

# **Liebert ITA2 1-3kVA UPS**

## **User Manual**

Version V1.3

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## Special Declaration

### Personnel Safety

1. This product must be installed and commissioned by professional engineers of the manufacturer or its authorized agent. Failure to observe this could result in product malfunction or personnel safety risk.
2. Take the time to read this product manual and the safety precaution thoroughly before installing and commissioning this product. Failure to observe this could result in product malfunction or personnel safety risk.
3. This product is not intended for life support equipment application.
4. Never dispose of the battery of this product in a fire, as it may explode and jeopardize personnel safety when exposed to flame.

### Product Safety

1. If this product will be stored or remain de-energized for a long period, it must be placed in a dry and clean environment within specified temperature range.
2. This product should be used in an appropriate operating environment. For details, refer to the Section 1.6 in this manual.
3. This product is not designed for application in an environment:
  - Where the temperature and relative humidity are outside the specifications
  - Subject to vibrations or shocks
  - Where conductive dusts, corrosive gases, salts, or flammable gases are present
  - Near heat sources or strong electromagnetic interferences

### Disclaimer

Vertiv disclaims any and all responsibility or liability for the defects or malfunction caused by:

- Application range or operating environment outside the specifications
- Unauthorized modification, improper installation or operation
- Force majeure
- Other actions not in compliance with the instructions in this manual

## Safety Precautions

This manual contains the information concerning the installation and operation of Liebert® ITA2 1kVA~ 3kVA UPS (hereinafter referred to as UPS). Please read this manual carefully prior to installation.

To reduce the chance of accident, please read the safety precautions very carefully before operation. The 'Caution, Note, Warning' in this user manual and on the product do not represent all the safety points to be observed, and are only supplement to various safety points. Therefore, the installation and operation personnel must receive strict training and master the correct operations and all the safety points before operation.

When operating Vertiv products, the operation personnel must observe the safety rules in the industry, the general safety points and special safety instructions provided by Vertiv.



1. The UPS must be installed, commissioned and serviced by engineers designated by the manufacturer or its agent. Failure to observe this could result in personnel safety risk, UPS malfunction and invalidation of warranty.
2. The UPS has been designed for commercial and industrial use only, and is not recommended for use in life support applications.
3. This is a Class C2 UPS product. In a residential environment, this product may nevertheless cause radio interference, in which case, the user is required to take additional measures to reduce the interference.
4. The UPS is not recommended for use in special loads with DC component.



### ***Backfeed protection***

Before operating the circuit, isolate the UPS firstly and then check the dangerous voltage between the ports, and that between the ports and earth.



### ***Conformity and standards***

The UPS complies with 2014/35/EU (LVD), 2014/30/EU (EMC), 2011/65/EU (Rohs) and the following product standards for UPS:

- IEC/EN 62040-1/AS 62040-1, General and safety requirements for UPS
- IEC/EN 62040-2/AS 62040-2: Class C2 compliant
- IEC/EN 62040-3/AS 62040-3 (VFI SS 111): Performance requirements and test methods

The UPS installation should follow the above instructions and use the accessories specified by manufacturer.



When the UPS is operating, some parts have high voltage, therefore, contacting with them directly or through moist objects will result in fatal risk.



1. Before moving or rewiring the UPS, disconnect mains input power and the battery and make sure that the UPS is completely shut down. Otherwise, the output terminal may carry live voltage, presenting an electric shock hazard
2. Liquid or other irrelevant external objects are prohibited inside the UPS.
3. In case of a fire, a dry chemical fire extinguisher is essential. Using a foam fire extinguisher will cause electric shock.
4. The output neutral line of the UPS is from the input, after the neutral line is suspended by the upstream protection devices, the output neutral line will be unconnected.
5. To prevent the radio frequency of output cables from disturbing other electric equipment, we recommend using the UPS output cable with the length less than 10m.



#### ***High leakage current***

1. Earth connection is essential before connecting the input power (AC mains and battery included).
2. Earth leakage current not greater than 3.5mA.
3. Transient and steady-state earth leakage currents, which may occur when starting the equipment, should be taken into account when selecting instantaneous residual current circuit breaker (RCCB) or residual current detector (RCD).
4. Note that the earth leakage current of the load will be carried by RCCB or RCD.
5. This equipment must be earthed in accordance with the local electrical codes.



1. When selecting the UPS system upstream distribution protection equipment, ensure that it complies with the local electric regulations.
2. The specified upstream breakers are required to obtain the conditional short-circuit current rating,  $I_{cc}$  at 10kA symmetrical rms. The specified upstream breakers should comply with an IEC 60947 series standard.



#### ***User serviceable components***

1. The UPS contains no user-serviceable parts. Do not remove the cover. Removing the cover may result in electric shock and will invalidate any implied warranty.
2. The UPS meets the safety requirements completely in operator access area. Only service personnel can contact the hazardous voltage inside the UPS. However, the risk of contacting these voltages is minimized because the components with hazardous voltage may be contacted only by using a tool to remove the protective cover. No risk will exist if you follow the general norms and in accordance with the procedures recommended in this manual on equipment operation.



### ***Battery high voltage***

1. All the physical service and maintenance of the battery are performed by the trained technicians.
2. Operation on the battery will result in electric shock and high short-circuit current, therefore, before operating the battery, the following should be observed:
  - Remove the watches, rings and other metal objects.
  - Use the tools with insulation handle.
  - Wear rubber glove and shoes.
  - Avoid placing the tools and metal objects on the battery surface.
  - Cut off the charge power supply before connecting or disconnecting the battery terminals.
  - Check whether the battery is earthed accidentally, if yes, please disconnect the earthing. Contacting any earth battery parts will result in electric shock. Therefore, make sure that the battery is not earthed during installation and maintenance.
3. Battery manufacturers provide the details of the precautions to be observed when working on, or in the vicinity of the batteries. These precautions should always be followed implicitly. Attention should be paid to the recommendations concerning local environmental conditions and the provision of protective clothing, first aid and fire-fighting facilities.

## Manual Describes the Following Devices

Product	Model
1kVA	ITA-01k00AS1102C00 (Standard model) ITA-01k00AL1102C00 (Long back-up model)
2kVA	ITA-02k00AS1102C00 (Standard model) ITA-02k00AL1102C00 (Long back-up model)
3kVA	ITA-03k00AS1102C00 (Standard model) ITA-03k00AL1102C00 (Long back-up model)

## Version Information

Date	Revision	Change
10.30.20	V1.0	Initial release
06.28.21	V1.1	Content optimization
05.11.22	V1.2	Add Appendix 3 product size information and three views drawing; 7.1 Option list update
03.14.23	V1.3	Add the description of special loads with DC component is not supported in the safety precautions chapter.





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# 1 Product Introduction

Liebert® ITA21kVA~3kVA UPS (UPS for short) is an intelligent online UPS system with sine wave output developed by Vertiv. The UPS offers reliable and high-quality AC power to the precision instrument.

The rack/tower installation can be used depending on your requirements. It is applicable to supplying AC power to small scale computer center, network, communication system, automatic control system and precision instrument.

This chapter introduces the features, model configurations, appearance and components, operating principle, UPS state and operation mode, and specifications of the UPS.

## 1.1 Features

The UPS features include:

- Output power factor is 1, which enhances the UPS load capacity
- Integrate Ethernet port, support HTTP protocol, and use the web browser to achieve the remote monitoring, no extra monitoring software required
- On-line double conversion efficiency up to 94% and ECO efficiency up to 98%, which provide more efficient products for customers
- Operation and display panel with colorful LCD to help you learn about the UPS operation state and operating parameters. The LCD display will change according to the layout of the model
- 2U thickness. Tower installation and rack installation are optional to meet different installation requirements
- Innovative design of the layout and whole machine process greatly improve the reliability of the product and enhance the reliability. Pass the harsh wet dust test and limit test
- Two-way LLC circuit topology, high input power factor, wide input voltage range. The output is not affected by the power grid interference, suitable for the harsh power grid environment
- Compared with the previous generation, the volume of the product is reduced by 10% on average. Space saving, easy to handle and install
- Full digital control platform and hardware design platform, which can adapt worse unstable mains supply and load impact
- Automatic recognition function of battery module

## 1.2 Model Configurations

The model configurations are shown in Table 1-1.

Table 1-1 Model configurations

	Model	Type	Description
1kVA	Standard model	ITA-01k00AS1102C00	The UPS can be connected to 10 battery modules, and automatically detect up to six
	Long back-up model	ITA-01k00AL1102C00	
2kVA	Standard model	ITA-02k00AS1102C00	
	Long back-up model	ITA-02k00AL1102C00	
3kVA	Standard model	ITA-03k00AS1102C00	
	Long back-up model	ITA-03k00AL1102C00	

## 1.3 Appearance and Components

### 1.3.1 Appearance

The UPS appearance is shown in Figure 1-1.



Figure 1-1 Appearance of UPS

### 1.3.2 Components

#### Front panel

As shown in Figure 1-2, the UPS front panel provides ventilation holes, operation and display panel, LED indicators and functional keys.



- 1. Ventilation holes
- 2. Functional keys
- 3. Operation and display panel
- 4. LED indicators

Figure 1-2 UPS front panel

## Rear panel

As shown in Figure 1-3, the UPS rear panel provides dry contact port, I/O outlet, battery module port, Intellislot port, Ethernet port, USB port, and REPO port.

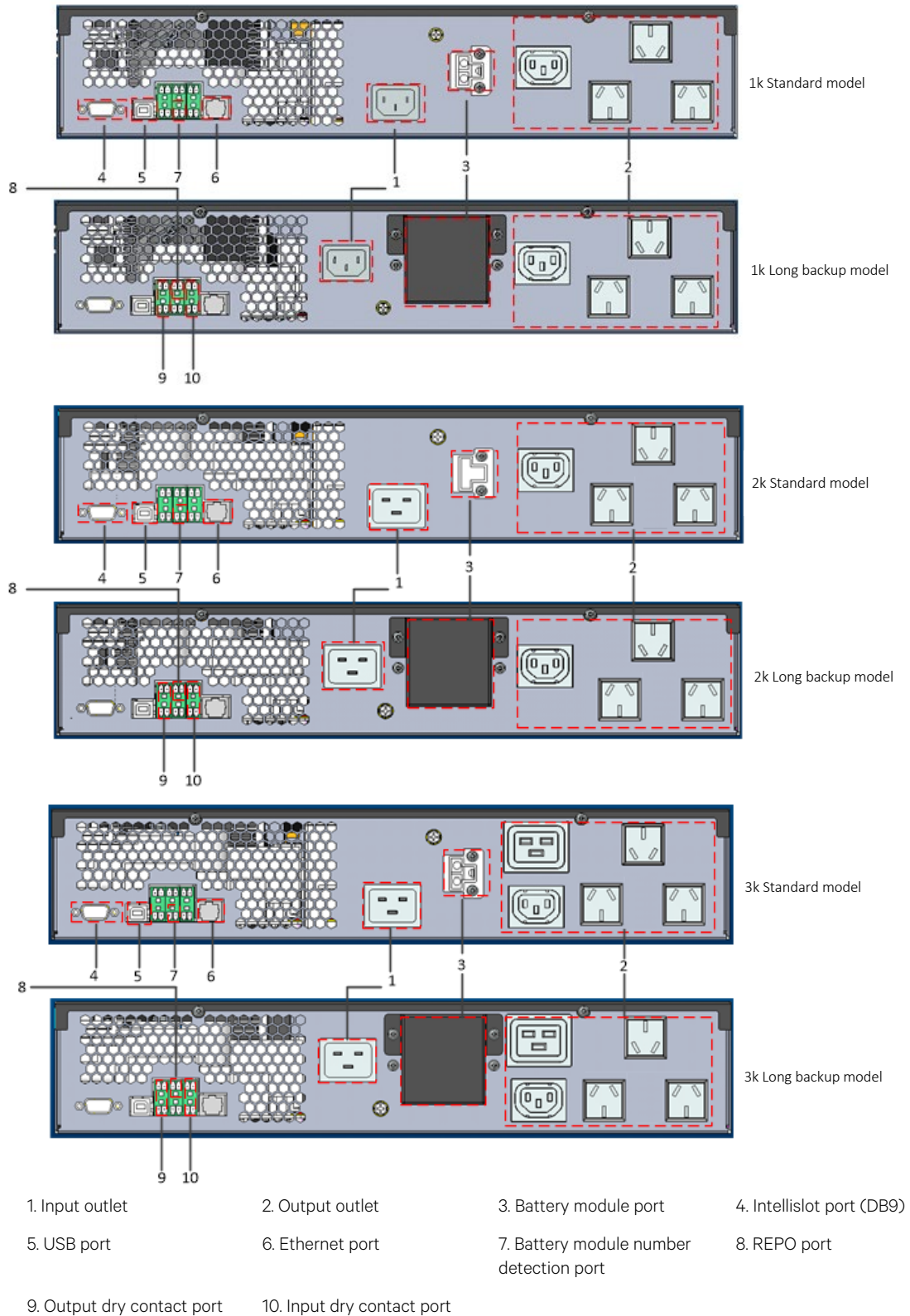


Figure 1-3 UPS rear panel



*Non-authorized personnel are prohibited from opening the UPS chassis cover.*



## 1.4 Operating Principle

The operating principle of the UPS is shown in Figure 1-4.

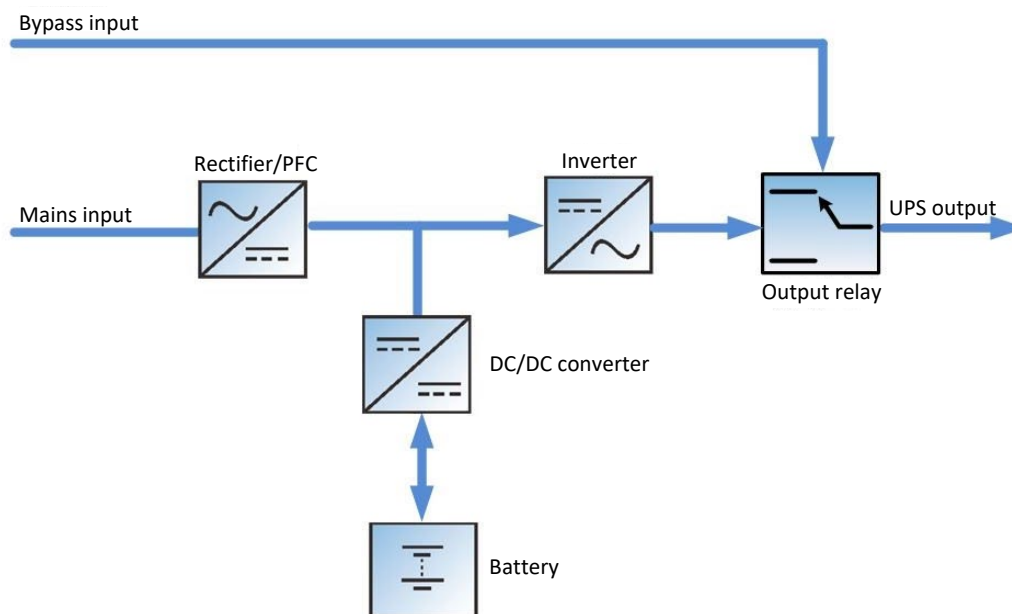


Figure 1-4 UPS operating principle

1. The UPS consists of mains input (main and bypass), rectifier/PFC, charger, inverter, bypass, battery, DSP controller, and output.
2. When the mains is normal, the rectifier will start, and the charger will charge the battery string. Before turning on the UPS, the output voltage is bypass voltage, and the mains supplies power to the load through the bypass. After turning on the UPS, the electronic transfer switch connects the inverter output to the load, and the mains supplies DC power to the inverter through the rectifier/PFC circuit. The inverter then converts DC power into pure sine wave AC power, and supplies the AC power to the load through the electronic transfer switch.
3. When the mains is outside the UPS input supply tolerance levels, the battery supplies the required power to the load through the rectifier/PFC circuit where the battery voltage is boosted, and then supplies to the Inverter where it converts DC into pure sinewave AC power.
4. After the input mains returns within tolerance levels, the UPS will automatically transfer from Battery mode to Normal mode, the mains supplies DC power to the inverter through the rectifier/PFC circuit, and then the electronic transfer switch supplies AC power to the load.

## 1.5 UPS State and Operation Mode

For the LED indicators introduced in this section, refer to *4.1.1 LED Indicators*.

The UPS state and operation mode include: Normal mode, Bypass mode, Battery mode, ECO mode, Fault state and Maintenance Bypass mode. The operation schematic diagrams of Normal mode, Bypass mode, Battery mode and Maintenance Bypass mode are shown in Figure 1-5 to Figure 1-7.

### 1.5.1 Normal Mode

When the mains input is normal, the load is supplied with voltage-stabilizing and frequency-stabilizing power by the mains after processing of the rectifier and the inverter, and meanwhile, the charger is charging the battery. The operation mode is Normal mode.

In Normal mode, the run indicator (green) is on, the alarm indicator is off, and the buzzer is silence.

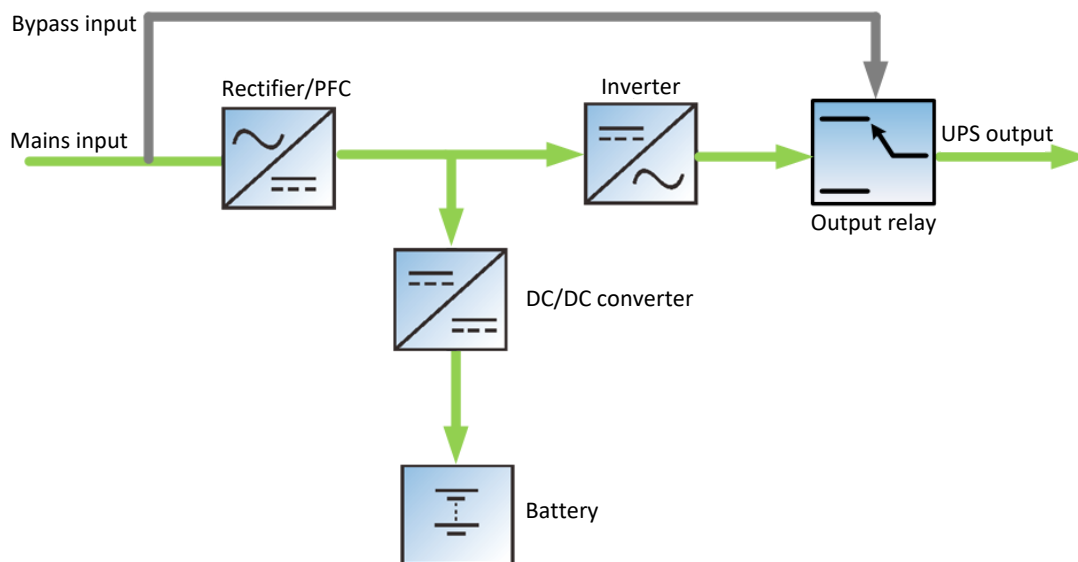


Figure 1-5 Normal mode

## 1.5.2 Bypass Mode

If the overload overtime, inverter or rectifier failure appears during the UPS operation in Normal mode, the UPS will transfer to Bypass mode, that is, the load is powered by the bypass source, which comes directly from the mains input. If the rectifier is normal, the internal charger will charge the battery.

In Bypass mode, the run indicator (green) is on, alarm indicator (yellow) is on, and the buzzer beeps every second. The 'Current' page in LCD will display 'On Bypass'.

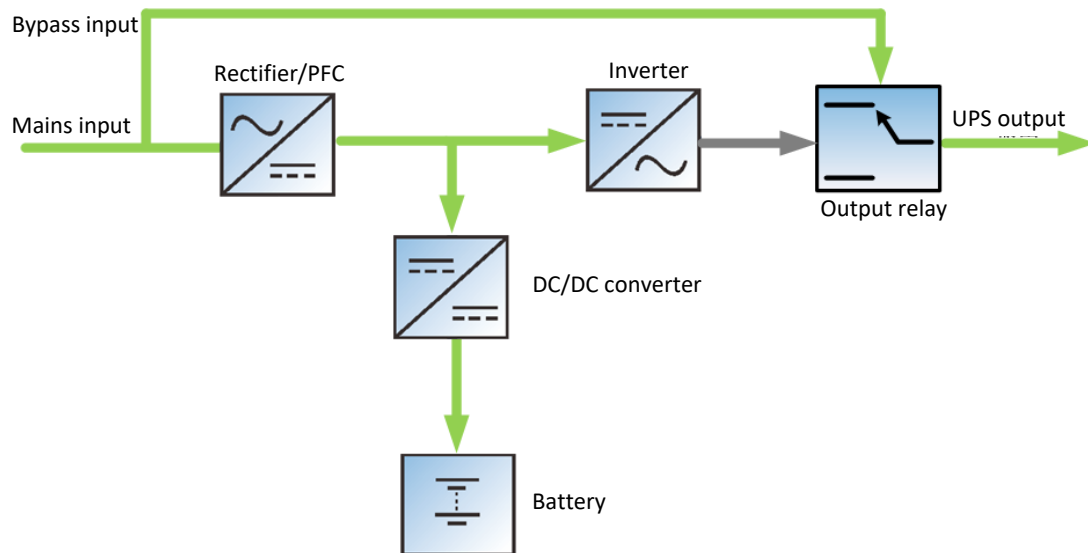


Figure 1-6 Bypass mode



*In case of mains failure or mains voltage out of range in Bypass mode, the UPS will shut down and stop the output.*

### 1.5.3 Battery Mode

Upon mains failure or voltage out of range, the rectifier and internal charger will stop running, and the battery will supply power to the load through the inverter. In Battery mode, the run indicator (green) is on, alarm indicator (yellow) is on, and the buzzer beeps every second. The 'Current' page in LCD will display 'On Battery'.

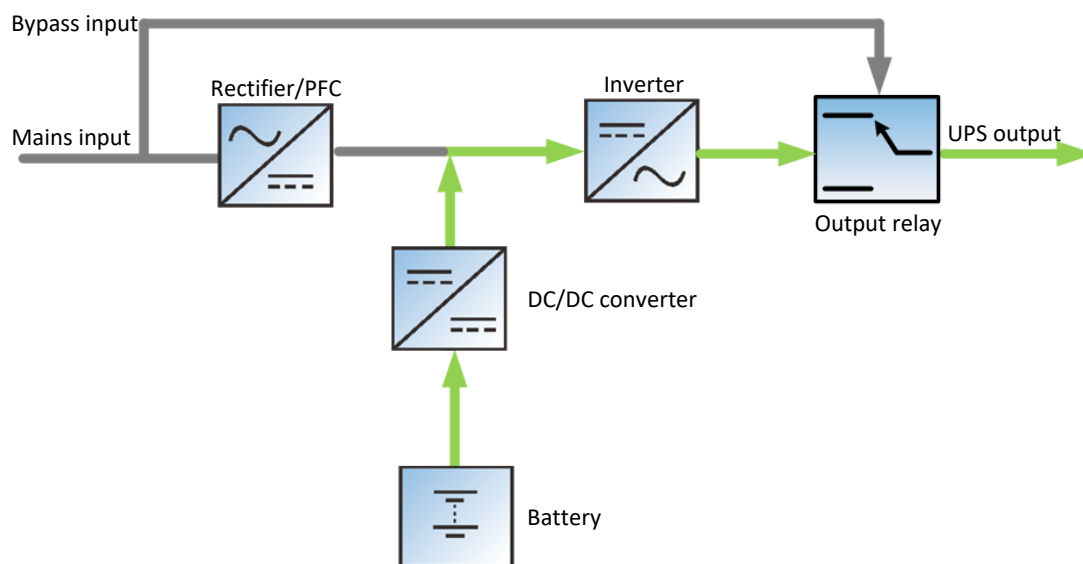


Figure 1-7 Battery mode



1. The battery has been fully charged before delivery. However, some loss of capacity is inevitable during transportation and storage. Therefore, it is important to charge the battery for eight hours before the UPS is first put into operation to ensure it can provide adequate backup time.

2. The Liebert ITA2 UPS supports cold start function, while this function is activated, UPS can be powered using battery mode without availability of input power supply. Therefore, the battery power can also be utilized independently for improving the system availability.

### 1.5.4 ECO Mode (for UPS Equipped with Battery only)

In ECO mode, the load is powered by bypass when the bypass voltage is normal, and the load is powered by inverter when the bypass voltage is abnormal. ECO mode is an energy-saving operation mode. For power equipment insensitive to power grid quality, you can use the ECO mode for power supply through bypass to reduce the power loss.



1. In ECO mode, if the bypass failure or abnormal bypass voltage appears when the output is not overloaded, the UPS will transfer to Normal mode. However, if the bypass failure or abnormal bypass voltage appears when the output is overloaded, the UPS will not transfer to Normal mode, but shut down the bypass.

2. In ECO mode, the efficiency of the UPS is up to 98%.

3. Only battery is available can the UPS enters ECO mode.

### 1.5.5 Fault State

In Normal mode, the UPS will transfer to Bypass mode if the inverter failure or UPS over-temperature appears. In Battery mode (without bypass mains), the UPS will shut down and stop the output if the inverter failure or UPS over-temperature appears. In UPS Fault state, the alarm indicator (red) will be solid on, the buzzer will keep beeping, and the corresponding fault information will be displayed on LCD.

## 1.6 Specifications

The specifications are listed in Table 1-2.

Table 1-2 Specifications

Item		Specifications (both standard and long backup model)		
		1kVA	2kVA	3kVA
Input	Rated voltage	220Vac		
	Voltage range	176Vac ~ 288Vac, at full load 100Vac ~ 176Vac, linear increasing 100Vac, at half load		
	Rated frequency	50Hz		
	Frequency range	40Hz ~ 70Hz		
	Power factor	≥ 0.99, at full load; ≥ 0.97, at half load; ≥ 0.94, at 30% load		
Output	Rated power	1000VA/1000W	2000VA/2000W	3000VA/3000W
	Voltage	220Vac/230Vac/240Vac, 220Vac by default		
	Frequency synchronization range	Rated frequency±3Hz. Configurable range: ±0.5Hz ~ ±5Hz		
	Frequency track rate	Default: 0.5Hz/s. Configurable range: 0.2/0.5/1Hz/s (single UPS)		
	Rated power factor	1		
	Crest factor	3:1		
	Voltage harmonic distortion	< 1% (linear load); < 3% (non-linear load)		
	Dynamic response recovery time	Less than 20ms		
	Overload capacity	Normal mode: 105% ~ 125%, 10min; 125% ~ 150%, 1min; 150% above, 200ms; Battery mode: 105% ~ 125%, 1min; 125% above, 200ms		
	Bypass voltage	Default: +20%. Configurable range: +10%, +15% or +20%; Default: -40%. Configurable range: -10%, -20% -30% or -40%		
Mains efficiency	90%	93%	94%	
Battery	Type	Sealed, lead-acid, maintenance-free battery		
	Cell No.	3	4	6
	Rated voltage	36Vdc	48Vdc	72Vdc
	Charge current	8A (Long back-up) 2A (Standard)	8A (Long back-up) 2A (Standard)	8A (Long back-up) 2A (Standard)
Transfer time	Mains ↔ Battery	0ms		
	Inverter ↔ Bypass	Synchronous transfer: less than 1ms		
Noise	Front panel less than 50dB, the rear panel and side panel less than 48dB			
Panel display mode	Colorful LCD			
Safety	IEC/EN 62040-1:2008+A1:2013			
EMC	Conduction emission	IEC/EN 62040-2 C2		
	Harmonic current	IEC/EN 61000-3-2		
Surge protection	IEC/EN 61000-4-5			
Protection level	IP20			
Ambient condition	Operating temperature	0 ~ 40°C		
	Storage temperature	-20°C ~ +60°C (battery excluded); -15°C ~ +40°C (battery included)		
	Relative humidity	5%RH ~ 95%RH, non-condensing		
	Altitude	≤3000m; derating when higher than 3000m		
W*D*H (mm)	Without package(Find	430*400*85(Without	430*470*85(Without	430*540*85(Without

Item		Specifications (both standard and long backup model)		
		1kVA	2kVA	3kVA
	appendix 3 for details)	cable box) 430*418*85(With cable box)	cable box) 430*488*85(With cable box)	cable box) 430*558*85(With cable box)
Weight	Net weight (kg)	15.6 (Standard) 7.1 (Long back-up)	19.9 (Standard) 8.6 (Long back-up)	26.7 (Standard) 10 (Long back-up)

## 2 UPS Installation

This chapter introduces the installation, cable connection of the single UPS.

Each site has its own peculiarity, so this chapter provides general installation procedures and methods for the installation engineer who should conduct the installation according to the actual conditions.



### *Professional installation*

1. The UPS should be installed by a qualified engineer in accordance with the information provided in this section. In the event of any problems, contact your local Vertiv service center immediately.
2. The UPS must NOT be switched ON without the approval of the commissioning engineer.
3. For other equipment which is not introduced in this manual, the detailed information about mechanical installation and electrical installation are delivered with the equipment.

### 2.1 Unpacking Inspection

Vertically place the cardboard box, unpack the cardboard box and remove the UPS. See Figure 2-1. Refer to Table 2-1 for the UPS size and weight with package.

Table 2-1 UPS size and weight (with package)

Specification	1kVA	2kVA	3kVA
Size (W×D×H, mm)	547*262*610	617*262*610	687*262*610
Gross weight (kg)	18.8 (Standard) 10.3 (Long back-up)	23.1 (Standard) 11.8 (Long back-up)	30.1 (Standard) 13.4 (Long back-up)

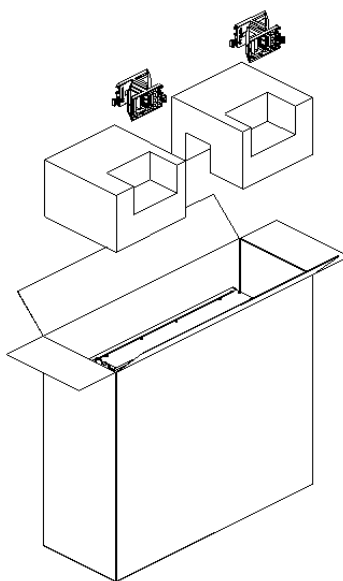


Figure 2-1 Unpacking

## 2.2 UPS Moving



*It is prohibited to move the UPS through the brackets.*

The UPS cabinet can be moved by human, or forklift or other similar lifting equipment.

## 2.3 Installation Preparation

### 2.3.1 Location

To extend the UPS life, the chosen place must offer:

- Convenient wiring
- Adequate operator access area
- Good ventilation to meet the heat dissipation requirements
- No corrosive gas, such as sulfur dioxide and so on
- No excessive moisture or heat source
- No excessive dust
- Compliance with fire-fighting requirements
- Operating temperature compliant with the specifications, see Table 1-2 for details

### 2.3.2 Environmental Requirement

#### UPS room

The UPS is designed for indoor installation, which should be installed in a clean and well-ventilated environment, to keep the ambient temperature within the specifications.

The internal fans provide forced air cooling for the UPS. Cooling air enters the UPS through the ventilation holes on the front panel, and exhausts the hot air through the back-ventilation holes. Therefore, do not obstruct the ventilation holes. Maintain at least 200mm clearances between the front, rear of the UPS and the wall or adjacent equipment (**see Figure 2-2**), to avoid obstructing the UPS ventilation and heat dissipation. Otherwise, the UPS internal temperature will rise, which will shorten the UPS life.

If necessary, an indoor exhaust fan should be installed to keep the indoor temperature from rising. An air filter should be used in a dusty environment where the UPS is to be operated.



## Space reserved

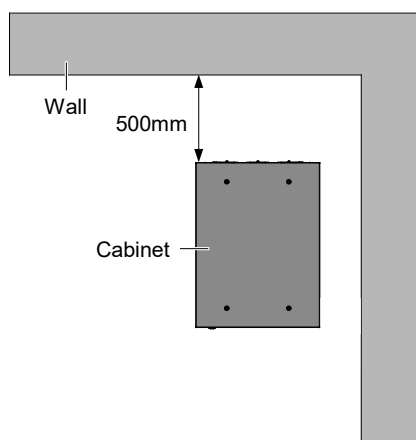


Figure 2-2 Installation clearances (top view of rack installation)



1. The UPS should only be installed on the concrete surface or other non-flammable surfaces.
2. As shown in Figure 2-3, the demonstration of the clearance between the rear panel of the cabinet and the wall is 500mm. The clearance should not be less than 200mm, it needs to be considered according to the actual situation for the sake of maintenance convenience.

## Battery room

A small amount of hydrogen and oxygen will be generated at the end of battery charging, therefore, you must ensure that the fresh air ventilation of battery installation environment meets the EN50272-2001 requirements.

The battery ambient temperature should keep constant, for the ambient temperature is the main factor to affect the battery capacity and life. The battery standard operating temperature is 20°C, operation above this temperature will shorten the battery life, and operation below this temperature will reduce the battery capacity. If the battery average temperature in operation rises from 20°C to 30°C, the battery life will be reduced by 50%; if the battery temperature in operation exceeds 40°C, the battery life will be decreased exponentially. In normal situation, the allowable ambient temperature for the battery is between 15°C to 25°C. The battery should be kept away from heat source and air outlet.

When the UPS uses an external battery, you must install a battery protective device (such as fuse or circuit breaker) close to the battery, and use the shortest wiring distance for the connection between the protective device and the battery.

## Storage environment

When the UPS does not need to be installed immediately, the UPS must be stored indoors to be protected from the excessive moisture or over-temperature environment. The battery requires dry and low temperature, well-ventilated environment for storage, and the most suitable storage temperature is 20°C ~ 25°C.



### **Battery hazards**

*During the battery storage, the battery must be periodically charged according to the battery instructions. When charging the battery, you can connect the UPS to*

the mains temporarily to charge and activate the battery.




















### 2.3.3 Installation Tools



1. For the sake of safety, the installation tools under live operation must be insulated.

2. Tools in Table 2-2 are for reference only; please follow the actual requirement for on-site installation and connection.

Table 2-2 Tools

Name	Drawing	Name	Drawing
Electric hand drill		Adjustable wrench	
Slotted screwdriver		Cross head screwdriver	
Stepladder		Forklift	
Drill		Wire cutting plier	
Claw hammer		Diagonal cutting plier	
Insulating shoes		Antistatic gloves	
Electrician knife		Cable tie	
Insulating tape		Insulating gloves	
Crimping plier		Heat shrinkable tube	
Insulated torque wrench		Torque screwdriver	
Multimeter		Clip-on ammeter	

### 2.4 External Protective Devices

The circuit breaker or other protective devices must be installed at the external AC input end of the UPS. This section provides the general guidance for qualified installation engineer. The qualified installation engineer should learn about the local wiring regulations and other related information.

### 2.4.1 Overcurrent

The appropriate over-current protective device should be installed on the mains input power distribution, and the current capacity of power cable and the system overload requirements should be taken into account in installation. For the thermomagnetic circuit breaker, see Table 2-2.

### 2.4.2 Earth Leakage Current

The residual current detector (RCD) for the UPS upstream input power distribution should be:

- Sensitive to the DC unidirectional pulse (level A) in power distribution network
- Insensitive to the transient current pulse
- General sensitivity type, settable: 0.3A ~ 1A

The residual current circuit breaker (RCCB) must be sensitive to the DC unidirectional pulse (level A) in power distribution network, but insensitive to the transient current pulse, as shown in Figure 2-3 respectively.

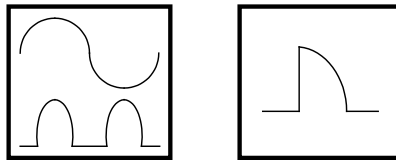


Figure 2-3 RCCB symbols

The earth leakage current fed by the RFI filter in the UPS should be less than 3.5mA. We recommend confirming the sensitivity of each differential device of the upstream input power distribution and downstream power distribution (to load).

### 2.4.3 Battery Input

If Vertiv battery module is selected, the battery module is equipped with overcurrent protection device. Otherwise, the battery module shall provide DC compatible circuit breaker to provide over-current protection for UPS and its batteries. The protective device specification is shown in Table 2-2.

## 2.5 Mechanical Installation

Two installation modes are available: tower installation and rack installation. You can select an appropriate installation mode according to the actual conditions.

### 2.5.1 Tower Installation

1. Take out the support bases from the accessories, assemble a pair of support bases and a support base extension (accessory) together through the fastenings, as shown in Figure 2-4, and place them onto the flat installation table.

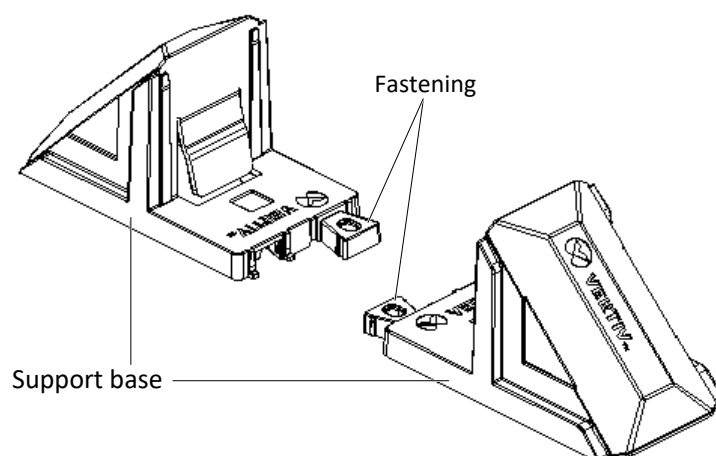


Figure 2-4 Connecting the support base with support base extension

2. If battery module installation is necessary, take out other support base extensions delivered with the battery module, and then assemble the support base extensions and the support bases through the fastenings, as shown in Figure 2-5.

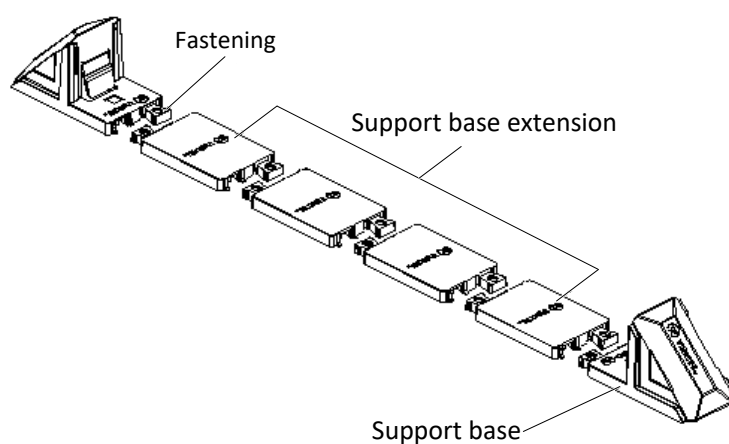


Figure 2-5 Connecting the support base with support base extension

3. Place the UPS on the support bases and support base extensions, as shown in Figure 2-6. The two sets of support bases are placed as far apart as possible to prevent the UPS from toppling. It is recommended to maintain a 70mm distance between the front and rear panels of UPS and the corresponding support bases.

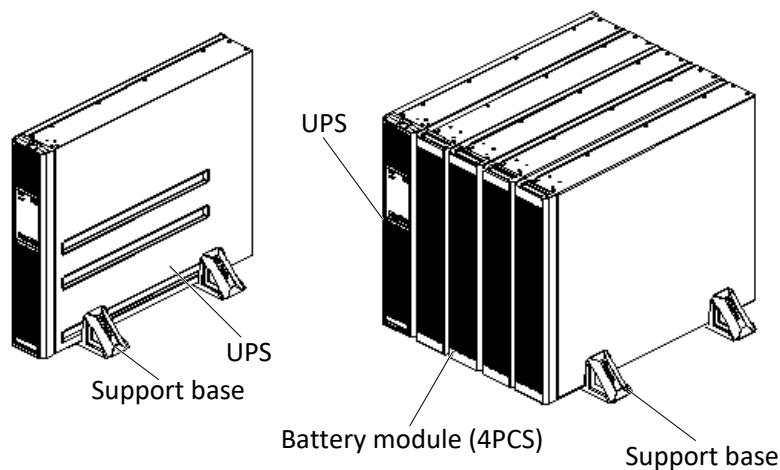


Figure 2-6 UPS and battery modules Installation complete

## 2.5.2 Rack Installation

### Installation procedures for UPS

1. Use eight M4 × 8 screws to fix the two brackets (accessories) respectively on both sides of the UPS front panel, as shown in Figure 2-7.

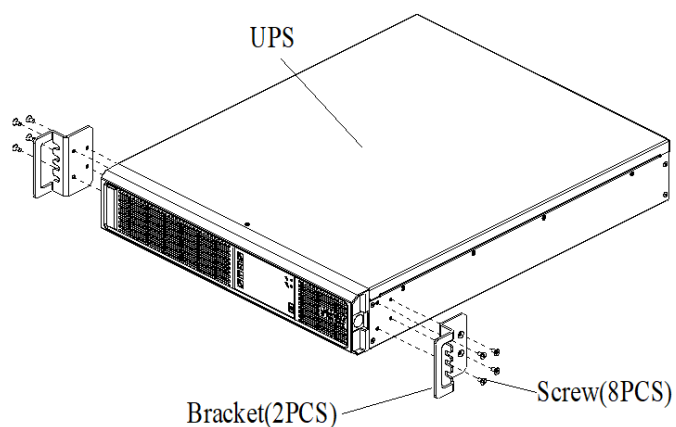


Figure 2-7 Installing brackets



*It is prohibited to move the UPS through the brackets.*

2. Install the guide rails.

The UPS adopts 2U guide rails for installation, and the installation procedures are as follows:

a) Take out the guide rails (one left guide rail and one right guide rail), guide rail screws from the package, distinguish the left guide rail and right guide rail according to Figure 2-8, and confirm its retractable function respectively.

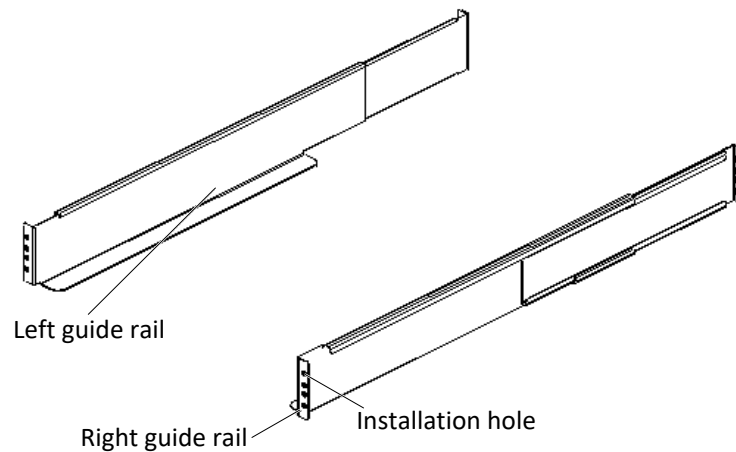


Figure 2-8 Appearance of the guide rail

The guide rail screw is shown in Figure 2-9.

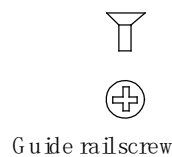


Figure 2-9 Appearance of the guide rail screw

b) Adjust the length of the guide rail according to the dimensions of the rack.

c) Align the installation holes of the guide rail with the square holes of the rack, fix the guide rail onto the rack through the guide rail screws (totally eight), each left guide rail and right guide rail need four guide rail screws, as shown in Figure 2-10.

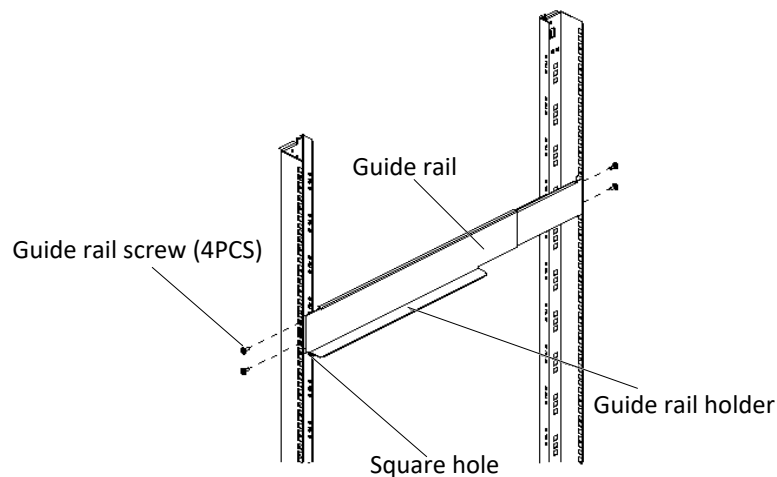


Figure 2-10 Installing the guide rail



1. The guide rail holder must be close to the front of the rack.
2. Any end of one guide rail has three installation holes (see Figure 2-8), do not use the installation hole in the middle when fixing the guide rail. We recommend using the top and bottom installation hole (from top to bottom, installation hole 1 and installation hole 4).

The guide rail installation is finished, as shown in Figure 2-11.

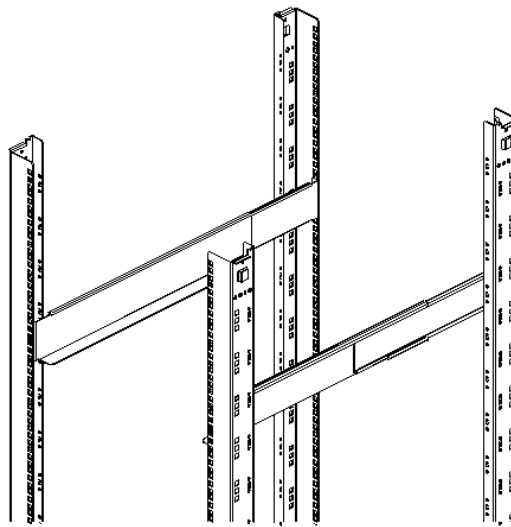


Figure 2-11 Guide rail installation completed

3. Place the UPS on the guide rails in the rack, and push it completely into the rack. Use four screws to fix the UPS in the rack through the brackets, as shown in Figure 2-12.

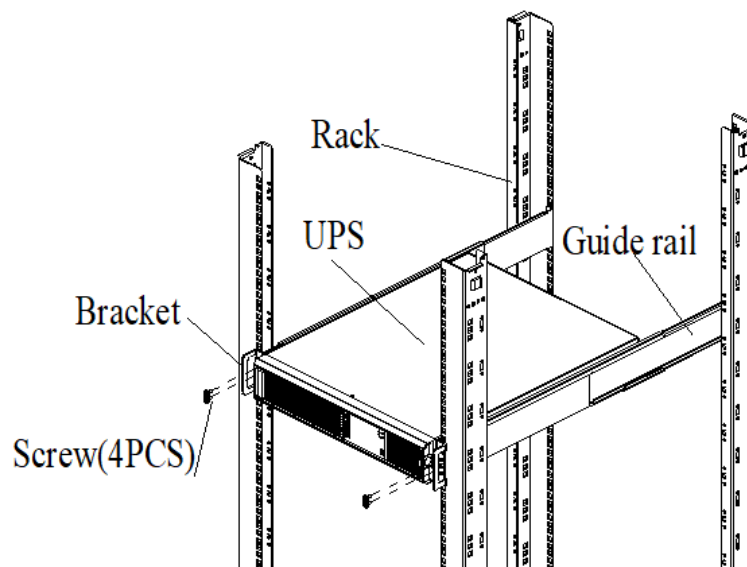


Figure 2-12 Installing the UPS

## Installation procedures for UPS with battery modules

1. The battery module installation method is exactly the same as the UPS installation method. Repeat the above installation steps, install the battery modules and UPS to the rack one by one (4 battery modules are installed here). After all the installation is completed, as shown in Figure 2-13.



1. Install the battery modules first, start the installation from the bottom, and then place the UPS onto the top.
2. It is prohibited to move the UPS through the brackets.
3. Two persons or more are required for the installation.

Repeat the preceding procedures to install and fix the four battery modules and a UPS in the rack one by one, as shown in Figure 2-13.

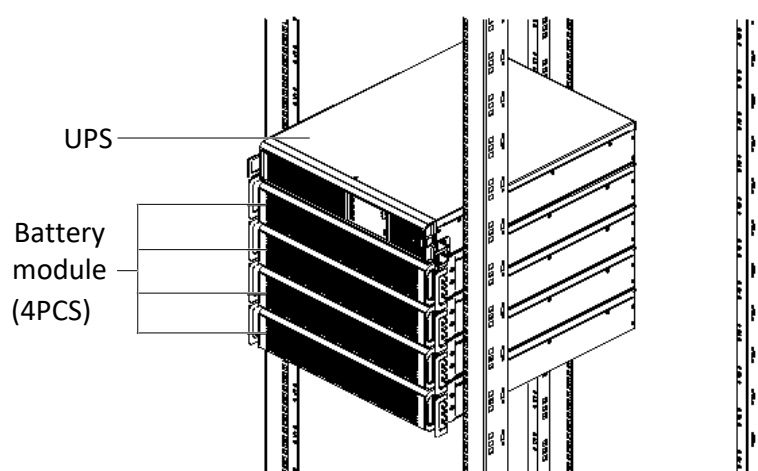


Figure 2-13 Installation of UPS with battery modules

## 2.6 Connecting Power Cables

The rear panel of the UPS provides an input plug and an output socket, see Section 1.3.2 for details. If the battery cabinet is configured, the battery cable is shipped with the battery cabinet.

### 2.6.1 Connecting Input Plug and Load



1. Ensure that all loads are shut off.
2. Prepare AC input power supply. According to national or local regulations, the input power must be properly protected and reliably grounded by circuit breaker.
3. See Table 2-3 for the recommended capacity of the circuit breaker.

Table 2-3 Recommended capacity for UPS I/O circuit breaker

Model	External input circuit breaker	Battery circuit breaker
1kVA (Long back-up, standard)	10A	63A
2kVA (Long back-up, standard)	16A	63A
3kVA (Long back-up, standard)	20A	63A

Connection procedures:



1. Connect the load to the output socket on the rear panel of the UPS. (**Note: a single output socket must not carry more load than the capacity identified on the rear panel of the UPS.**)

2. Connect the AC input to the UPS input socket using the attached input cables.

## 2.6.2 Connecting Battery Cables



1. *The batteries in the battery cabinet must be of the same manufacturer, the same model, the same capacity, and each battery rated voltage of 12V.*

2. *The external battery capacity limit of 1kVA (long back-up) is not less than 7Ah, factory default 7Ah; the external battery capacity limit of 2kVA and 3kVA (long back-up) is not less than 8Ah, factory default 8Ah;*

*Three batteries in series for 1kVA, and the rated battery voltage is 36V;*

*Four batteries in series for 2kVA, and the rated battery voltage is 48V;*

*Six batteries in series for 3kVA, and the rated battery voltage is 72V;*

*Before connecting the battery cables, confirm that the actual battery cell number and capacity are consistent with the parameter settings on the LCD menus.*

3. *It is prohibited to reverse the polarity of the battery cables.*

4. *Before replacing the battery module and connecting the battery cables, disconnect the DC battery MCB, power off the UPS completely, and conduct isolation protection on the terminals.*

5. *It is recommended that the battery cable should not be longer than 10 meters. Otherwise, the UPS cannot operate normally.*

6. *Shut off the battery circuit breaker before using the battery module.*

### Connecting standard model and battery module

The connection mode between the standard model and Vertiv 36/48/72V battery module is shown in Figure 2-14, using cable ITA2-1k EBC CABLE\_S/ITA2-2k EBC CABLE\_S/ITA2-3k EBC CABLE\_S. Remove the battery cable from the battery cabinet attachment, insert one end of the battery cable into the external battery port on the rear panel of UPS, and the other end into the corresponding battery port on the rear panel of the battery cabinet, and then connect the battery number to the automatic detection cable and PE cable.

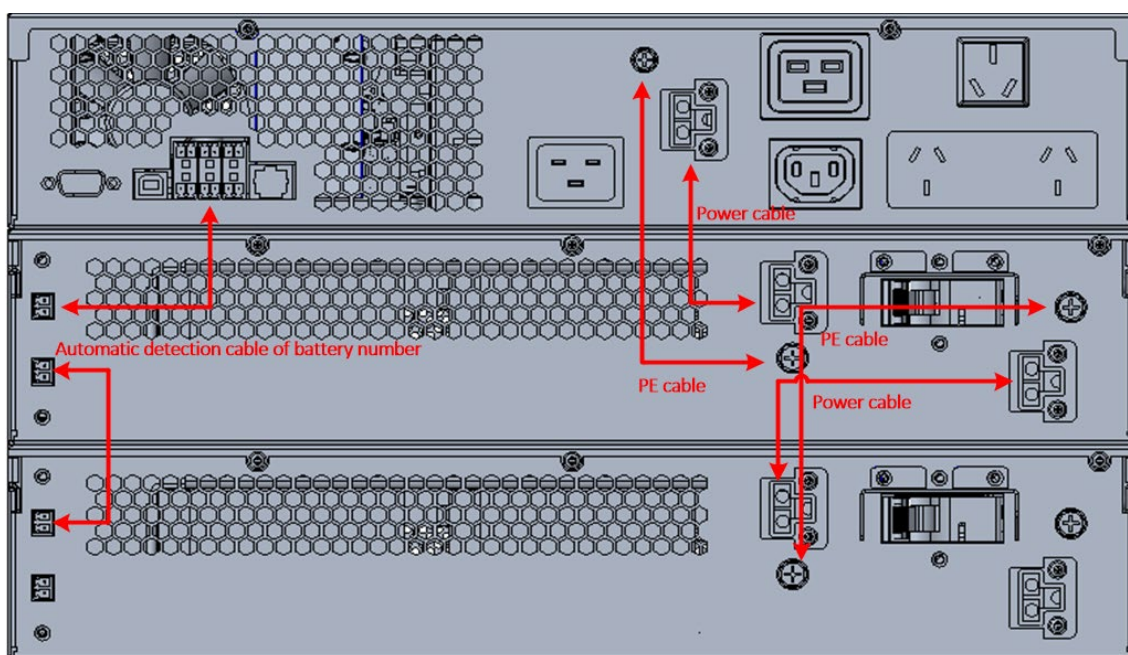


Figure 2-14 Connection between standard model and battery module

### Connecting long back-up model and battery module

#### Connecting long back-up model and Vertiv battery module

The connection mode between the long back-up model and Vertiv battery module is similar to Figure 2-14, except that the connection cable between UPS and the battery cabinet needs to use the cable ITA2-1k EBC CABLE\_L/ITA2-2k EBC CABLE\_L/ITA2-3k EBC CABLE\_L. One end of the cable is connected to UPS through the OT terminal, and the connection mode of the other end is exactly the same as that between the standard model and the battery module. Please refer to Figure 2-14 for the connection between the battery cabinets.



*The customer should pay special attention when wiring the battery. Connect the cables between UPS and the battery module in strict accordance with the positive, negative and PE cables marked by the UPS, and do not forget to automatically detect the cables in connection with the number of battery modules.*

#### Connecting long back-up model and customer battery cabinet

The recommended type of wire diameter and OT terminal for connecting long model and user battery cabinet are shown in Table 2-4.

Table 2-4 Wire diameter and OT terminal for connecting long model and user battery cabinet

Cable CSA (Unit: mm <sup>2</sup> )	Terminal type
Wire diameter >=6 or above 10AWG	OT 6-5

The customer shall wire the battery cables according to the recommended wire diameter and OT terminal model in Table 2-3. In order to avoid safety problems, special attention should be paid to the wiring procedures and precautions.

The wiring schematic diagram of the external battery string for the user's self-distribution is shown in Figure 2-15.



1. Between the battery string and the UPS, the DC battery circuit breaker must be configured. The circuit breaker specifications are selected according to the specifications recommended in Table 2-2.

2. Battery number shall be strictly connected according to Section 2.5.2. For lead-acid batteries with rated voltage of 12V, 1kVA/2kVA/3kVA models shall be connected in series with 3/4/6 batteries respectively. Too many or too few series connection will cause the risk of UPS damage.

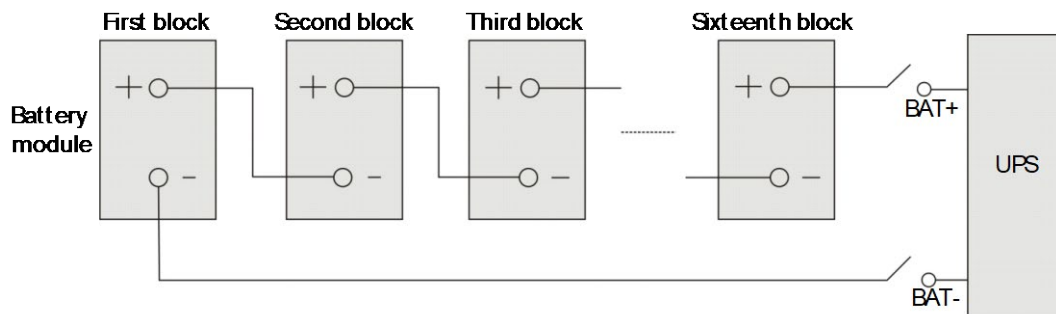



Figure 2-15 Battery string connection principle diagram

## 3 UPS Operation Instructions

This chapter gives a detailed description of the UPS operation procedures.

During the operation, the buzzer alarm may appear, at this point, you can press the  key for three seconds to silence the audible alarm.



***Hazardous mains and/or battery voltage exists behind the protective cover***

1. No user accessible parts are located behind the protective covers that require a tool for removal.
2. Only qualified service personnel are authorized to remove such covers.

### 3.1 UPS Start-Up

The start-up procedures can be performed after the installation is completed, the system has been commissioned by authorized engineer and the external input MCBs are closed.






*This procedure results in mains voltage being applied to the UPS output terminals. Confirm that the load power is safe, if there is a load to be connected with the UPS output terminal. Ensure that the load is isolated with the UPS output terminal, if the load is not ready for accepting the power.*

Check before startup:

1. Whether the UPS input plug and output socket are connected correctly and reliably.
2. Check the battery installation and wiring connection is correct, the battery positive and negative polarity is correct.
3. Whether the communication cable is connected reliably.
4. Measure and confirm that the mains voltage and frequency are normal.
5. Check whether the REPO is connected. The factory default should be connected.
6. Check whether the remaining 1, 2, 3, 5, 6 input/output dry contacts are connected with terminals. The factory default should be empty.

Startup steps are as follows:

1. Close the UPS external input circuit breaker.
2. About 30 seconds after the rectifier enters the normal operating state, the rectifier starts.
3. Hold the power button for 2 seconds until the LCD pops up the confirmation dialog box. (**Note: if the battery is not available, no dialog box appears when pressing and holding the power button.**)
4. Use  or  move the cursor, press the  key to select "Yes", then the running indicator (green) flashes, the inverter is on, and the running indicator is solid on.
5. Check whether the inverter output voltage is normal and then close the external output circuit breaker.

6. If the battery is not connected, the alarm indicator will turn yellow. If battery access, alarm indicator will be off.

7. If this is the first time UPS is started, the start guide is opened to set the basic parameters of UPS. Section 3.2 describes the setup guide. For detailed instructions on UPS display functions and settings, refer to *Chapter 4 Operation and Display Panel*.

### 3.2 Initial Start-up Guidance

When the UPS is the initial start-up, the interface shown in Figure 3-1 will appear to guide the user to set basic parameters of the UPS.

Please refer to Section 4.1.3 for instructions on the use of UPS keys, and operate the system according to the function of each key.

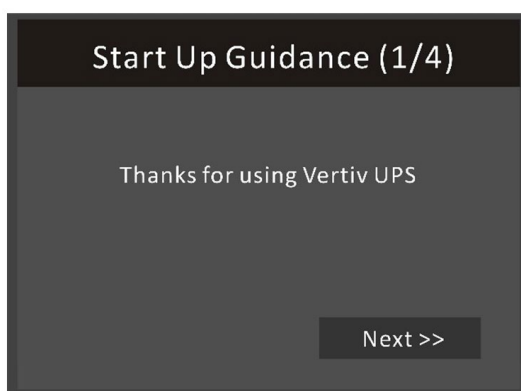


Figure 3-1 Initial start-up guidance (1)

#### Welcome page

Click **Next** to start the guidance.

#### Language, date and time page

At this page, you can set the language, date and time you need.

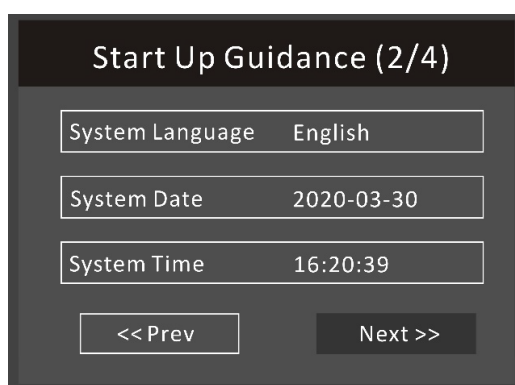


Figure 3-2 Initial start-up guidance (2)

#### Output and battery parameters page

At this page, you can set the output voltage, output frequency and total Ah (According to the number of batteries connected, the settings can be changed). See Figure 3-3.

Note: The standard model can be equipped with battery modules for boost charging (up to 5, 2 by default). Compared with the long backup model, the standard model has built-in battery package. If battery module is

available, the system will automatically identify the Ah of this single unit. If external battery is connected, the built-in Ah will add to this single unit: 7Ah for 1kVA, 8Ah for 2kVA and 3kVA.

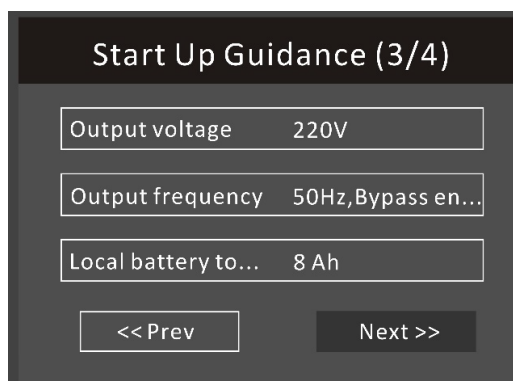


Figure 3-3 Initial start-up guidance (3)

#### Finish page

The interface shown in Figure 3-4 will appear. Click **Finish** to enter the Flow page, then the user can operate the UPS normally.

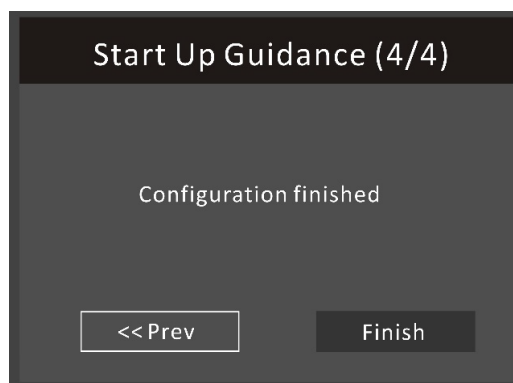


Figure 3-4 Initial start-up guidance (4)

### 3.3 Transfer Procedures Between Operation Modes



*The Inverter operation mode include Normal mode (mains inverter) and Battery module (battery inverter).*

#### 3.3.1 Transfer from Normal Mode to Battery Mode

UPS will usually run in Normal mode unless the mains are disconnected; After the mains is disconnected, the UPS will automatically enter the battery mode. If it is necessary to switch UPS to normal mode and restore power supply, UPS will back to normal mode again.

### 3.3.2 Transfer from Inverter Mode to Bypass Mode

In standby mode, press and hold the power button. If the rectifier and inverter are normal, the interface shown in Figure 3-5 will appear, select 'YES' to turn on the UPS. **Note: Only when batteries are available can the pressing and holding is valid.**

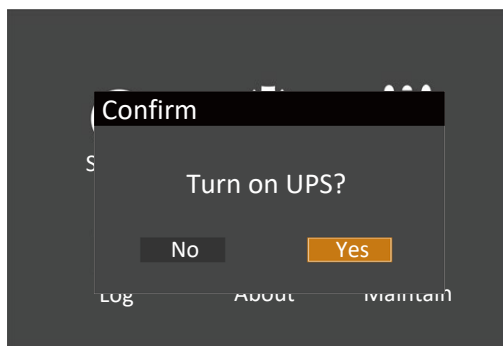


Figure 3-5 Turning on UPS

In Inverter mode, press and hold the power button. If the bypass is normal, the interface shown in Figure 3-6 is displayed. Select 'To the Bypass' and click OK to transfer the UPS to Bypass mode; select 'Turn off UPS' and click OK to turn off the UPS.



Figure 3-6 Bypass normal interface

In Inverter mode, press and hold the power button. If the bypass is abnormal, then the interface shown in Figure 3-7 will appear, select 'YES' to shut down the UPS output.

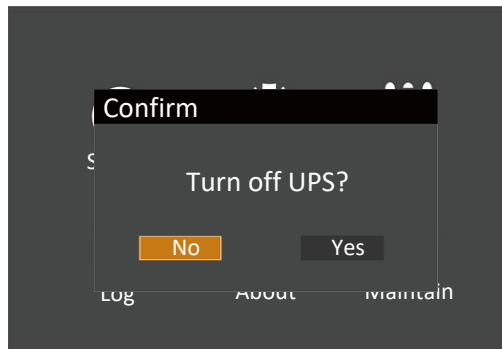


Figure 3-7 Bypass abnormal interface



In Bypass mode, the load is directly fed by the mains power instead of the pure AC power from the inverter.

### 3.3.3 Transfer from Bypass Mode to Inverter Mode

In Bypass mode, press and hold the power button.

If the ECO mode is not turned on, the interface shown in Figure 3-8 is displayed.

Select 'Turn on UPS' and click OK to transfer to the Inverter mode, see Figure 3-9.

Select 'Turn off UPS' and click OK to shut down the UPS output.

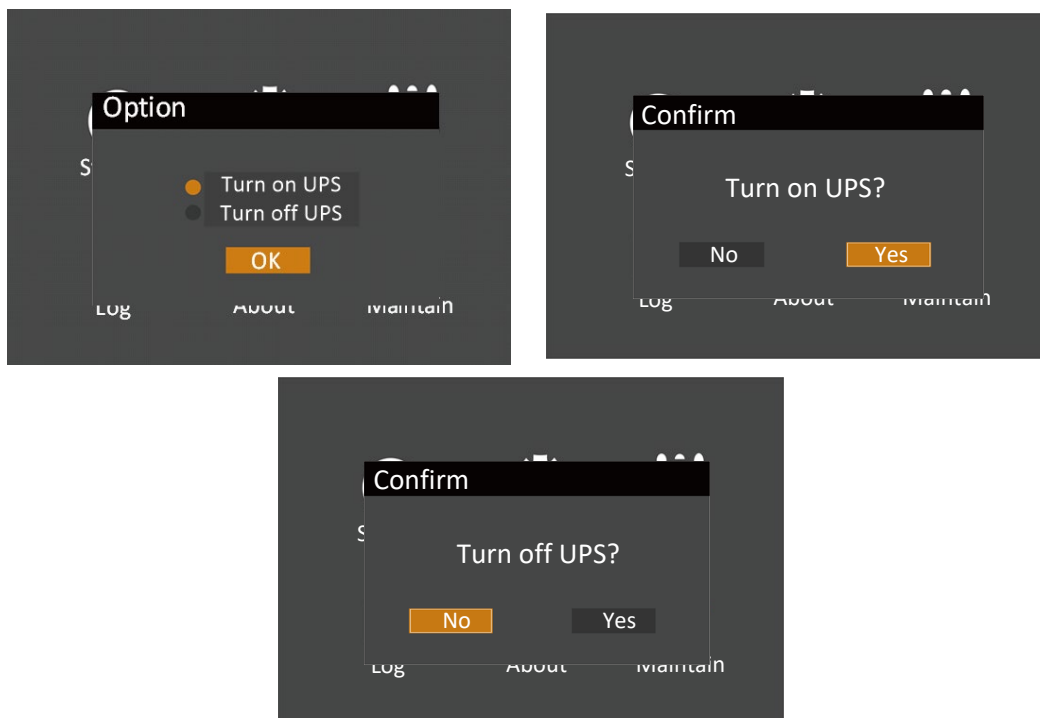


Figure 3-8 ECO mode not turned on

If the ECO turned on, the interface shown in Figure 3-9 will appear. Select 'YES' to shut down the UPS output.



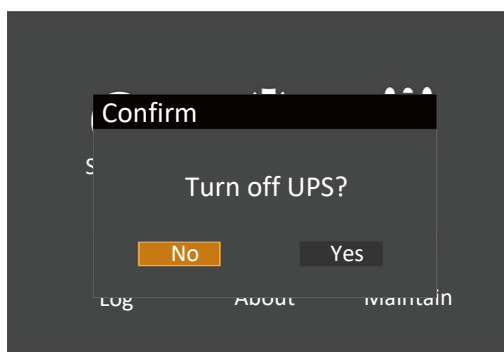


Figure 3-9 ECO turned on interface

### 3.4 UPS Complete Shutdown

For UPS system which the distribute power is accomplished by the user, if you need to isolate the UPS from AC power, disconnect the external input MCB.

### 3.5 REPO

Located at rear of the UPS, the REPO port is designed to switch off the UPS in emergency conditions (such as fire, flood). The system will turn off the rectifier, inverter and stop powering the load immediately (inverter and bypass output included), and the battery stops charging or discharging. Just unplug the terminal connecting to the REPO if you need emergency power-off.

If the mains input is present, the UPS control circuit will remain active; however, the output is closed. To remove all mains power from the UPS, the external main input MCB should be disconnected.

### 3.6 Auto Restart

The ITA2 UPS can realize the auto restart function in two conditions: with battery, without battery.

With battery: When the mains power failure, the UPS draws power from the battery to supply the load until the batteries are depleted, then the UPS will shut down.

Without battery: The inverter is on, and the mains power fails, then the UPS has no power supply.

The UPS will automatically restart and recover output power supply:




- After the mains power is restored.
- The UPS Auto Restart function is enabled.
- After the Auto Restart is delayed (default: 0s). During the Auto Restart delay, the UPS will charge the battery to provide a safety margin for equipment shutdown if input power fails again.

If the Auto Restart function is disabled, you can restart the UPS manually by pressing the power button.

### 3.7 Language Selection

The LCD menus are available in two languages: Chinese, English.

Procedures for selecting the language:

1. At the main menu screen, press the  or  key to switch the cursor to select 'Settings', then press the  key to confirm it. See Figure 3-10.

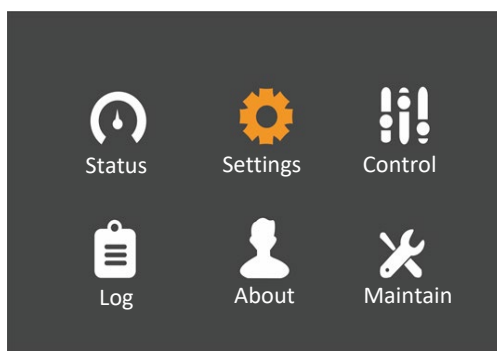



Figure 3-10 Main menu

2. Press the  key to move the cursor to 'Monitor', see Figure 3-11.




Output	Battery	Monitor	System
Language	English		
Date	2020-03-30		
Time	16:23:18		
Display orientation	Auto-rotate		
Audible alarm	Enable		
UPS Comm,Address	1		
IP Address Method	DHCP		

Figure 3-11 Monitor interface

3. Press the  key to highlight the language, see Figure 3-12

Output	Battery	Monitor	System
Language	English		
Date	2020-03-31		
Time	09:41:43		
Display orientation	Auto-rotate		
Audible alarm	Enable		
UPS Comm.Address	1		
IP Address Method	DHCP		

Figure 3-12 Language selection

4. Press the  or  key to select the language you need, then press the  key to confirm it. At this time, the LCD contents will be the language selected by you.

5. Press the  key for several times to back to the main menu screen.

### 3.8 Changing Current Date and Time

Procedures for changing the system date and time:

1. At the main menu screen, press the or key to switch the cursor to select 'Settings', then press the key to confirm it. See Figure 3-13.

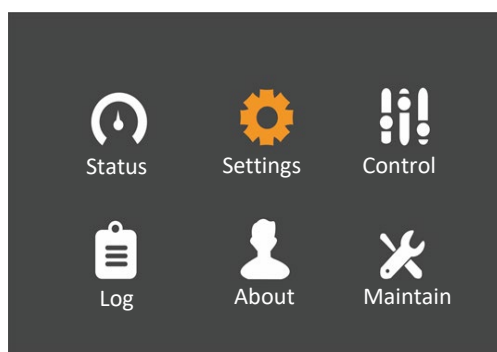


Figure 3-13 Main menu screen

2. Press the key to move the cursor to 'Monitor', see Figure 3-14.

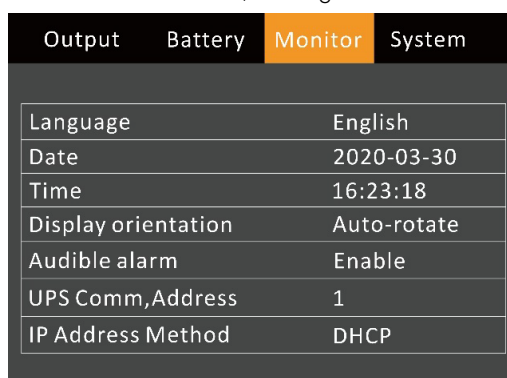


Figure 3-14 Monitor interface

3. Press the key, and press the or key to highlight the date and time, see Figure 3-15.

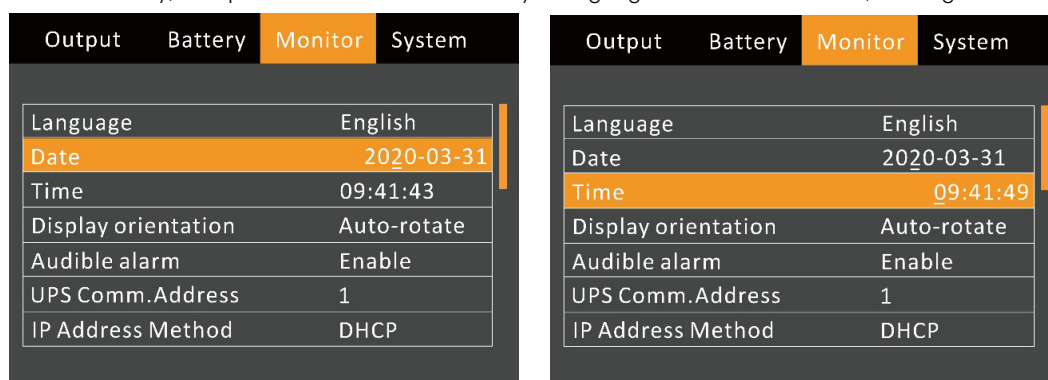


Figure 3-15 Selection of date and time

4. Press the key, move the cursor and press the or key to change the date and time you need.

5. Press the **Enter** key to confirm it, and then press the **Esc** key several times to back to the main menu screen.

### 3.9 Setting Password

The default password for the Settings page is 111111. You must enter the current password first, and then change the password you preferred. However, we recommend that you set the password to the default value to protect your system and devices. If you change the default password, record the new password and store it in an accessible location for later retrieval.

If the user needs to change the password of setting page, please follow the steps below:

1. After powering on the UPS, at the main menu screen, press the **▲** or **▼** key to move the cursor to select 'Settings'. See Figure 3-16.

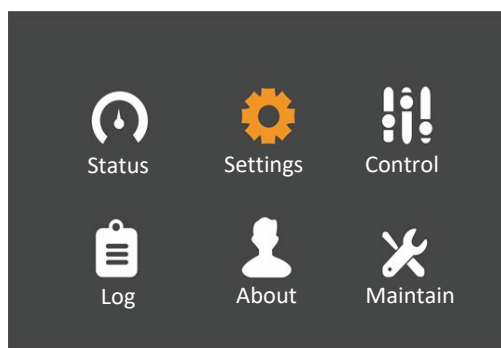


Figure 3-16 Main menu

2. Press the **Enter** key, the interface shown in Figure 3-17 will appear.

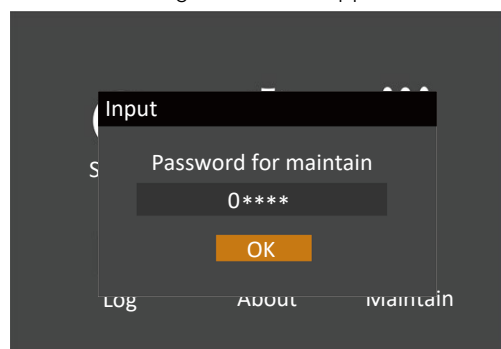



Figure 3-17 Inputting password

The user can observe the following procedures to change password:

1. Press the  key to move the cursor to the 'Monitor', see Figure 3-18.

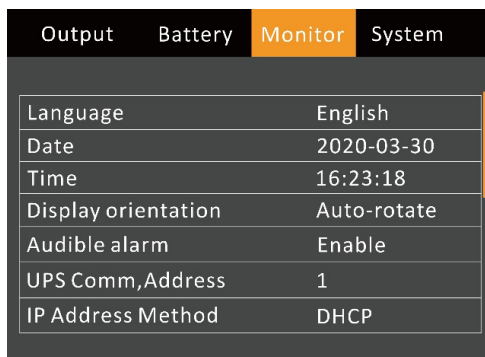




Figure 3-18 Monitor interface

2. Press the  key, then press the  key to select the 'Change settings password', see Figure 3-19.

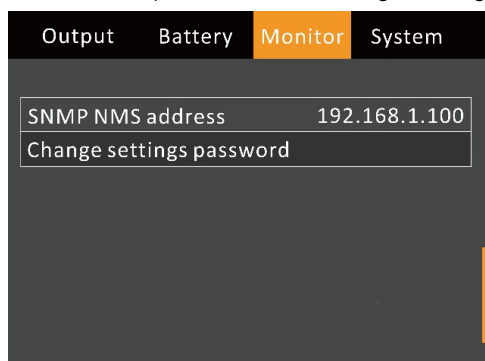



Figure 3-19 Changing settings password

3. Press the  key, the interface shown in Figure 3-20 will appear.

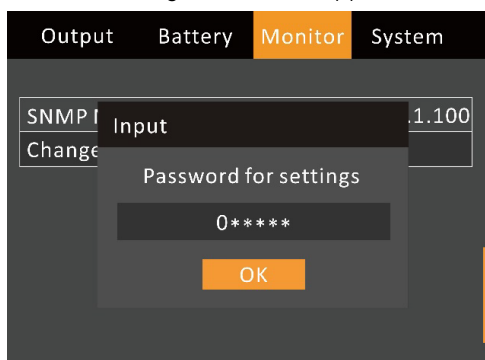


Figure 3-20 Password for settings

4. Input the existing password, press the key to confirm it, then the system requires to input a new password. See Figure 3-21.

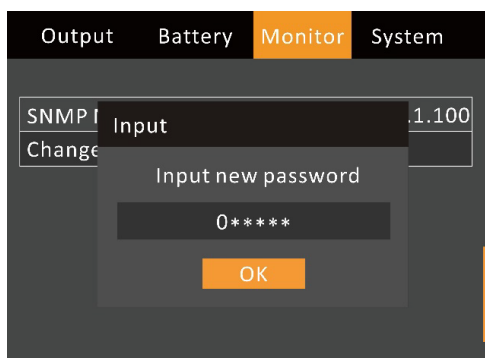


Figure 3-21 Inputting new password

5. After inputting the new password, press the key to confirm it, then the system requires to confirm the new password, see Figure 3-22.

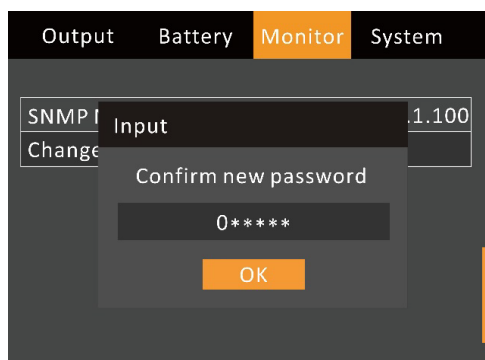


Figure 3-22 Confirming new password

6. After the confirmation, press the key and the system prompts that the password changing is successful, see Figure 3-23.

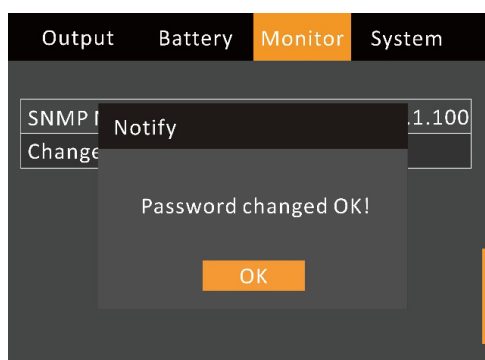


Figure 3-23 Password changed OK

7. Press the key for several times to back to the main menu screen.



Only through the correct password (default: 11111) verification can you conduct the parameters of the UPS.

## 4 Operation and Display Panel

This chapter introduces the functions and use of the components on the UPS operation and display panel, and provides LCD display information, including the LCD screen types, detailed menu messages, prompt windows message and UPS alarm list.

### 4.1 Introduction

The display panel is located on the front panel of the UPS. The display panel allow the user to operate and monitor the UPS, and view the UPS parameters, UPS and battery status information and any alarm messages.

As shown in Figure 4-1, the display panel includes LCD screen, menu keys, LED indicators (run indicator and alarm indicator).



Figure 4-1 Operation and display panel



The device has a gravity sensor function, thus the LCD display direction will be changed according to the device layout mode.



### 4.1.1 LED Indicators

The LED indicators consist of the run indicator and alarm indicator. Table 4-1 provides a description of these indicators.

Table 4-1 Description of LED indicators

Indicator	Color	State	Meaning
Run indicator	Green	On	UPS has output
		Blinking	Inverter is starting
		Off	UPS has no output, inverter is starting
Alarm indicator	Yellow	On	Alarm occurs
	Red	On	Fault occurs
	/	Off	No alarm, no fault

### 4.1.2 Audible Alarm (Buzzer)

The UPS operation is accompanied with the following two different kinds of audible alarms shown in Table 4-2.






Table 4-2 Description of audible alarm

Sound	Meaning
Continuous beep	Sound is generated when the UPS fault appears, such as fuse or hardware failure
One beep every 0.5 second	Sound is generated when the UPS critical alarm appears, such as Inverter overload
One beep every second	Sound is generated when the UPS critical alarm appears, such as battery low voltage
One beep every 3.3 second	Sound is generated when the UPS general alarm appears

### 4.1.3 LCD and Functional Keys

The operation and display panel include five functional keys, the respective functions are described in Table 4-3.

Table 4-3 Description of control buttons

Functional key	Silkprint	Description
Confirm		Used to confirm or enter
Up		Used to page up, turn left or add value, etc.
Down		Used to page down, turn right or reduce value, etc.
Escape		Used to back, escape, cancel or forbid operation
Power		Used to power on, power off or transfer to Bypass mode

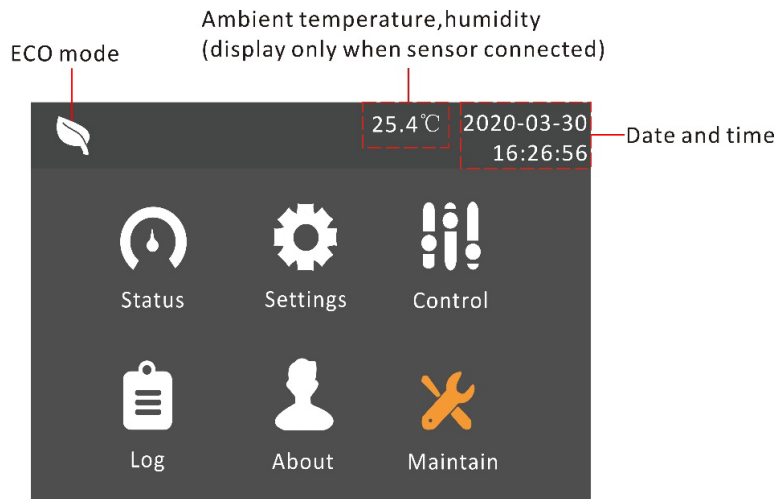


Figure 4-2 LCD screen

LCD provides you with the user-friendly interface. The user-friendly and menu-driven LCD allows you to easily browse through the UPS input, output, parameters of the load and the battery, learn about the current UPS status and alarm message, perform functional settings and control operation. The LCD also stores historical alarm records that can be retrieved for reference and diagnosis.

## 4.2 LCD Menu Structure

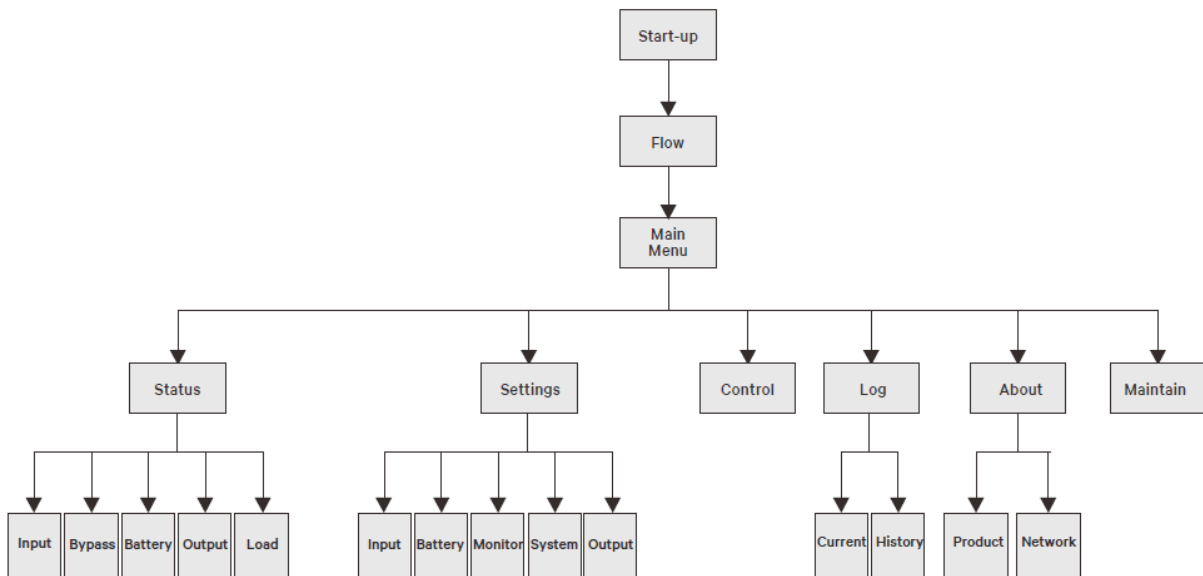


Figure 4-3 LCD menu structure

## 4.3 LCD Screen Types

### 4.3.1 Start Screen

Upon UPS start-up, the UPS executes the system self-test, and the start screen will appear and remain for about 10 seconds, as shown in Figure 4-4.



Figure 4-4 Start screen

### 4.3.2 Flow Screen

After the self-test of the UPS, the flow screen shown in Figure 4-5 will appear.

The flow screen is the total status view of the UPS, includes input, bypass, rectifier, battery, inverter and output, etc. The working modes with color display while the invalid modes with gray display.

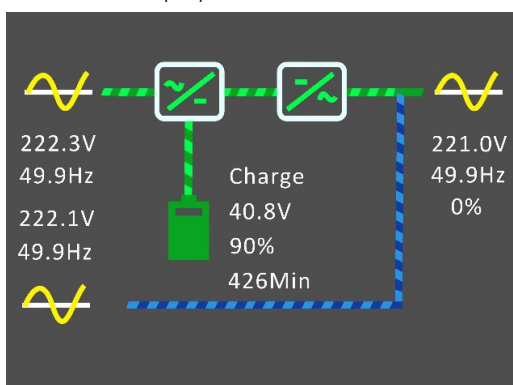


Figure 4-5 Flow screen

At the flow page, press the  key to enter the primary screen.

### 4.3.3 Main Menu Screen

The main menu screen is composed of six icons: Status, Settings, Control, Log, About, Maintain. As shown in Figure 4-6.

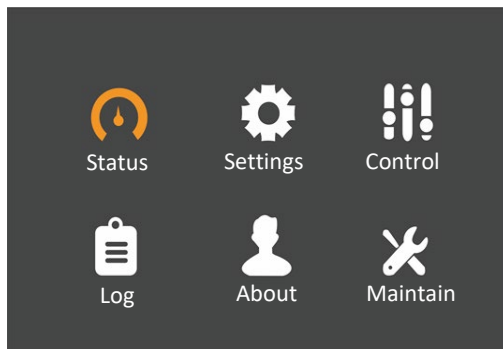


Figure 4-6 Main menu screen

At main menu screen, press the **Esc** key to back to the flow screen. Press the **▲** or **▼** key to switch the cursor to select the submenu you need, then press the **Enter** key to confirm it.

### 4.3.4 Submenu Screen

The submenu screen contains the UPS parameters and item settings.

After entering the submenu screen, if there is a tab control, just move the cursor to the tab. At this time, you can press the **▲** or **▼** key to switch the tab. Press the **Enter** key to move the cursor to a certain item.

After entering the submenu screen, if there is no tab control, then the cursor will stop at a certain item.

Press the **Esc** key to back to the previous screen.

For details about the submenu screen, see following pages.

## Status page

The Status page contains the Input, Bypass, Battery, Output and Load.

See below:

Input	
L-N voltage(V)	222.3
L-N current(A)	0.2
Frequency(Hz)	49.95
Power factor	0.00
Energy(kWh)	0

Bypass	
L-N voltage(V)	221.9
Frequency(Hz)	49.95

Battery	
Battery status	FloatChg
Battery voltage(V)	40.8
Battery current(A)	0.06
Backup time(Minutes)	426.4
Remaining capacity(%)	90
External battery cabinet gro...	0
Battery replaced time	2000-01...

Output		
L-N voltage(V)	0.0	
L-N current(A)	0.0	
Frequency(Hz)	0.00	

Load			
Sout(kVA)	0.00	0.00	0.00
Pout(kW)	0.00	0.00	0.00
Power factor	0.00	0.00	0.00
Load percent(%)	0.0	0.0	0.0

## Settings page

The Settings page contains the Output, Battery, Parallel, Monitor, System, and Outlet. For details about the parameters setting, refer to *Appendix 1 LCD Parameters Setting*.

See below:

The following tables represent the data shown in the screenshots:

**Screenshot 1: Main Menu**

- Status
- Settings
- Control
- Log
- About
- Maintain

**Screenshot 2: Output Tab**

Voltage selection	220V
Startup on bypass	Disable
Frequency selection	50Hz, Bypa...
Inverter sync range	+3.0Hz
Bypass voltage upper limit	+20%
Bypass voltage lower limit	-40%
Bypass frequency range	+10Hz

**Screenshot 3: Battery Tab**

Run mode	Normal
----------	--------

**Screenshot 4: Battery Tab**

Local battery total AH	8 Ah
External battery cabinet...	AutoTest
Low battery time	2 min
Battery test interval	Disable
Battery test weekday	Wednesday
Battery test time	00:00
Dischg protect time	4320min

**Screenshot 5: Monitor Tab**

Equal charge enable	Disable
Temp compensation	Disable
Replace battery	

**Screenshot 6: Monitor Tab**

Language	English
Date	2020-03-30
Time	16:23:18
Display orientation	Auto-rotate
Audible alarm	Enable
UPS Comm,Address	1
IP Address Method	DHCP

**Screenshot 7: Monitor Tab**

SNMP NMS address	192.168.1.100
Change settings password	

**Screenshot 8: System Tab**

Auto restart	Enable
Auto restart delay	0 sec
Guaranteed shutdown	Disable
Remote control	Enable
Remote power on delay	0 sec
Remote shutdown delay	0 sec
IT system compatibility	Disable

Output	Battery	Monitor	System
Dry contact 1 (Output)			Low battery
Dry contact 2 (Output)			UPS fault
Dry contact 5 (Input)			Battery mo...
Dry contact 6 (Input)			ry mode sh...

### Control page

The Control page contains the Turn ON/OFF/to BYPASS, and Manual battery test, etc.. See below:

Turn on/off/to bypass	
Mute/Unmute audible alarm	
Start/Stop battery manual test	
Clear faults	
<input type="checkbox"/> Power on time	2000-01-01 00:00:00
<input type="checkbox"/> power off time	2000-01-01 00:00:00

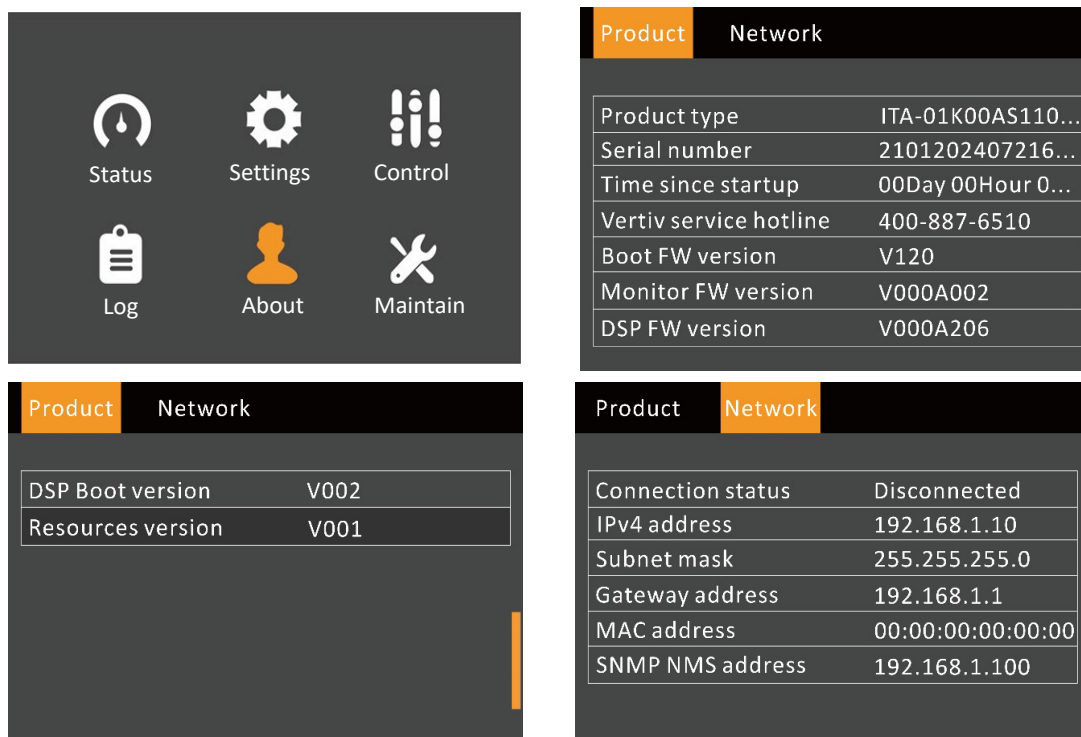
### Log page

The Log page contains the Current and History. See below:

Current	History
01 Battery-to-utility transi...	NG20
● 2020-03-30 16:25:17	
2020-03-30 16:25:17	
02 Operating on inverter	NG23
● 2020-03-30 16:25:17	
2020-03-30 16:25:17	
03 Manual power-on	NG24
● 2020-03-30 16:25:07	
2020-03-30 16:25:07	

## About page

The About page contains the Product and Network. See below:



## Maintain page



*The Maintain page needs correct password and for Vertiv service engineer operation only.*

### 4.3.5 Default Screen

During the UPS operation, if there is no alarm within two minutes, the default screen shown in Figure 4-7 will appear. At the default screen, if there is an alarm or a fault, or the user press any key, the Flow screen will appear again.



Figure 4-7 Default screen



## 4.4 Prompt Window

A prompt window is displayed during the operation of the system to alert you to certain conditions and/or to require your confirmation of a command or other operation. Table 4-4 lists the prompts and meanings.

Table 4-4 Prompts and meanings

Prompt	Meaning
Cannot set this online, please shut down output	If the user wants to change some important settings under condition of output (output voltage, output frequency, output phase No.), the prompt will appear
Incorrect password, please input again	The prompt will appear when the user incorrectly input the Settings password
Operation failed, condition is not met	The prompt will appear when the user wants to execute a certain operation but the condition is not met
Password changed OK	The prompt will appear when the user successfully change the Settings password
Fail to change password, please try again	The prompt will appear when the user tries to change the Settings password but input two different new passwords
The time cannot be earlier than system time	The prompt will appear when the user set the time of 'Turn on delay' or 'Turn off delay' is earlier than the current system time
Turn on failed, condition is not met	When users press the power button (or execute the command of 'Turn on/Turn off/to Bypass' under 'Control' page), the prompt will appear

## 4.5 List of UPS Alarm and Fault Message

Table 4-5 gives all UPS alarm and fault messages based on the 'Current' and 'History' menus.

Table 4-5 UPS alarm message list

Alarm message	Description
Input abnormal	The rectifier and charger are off due to the mains voltage and frequency exceeding normal range. Check that the rectifier input phase voltage and frequency exceed the normal range or that the mains has power-off
Fan fault	Fan is faulty. Check that the fan is blocked or the speed is zero, or the cables connection is loosened
Rectifier overload	The output power is larger than the rectifier overload point. Check that the input voltage meets the output load, mains input 176V ~ 100V, the load 100% ~ 50% linear derating
Inverter on failed	Check the input voltage, frequency and system settings
Rectifier fault	The rectifier is faulty and off
Charger fault	The charger output voltage is abnormal, and the charger is off
DC/DC fault	The discharger is faulty, because the bus voltage exceeds the setting range when discharger starts or soft starts
System overtemp	Internal heat sink temperature too high, and the inverter is off. Only each module heat sink temperature decreased to the setting value can you silence the alarm. The system can automatically start after overtemperature fault is solved. If overtemperature, please check: 1. Ambient temperature too high or not 2. Dust is blocked or not 3. Fan fault or not
Inverter overload	Inverter load capacity is larger than the rated value, overload delay time is up, inverter shuts down. If bypass is available, the system will transfer to the bypass mode, otherwise the output is failure. Check that the actual inverter load capacity, if overloaded, just reduce the load capacity, and the system will transfer to the inverter mode after five minutes with alarm cleared
Inverter fault	The inverter is off when the inverter output voltage and current exceed the setting range. If bypass is available, the UPS will transfer to bypass mode, otherwise the system will power off
Output pending	Remote shutdown is enabled, and the system will be off
Output disabled	The system is in standby state, and the dry contact shutdown is enabled. Check whether the shutdown dry contact is enabled or not
Battery module connection abnormal	If the number of battery cabinets detected exceeds 6, report abnormal connection of battery modules

Alarm message	Description
DC bus abnormal	The inverter is off when DC bus voltage is faulty. The load will transfer to bypass if the bypass is available
Bypass overcurrent	The bypass current exceeds the rated value. Overload delay time is up, inverter shuts down
Byapss abnormal	Maybe caused by bypass voltage and frequency outside of range, bypass power-off and incorrect bypass cables connection. 1. Check that the bypass voltage and frequency are within the setting range. 2. Check the bypass cables connection
Bypass abnormal in ECO mode	The ECO mode is available, and the bypass voltage and frequency are outside of the setting range. Check that the bypass input voltage and frequency are within the setting range
Battery reversed	The battery positive and negative are reversed. Please reconnect the battery and check the battery cables connection
Battery low pre-warning	This alarm occurs when the battery reaches the EOD. After the pre-warning, the battery capacity allows two minutes discharge at full load. The user can set the time ranging from 2min ~ 30min, (2 min by default). Please shut down the load timely
Battery voltage abnormal	When battery is connected, the system checks that the battery voltage exceeds the normal setting range. Check that the battery terminal voltage exceeds the normal range
No battery	Check the battery and battery cables connection
Battery test fail	The battery low voltage is detected when the battery has manual or peroidal self-test. Battery replacement is recommended
Battery overtemp	Battery ambient temperature too high. Check that the battery ambient temperature is higher than setting value 40 ~ 60°C (default: 50°C)
Battery mode	The UPS is on battery, and the inverter starts
REPO	Shutdown caused by the REPO terminal Normally Closed contact open
Output off, voltage is not zero	When there is no output, the system detects that the output has a voltage
Output short	Check that the output cables are not shorted
System fault	The alarm occurs when model identification is incorrect. Solution: Contact service manager
Operating on inverter	The UPS output state is on inverter
Bypass mode	The UPS is on bypass
No output	The UPS has no output
Internal communication fails	Check the communication cables are normal



*If the alarm is caused through setting the software value by Vertiv authorized engineer, and when you wish to change the setting values, please get in touch with the Vertiv local customer service center.*

## 5 Communication

This chapter briefly introduces the UPS communication.

The communication ports include: intelligent card port, dry contact port, built-in port, DB9 port and USB port.



*We recommend making the signal cable length be less than 3m and keep away from the power cable.*

### 5.1 Connecting Built-in Ethernet Port

The built-in Ethernet port supports the HTTP and SNMP protocol. The user can remotely access the UPS via the IE (Google browser recommended) to monitor the UPS in real time. The user can connect one end of the network cable to the Ethernet port of the UPS, and connect the other end to the built-in Ethernet port of the computer.



- 1. The IPV4 address needs to be in a network segment. For example, if the UPS IPV4 address is 10.168.1.10, the IPV4 address needs to be set to 10.168.1.xxx (XXX is between 0 and 255, but not 10).*
- 2. The subnet mask needs to be consistent and is 255.255.255.0.*
- 3. The gateway address needs to be consistent and 192.168.1.1.*

There are two ways to set network parameters: static specification, dynamic acquisition.

Static specification indicates that the user manually changes the network parameters of the computer or UPS (including IP address, subnet mask, and gateway address) so that the computer and UPS can communicate normally. UPS network parameters can be changed in the LCD 'Settings' -> 'Monitor' page.

Dynamic acquisition indicates that the UPS network parameters can be changed in the LCD 'Settings' -> 'Monitoring' page, UPS and computer network cable to connect to a LAN environment. The obtained IP address can be viewed in the 'About' -> 'Network' page of the LCD monitoring panel, as shown in Figure 5-1.

## Webpage monitoring function

Open the browser (like IE), input the IPv4 address at the address bar to the login interface. After inputting the correct user name and password (default name: user, password: 11111), you can monitor the UPS working status.

Product	Network
Connection status	Disconnected
IPv4 address	192.168.1.10
Subnet mask	255.255.255.0
Gateway address	192.168.1.1
MAC address	00:00:00:00:00:00
SNMP NMS address	192.168.1.100

Figure 5-1 Changing UPS network parameters

## Browser support

To obtain the best user experience, we recommend using the Internet Explorer (IE9 or above), or the Chrome, FireFox (latest version required).

## Screen resolution

The display with resolution of 1024\*768 or above is recommended.

## 5.2 Connecting Serial Port Communication Cables

The methods to connect the serial port communication cable are as follows:

Insert one end of the DB9 serial port communication cable to the DB9 serial port on the rear panel of the UPS, and connect the other end to the DB9 port of the computer.

The pin function of DB9 is listed below:

Pin No.	Function
2	Send data
3	Receive data
5	Common terminal

## 5.3 Installing Intelligent Card

### 5.3.1 Intelligent Card Port

The card box is connected to UPS through the DB9 serial port communication cable. One end is inserted into the DB9 serial port on the rear panel of UPS, and the other end is inserted into the serial port of the external card box. The smart card is installed directly in the card box to realize the communication between the Intellislot card and UPS. Intellislot card options include: SIC card, RDU-SIC card, RS232 card, RS485 card.

### SIC card

SIC card is a network management card, which makes the intelligent devices (such as UPS, air conditioner, static transfer system (STS), sever power management system (SPM), and so on) produced by Vertiv have

network communication capability. The SIC card can also be used with the Network Shutdown designed by Vertiv to provide safe automatic shutdown function for the computer, in which the Network Shutdown has been installed, to protect data and reduce loss. The version of SIC card should be V260B003D00 or above.

Refer to *the corresponding user manual* for the installation and operation guide.

### **RDU-SIC card**

The RDU-SIC card is a network management card. It can make the intelligent equipment (such as UPS, PDU and so on) developed by Vertiv have the capacity of network communication. The SIC card can also connect to the environment monitoring equipment, including IRM series or 1-Wire series temperature sensor, temperature & humidity sensor or dry contact signal input & detecting sensors. In case of an intelligent equipment alarm, it notifies the user by multiple ways: recording, sending a Trap message, sending an E-Mail or sending an SMS. The version of RDU-SIC card should be V5.21 or above.

The RDU-SIC card provides four approaches to monitor the intelligent equipment and equipment room environment:

- Web browser. Monitor your intelligent equipment and equipment room environment through the Web server function provided by the SIC card
- Network management system (NMS). Monitor your intelligent equipment and equipment room environment through the SNMP agent function provided by the SIC card
- RDU-Manager. RDU-Manager is a piece of management software for equipment room. You can use RDU-Manager to monitor your intelligent equipment and equipment room environment through the TCP/IP interface provided by the SIC card
- Centralized management software (Nform). Monitor your intelligent equipment through the Velocity Server service function provided by the SIC card

The SIC card can also work with the Network Shutdown computer safe shutdown program developed by Vertiv to provide automatic safe shutdown function for your computer installed with Network Shutdown, so as to prevent data loss.

Refer to *the corresponding user manual* for the installation and operation guide.

### **RS485 card**

RS485 card should be used together with Liebert® ITA series UPS provided by Vertiv to realize the signal transform from RS232 to RS485.

Refer to the corresponding user manual for the installation and operation guide.

### **RS232 card**

The RS232 card should be used together with the Liebert® ITA series UPS of Vertiv. It only supports RS232 protocol communication, and the maximum length of the communication cable cannot exceed 15 meters.

## 6 Maintenance

This chapter focuses on the UPS maintenance, including the fan maintenance, battery maintenance, UPS cleaning, UPS state check, UPS function check.



*Never attempt to carry out maintenance on the UPS while it is on line. Ensure that the UPS has been switched off completely when performing any internal maintenance operations on it.*

### 6.1 Fan Maintenance



*In order to avoid injury or damaging the device, wait until the fan is completely stationary before in-serting fingers or any tools into it.*

The UPS fans are expected to run for 20000 hours ~ 40000 hours continuously. The higher the ambient temperature, the shorter the fan life is.

During the UPS operation, please verify the fan status once every half year by confirming that air blows out from the ventilation holes on the rear panel.

### 6.2 Battery Maintenance



*1. Never reverse-connect the battery connections, otherwise the fire will occur.  
2. Never attempt to open batteries since they contain electrolyte which is potentially harmful to personnel. In the event of accidental with electrolyte, wash the affected area with abundant, clean water, and seek medical assistance immediately.*

The internal battery of the UPS is sealed, lead-acid, maintenance-free battery. The battery life depends on the ambient temperature, charge and discharge times. High ambient temperature and deep discharge shortens the battery life.

To ensure the battery life, it is required to:

- Keep the ambient temperature ranging from 15°C to 25°C
- Prevent small current discharge. Continuous battery operation time exceeding 24 hours is strictly prohibited
- Charge the battery for at least 12 hours, if the battery hasn't been charged for three months at specified ambient temperature, or two months at high ambient temperature



*1. Check regularly the screws at the battery connection parts, fasten it immediately if not tight.  
2. Make sure that the safety equipment are complete and that the function is normal, especially that the settings of the battery management parameters are normal.  
3. Measure and record the internal temperature of the battery room.  
4. Check whether the battery ports are damaged or hot, and whether the chassises and the covers are damaged.*

If liquid leakage and damage to the battery are found, place the battery in the anti-vitriol tank, and deal with it according to the local regulations.

The waste lead-acid battery is dangerous waste material. It is one of the national emphases to control the waste battery pollution. Its storage, transportation, usage and disposal must follow the national and local law and other criterions about the dangerous waste material and the waste battery pollution prevention.

According to the related regulations, recycle the waste lead-acid battery, and other disposal methods are prohibited. Throwing away randomly the waste lead-acid battery and other improper disposal methods can result in serious environment pollution, which will be investigated the legal responsibility.

As the provider of the lead-acid battery, Vertiv has built perfect service network and recycle system for the waste battery to assist users to deal with the waste battery by law. Contact Vertiv or the nearest service center for the detailed information of the recycle system about the waste battery.

Vertiv is not liable for the environment results caused by failure to comply with the notices in this section or to use the waste battery recycle system provided by Vertiv.

### 6.3 Cleaning UPS

To ensure free airflow inside the UPS: Clean the UPS periodically, especially the ventilation holes. If necessary, clean the UPS with a vacuum cleaner. Confirm that the ventilation holes are unobstructed.

### 6.4 Checking UPS State

It is recommended to check the UPS operation status once every half year.

Check the following items:

1. Check if the UPS is faulty: Is the alarm indicator on? Are there any active UPS alarms?
2. Check if the UPS is operating in Bypass mode Under normal conditions, the UPS operates in Normal mode; if you find that it is operating in Bypass mode, determine the reason (operator intervention, overload, internal fault, etc.)
3. Check if the battery is discharging: If the AC mains supply is within normal limits, the battery should not be discharged; if you find that it is operating in Battery mode, determine the reason (mains failure, battery test, operator intervention, etc.).

### 6.5 Checking UPS Functions



*UPS functions check procedures may cause power interruption to load!*

We recommend checking the UPS functions once every half year.

Backup the load data before conducting the UPS functions check. Procedures are as follows:

1. Press the power button to check if the buzzer beeps, indicators are ON, and the LCD display is normal.
2. Press the ESC key to check again if the indicators are ON, the LCD display is normal and the UPS has been transferred to the inverter mode.

## 7 Options

This chapter introduces the options of the UPS.

### 7.1 Option List

See Table 7-1 for the option list.

Table 7-1 Option list

Option name	Model or description	Remark
Battery associated	ITA-01k00BCI02	It can increase the backup time of ITA2 1kVA UPS
	ITA-02k00BCI02	It can increase the backup time of ITA2 2kVA UPS
	ITA-03k00BCI02	It can increase the backup time of ITA2 3kVA UPS
	Connection cables of battery module	Used for connection between battery module and UPS or both battery modules. The cable attached to the battery module. Different cables for different models
Guide rail/bracket	RMKIT1832	For rack installation between the battery module and UPS; Left and right two guide rails for a set, bearing 50kg, for rack installation use
Communication options	UF-SNMP SLOT	Card box for installing smart cards to facilitate UPS connection communication
	UF-SNMP810	SIC card is used for Intellislot series UPS Remote monitoring of UPS through TCP/IP protocol and Internet; Support remote security shutdown function
	RDU-SIC G2	Rdu-SIC card is used for Intellislot series UPS Used for UPS access to RDU-SIC monitoring unit or cascade communication of parallel systems
	UF-RS485	Realize the signal transform from RS232 to RS485.
	UF-RS232	Support RS232 protocol communication only

### 7.2 Backup Time of ITA2 1kVA~3kVA

For the backup time of ITA2 1kVA~3kVA, refer to Table 7-2 to Table 7-4.

Table 7-2 Backup time of 1kVA UPS (Unit: min)

Model	Qty. of battery module	Backup time									
		1kW	0.9kW	0.8kW	0.7kW	0.6kW	0.5kW	0.4kW	0.3kW	0.2kW	0.1kW
1kVA (Standard)	0	4.2	4.9	5.8	7.1	8.7	11.1	14.6	20.7	32.0	63.9
	1	19.6	22.7	26.3	31.4	38.0	47.7	62.1	83.8	118.0	244.0
	2	38.3	44.0	51.2	61.5	73.3	91.2	115.0	161.0	239.0	443.0
	3	58.9	67.7	77.9	92.8	112.0	140.0	175.0	235.0	328.0	634.0
	4	80.7	92.6	105.0	128.0	152.0	190.0	237.0	321.0	470.0	815.0
	5	104.0	117.0	139.0	163.0	196.0	238.0	298.0	386.0	539.0	1017.0
	6	130.0	147.0	168.0	199.0	237.0	287.0	358.0	483.0	693.0	1201.0
	7	153.0	173.0	201.0	236.0	280.0	339.0	433.0	560.0	750.0	1386.0
	8	183.0	203.0	233.0	273.0	324.0	385.0	489.0	645.0	925.0	1572.0
	9	205.0	232.0	266.0	312.0	362.0	448.0	560.0	711.0	969.0	1793.0
10	231.0	262.0	294.0	345.0	418.0	496.0	616.0	797.0	1143.0	1982.0	
1kVA	1	11.4	13.1	15.4	18.5	22.7	28.2	36.6	49.5	72.2	151.0



(Long babkup)	2	28.9	32.9	38.1	45.7	55.2	68.7	87.9	124.0	187.0	340.0
	3	48.7	55.4	64.4	76.9	92.4	113.0	147.0	197.0	276.0	533.0
	4	70.9	79.4	93.1	110.0	133.0	163.0	206.0	279.0	419.0	726.0
	5	93.1	105.0	124.0	146.0	172.0	217.0	271.0	351.0	491.0	926.0
	6	116.0	133.0	152.0	184.0	219.0	266.0	331.0	447.0	640.0	1110.0
	7	143.0	161.0	187.0	220.0	261.0	316.0	387.0	512.0	700.0	1294.0
	8	166.0	191.0	219.0	256.0	298.0	362.0	460.0	607.0	869.0	1478.0
	9	193.0	219.0	254.0	289.0	343.0	424.0	519.0	672.0	917.0	1662.0
	10	220.0	243.0	282.0	327.0	381.0	471.0	586.0	758.0	1086.0	1882.0

Table 7-3 Backup time of 2kVA UPS (Unit: min)

Model	Qty. of battery module	Backup time									
		2kW	1.8kW	1.6kW	1.4kW	1.2kW	1kW	0.8kW	0.6kW	0.4kW	0.2kW
2kVA (Standard)	0	3.1	3.6	4.4	5.3	6.7	8.7	11.7	17.2	27.5	56.5
	1	13.8	15.9	18.9	22.9	27.9	35.3	46.2	66.5	102.0	202.0
	2	27.4	31.3	37.0	43.7	53.9	67.5	89.1	126.0	192.0	360.0
	3	42.6	48.2	56.8	67.4	83.1	102.0	137.0	190.0	281.0	525.0
	4	58.0	66.9	77.9	92.0	112.0	142.0	186.0	256.0	370.0	690.0
	5	75.6	85.9	100.0	117.0	145.0	183.0	232.0	320.0	473.0	861.0
	6	92.7	104.0	126.0	146.0	181.0	221.0	281.0	378.0	570.0	1016.0
	7	111.0	128.0	148.0	171.0	214.0	261.0	331.0	455.0	657.0	1171.0
	8	130.0	147.0	170.0	201.0	242.0	295.0	375.0	515.0	744.0	1329.0
	9	149.0	168.0	198.0	231.0	278.0	339.0	440.0	591.0	854.0	1493.0
2kVA (Long backup)	1	7.9	9.2	10.9	13.1	16.3	20.7	27.6	39.2	62.0	126.0
	2	20.5	23.5	27.8	32.9	40.9	51.3	67.4	94.3	146.0	283.0
	3	34.9	39.6	46.7	55.3	68.2	85.4	111.0	158.0	237.0	452.0
	4	50.9	57.5	67.8	79.3	98.5	124.0	160.0	223.0	330.0	616.0
	5	67.4	76.6	90.2	104.0	130.0	161.0	212.0	286.0	432.0	771.0
	6	85.0	95.3	112.0	133.0	162.0	200.0	260.0	351.0	518.0	942.0
	7	102.0	115.0	138.0	161.0	196.0	239.0	310.0	426.0	614.0	1100.0
	8	123.0	139.0	161.0	191.0	229.0	280.0	355.0	488.0	705.0	1257.0
	9	142.0	160.0	188.0	219.0	264.0	299.0	411.0	560.0	793.0	1415.0
	10	160.0	184.0	214.0	244.0	293.0	357.0	463.0	622.0	898.0	1572.0

Table 7-4 Backup time of 3kVA UPS (Unit: min)

Model	Qty. of battery module	Backup time									
		3kW	2.7kW	2.4kW	2.1kW	1.8kW	1.5kW	1.2kW	0.9kW	0.6kW	0.3kW
3kVA (Standard)	0	3.0	3.5	4.2	5.2	6.5	8.2	11.2	16.1	26.0	55.3
	1	14.5	16.8	19.7	23.8	28.9	36.1	47.7	67.6	104.0	218.0
	2	28.7	32.8	38.0	45.9	55.6	68.9	91.0	128.0	197.0	380.0
	3	44.3	51.0	58.6	71.0	85.9	104.0	140.0	194.0	291.0	567.0

	4	61.9	70.3	80.0	95.7	115.0	145.0	190.0	260.0	380.0	728.0
	5	78.6	90.3	103.0	126.0	150.0	187.0	238.0	326.0	486.0	909.0
	6	98.2	102.0	129.0	152.0	187.0	226.0	287.0	384.0	584.0	1074.0
	7	115.0	133.0	155.0	185.0	221.0	267.0	339.0	464.0	677.0	1239.0
	8	138.0	156.0	181.0	214.0	255.0	302.0	383.0	524.0	763.0	1403.0
	9	157.0	181.0	203.0	240.0	286.0	345.0	447.0	600.0	875.0	1569.0
	10	174.0	199.0	229.0	271.0	322.0	381.0	494.0	661.0	961.0	1767.0
3kVA (Long backup)	1	8.3	9.6	11.3	13.8	16.9	21.2	28.1	39.8	63.5	132.0
	2	21.4	24.6	28.6	34.5	41.9	52.0	68.5	95.3	149.0	297.0
	3	36.3	41.7	48.3	57.8	70.9	86.9	113.0	160.0	243.0	475.0
	4	52.6	61.0	70.2	84.0	101.0	126.0	162.0	226.0	337.0	646.0
	5	70.4	79.1	92.2	110.0	133.0	164.0	216.0	290.0	442.0	808.0
	6	87.7	100.0	114.0	139.0	166.0	203.0	264.0	354.0	527.0	989.0
	7	105.0	124.0	142.0	166.0	201.0	243.0	316.0	433.0	631.0	1155.0
	8	127.0	144.0	165.0	197.0	235.0	284.0	360.0	493.0	717.0	1319.0
	9	146.0	165.0	192.0	227.0	270.0	326.0	423.0	568.0	812.0	1485.0
	10	165.0	190.0	218.0	257.0	300.0	362.0	470.0	628.0	915.0	1649.0

## Appendix 1 LCD Parameters Setting

Menu	Item	Setting range	Default setting	
System	Auto restart	Disable, Enable	Enable	
	Auto restart delay	0 ~ 999 seconds	0	
	Guaranteed shutdown	Disable, Enable	Disable	
	Remote control	Disable, Enable	Enable	
	Remote power on delay	0 ~ 999 seconds	0	
	Remote shutdown delay	0 ~ 999 seconds	0	
	IT system compatibility	Disable, Enable	Disable	
	Dry contact 1 (Output)	Low battery, On bypass, On battery, UPS fault	Low battery	
	Dry contact 2 (Output)	Low battery, On bypass, On battery, UPS fault	UPS fault	
	Dry contact 3 (Input)	Battery mode shutdown, Any mode shutdown, Maintain mode	Maintain mode	
	Dry contact 4 (Input)	Battery mode shutdown, Any mode shutdown, Maintain mode	Maintain mode	
Output	Voltage selection	220V, 230V, 240V	220V	
	Startup on bypass	Disable, Enable	Disable	
	Frequency selection	Auto, BypEna; Auto, BypDisa; 50Hz, BypDisa; 60Hz, BypDisa	Auto, BypEna	
	Inverter sync range	±0.5Hz, ±1.0Hz, ±2.0Hz, ±3.0Hz, ±4.0Hz, ±5.0Hz	±3.0Hz	
	Bypass voltage upper limit	+10%, +15%, +20%	+20%	
	Bypass voltage lower limit	-10%, -20%, -30%, -40%	-40%	
	Bypass frequency range	±5Hz, ±10Hz	±10Hz	
	Run mode	Normal, ECO mode	Normal	
	ECO voltage range	±5%, ±10%, ±15%	±5%	Appear only when the 'Run mode' is set to 'ECO mode'
	ECO frequency range	±1Hz, ±2Hz, ±3Hz	±3Hz	
ECO requalification time	5, 15, 30 (min)	5		
Battery	Local/Parallel battery total Ah	7 ~ 3000Ah	7Ah for 1kVA standard while 14Ah for 1kVA long backup; 8Ah for 2kVA and 3kVA standard while 16Ah for 2kVA and 3kVA long backup	
	EBC number	Automatic, 0-10	Automatic	
	Low battery time	2 ~ 30 (min)	2	
	Battery start time	YYYY-MM-DD HH:MM:SS	2010-01-01 0:00:00	
	Battery test interval	Disable, 8 weeks, 12 weeks, 16 weeks, 20 weeks, 26 weeks	Disable	
	Battery test weekday	Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday	Wednesday	
	Battery test time	HH:MM:SS	00:00:00	
	Discharge protect time	1 ~ 4320 (min)	4320	
	Equal charge enable	NO, YES	NO	
	Temperature compensation	Disable, Enable	Disable	
	Replace battery	Button	Button	
Monitor	Language	English, Chinese	English	
	Date	YYYY-MM-DD	2000-01-01	

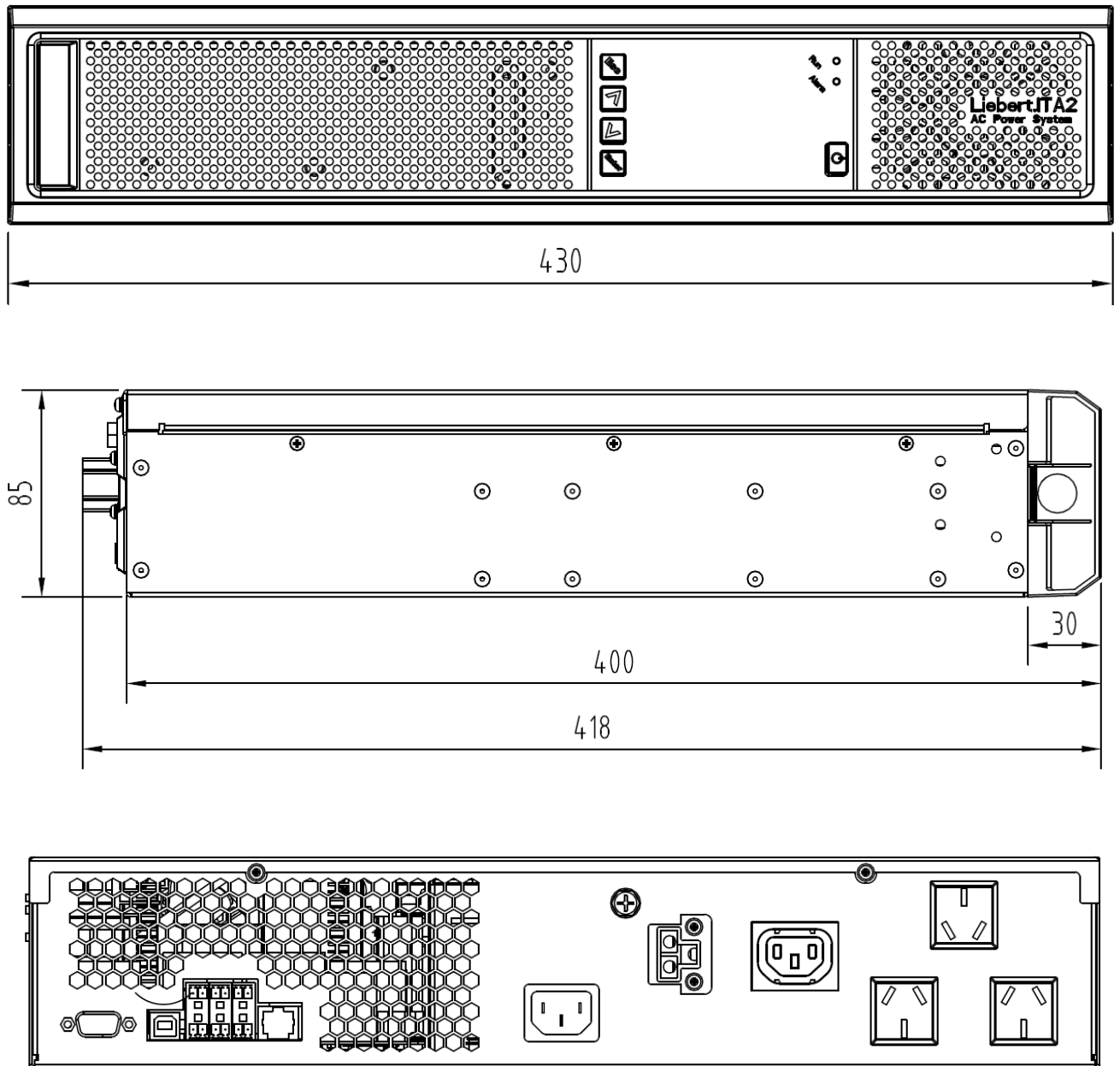
Menu	Item	Setting range	Default setting
	Time	HH:MM:SS	00:00:00
	Display orientation	Auto-rotate, Horizontal, Vertical	Auto-rotate
	Audible alarm	Enable, Disable	Enable
	Intellislot	<b>Velocity, YDN23</b>	<b>Velocity</b>
	UPS comm address	1 ~ 255	1
	IP receive method	Static specification, dynamic acquisition	Dynamic acquisition
	IPv4 address	ddd.ddd.ddd.ddd ('d' is a decimal number)	192.168.1.10
	Subnet mask		255.255.255.0
	Gateway address		192.168.1.1
	SNMP NMS address		192.168.1.100
	Change settings password	The password is numeric only and can be set from 0 to 9. The password length is 6	111111

## Appendix 2 Glossary

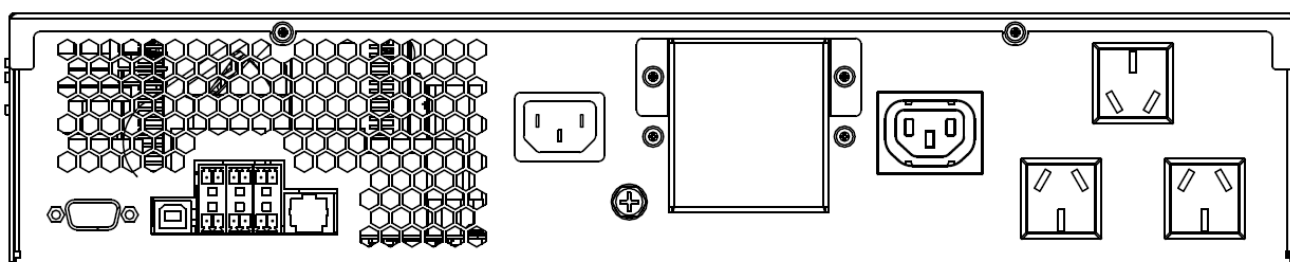
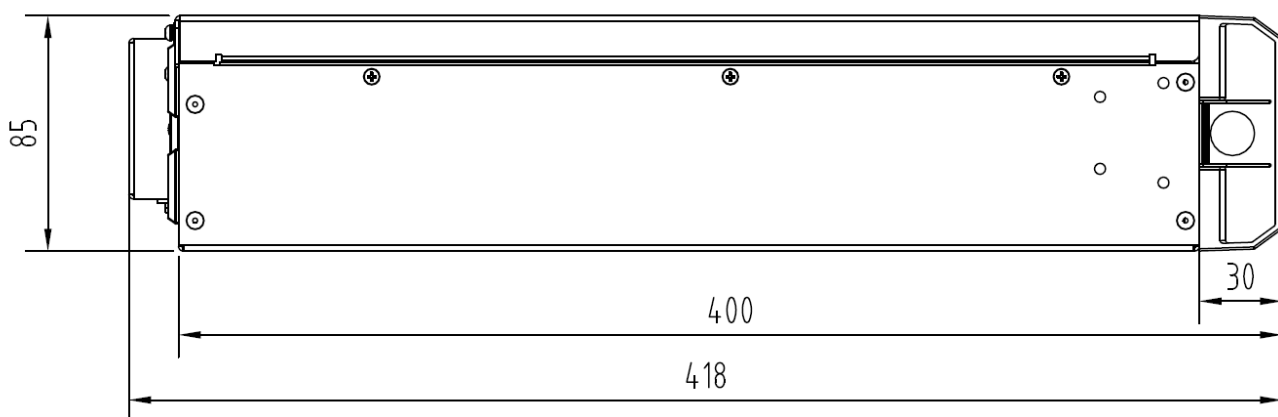
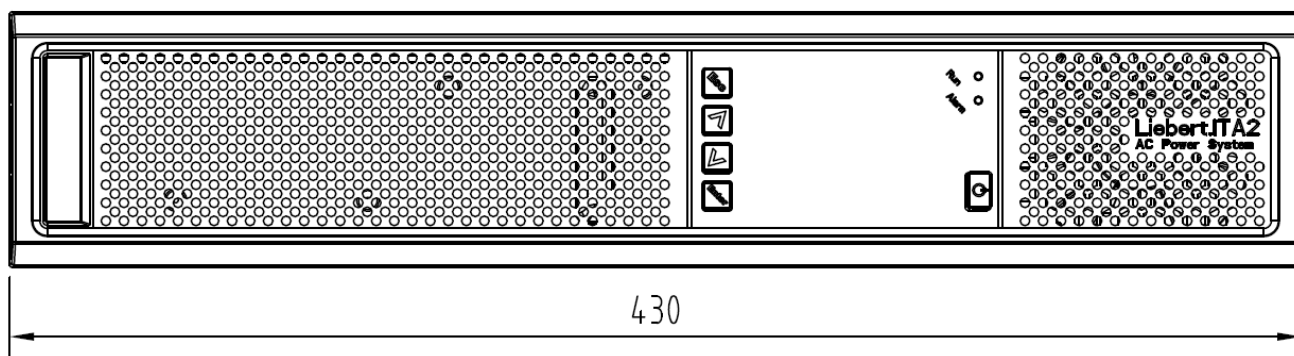
AC	Alternating current
CB	Circuit breaker
CSA	Cross sectional area
DC	Direct current
DIP	Dual in-line package
DSP	Digital signal processor
EBC	Battery module
EMC	Electromagnetic compatibility
EMI	Electromagnetic interference
EOD	End-of-discharge
EPO	Emergency power off
I/O	Input/output
LBS	Load bus synchronizer
LCD	Liquid crystal display
LED	Light-emitting diode
MCB	Miniature circuit breaker
NMS	Network management system
PE	Protective earth
RCCB	Residual current circuit breaker
RCD	Residual current detector
REPO	Remote emergency power off
RFI	Radio frequency interference
SCR	Silicon-controlled rectifier
SNMP	Simple network monitoring protocol
STS	Static transfer switch
UPS	Uninterruptible power system

### Appendix 3 Dimension (unit: mm)

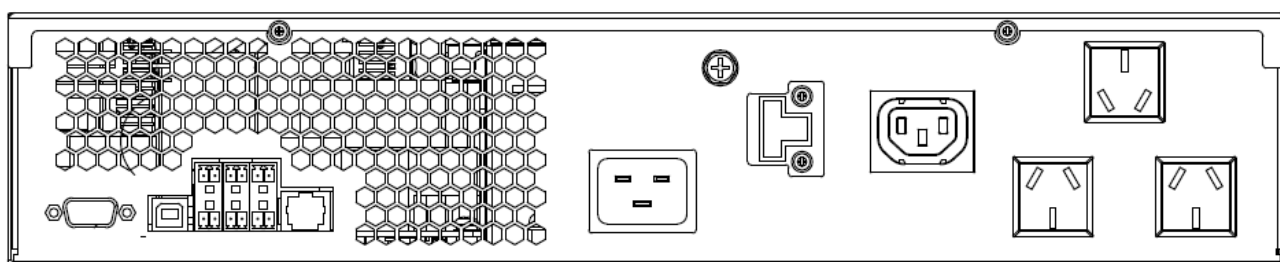
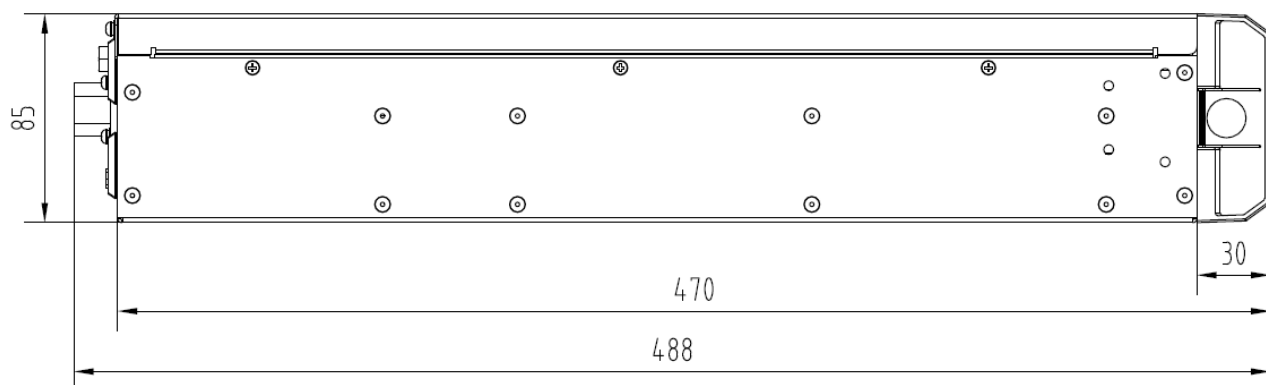
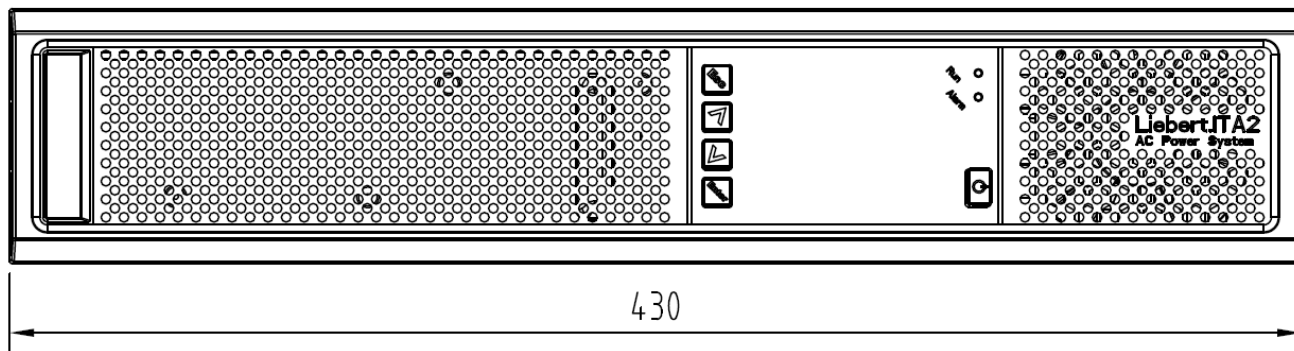
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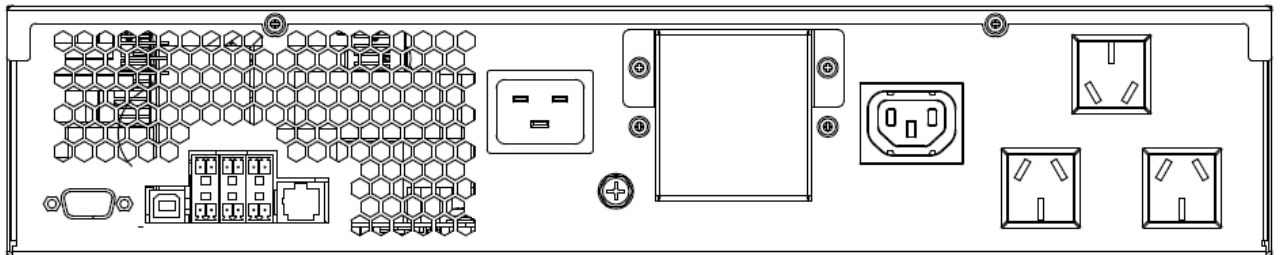
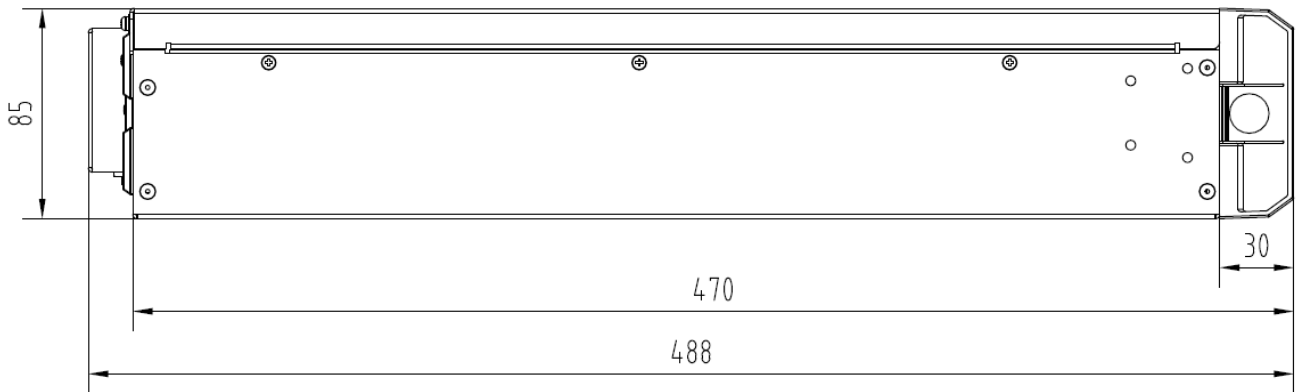
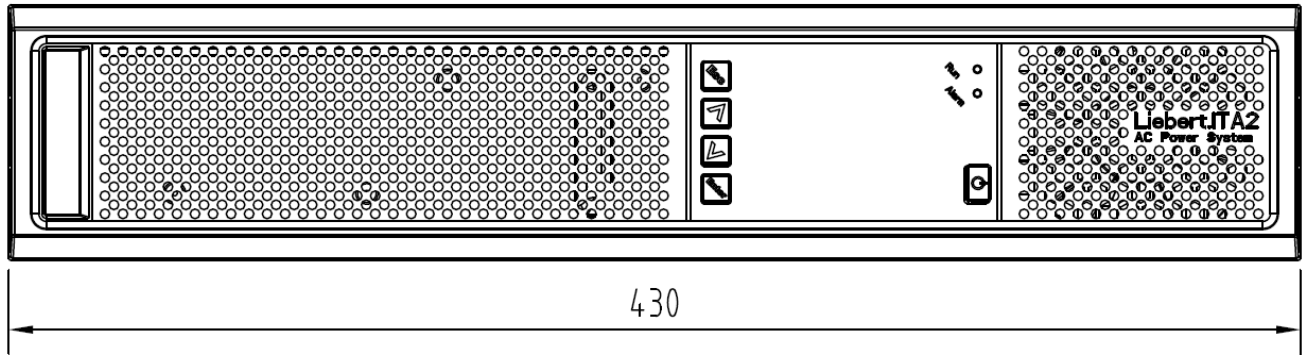


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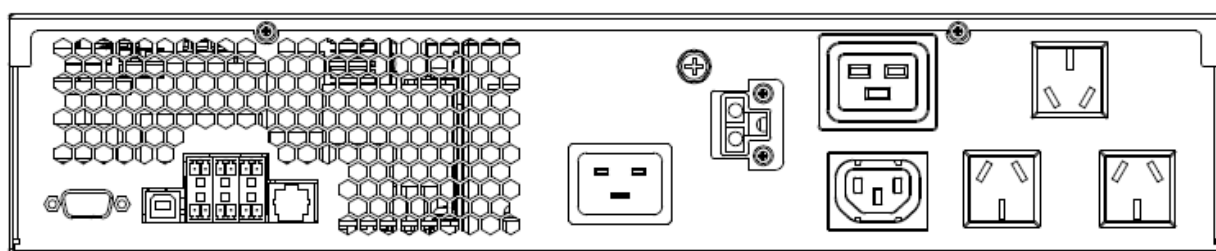
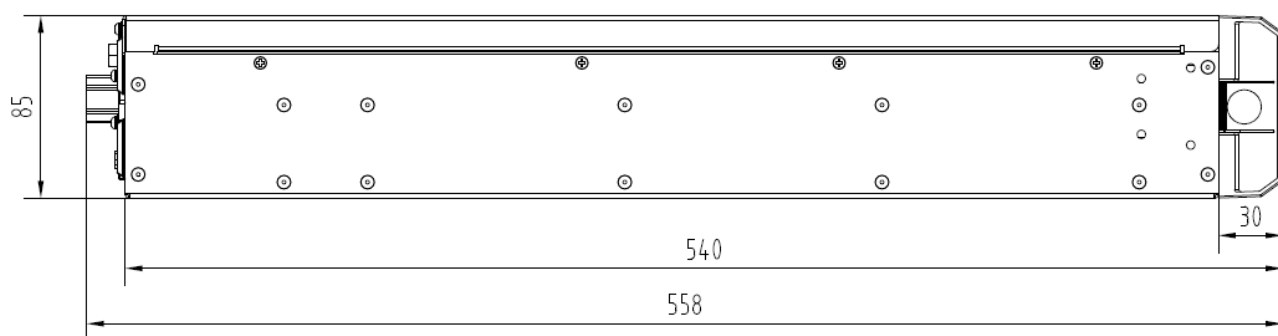
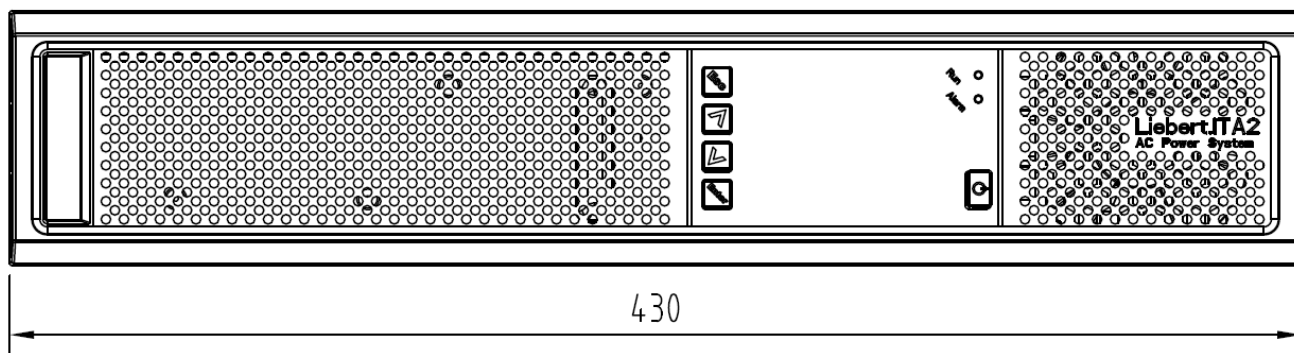




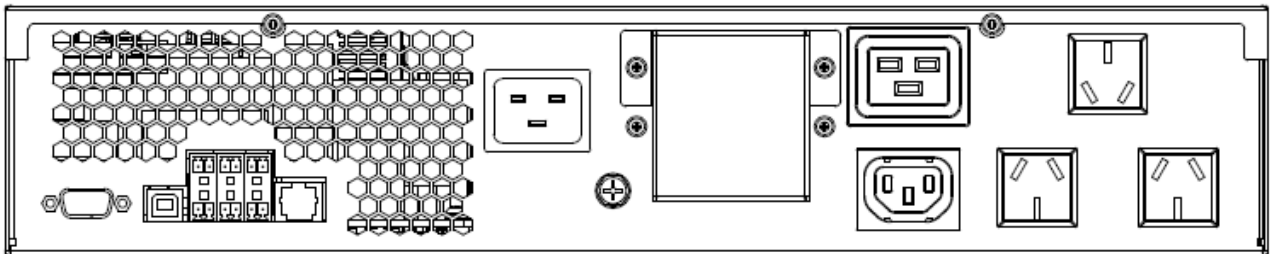
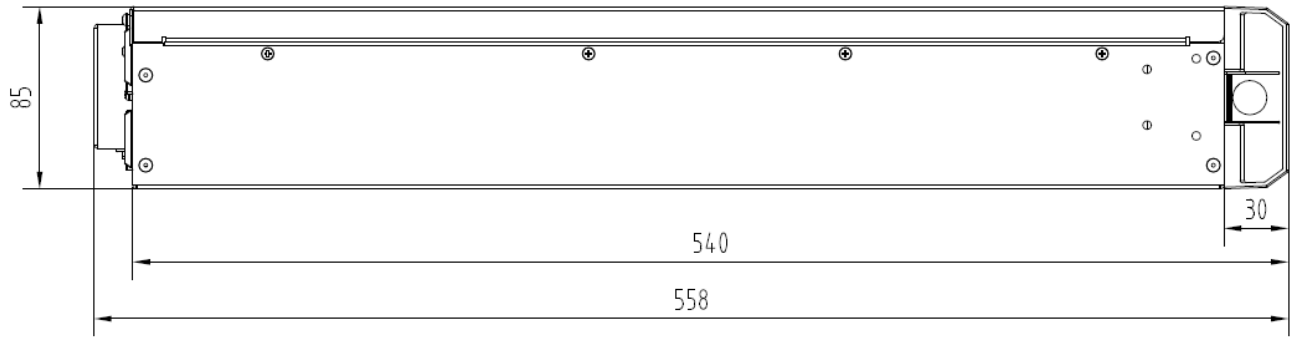
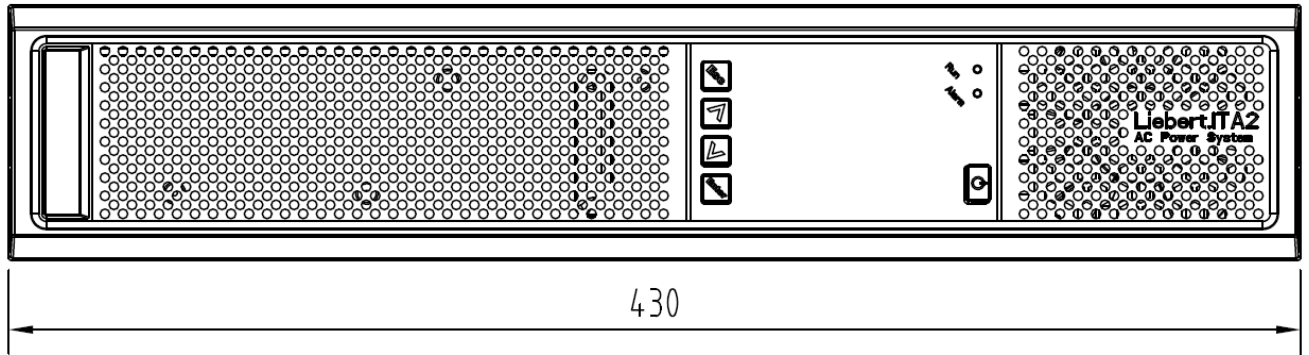
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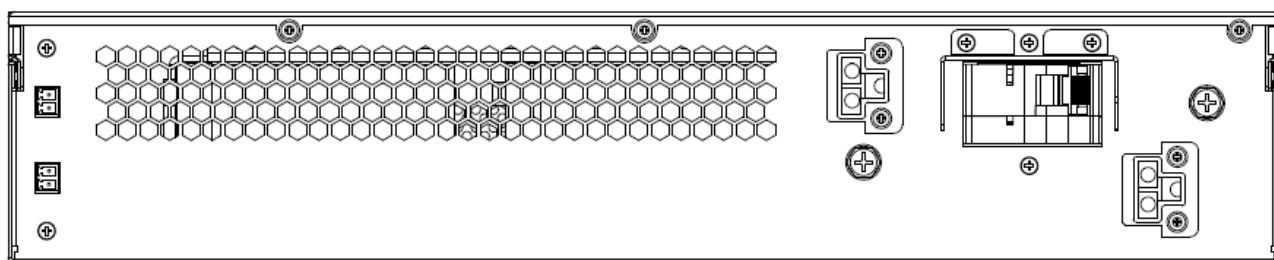
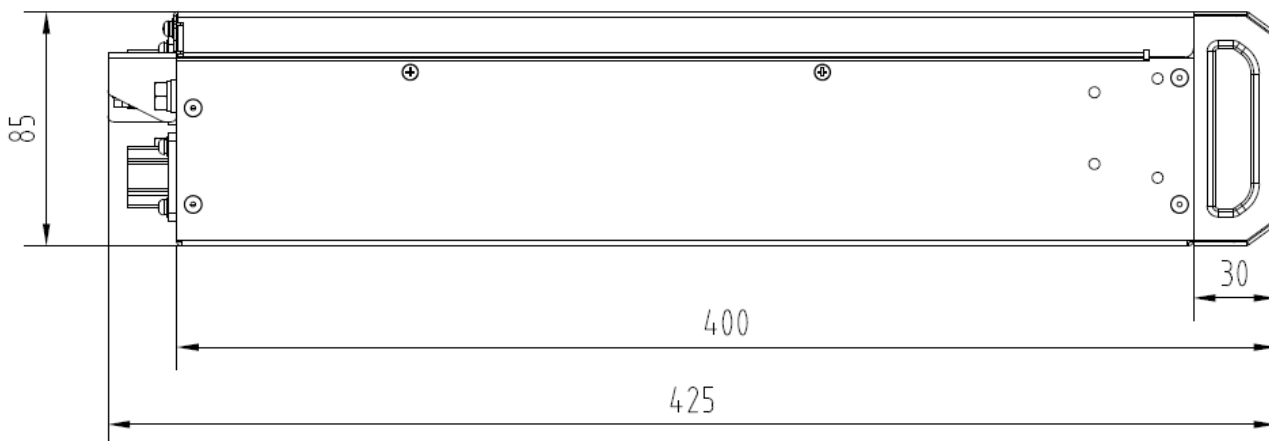
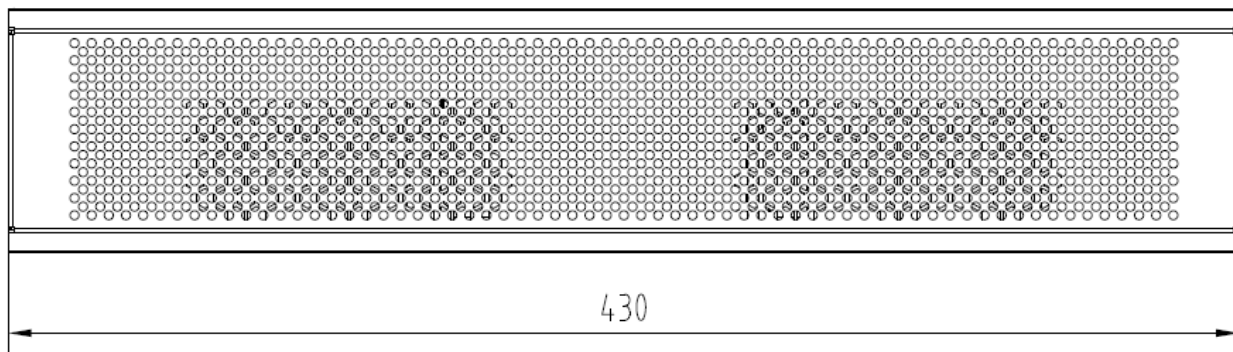
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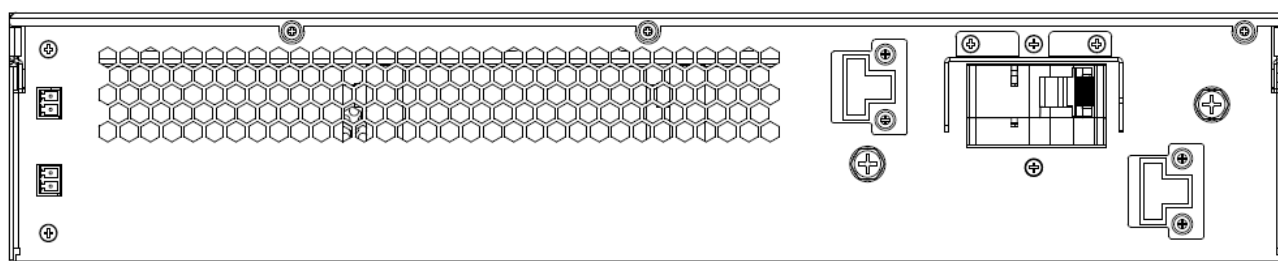
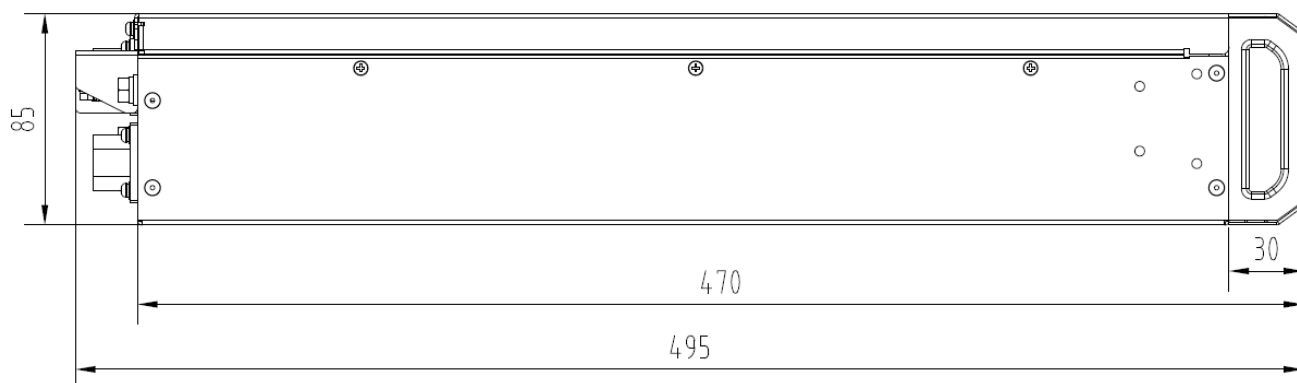
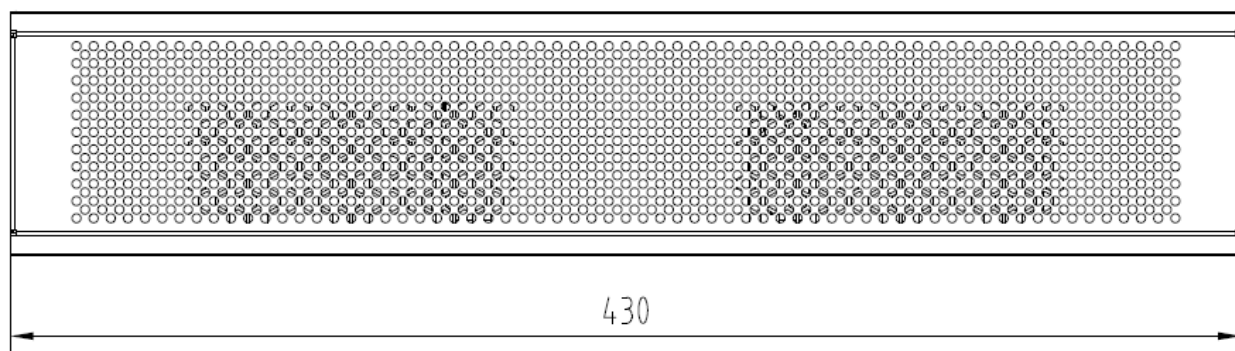
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