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Delta UPS - Ampron Family

INX Series, Single Phase
1/ 2/ 3 kVA

User Manual

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Save This Manual

This manual contains important instructions and warnings that you should follow during the installation, operation, storage and maintenance of this product. Failure to heed these instructions and warnings will void the warranty.

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Chapter 1 : Important Safety Warnings

Please comply with all warnings and operating instructions in this manual strictly. Save this manual properly and read carefully the following instructions before installing the unit. Do not operate this unit before reading through all safety information and operating instructions carefully.

1.1 Transportation

- Please transport the UPS system only in the original package to protect against shock and impact.

1.2 Preparation

- Condensation may occur if the UPS system is moved directly from cold to warm environment. The UPS system must be absolutely dry before being installed. Please allow at least two hours for the UPS system to acclimate the environment.
- Do not install the UPS system near water or in moist environments.
- Do not install the UPS system where it would be exposed to direct sunlight or near heater.
- Do not block ventilation holes in the UPS housing.

1.3 Installation

- Do not connect appliances or devices which would overload the UPS system (e.g. laser printers) to the UPS output sockets.
- Please do not attached half-sinewave load or motor load to the UPS.
- Place cables in such a way that no one can step on or trip over them.
- Do not connect domestic appliances such as hair dryers to the UPS output sockets.
- The UPS can be operated by any individuals with no previous experience.
- Connect the UPS system only to an earthed shockproof outlet which must be easily accessible and close to the UPS system.
- Please use only VDE-tested, CE-marked mains cable (e.g. the mains cable of your computer) to connect the UPS system to the building wiring outlet (shock-

proof outlet).

- Please use only VDE-tested, CE-marked power cables to connect the loads to the UPS system.
- When installing the equipment, it should ensure that the sum of the leakage current of the UPS and the connected devices does not exceed 3.5mA.

1.4 Operation

- Do not disconnect the mains cable on the UPS system or the building wiring outlet (shockproof socket outlet) during operations since this would cancel the protective earthing of the UPS system and of all connected loads.
- The UPS system features its own, internal current source (batteries). The UPS output sockets or output terminals block may be electrically live even if the UPS system is not connected to the building wiring outlet.
- In order to fully disconnect the UPS system, first press the OFF/ ENTER button to disconnect the mains.
- Prevent no fluids or other foreign objects from inside of the UPS system.

1.5 Maintenance, Service and Faults

- The UPS system operates with hazardous voltages. Repairs may be carried out only by qualified maintenance personnel.



WARNING:

Risk of electric shock. Even after the unit is disconnected from the mains (building wiring outlet), components inside the UPS system are still connected to the battery and electrically live and dangerous.

- Before carrying out any kind of service and/ or maintenance, disconnect the batteries and verify that no current is present and no hazardous voltage exists in the terminals of high capability capacitor such as BUS-capacitors.
- Only persons are adequately familiar with batteries and with the required precautionary measures may replace batteries and supervise operations. Unauthorized persons must be kept well away from the batteries.

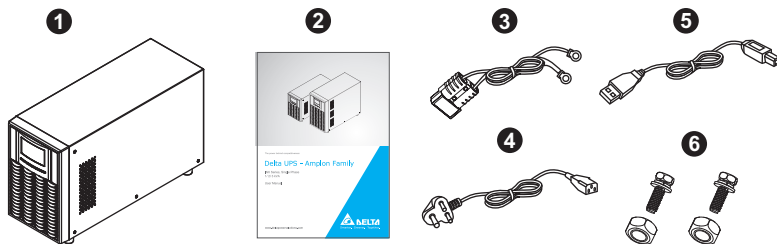


WARNING:

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. Before touching, please verify that no voltage is present!

- Batteries may cause electric shock and have a high short-circuit current. Please take the precautionary measures specified below and any other measures necessary when working with batteries:
 - remove wristwatches, rings and other metal objects
 - use only tools with insulated grips and handles.
- When changing batteries, install the same number and same type of batteries.
- Do not attempt to dispose of batteries by burning them. This could cause battery explosion.
- Do not open or destroy batteries. Escaping electrolyte can cause injury to the skin and eyes. It may be toxic.
- Please replace the fuse only with the same type and amperage in order to avoid fire hazards.
- Do not dismantle the UPS system.

1.6 Packing List



No.	Item	Q'ty
1	UPS	1 PC
2	User manual	1 PC
3	Battery cable	1 PC
4	Input cable (1kVA/2kVA)	1 PC
5	USB cable	1 PC
6	Screws and nuts	2 Sets

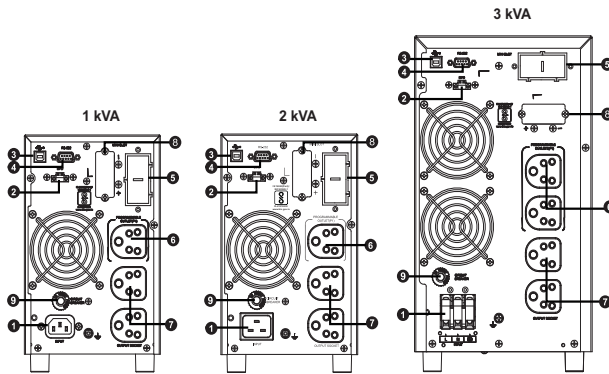
Chapter 2 : Installation and Setup



NOTE :

Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. Please keep the original package in a safe place for future use.

2.1 Rear Panel View

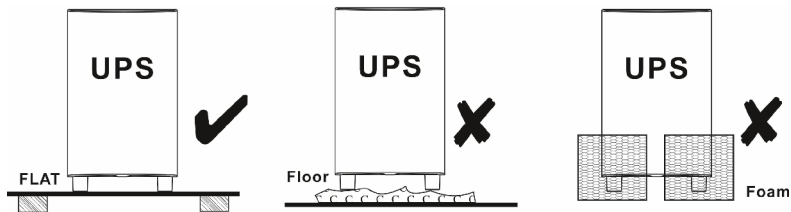


No.	Item
①	AC input
②	Emergency power off port
③	USB port
④	RS-232 port
⑤	Mini slot
⑥	Programmable output socket
⑦	Output socket
⑧	External battery connector
⑨	Input circuit breaker

2.2 Setup the UPS

Before installing the UPS, please read below to select proper location to install UPS.

- 1.UPS should be placed on the flat and clean surface. Place it in an area away from vibration, dust, humidity, high temperature, flammable liquids, gases, corrosive and conductive contaminants. Install the UPS indoors in a clean environment, where it is away from window and door. Maintain minimum clearance of 100mm in the bottom of the UPS to avoid dust and high temperature.

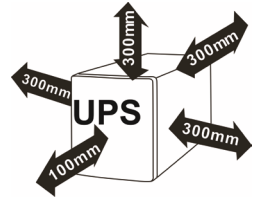


2. Maintain an ambient temperature range of 0°C to 45°C for UPS optimal operation. For every 5°C above 45°C, the UPS will derate 12% of nominal capacity at full load. The highest working temperature requirement for UPS operation is 50°C.
3. It's required to maintain maximum altitude of 1000m to keep UPS normal operation at full load UPS. If it's used in high altitude area, please reduce connected load. Altitude derating power with connected loads for UPS normal operation is listed as below:

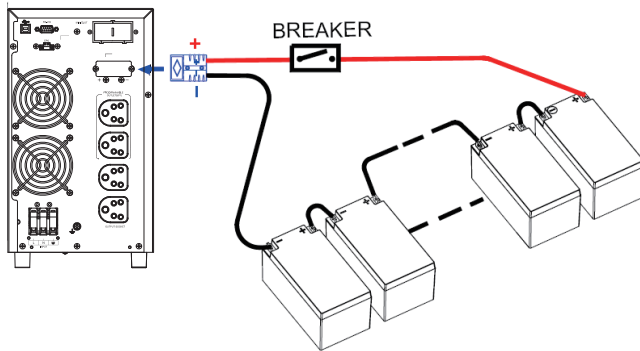
Altitude m	Derating factor ¹⁾
1 000	1.0
1 500	0.95
2 000	0.91
2 500	0.86
3 000	0.82
3 500	0.78
4 000	0.74
4 500	0.7
5 000	0.67
NOTE - Note to table 1	
Based on density of dry air = 1.225 kg/m ³ at sea-level, +15 °C.	
¹⁾ Since fans lose efficiency with altitude, forced air-cooled equipment will have a smaller derating	

4. Place UPS:

It's equipped with fan for cooling. Therefore, place the UPS in a well-ventilated area. It's required to maintain minimum clearance of 100mm in the front of the UPS and 300mm in the back and two sides of the UPS for heat dissipation and easy-maintenance.



5. Connect to External Battery Pack



When connecting external battery packs, please be sure to connect polarity correctly. Connect positive pole of battery pack to positive pole of external battery connector in UPS and negative pole of battery pack to negative pole of external battery connector in UPS. Polarity misconnection will cause UPS internal fault. It's recommended to add one breaker between positive pole of battery pack and positive pole of external battery connector in UPS to prevent damage to battery packs from internal fault.

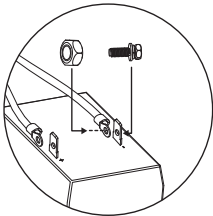
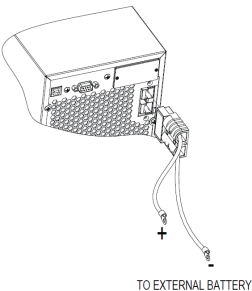
The required specification of breaker: voltage $\geq 1.25 \times$ battery voltage/set; current $\geq 50A$

Please choose battery size and connected numbers according to backup time requirement and UPS specifications. To extend battery lifecycle, it's recommended to use them in the temperature range of 15°C to 25°C.

Step 1: Connect battery wires

Please connect external batteries to the UPS as right chart.

Please refer to below chart to secure battery cable to the terminal with supplied screws and nuts.



Step 2: UPS input connection

Plug the UPS into a two-pole, three-wire, grounded receptacle only. Avoid using extension cords.

- For input-socket type, the power cord is supplied in the UPS package. For the type of power cord, please refer to the table below.

UPS	Type of Power Cord
1kVA	Plug 10A INDIA
2kVA	Plug 16A INDIA

- For input-terminal type, please follow below steps for the wiring configuration
 1. Remove the small cover of the terminal block.
 2. Suggest using AWG14 or 2.1mm2 power cords.
 3. Upon completion of the wiring configuration, please check whether the wires are securely affixed.
 4. Put the small cover back to the rear panel.

Step 3: UPS output connection

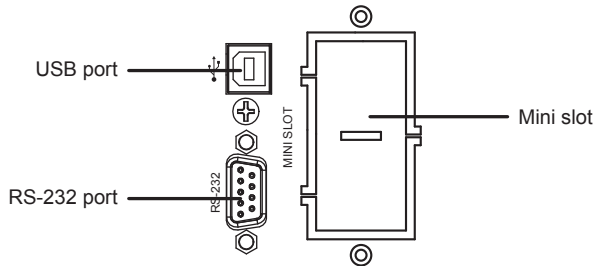
There are two kinds of outputs: programmable outlets and general outlets. Please connect non-critical devices to the programmable outlets and critical devices to the general outlets. During power failure, you may extend the backup time to critical devices by setting shorter backup time for non-critical devices.



NOTE:

1. Please be sure not to cause over-current ($>6A$) on each output socket when connecting to the loads.

Step 4: Communication connection



To allow for unattended UPS shutdown/ start-up and status monitoring, connect the communication cable one end to the USB/ RS-232 port and the other to the communication port of your PC. With the monitoring software installed, you can schedule UPS shutdown/ start-up and monitor UPS status through PC.

The UPS is equipped with mini slot perfect for Delta mini SNMP, Relay I/O, Modbus or TVSS cards (optional). When installing mini card in the UPS, it will provide advanced communication and monitoring options.

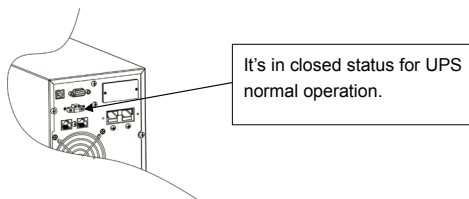


NOTE:

1. The USB port and RS-232 port can't work at the same time.
2. If you choose to use the USB port rather than RS-232 port, please install the USB driver software in your computer after connecting your computer to the UPS's USB port. The software can be downloaded from <http://www.deltapowersolutions.com/en-in/mcis/1kva-3kva-single-phase-ups-inx-series-downloads.php>.

Step 5: Disable and enable EPO function

Keep the pin 1 and pin 2 closed for UPS normal operation. To activate EPO function, cut the wire between pin 1 and pin 2.



Step 6: Turn on the UPS

Press the ON/ MUTE button on the front panel for two seconds to power on the UPS.



NOTE:

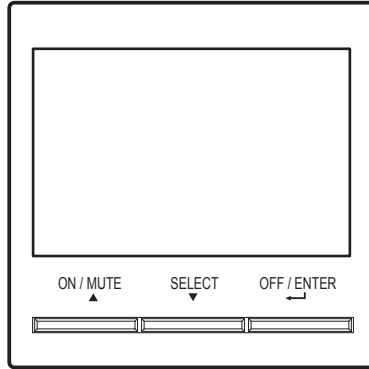
The battery charges fully during the first five hours of normal operation. Do not expect full battery run capability during this initial charge period.

Step 7: Install software

For optimal computer system protection, install UPS monitoring software to fully configure UPS shutdown. Please download the software from <http://www.deltapowersolutions.com/en/mcis/software-center.php>.

Chapter 3 : Operation

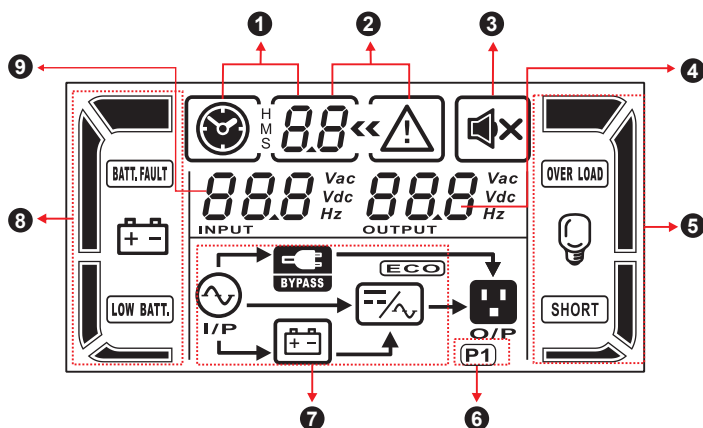
3.1 Button Operation























Button	Function
ON/ MUTE Button	<ul style="list-style-type: none"> • Turn on the UPS: Press and hold the ON/ MUTE button for at least 2 seconds to turn on the UPS. • Mute the alarm: When the UPS is in battery mode, press and hold this button for at least 5 seconds to disable or enable the alarm system. But it's not applied to the situations when warnings or errors occur. • Up key: Press this button to display previous selection in UPS setting mode. • Switch to UPS self-test mode: Press and hold this button for 5 seconds to enter UPS self-testing while in AC mode, ECO mode, or converter mode.
OFF/ ENTER Button	<ul style="list-style-type: none"> • Turn off the UPS: Press and hold this button at least 2 seconds to turn off the UPS. The UPS will switch to either standby mode or bypass mode according to your setting of bypass function. If you enable the bypass function, the UPS will transfer to bypass mode; if you disable the bypass function, the UPS will transfer to standby mode without any output. Please refer to 3.5 UPS Setting- 06: Bypass enable/ disable when the UPS is off.

Button	Function
	<ul style="list-style-type: none"> Confirm selection key: Press this button to confirm selection in UPS setting mode.
SELECT Button	<ul style="list-style-type: none"> Switch LCD message: Press this button to change the LCD message for input voltage, input frequency, battery voltage, output voltage and output frequency. It will return back to default display when pausing for 10 seconds. Setting mode: Press and hold this button for 5 seconds to enter UPS setting mode when the UPS is in standby mode or bypass mode. Down key: Press this button to display next selection in UPS setting mode.
ON/ MUTE + SELECT Buttons	<ul style="list-style-type: none"> Switch to bypass mode: When the main power is normal, press the ON/ MUTE and SELECT buttons simultaneously for 5 seconds. Then the UPS will enter to bypass mode. This action will be ineffective when the input voltage is out of acceptable range. Exit setting mode or return to the upper menu: When working in setting mode, press ON/Mute and Select buttons simultaneously for 0.2 seconds to return to the upper menu. If it's already in top menu, press these two buttons at the same time to exit the setting mode.

3.2 LCD Panel



Display	Function
① Remaining backup time information	
	Indicates the remaining backup time in pie chart.
	Indicates the remaining backup time in numbers. H: hour, M: minute, S: second
② Configuration and fault information	
	Indicates the configuration items, and the configuration items are listed in details in section 3.5 UPS Setting.
	Indicates the warning and fault codes, and the codes are listed in details in 3.7 Fault Reference Code and 3.8 Warning Indicator..
③ Mute operation	
	Indicates that the UPS alarm is disabled.
④ Output & Battery voltage information	
	Indicates the output voltage, frequency or battery voltage. Vac: output voltage, Vdc: battery voltage, Hz: frequency
⑤ Load information	
	Indicates the load level by 0-24%, 25-49%, 50-74%, and 75-100%.
	Indicates overload.
	Indicates the load or the UPS output is short circuit.
⑥ Programmable outlets information	
	Indicates that programmable management outlets are working.
⑦ Mode operation information	
	Indicates the UPS connects to the mains.

Display	Function
	Indicates the battery is working.
	Indicates the bypass circuit is working.
	Indicates the ECO mode is enabled.
	Indicates the inverter circuit is working.
	Indicates the output is working.
8 Battery information	
	Indicates the battery level by 0-24%, 25-49%, 50-74%, and 75-100%. .
	Indicates the battery is fault.
	Indicates low battery level and low battery voltage.
9 Input & Battery voltage information	
	Indicate the input voltage, input frequency and battery voltage. Vac: Input voltage, Vdc: battery voltage, Hz: input frequency

3.3 Audible Alarm

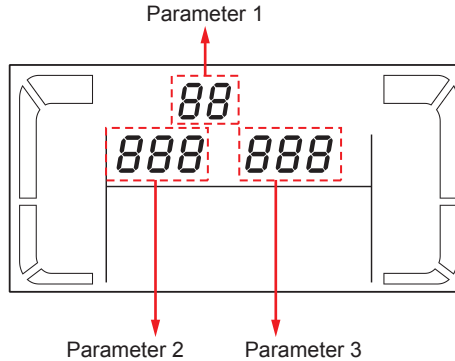
Condition	Alarm
Battery Mode	Sounding every 5 seconds
Low Battery	Sounding every 2 seconds
Overload	Sounding every second
Fault	Continuously sounding
Bypass Mode	Sounding every 10 seconds

3.4 LCD Display Wordings Index

Abbreviation	Display Content	Meaning
ENA	ENR	Enable
DIS	DIS	Disable
ESC	ESC	Escape
HLS	HLS	High loss
LLS	LLS	Low loss
BAT	BAT	Battery
BAH	BAH	Battery AH
CHA	CHA	Charger current
CBV	CBV	Charger boost voltage
CFV	CFV	Charger float voltage
EPO	EPO	EPO
AO	AO	Active open
AC	AC	Active close
OIT	OIT	Output isolation transformer
EAT	EAT	Remaining autonomy time
RAT	RAT	Accumulated autonomy time
SD	SD	Shutdown
CF	CF	Converter
ON	ON	ON
OI	OI	Over input current
EP	EP	EPO
TP	TP	Temperature
CH	CH	Charger
BF	BF	Battery fault
FU	FU	Bypass frequency unstable
BR	BR	Battery Replacement
EE	EE	EEPROM error

3.5 UPS Setting

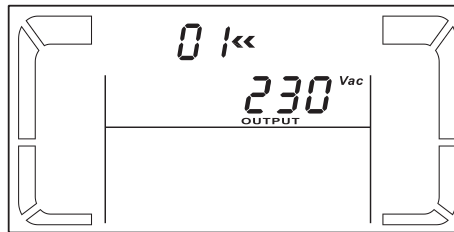
There are three parameters to set up the UPS.



Parameter 1: It's for program alternatives. Refer to below table.

Parameter 2 and **Parameter 3** are the setting options or values for each program.

• 01: Output voltage setting

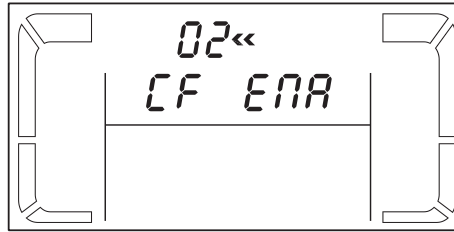


Parameter 3: Output voltage

For 200/208/220/230/240 VAC models, you may choose the following output voltage:

- 200:** presents output voltage is 200Vac
- 208:** presents output voltage is 208Vac
- 220:** presents output voltage is 220Vac
- 230:** presents output voltage is 230Vac (Default)
- 240:** presents output voltage is 240Vac

• 02: Frequency converter enable/ disable

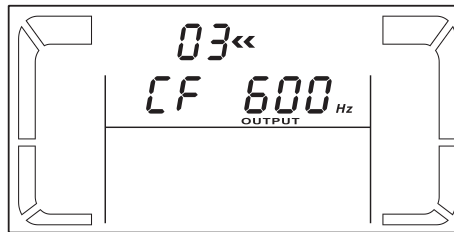


Parameter 2 & 3: Enable or disable converter mode. You may choose the following two options.

CF ENA: converter mode enable

CF DIS: converter mode disable (Default)

• 03: Output frequency setting



Parameter 2 & 3: Output frequency setting.

You may set the initial frequency in battery mode.

BAT 50: presents output frequency 50Hz

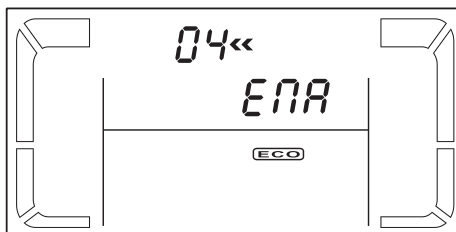
BAT 60: presents output frequency 60Hz

If converter mode is enabled, you may choose the following output frequency.

CF 50: presents output frequency 50Hz

CF 60: presents output frequency 60Hz

- **04: ECO enable/ disable**

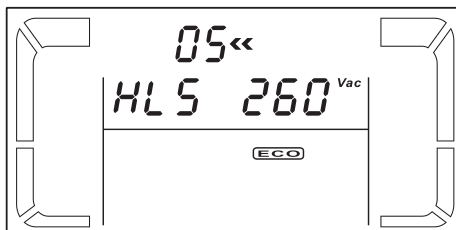


Parameter 3: Enable or disable ECO function. You may choose the following two options.

ENA: ECO mode enable

DIS: ECO mode disable (Default)

- **05: ECO voltage range setting**



Parameter 2 & 3: Set the acceptable high voltage point and low voltage point for ECO mode by pressing the Down key or Up key.

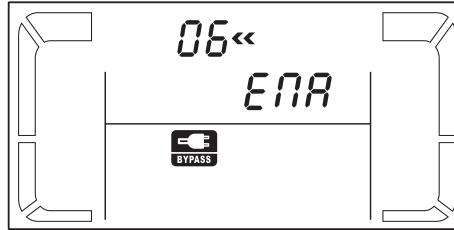
HLS: High loss voltage in ECO mode in parameter 2.

For 200/208/220/230/240 VAC models, the setting range in parameter 3 is from +7V to +24V of the nominal voltage. (Default: +12V)

LLS: Low loss voltage in ECO mode in parameter 2.

For 200/208/220/230/240 VAC models, the setting range in parameter 3 is from -7V to -24V of the nominal voltage. (Default: -12V)

- **06: Bypass enable/ disable when the UPS is off**

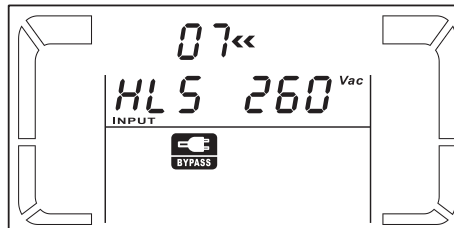


Parameter 3: Enable or disable bypass function. You may choose the following two options.

ENA: Bypass enable

DIS: Bypass disable (Default)

- **07: Bypass voltage range setting**



Parameter 2 & 3: Set the acceptable high voltage point and acceptable low voltage point for bypass mode by pressing the Down key or Up key.

HLS: Bypass high voltage point

For 200/208/220/230/240 VAC models:

230-264: setting the high voltage point in parameter 3 from 230Vac to 264Vac. (Default: 264Vac)

LLS: Bypass low voltage point

For 200/208/220/230/240 VAC models:

170-220: setting the low voltage point in parameter 3 from 170Vac to 220Vac. (Default: 170Vac)

- **08: Bypass frequency range setting**



Parameter 2 & 3: Set the acceptable high frequency point and acceptable low frequency point for Bypass mode by pressing the Down key or Up key.

HLS: Bypass high frequency point

For 50Hz output frequency models:

51-55Hz: setting the frequency high loss point from 51Hz to 55Hz
(Default: 53.0Hz)

For 60Hz output frequency models:

61-65Hz: setting the frequency high loss point from 61Hz to 65Hz
(Default: 63.0Hz)

LLS: Bypass low Frequency point

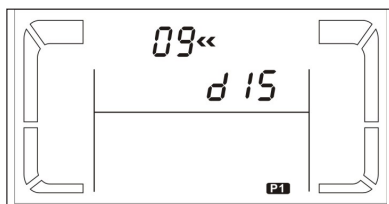
For 50Hz output frequency models:

45-49Hz: setting the frequency low loss point from 45Hz to 49Hz
(Default: 47.0Hz)

For 60Hz output frequency models:

55-59Hz: setting the frequency low loss point from 55Hz to 59Hz
(Default: 57.0Hz)

- **09: Programmable outlets enable/disable**

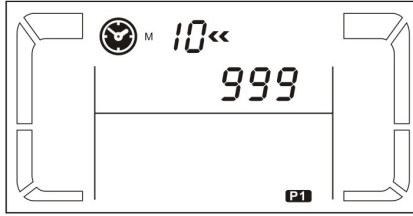


Parameter 3: Enable or disable programmable outlets.

ENA: Programmable outlets enable

DIS: Programmable outlets disable (Default)

• 10: Programmable outlets setting



Parameter 3: Set up backup time limits for programmable outlets.

0-999: setting the backup time limits in minutes from 0-999 for programmable outlets which connect to non-critical devices on battery mode. (Default: 999)

• 11: Autonomy limitation setting



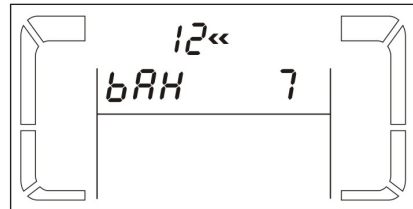
Parameter 3: Set up backup time on battery mode for general outlets.

0-999: setting the backup time in minutes from 0-999 for general outlets on battery mode.

DIS: Disable the autonomy limitation and the backup time will depend on battery capacity. (Default)

Note: When setting as "0", the backup time will be only 10 seconds.

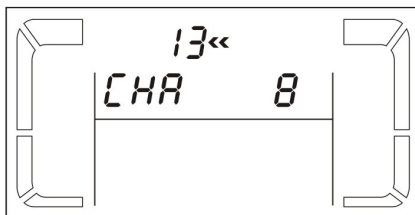
• 12: Battery total AH setting



Parameter 3: Set up the battery total AH of the UPS.

7-999: setting the battery total capacity from 7-999 in AH. Please set the correct battery total capacity if external battery bank is connected.

- **13: Maximum charger current setting**



Parameter 3: Set up the maximum charger current.

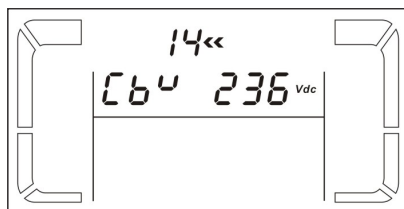
Selectable options are 2, 4, 6, 8, 10, 12, 14 and 16.

2/4/6/8/10/12/14/16: setting the maximum charger current in 2/4/6/8/10/12/14/16 Ampere. (Default: 16A)

Note: Please set the appropriate charger current based on battery capacity used. The recommended charging current is 0.1C~0.3C of battery capacity as following table for reference.

Battery capacity(AH)	Total charging current (A)
7~20	2
20~40	4
40~60	6
60~80	8
80~100	10
100~120	12
120~140	14
140~160	16

- **14: Charger boost voltage setting**

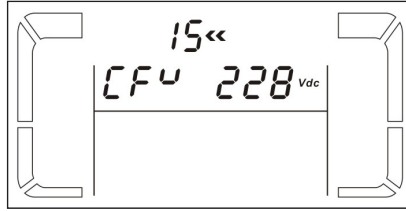


Parameter 3: Set up the charger boost voltage.

2.25-2.40: setting the charger boost voltage from 2.25 V/cell to 2.40V/cell.

(Default: 2.36V/cell)

• 15: Charger float voltage setting



Parameter 3: Set up the charger float voltage.

2.20-2.33: setting the charger float voltage from 2.20 V/cell to 2.33V/cell.
(Default: 2.28V/cell)

• 16: EPO logic setting

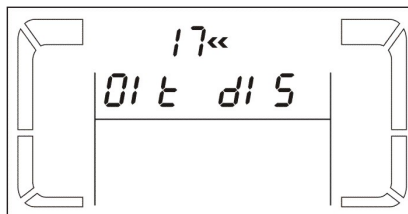


Parameter 3: Set up the EPO function control logic.

AO: Active Open (Default). When AO is selected as EPO logic, it will activate EPO function with Pin 1 and Pin 2 in open status.

AC: Active Close. When AC is selected as EPO logic, it will activate EPO function with Pin 1 and Pin 2 in close status.

• 17: External output isolation transformer connection

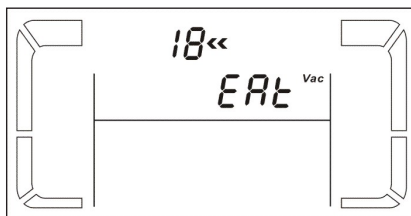


Parameter 3: Allow or disallow external output isolation transformer connection.

ENA: If selected, it's allowed to connect to an external output isolation transformer.

DIS: If selected, it's not allowed to connect to external output isolation transformer. (Default)

- **18: Display setting for autonomy time**

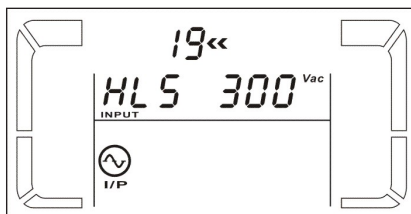


Parameter 3: Set up the display setting for autonomy time

EAT: If EAT is selected, it will display the remaining autonomy time. (Default)

RAT: If RAT is selected, it will show accumulated autonomy time so far.

- **19: Acceptable input voltage range setting**



Parameter 2 & 3: Set the acceptable high voltage point and acceptable low voltage point for input voltage range by pressing the Down key or Up key.

HLS: Input high voltage point

For 200/208/220/230/240 VAC models:

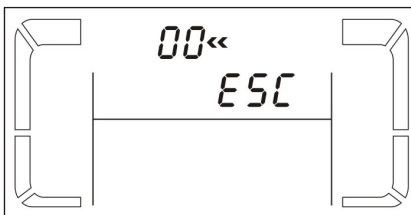
280/290/300: setting the high voltage point in parameter 3. (Default: 300Vac)

LLS: Bypass low voltage point

For 200/208/220/230/240 VAC models:

110/120/130/140/150/160: setting the low voltage point in parameter 3. (Default: 110Vac)

- **00: Exit setting**

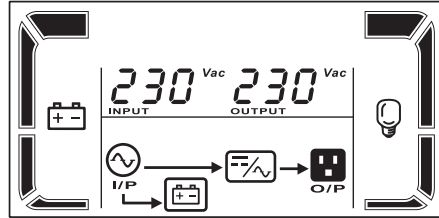


Exit the setting mode.

3.6 Operating Mode Description

- Online Mode**

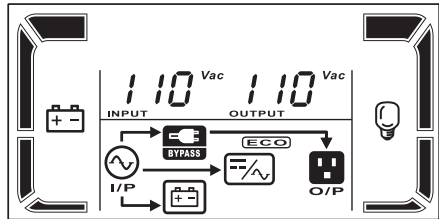
When the input voltage is within acceptable range, the UPS will provide pure and stable AC power to output. The UPS will also charge the battery in online mode.



- ECO Mode**

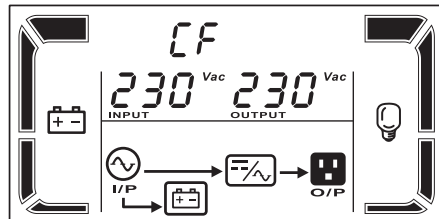
Energy saving mode:

When the input voltage is within voltage regulation range, the UPS will run in bypass mode to supply power to output for energy saving.



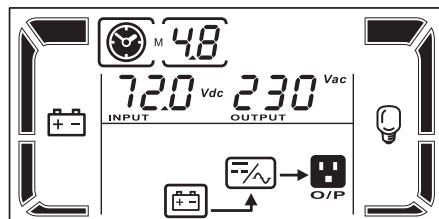
- Frequency Converter Mode**

When the input frequency is within 40 Hz to 70 Hz, the UPS can be set at a constant output frequency, 50 Hz or 60 Hz. The UPS will still charge batteries under this mode.



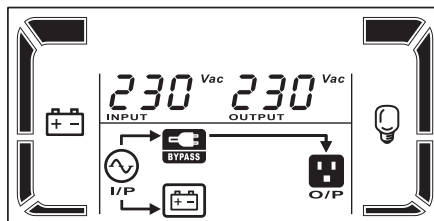
- Battery Mode**

When the input voltage is beyond the acceptable range or power failure occurs, the UPS will backup power from batteries and the alarm is sounding every 5 seconds.



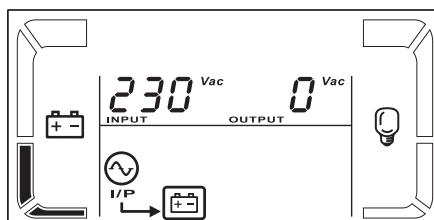
- **Bypass Mode**

When the input voltage is within acceptable range but the UPS is overloaded, the UPS will enter bypass mode or bypass mode can be set via the front panel. The alarm is sounding every 10 seconds.



- **Standby Mode**






















The UPS is powered off and there is no output, but the batteries can still be charged.



3.7 Faults Reference Code






Fault Event	Fault Code	Icon
Bus start fail	01	x
Bus over	02	x
Bus under	03	x
Inverter soft start failure	11	x
Inverter voltage high	12	x
Inverter voltage Low	13	x
Inverter output short	14	SHORT
Battery voltage too high	27	BATT. FAULT
Battery voltage too low	28	BATT. FAULT
Charger output short	2A	x
Over temperature	41	x
Overload	43	OVER LOAD
Charger failure	45	x
Over input current	49	x

3.8 Warning Indicator

Warning	Icon (flashing)	Code	Alarm
Low Battery	 	BL	Sounding every 2 seconds
Overload	 	OL	Sounding every second
Over input current		OI	Sounding 2 beep every 10 seconds
Battery is not connected	 	NC	Sounding every 2 seconds
Over Charge	 	OC	Sounding every 2 seconds
Site wiring fault	 	SF	Sounding every 2 seconds
EPO enable		EP	Sounding every 2 seconds
Over temperature		TP	Sounding every 2 seconds
Charger failure		CH	Sounding every 2 seconds
Battery fault	 	BF	Sounding every 2 seconds (At this time, UPS is off to remind users something wrong with battery)
Out of bypass range	 	BY	Sounding every 2 seconds
Bypass frequency unstable		FU	Sounding every 2 seconds
Battery replacement		BT	Sounding every 2 seconds
EEPROM error		EE	Sounding every 2 seconds

Chapter 4 : Troubleshooting

If the UPS system does not operate correctly, please solve the problem by using the table below.

Symptom	Possible Cause	Remedy
No indication and alarm even though the mains is normal.	The AC input power is not connected well.	Check if the input power cord firmly connected to the mains.
	The AC input is connected to the UPS output.	Plug the AC input power cord to the AC input correctly.
The icons  and  are flashing on the LCD display and the alarm is sounding every second.	The external or internal batteries are incorrectly connected.	Check if all batteries are connected well.
Fault code is shown as 27 or 28 and the icon  is lighting on the LCD display and the alarm is continuously sounding.	Battery voltage is too high/low or the charger is fault.	Contact your dealer.
The icons  and  are flashing on the LCD display and the alarm is sounding twice every second.	The UPS is overloaded.	Remove excess loads from the UPS output.
	The UPS is overloaded. Devices connected to the UPS are fed directly by the electrical network via the bypass.	Remove excess loads from the UPS output.
	After repetitive overloads, the UPS is locked in bypass mode. Connected devices are fed directly by the mains.	Remove excess loads from the UPS output first. Then shut down the UPS and restart it.

Symptom	Possible Cause	Remedy
Fault code is shown as 43 and the icon OVER LOAD is lighting on the LCD display and the alarm is continuously sounding.	The UPS shuts down automatically because of overload at the UPS output.	Remove excess loads from the UPS output and restart it.
Fault code is shown as 14 and the icon SHORT is lighting on the LCD display and the alarm is continuously sounding.	The UPS shuts down automatically because short circuit occurs on the UPS output.	Check output wiring and if connected devices are in short circuit status.
Fault code is shown as 01, 02, 03, 04, 11, 12, 13, 41 or 45 on the LCD display and the alarm is continuously sounding.	An UPS internal fault has occurred. There are two possible results: 1. The load is still supplied, but directly from AC power via bypass. 2. The load is no longer supplied by the power.	Contact your dealer.
Battery backup time is shorter than nominal value.	Batteries are not fully charged.	Charge the batteries for at least 5 hours and then check capacity. If the problem still persists, consult your dealer.
	Batteries are damaged.	Contact your dealer to replace the batteries.

Chapter 5 : Storage and Maintenance

- **Operation**

The UPS system contains no user-serviceable parts. If the battery service life (3~5 years at 25°C ambient temperature) has been exceeded, the batteries must be replaced. In this case, please contact your dealer.



Be sure to deliver the spent battery to a recycling facility or ship it to your dealer in the replacement battery packing material.

- **Storage**

Before storing, charge the UPS 5 hours. Store the UPS covered and upright in a cool, dry location. During storage, recharge the battery in accordance with the following table:

Storage Temperature	Recharge Frequency	Charging Duration
-25°C ~ 40°C	Every 3 months	1 ~ 2 hours
40°C ~ 45°C	Every 2 months	1 ~ 2 hours

Chapter 6 : Technical Specifications

Model	1K	2K	3K
Capacity	1000 VA / 900 W	2000 VA / 1800 W	3000 VA / 2700 W
Input			
Voltage Range	110-300Vac ¹		
Frequency Range	40Hz ~ 70Hz		
Phase	Single phase with ground		
Power Factor	≥ 0.99 @ nominal voltage (Input Voltage)		
Output			
Nominal voltage	200 ² /208 ² /220/230/240 Vac		
Voltage Regulation	±1% (Batt. Mode)		
Frequency Range	47 ~ 53 Hz or 57 ~ 63 Hz (Synchronized Range)		
Frequency Range (Batt. Mode)	50Hz ± 0.25Hz or 60Hz ± 0.3Hz		
Overload	Ambient Temp.<40°C 100% ~ 110%: Warning only. 110% ~ 130%: The UPS shuts down after 2 minutes in battery mode or transfer to bypass after 5 minutes when the utility is normal. 130% ~ 140%: The UPS shuts down after 10 seconds in battery mode or transfer to bypass after 30 seconds when the utility is normal. > 140%: The UPS shuts down after 1.5 seconds or transfer to bypass when the utility is normal.		
Current Crest Ratio	3:1		
Harmonic Distortion	≤ 2 % THD (linear load); ≤ 4 % THD (non-linear load)		

Model	1K	2K	3K
Waveform (Batt. Mode)	Pure Sinewave		
Efficiency			
AC Mode	≥ 89% @ full charged battery	≥ 90% @ full charged battery	≥ 91% @ full charged battery
Recommended External Battery			
Battery Type	12V, sealed lead acid maintenance free battery		
Recharge Time	Depends on the batteries attached		
Charging Voltage	41.0 VDC ± 1%	82.1 VDC ± 1%	82.1 VDC ± 1%
Charging Current	2/4/6/8/10/12/14/16A		
External Battery Connector	1 PC		
Physical			
Dimensions (D x W x H)(mm)	397 X 145 X 220		421 X 190 X 318
Net Weight (kg)	6.1	7.4	11.4
Environment			
Operation Humidity	20-95 % RH @ 0- 40°C (non-condensing)		
Noise Level	Less than 50dBA @ 1 Meter	Less than 57.5dBA @ 1 Meter	
Communication			
Interface	RS-232, USB, Mini-slot, EPO		


NOTE:

1. At 110~160Vac, linear de-rating between 60 ~ 100% load is required.
2. Derate capacity to 80% of capacity when the output voltage is adjusted to 200VAC or 208VAC.
3. Please refer to the rating label for the safety rating.
4. All specifications are subject to change without prior notice.

Chapter 7 : Warranty

Seller warrants this product, if used in accordance with all applicable instructions, to be free from original defects in material and workmanship within the warranty period. If the product has any failure problem within the warranty period, Seller will repair or replace the product at its sole discretion according to the failure situation.

This warranty does not apply to normal wear or to damage resulting from improper installation, operation, usage, maintenance or irresistible force (i.e. war, fire, natural disaster, etc.), and this warranty also expressly excludes all incidental and consequential damages.

Maintenance service for a fee is provided for any damage out of the warranty period. If any maintenance is required, please directly contact the supplier or Seller.

**WARNING:**

The individual user should take care to determine prior to use whether the environment and the load characteristic are suitable, adequate or safe for the installation and the usage of this product. The User Manual must be carefully followed. Seller makes no representation or warranty as to the suitability or fitness of this product for any specific application.

