified technician, please get the advice from local distributor

Chapter 6 Trouble shooting

When any trouble with UPS, please check the problem refer to the table below first. If the problem cannot be solved, please contact local supplier.

6.1 LCD Warning and Fault Code

Fault code	Description	Possible cause and solution
01	UPS start up not success	Battery Low
		UPS Internal failure， Contact distributor for service
02	Internal DC BUS over-voltage protection	Half-wave rectifier load(hair dryer, half-wave solenoid valve, energy re-generated type load (motor, huge transformer, capacitor with residue charge, remove this kind of load and turn on the UPS again.
		Over mains voltage, turn on the UPS again.
		UPS Internal failure， Contact distributor for service
03	Internal DC BUS under-voltage protection	Battery Low or overload
		UPS Internal failure， Contact distributor for service
10	UPS Output Short-Circuit	Remove short-circuit equipment from UPS
22	UPS Overload	Reduce loading capacity below UPS rating
23	UPS Over Temperature	Make sure UPS should work in ambient of -10-45^{o}C, if the ambient temperature can't meet this spec. Try reducing loading
		Check ventilation inlet of the UPS ON from panel and outlet on the rear panel is not blocked
		UPS Internal failure， Contact distributor for service
29	UPS Input rectifier protection	Low input voltage and overload
		UPS Internal failure， Contact distributor for service
57	Battery UN-connected	Check battery input wiring and battery cutoff device such as circuit breaker etc.
59	Charger Fail	UPS Internal failure， Contact distributor for service
60	EPO activated	Reset the External EPO switch，if no EPO switch install, turn off EPO function via the operating panel
Battery Icon Flashing		Battery not connected or battery low
		Charger failure, Contact distributor for service
UPS not working normal line mode, With normal mains input		Make sure Input circuit breaker is ON
		Turn on the UPS via ON/OFF button
Backup time is not as long as expected		Battery low, recharge the battery long enough time
		Overload, reduce the loading
		Battery aged, Contact distributor for service
UPS do not turn ON after pressing ON/OFF button		Press the ON/OFF button long enough time, 3 seconds, and hear a buzzer beep for acknowledging the correct TURN ON operation
		Battery low or not connected
		UPS Internal failure， Contact distributor for service

Chapter 7 Specification

7.1 Single phase input Tower model Specification

ARES PLUS		ECO1000		ECO2000		ECO3000	
Nominal power①		1000VA/900W		2000VA/1800W		3000VA/2700W	
AC Input	Input system	Single phase (L/N+PE)					
	Nominal voltage	LV: 100/110/120/125Vac					
	Frequency	50/60Hz					
	Voltage range	LV: 65~145VAC±5VAC					
	Frequency range	（40~70)±0.5Hz					
	Input power factor	>0.99					
	Bypass Voltage Range	LV:95~130V/ (75~145Vac max)					
Battery	Nominal Voltage	24V		48V		72V	
	Battery Capacity & Quantity	12V/9AH x 2pcs		12V/9AH x 4pcs		12V/9AH x 6pcs	
	Backup Time	Half loaded ≥12 minutes, Full loaded ≥5 minutes (standard)					
	Battery charger time	Charger to 90% battery capacity in 5 hours (standard) Dependent on the capacity of external batteries (long backup time)					
AC Output	Output wiring system	Single phase (L/N+PE)					
	Inverter Mode Output voltage	LV:100/110/120/125Vac					
	Waveform	Sine Wave					
	Harmonic Distortion	THD<2% (linear load)					
	Output frequency	50/60±4Hz (Sync mode) 50/60Hz±1% (Fix Freq. mode)					
	Overload capability	105 ~ 125%≥ 60s,126 ~ 150%≥30s The recover point is 70%					
	Transfer time	Battery <-> Line Mode: 0 ms					
Efficiency	Line Mode	88%		89%		90%	
	Battery Mode	85%		86%		87%	
Interface		RS232, USB, Intelligent Slot, EPO, ROO					
Alarm Function		AC/DC input under abnormal, overload condition and Inverter problems					
Protection Function		AC input or output above or below the range of voltage, overload, over temperature and short circuit protection					
Noise		<50dB					

1. Subject to safety regulation and rating of power cord/socket, output power might need derating, find detail on the product label
2. Subject to change according to order, check the product name plate for specified battery voltage information.

7.2 Mechanical

Model	W x H x L(mm)	Weight(kg)	Remark
ECO1000	144×224×349	8.9	Internal 2Pcs Battery
ECO2000	190×323×366	14.0	Internal 4Pcs Battery
ECO3000	190×323×366	21.6	Internal6Pcs Battery
ECO1000RT	439.8x88(2U)×428	13.0	Internal 2pcs*12V/9AH Battery
ECO2000RT	439.8x88(2U)×428	18.5	Internal 4pcs*12V/9AH Battery
ECO3000RT	439.8x88(2U)×640	21.9	Internal 6pcs*12V/9AH Battery

7.3 Environmental

ITEM	Normal range
Ambient temperature	－20ºC~ +40ºC
Environment humidity	0~97%, no condensing
Altitude	no derating for lower than 1000M Over 1000m: 1% derating for every 100M rise，Max. 3000M
Storage temperature	-25ºC~+55ºC

7.4 EMC & Safety Regulation

ITEM	Standard	Level
EMC	FCC CFR Title 47, Part 15, Subpart B	
Safety	UL1778	

Warranty

- Serial number of the product or sales contract is credentials to the warranty.
- In case of UPS fault, please contact local service center and dealer.

This limited warranty does not apply to conditions as follows:

- Damage or loss resulted from force majeure or external causes.
- Warranty period expired.
- The product serial number is missed or modified.
- Disassemble or modifications to the product without authorization.
- Man-made damage