Line Interactive Sinewave UPS

1.1KVA | 1.5KVA | 2KVA | 3KVA Models

Uninterruptible Power Supply System
User Manual

I-00886 Rev A

Table of Contents

Important Safety Warnings

Comply with all warnings and operating instructions in this manual and save it for future reference. Do not operate this unit before carefully reading through all safety information and operating instructions.

Transportation and Storage

 Transport the UPS system only in the original package to protect against shock and impact.

 The UPS must be stored in a ventilated and dry room.

Preparation

 Condensation may occur if the UPS system is moved directly from cold to warm environments. The UPS system must be absolutely dry before being installed. Please allow at least two hours for the UPS system to adjust to the environment.

 Do not install the UPS system near water or in damp environments.

 Do not install the UPS system where it would be exposed to direct sunlight or near a heater.

 Do not block ventilation holes on the UPS housing.

Installation

 Do not connect appliances or devices to the UPS output sockets or terminal that would over load the UPS.

 Place cables in such a way that no one can step on or trip over them.

 Do not connect domestic appliances such as hair dryers to UPS output sockets.

 Connect the UPS system only to a grounded, shockproof outlet, which must be easily accessible and close to the UPS system.

 Use only a VDE-tested, CE-marked (or UL-marked for 100/110/115/120/127 Vac models) mains cable (e.g. the mains cable of your computer) to connect the UPS system to the building wiring outlet (shockproof outlet).

 Use only VDE-tested, CE-marked (or UL-marked for 100/110/115/120/127 Vac models) power cables to connect the loads to the UPS system.

 When installing the equipment, ensure that the sum of the leakage current of the UPS and the connected devices does not exceed 3.5mA.

 Temperature Rating: Units are considered acceptable for use in a maximum ambient environment of 104°F (40°C).

 For Pluggable Equipment: The socket-outlet shall be installed near the equipment and shall be easily accessible.

 The unit is heavy. Lifting the unit requires a minimum of two people.

Operation

 Do not disconnect the ground conductor cable on the UPS or the building wiring terminals at any time since this would cancel the protective earth of the UPS system and of all connected loads.

 The UPS system features its own, internal current source (batteries), therefore, the UPS output sockets or output terminal blocks may be electrically live even if the UPS system is not connected to the building wiring outlet.

 In order to fully disconnect the UPS system, first press the “OFF” button, and then disconnect the mains.

 Ensure that no liquid or other foreign objects can enter into the UPS system.

 The EPO, RS-232 and USB circuits are an IEC 60950-1 safety extra low voltage (SELV) circuit. This circuit must be separated from any hazardous voltage circuits by reinforced insulation.

Maintenance, Service and Faults

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

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

 Before performing any service and/or maintenance, disconnect the batteries and verify that no current is present and no hazardous voltage exists on the terminals of the high capability capacitor, such as BUS-capacitors.

 Only persons are adequately familiar with batteries and with the required precautionary measures may replace batteries and supervise operations. Unauthorized persons must be kept well away from the batteries.

 Risk of electric shock. The battery circuit is not isolated from the input voltage. Hazardous voltages may occur between the battery terminals and the ground. Before touching, please verify that no voltage is present.

 Do not dispose of batteries in a fire. The batteries may explode.

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

 Batteries may cause electric shock and have a high short-circuit current. Please take the precautionary measures specified below and any other measures necessary when working with batteries:

- Remove watches, rings, or other metal objects.
- Use tools with insulated handles.
- Wear rubber gloves and boots.
- Do not lay tools or metal parts on top of batteries.
- Disconnect charging source and load prior to installing or maintaining the battery.
- Remove battery grounds during installation and maintenance to reduce likelihood of shock. Remove the connection from ground if any part of the battery is determined to be grounded.

 When changing batteries, install the same number and same type of batteries or battery packs.

 For UPS with internally mounted battery:

- Instructions shall have sufficient information to enable the replacement of the battery with a suitable manufacturer and catalogue number.
- Safety instructions to allow access by Service Personnel shall be stated in the installation/service handbook.
- If batteries are to be installed by Service Personnel, instructions for interconnections, including terminal torque, shall be provided.

 Do not attempt to dispose of batteries by burning them. This could cause an explosion.

 Do not open or destroy batteries. Escaping electrolyte can cause injury to the skin and eyes. It may be toxic.

 Only replace the fuse with the same type and amperage to avoid fire hazards.

 Do not disassemble the UPS system.

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

 Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

 This is a product for commercial and industrial applications. In second environment installations, restrictions or additional measures may be needed to prevent disturbances.

Avertissements de sécurité importants

Respectez tous les avertissements et consignes d'utilisation de ce manuel et conservez-le pour référence ultérieure. Ne faites pas fonctionner cet appareil avant de lire attentivement toutes les informations de sécurité et les instructions d'utilisation.

Transport et stockage

 Transportez le système UPS uniquement dans son emballage d'origine pour le protéger contre les chocs.

 L'onduleur doit être stocké dans une pièce ventilée et sèche.

Préparation

 De la condensation peut se produire si le système UPS est directement déplacé d'un environnement froid à un environnement chaud. Le système UPS doit être absolument sec avant d'être installé. Veuillez prévoir au moins deux heures pour que le système d'ASI s'adapte à l'environnement.

 N'installez pas l'onduleur à proximité d'eau ou dans un environnement humide.

 N'installez pas le système UPS à un endroit exposé à la lumière directe du soleil ou à proximité d'un appareil de chauffage.

 Ne bloquez pas les trous de ventilation sur le boîtier de l'onduleur.

Installation

 Ne connectez pas de périphériques à la sortie de l'onduleur ou à un terminal susceptible de surcharger l'onduleur.

 Placez les câbles de manière à ce que personne ne puisse marcher dessus ou trébucher dessus.

 Ne connectez pas d'appareils domestiques tels que des sèche-cheveux aux prises de sortie de l'ASI.

 Ne connectez le système ASI qu'à une prise de terre protégée contre les chocs, qui doit être facilement accessible et proche du système ASI.

 Utilisez uniquement un câble d'alimentation certifié VDE, marqué CE (par exemple, le câble d'alimentation de votre ordinateur) pour connecter le système UPS au câblage du bâtiment sortie (sortie antichoc).

 Utilisez uniquement des câbles d'alimentation VDE, marqués CE pour connecter les charges au système UPS.

 Lors de l'installation de l'équipement, assurez-vous que la somme du courant de fuite de l'onduleur et des périphériques connectés ne dépasse pas 3.5 mA.

 Température nominale: Les unités sont considérées acceptables pour une utilisation dans un environnement ambiant maximal de 40°C (104°F).

 Pour les équipements enfichables: La prise de courant doit être installée près de l'équipement et doit être facilement accessible.

 L'unité est lourde. Le levage de l'unité nécessite un minimum de deux personnes.

Fonctionnement

 Ne déconnectez pas le câble du conducteur de mise à la terre de l'onduleur ou des bornes de câblage du bâtiment car cela annulerait la mise à la terre de protection de l'onduleur et de toutes les charges connectées.

 Le système ASI dispose de sa propre source de courant interne (batteries). Par conséquent, les prises de sortie ou les borniers de sortie de l'ASI peuvent être sous tension même si le système ASI n'est pas connecté à la sortie du bâtiment.

 Pour déconnecter complètement le système UPS, appuyez d'abord sur le bouton "OFF", puis débranchez le secteur.

 Assurez-vous qu'aucun liquide ou autre corps étranger ne puisse pénétrer dans le système ASI.

 Les circuits EPO, RS-232 et USB sont des circuits de très basse tension de sécurité (TBTS) CEI 60950-1. Ce circuit doit être séparé de tout circuit de tension dangereux par une isolation renforcée.

Maintenance, Service et Défauts

 Le système UPS fonctionne avec des tensions dangereuses. Les réparations ne peuvent être effectuées que par du personnel de maintenance qualifié.

 Risque de choc electrique. Même après que l'appareil est déconnecté du secteur (prise de câblage du bâtiment); les composants à l'intérieur du système UPS sont toujours connectés à la batterie et sont sous tension et dangereux.

 Avant d'effectuer toute opération de maintenance, déconnectez les batteries et vérifiez qu'il n'y a pas de courant et qu'aucune tension dangereuse n'existe sur les bornes du condensateur haute capacité, telles que les condensateurs BUS.

 Seules des personnes connaissent bien les batteries et, avec les mesures de précaution requises, peuvent les remplacer et superviser les opérations. Les personnes non autorisées doivent être tenues à l'écart des batteries.

 Risque de choc electrique. Le circuit de la batterie n'est pas isolé de la tension d'entrée. Des tensions dangereuses peuvent se produire entre les bornes de la batterie et le sol. Avant de toucher, vérifiez s'il n'y a pas de tension.

 Ne jetez pas les piles dans un feu. Les piles peuvent exploser.

 N'ouvrez pas et ne mutilez pas les piles. L'électrolyte libéré est nocif pour la peau et les yeux. Cela peut être toxique.

 Les batteries peuvent provoquer un choc électrique et un courant de court-circuit élevé. Veuillez prendre les mesures de précaution suivantes et toutes les autres mesures nécessaires lorsque vous travaillez avec des batteries:

- Retirez les montres, bagues ou autres objets métalliques.
- Utilisez des outils avec des poignées isolées.
- Portez des gants et des bottes en caoutchouc.
- Ne posez pas d'outils ou de pièces métalliques sur les batteries.
- Débranchez la source de charge avant d'installer ou de maintenir la batterie.
- Retirez les masses de la batterie pendant l'installation et la maintenance afin de réduire les risques de choc. Retirez la connexion de la masse si une partie de la batterie est déterminée pour être mise à la terre.

 Lorsque vous changez les piles, installez le même numéro et le même type de piles ou de batteries.

 Pour onduleur avec batterie interne:

- Les instructions doivent contenir suffisamment d'informations pour permettre le remplacement de la batterie par un fabricant et un numéro de catalogue appropriés.
- Les instructions de sécurité pour permettre l'accès au personnel de service doivent être indiquées dans le manuel d'installation/d'entretien.
- Si des batteries doivent être installées par le personnel de service, des instructions pour les interconnexions, y compris le couple aux bornes, doivent être fournies.

 N'essayez pas de vous débarrasser des piles en les brûlant. Cela pourrait provoquer une explosion.

 Ne pas ouvrir ou détruire les piles. L'électrolyte qui s'échappe peut causer des blessures à la peau et aux yeux. Cela peut être toxique.

 Ne remplacez le fusible que par le même type et le même ampérage pour éviter les risques d'incendie.

 Ne démontez pas le système UPS.

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

 Les changements ou modifications non expressément approuvés par la partie responsable de la conformité pourraient annuler l'autorité de l'utilisateur à utiliser l'équipement.

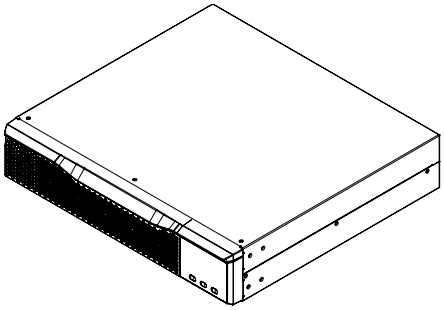
 Ceci est un produit pour les applications commerciales et industrielles. Dans les installations du deuxième environnement, des restrictions ou des mesures supplémentaires peuvent être nécessaires pour éviter les perturbations.

1. Installation and Setup

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

Unpacking and Inspection

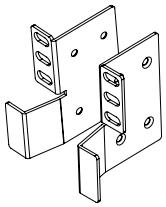
Unpack your products and inspect the contents. The contents should include the following supplied components and hardware.



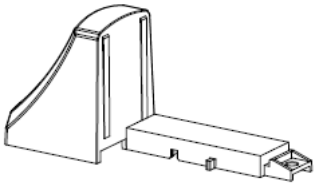
1.1, 1.5, 2, or 3KVA
UPS Unit

User Manual

USB Cable



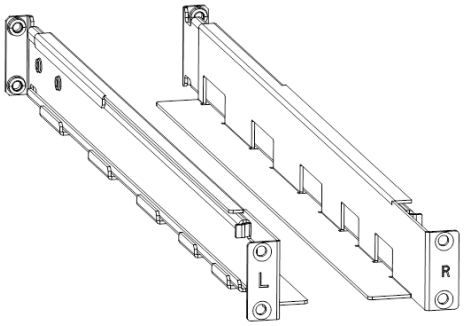
(2x) UPS Mounting Brackets and Screws



(4x) Foot

NOTE:

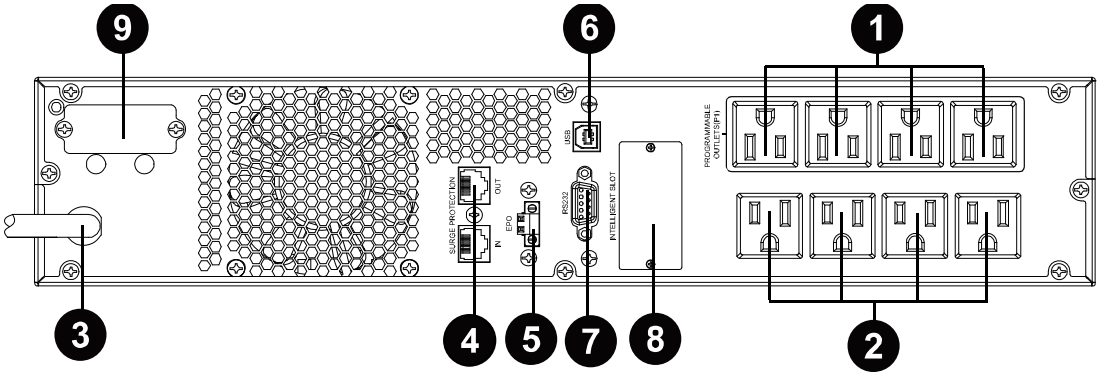
- Rail Slider is provided. For more information, refer to the 2U Rackmount Rail Slider instruction sheet (I-00888.pdf).



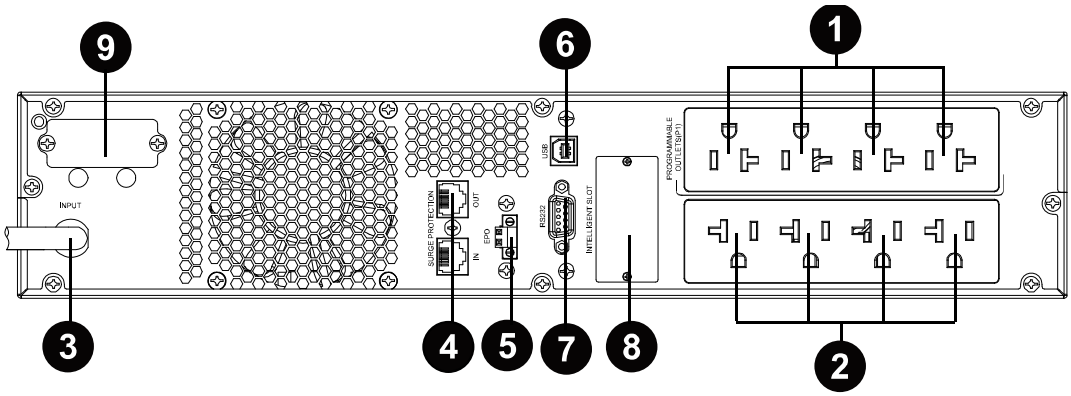
- Before installation, inspect all supplied components and hardware to ensure nothing was damaged during transportation. If you notice any damaged or missing parts, do not turn on the unit and notify the carrier and utilize the support reference number provided on your unit. Please keep the original package in a safe place for future use.

Rear Panel

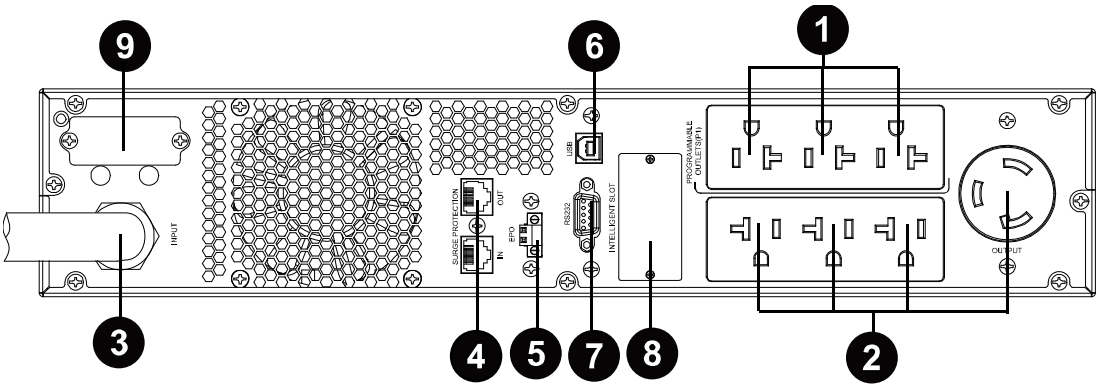
1.1K and 1.5K Models



2K Models



3K Models

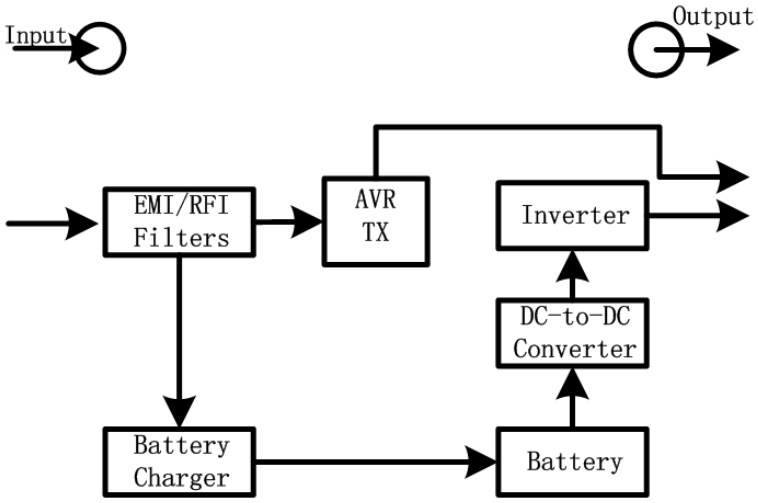


Label Descriptions:

1. Programmable Outlets: Connect to non-critical loads.
2. Output Receptacles: Connect to critical loads.
3. AC Input
4. Network/Fax/Modem Surge Protection
5. EPO (Emergency Power Off) Function Connector
6. USB Communication Port
7. RS-232 Communication Port
8. SNMP Intelligent Slot
9. External Battery Connector

Operating Principle

The operating principle of the UPS is shown as follows:

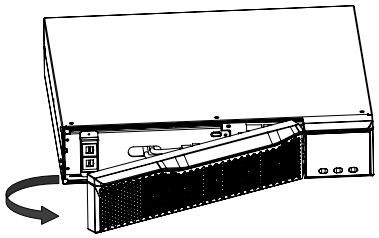


The UPS is composed of a mains input, EMI/RFI filters, inverter, battery charger, DC-to-DC converter, battery, AVR TX, and UPS output.

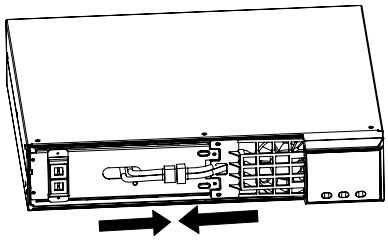
Installing The UPS

For safety considerations, the UPS is ships from the factory without the battery wires connected. Before installing the UPS, please use the following steps to first re-connect the battery wires.

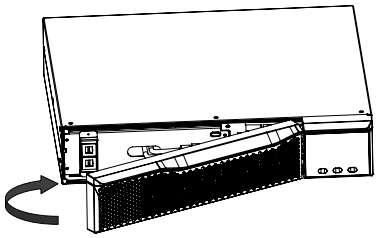
Step 1: Remove the front panel.



Step 2: Connect the AC input and re-connect the battery wires.



Step 3: Put the front panel back on the unit.



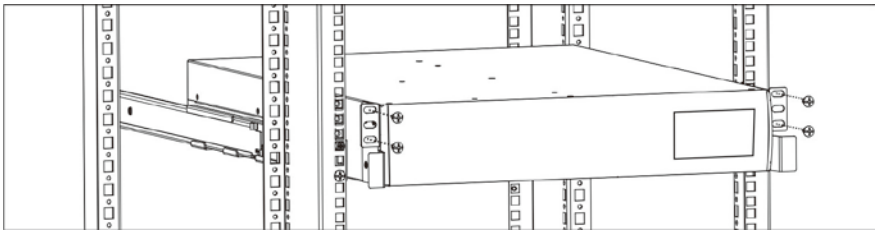
This UPS can be either placed on a surface or mounted in a 19” rack chassis.

Rackmount Installation

CAUTION: Do not use the mounting brackets to lift the unit. Use the mounting brackets only for securing the unit to the rack.

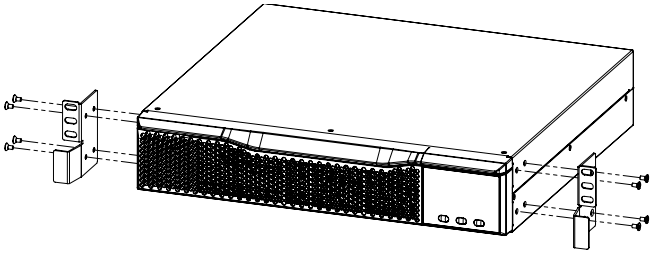
ATTENTION: N'utilisez pas les supports de montage pour soulever l'appareil. Utilisez les supports de montage uniquement pour fixer l'unité au rack.

NOTE: Rail Slider is provided. For more information, refer to the 2U Rackmount Rail Slider instruction sheet (I-00888.pdf).

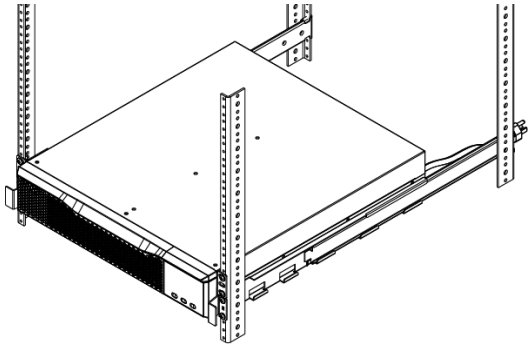


Use the following steps to mount your UPS system into a 19” rack.

Step 1

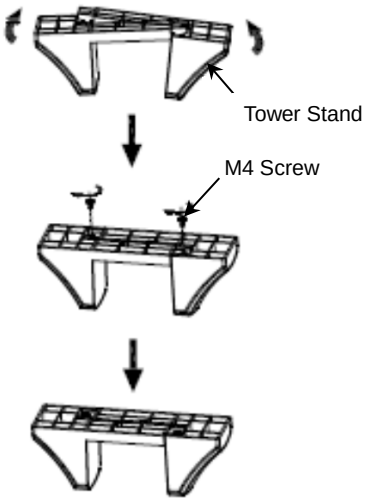


Step 2

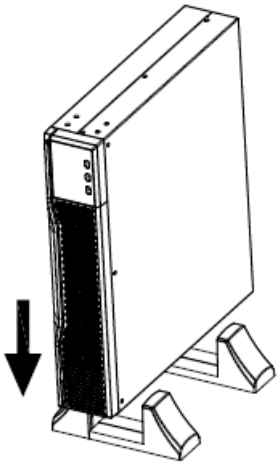


Tower Installation

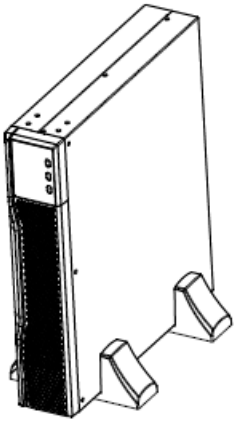
Step 1



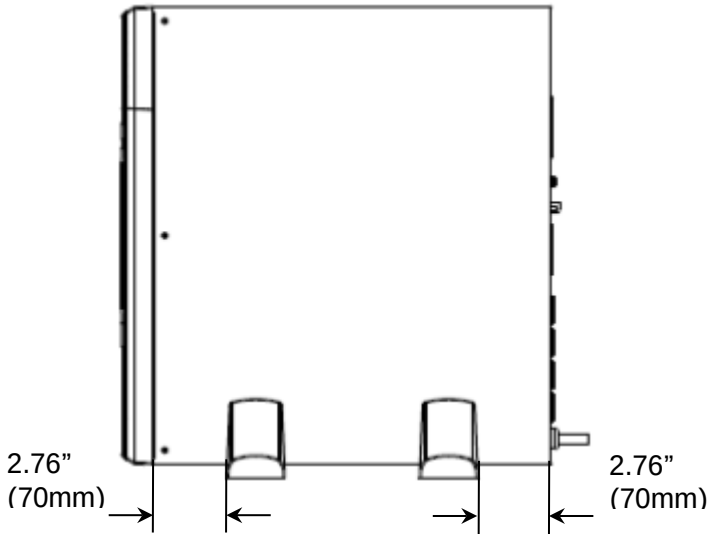
Step 2



Step 3



NOTE: When using feet for tower installations of the UPS or battery pack, ensure a 2.76” (70mm) distance from the edge of the unit to the feet as follows.



Setting Up the UPS

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

1. The UPS should be placed on a flat, clean surface. Place it in an area away from vibration, dust, humidity, high temperature, flammable liquids, gases, corrosive, and conductive contaminants. Install the UPS indoors in a clean environment, where it is away from windows and doors. Maintain a minimum clearance of 3.94 in. (100mm) on the bottom of the UPS to avoid dust and high temperatures.
2. Maintain an ambient temperature range of 32ºF (0ºC) to 113ºF (45ºC) for optimal UPS operation. For every 41ºF (5ºC) above 113ºF (45ºC), the UPS will derate 12% of nominal capacity at full load. The highest working temperature requirement for operation is 122ºF (50ºC).
3. It is required to maintain a maximum altitude of 1093.61yd. (1000m) to keep the UPS within normal operation at full load. If used in high altitudes, please reduce the connected load. Altitude derating power with connected loads for UPS normal operation is listed as follows:

Altitude (Feet and Meters)		Derating Factor
3280.84	1000	1.0
4921.26	1500	0.95
6561.68	2000	0.91
8202.1	2500	0.86
9842.52	3000	0.82
11482.94	3500	0.78
13123.36	4000	0.74
14763.78	4500	0.7
16404.2	5000	0.67

NOTE: Based on density of dry air = 1.225 kg/m^3 at sea level, + 59˚F (15˚C).

4. UPS Placement

   Your UPS is equipped with a fan for cooling. Therefore, place the UPS in a well-ventilated area. It's required to maintain minimum clearance of 4" (100mm) in the front of the UPS, and 12" (300mm) at the back and two sides of the UPS, for heat dissipation and easy-maintenance.

UPS Input Connection

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

⚠ **ATTENTION**: Branchez l'onduleur dans une prise bipolaire, trois fils et mise à la terre uniquement. Évitez d'utiliser des rallonges.

- The power cable is attached to the UPS. The input plug is a NEMA 5-15P for 1.1K and 1.5K models, NEMA 5-20P for 2K model and NEMA 5-30P for 3K model.

NOTE: Check if the site wiring fault indicator lights up on the LCD panel. It will be illuminated when the UPS is plugged into an improperly wired utility power outlet. For more information, see "Troubleshooting" on page 26. Please also check if there is a circuit breaker against overcurrent and short circuit between the mains and AC input of the UPS for safe operation. The recommended protection values are as follows:

- 15A for the 1.1K and 1.5K models
- 20A for 2K model
- 30A for 3K model

UPS Output Connections

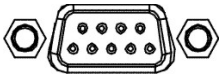
There two kinds of outputs: programmable outlets and general outlets. Please connect non-critical devices to the programmable outlets and critical devices to the general outlets. During a power failure, you may extend the backup time to critical devices by setting a shorter backup time for non-critical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

Communication Connection

Communication Ports:

USB Port

RS-232 Port



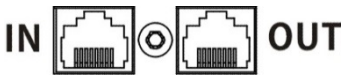
Intelligent Slot

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

The UPS is equipped with an intelligent slot for attaching either an SNMP card. When installing either card in the UPS, it will provide advanced communication and monitoring options.

Making Network Connections

Network, Phone, or Fax Surge Ports



Connect a single modem, phone, or fax line into the surge-protected “IN” outlet on the back panel of the UPS unit. Connect from the “OUT” outlet to your equipment with another modem, phone, or fax line cable.

Disabling and Enabling the EPO Function

The UPS is equipped with an EPO (emergency power off) function. By default, the UPS is delivered from the factory with a metal plate connecting Pin 1 and Pin2, which disables the EPO function. To activate the EPO function, loosen the two screws and remove metal plate from the EPO port.

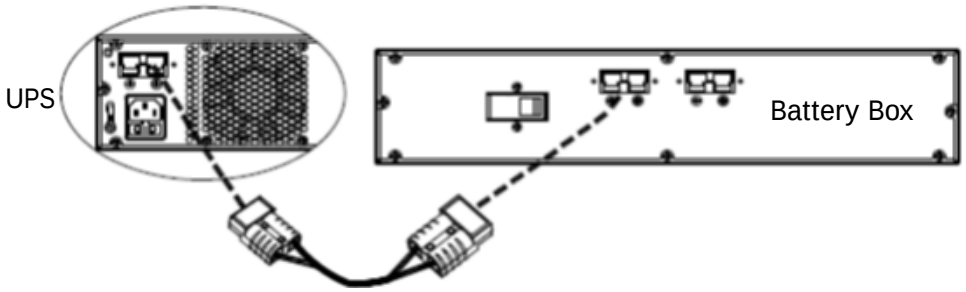
NOTE: The EPO function’s logic is set up via LCD settings. For more information, see Program 07 in “UPS Settings,” on page 22.

Optional Expandable Battery Connection

Connect one end of the external battery cable into your UPS and the other end into the battery box. Use the following illustration to connect your expandable battery.

CAUTION: External battery connections must only be performed by qualified service technicians.

ATTENTION: Les connexions de batterie externes doivent uniquement être effectuées par des techniciens de maintenance qualifiés.



NOTE: For more information, refer to the Expandable Battery Box User Manual (I-00890.pdf).

Turning on the UPS

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

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

Installing the UPS Monitoring Software

For optimal computer system protection, install the UPS monitoring software to fully configure your UPS shutdown procedure. Then, use the following steps to install the UPS monitoring software.

1. Download the UPS monitoring software from www.legrand.us/upsdownloads and then follow the on-screen instructions.
2. When your computer restarts, the monitoring software will appear as an orange plug icon located in the system tray, near the clock.

Battery Replacement

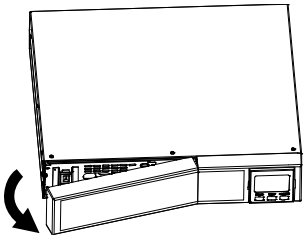
NOTE: This UPS is equipped with internal batteries and only service person can replace the batteries.

CAUTION: Consider all warnings, cautions, and notes before replacing batteries.

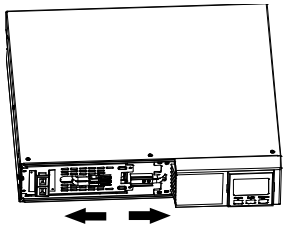
ATTENTION: Tenez compte de tous les avertissements, mises en garde et remarques avant de remplacer les piles.

NOTE: After disconnecting the battery, your connected equipment is not protected from power outages.

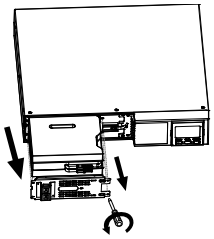
Step 1: Remove the front panel.



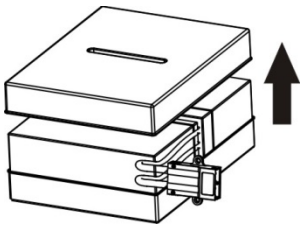
Step 2: Disconnect the battery wires.



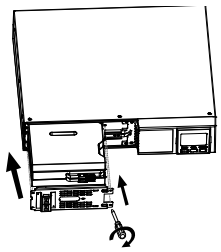
Step 3: Pull out the battery box by removing the two screws on the front panel.



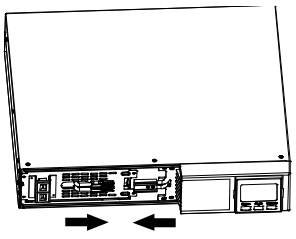
Step 4: Remove the top cover of the battery box and replace the batteries inside.



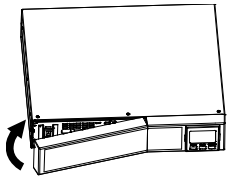
Step 5: After replacing the batteries, put the battery box back in the original location and replace the two screws.



Step 6: Re-connect the battery wires.



Step 7: Put the front panel back on the unit.

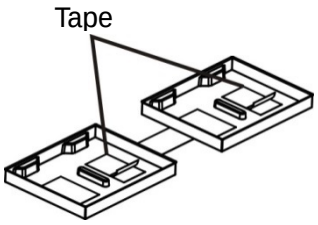


Replacement Battery Assembly

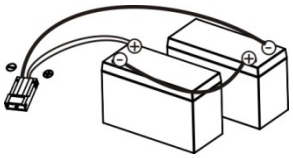
NOTE: Assemble the battery kit first before installing it inside of your UPS. Select from the following battery kit procedures for proper assembly.

2 Cell Battery Kit

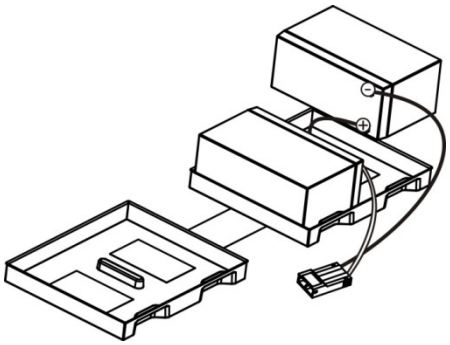
Step 1: Thoroughly remove old adhesive tape and install new tape in the following locations.



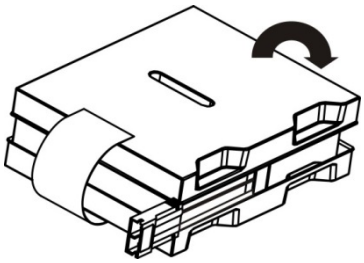
Step 2: Connect all battery terminals as shown.



Step 3: Place the connected battery packs onto adhesive strips on one side of the plastic shells.

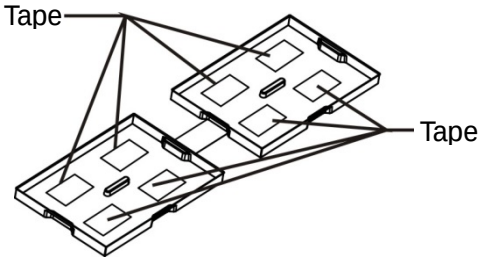


Step 4: Cover the other side of the plastic shell as shown.

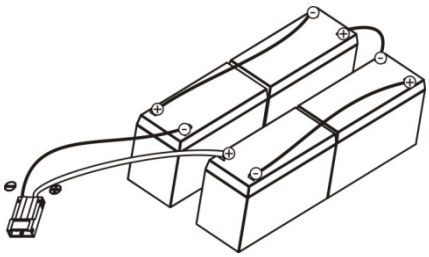


4 Cell Battery Kit

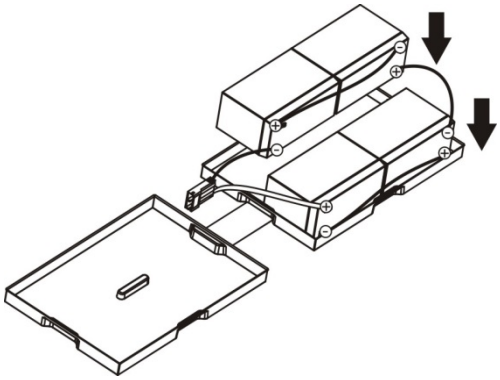
Step 1: Thoroughly remove old adhesive tape and install new tape in the following locations.



Step 2: Connect all battery terminals as shown.



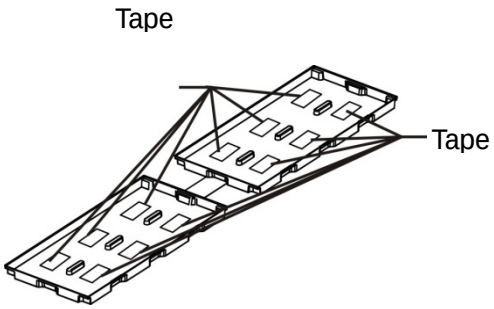
Step 3: Place the assembled battery packs on adhesive strips on one side of the plastic shells.



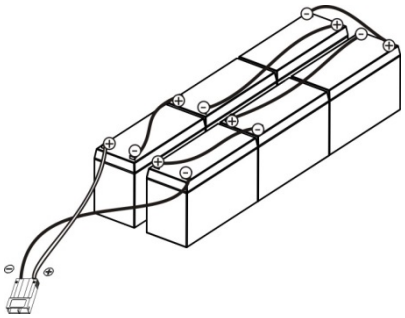
Step 4: Cover the other side of the plastic shell as shown.

6 Cell Battery Kit

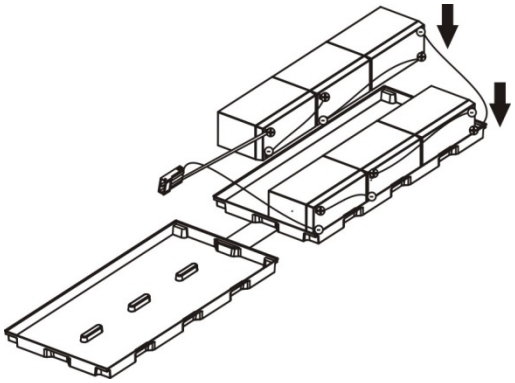
Step 1: Thoroughly remove old adhesive tape and install new tape in the following locations.



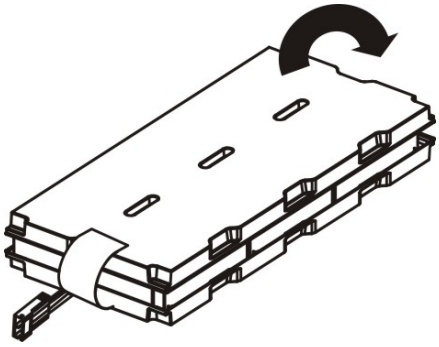
Step 2: Connect all battery terminals as shown.



Step 3: Place the assembled battery packs onto adhesive strips on one side of the plastic shells.

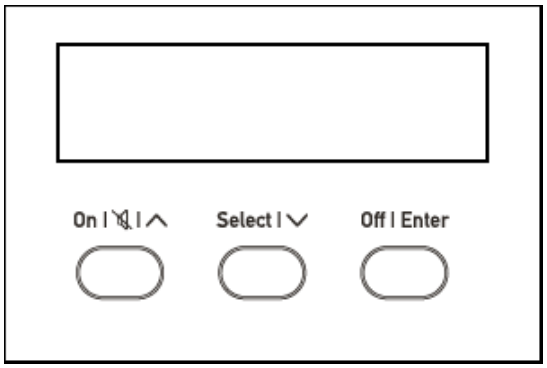


Step 4: Cover the other side of the plastic shell as shown.



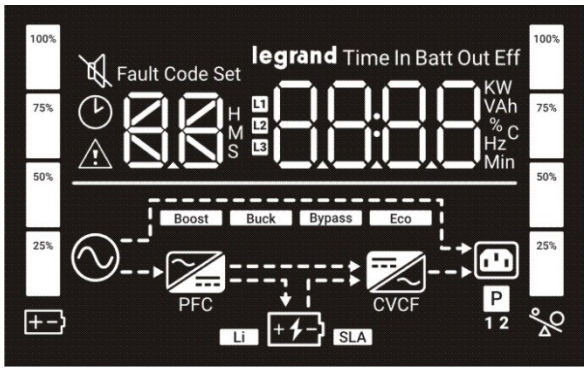
2. Operations

Button Operations



Button	Function
On I 🔇 I ^	• Turn on the UPS: Press and hold this button for at least 2 seconds to turn on the UPS. • Mute the alarm: While the UPS is turned on and in battery mode, press and hold this button for at least 3 seconds to disable or enable the alarm system. This function is overridden by warning or error alerts. • Up key: Press this button to display the previous selection when in the UPS settings mode. • Switch to UPS self-test mode: While in AC mode, press and hold the ON/Mute button for 3 seconds.
Off I Enter	• Turn off the UPS: Press and hold this button at least 2 seconds to turn off the UPS • Confirm selection key: Press this button to confirm your selection while in the UPS settings mode.
Select I v	• Switch LCD message: Press this button to change the LCD message from input voltage, input frequency, battery voltage, battery capacity, ambient temperature, output voltage, output frequency, load current, and load percent choices. • Settings mode: When the UPS is off, press and hold this button for 3 seconds to enter UPS settings mode. • Down key: Press this button to display the next selection when in the UPS settings mode.
On I 🔇 I ^ + Select I v	• Exit the setting mode or return to the previous menu: When working in setting mode, press both of these buttons simultaneously for 2 seconds to return to the main menu. When already in the main menu, press these 2 buttons at the same time to exit the setting mode.

LCD Panel



Backup Time Information

Display	Function
	Indicates the backup time in pie chart.
H M S	Indicates the backup time in numbers. H: hours, M: minute

Warning and Fault Information

Display	Function
	Indicates that the warning and fault occurs.
Fault Code	Indicates the warning and fault codes. For more information, see “Fault Reference Codes,” on page 25 and “Warning Indicators,” on page 25.

Setting Operation

Display	Function
Set	Indicates the selected UPS setting program. For more information, see “UPS Settings” on page 22.

Input, Battery, Temperature, Output, and Load Information

Display	Function
In Batt Out KW VAh % C Hz	Indicates the input voltage, input frequency, battery voltage, battery capacity, ambient temperature, output voltage, output frequency, load current, and load percentage. k: kilo, W: watt, V: voltage, A: ampere, %: percent, C°: centigrade degree, Hz: frequency

Load Information

Display	Function
100% 75% 50% 25%	Indicates the load level by 0-24%, 25-49%, 50-74%, and 75-100%.
	Indicates overload.

UPS Status

Display	Function
	Indicates the UPS is connected to the mains.
	Indicates that the unit is using the battery for power.
	Indicates the AC to DC circuit is working.
	Indicates the inverter circuit is working.
	Indicates the output is working.
	Indicates that programmable outlets are working.
	Indicates the ECO (efficiency corrective optimizer) mode is enabled.
	Indicates the UPS is working in boost mode.
	Indicates the UPS is working in buck mode.
	Indicates the battery charger is working.
	Indicates the UPS alarm is disabled.

Battery Information

Display	Function
	Indicates the Battery level by 0-24%, 25-49%, 50-74%, and 75-100%.
	Indicates low battery.

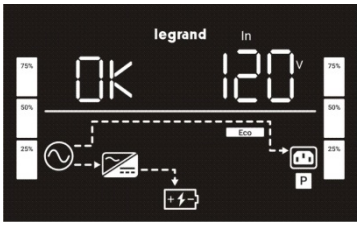
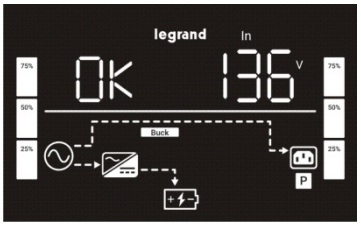
Audible Alarms

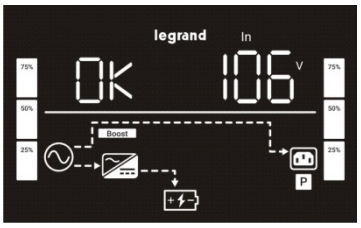
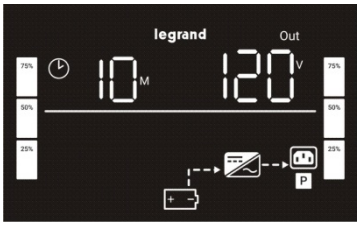
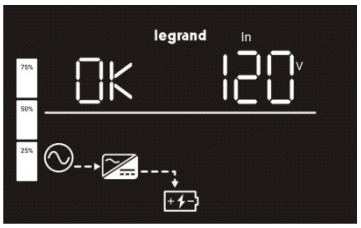
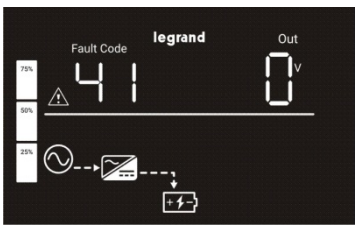
Reason	Sound
Battery Mode	Sounding every 10 seconds
Low Battery	Sounding every 2 seconds
Overload	Sounding every second
Fault	Continuously sounding

LCD Panel Index

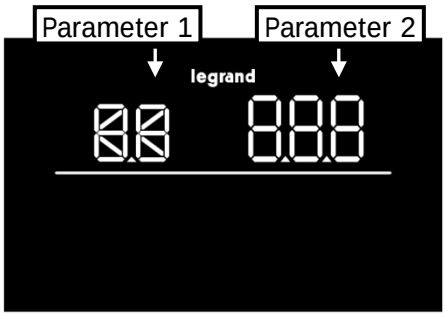
Abbreviation	Display Content	Meaning
ENA	ENA	Enable
DIS	dIS	Disable
ESC	ESC	Escape
ON	ON	ON
OK	OK	OK
EP	EP	EPO (Emergency Power Off)
AO	AO	Active Open
AC	AC	Active Close
ST 1/2/3	St1 / St2 / St3	Input waveform sensitivity 1/2/3
AUT / AON	AUt / AON	Automatic / Always on
TP	tP	Temperature
CH	CH	Charger
BF	bF	Battery Fault
BR	bR	Battery Replacement
EE	EE	EEPROM Error

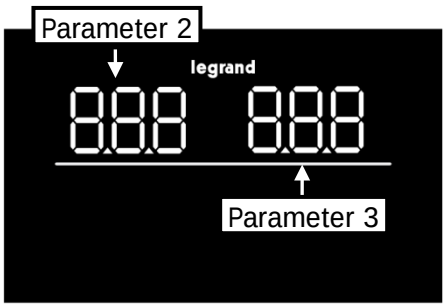
Operating Mode Descriptions

Operating Mode	Description	LCD Panel
ECO (Efficiency Corrective Optimizer) Mode	When the input voltage is within the voltage regulated range, the UPS powers the output directly from the mains. When the battery is fully charged in this mode, the fan stops working to save energy.	
Buck Mode (When AC is normal)	When the input voltage is higher than the voltage regulation range, but lower than the high loss point, the buck AVR (automatic voltage regulation) is activated.	

Operating Mode	Description	LCD Panel
Boost Mode (When AC is normal)	When the input voltage is lower than the voltage regulation range, but higher than the low loss point, the boost AVR (automatic voltage regulation) is activated.	
Battery Mode	When the input voltage is beyond the acceptable range or when a power failure takes place and the alarm is sounding every 10 seconds, the UPS switches to backup power from the battery.	
Standby Mode	In this mode, the UPS is powered off and no outputs are supplied power, however, the unit can still charge the batteries.	
Fault Mode	When a fault occurs, the ERROR icon and the fault code will be displayed.	

UPS Settings





There are three parameters used for setting up your UPS.

Parameter 1 is for selecting available programs for your UPS system. See the remainder of this topic for program details.

Parameter 2 is the setting options or values for each program.

If another level of attenuation is available from Parameter 2, the screen changes to show Parameter 2 and Parameter 3 as shown.

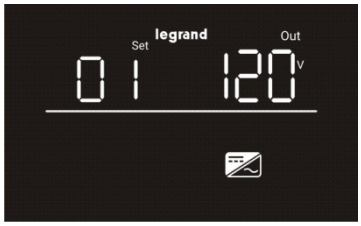
NOTE:

The following tables refer to these parameters as Interface (Parameter 1) and Setting (Parameter 2) or (Parameter 3), respectively.

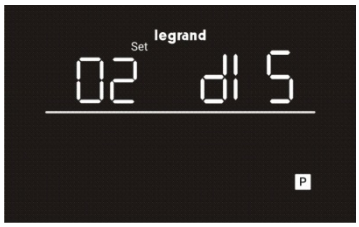
Enter Settings mode before performing the following configurations. To enter the UPS settings mode, your UPS needs to be OFF. With the unit off, press and hold the Select button for 5 seconds.

For more information, see “Button Operations” on page 18.

01: Output Voltage Setting

Interface	Setting
	For 110/115/120/127 Vac models, you may choose the following output voltage: **110**: The output voltage is 110Vac **115**: The output voltage is 115Vac **120**: The output voltage is 120Vac (Default) **127**: The output voltage is 127Vac

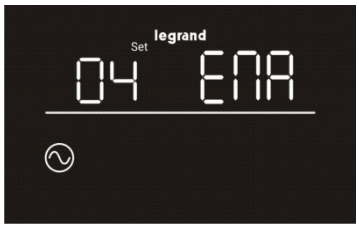
02: Programmable Outlets (Enable/Disable)

Interface	Setting
	Enable or disable programmable outlets. **ENA**: The programmable outlet is enabled **DIS**: The programmable outlet is disabled (Default)

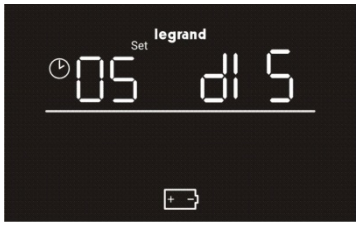
03: Programmable Outlets Setting

Interface	Setting
	Set up backup time limits for all programmable outlets. **0-999:** Set the backup time limits in minutes from 0-999 for programmable outlets which connect to non-critical devices in battery mode. (Default: 999)

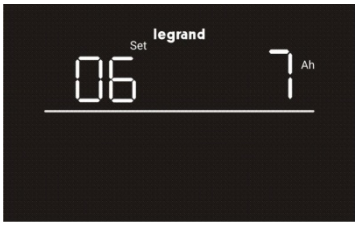
04: Site Fault Detection (Enable/Disable)

Interface	Setting
	Enable or disable site fault detection. **ENA**: Site fault detection enabled (Default) **DIS**: Site fault detection disabled

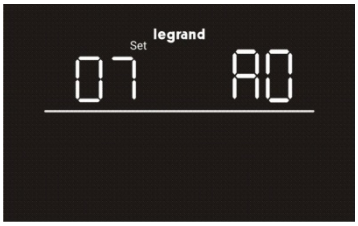
05: Autonomy Limitation Setting

Interface	Setting
	Sets up backup time for general outlets when in battery mode. **0-999**: setting the backup time in minutes from 0-999 for general outlets on battery mode. **DIS**: Disable the autonomy limitation and the backup time will depend on battery capacity. (Default) **NOTE**: • When enabled, if the set time duration is less than the programmable outlet setting, it overrides the latter. • When setting as “0”, the backup time will be only 10 seconds.

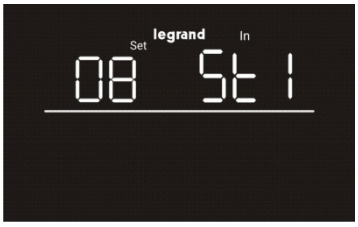
06: Battery Total Ah Setting

Interface	Setting
	Sets up the battery total Ah of the UPS. **7-81**: Set the total capacity of the battery from 7-81 in AH. **NOTE**: Be sure to set the correct total capacity of the battery, including the external battery bank, if used.

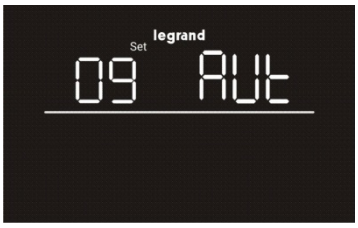
07: EPO Logic Setting

Interface	Setting
	Sets up the EPO (Emergency Power Off) function control logic. **AO:** Active Open (Default). When AO is selected as EPO logic, it will activate EPO function with Pin 1 and Pin 2 in open status. **AC:** Active Close. When AC is selected as EPO logic, it will activate EPO function with Pin 1 and Pin 2 in close status.

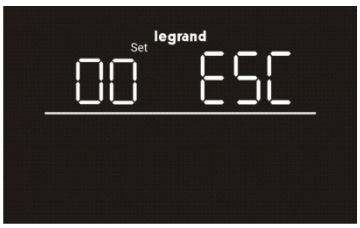
08: Input Waveform Sensitivity Setting

Interface	Setting
	Sets the input waveform sensitivity when connected to a generator. **St1**: Input voltage waveform detection is set to high sensitivity. (Default) **St2**: Input voltage waveform detection is set to middle sensitivity. **St3**: Input voltage waveform detection is set to low sensitivity. (St3 is recommended for generator input.)

09: LCD Display Backlight Setting

Interface	Setting
	Sets up the working mode for the LCD display backlight. **Aon**: LCD display backlight is on all the time. (Default) **Aut**: LCD display backlight turns off 60 seconds after the last button press.

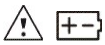
00: Exit Settings

Interface	Setting
	Exit the settings mode.

Fault Reference Codes

Fault Event	Fault Code	Icon	Fault Event	Fault Code	Icon
Bus start fail	01	None	Inverter output short	14	None
Bus over	02	None	Battery voltage too high	27	None
Bus under	03	None	Battery voltage too low	28	None
Inverter soft start fail	11	None	Over temperature	41	None
Inverter voltage high	12	None	Overload	43	
Inverter voltage Low	13	None	Charger failure	45	None

Warning Indicators

Warning	Icon (Flashing)	Alarm
Low Battery		Sounding every 2 seconds
Overload		Sounding every second
Battery Disconnected		Sounding every 2 seconds
Overcharge		Sounding every 2 seconds
Site Wiring Fault		Sounding every 2 seconds
EPO (Emergency Power Off) Enabled		Sounding every 2 seconds
Over Temperature		Sounding every 2 seconds
Charger Failure		Sounding every 2 seconds
Battery Fault		Sounding every 2 seconds (At this time, UPS is off to remind users of something wrong with battery)
EEPROM Error		Sounding every 2 seconds
Battery Replacement		Sounding every 2 seconds

4. Troubleshooting

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

Issue	Possible Cause	Solution
No indication showing on LED or alarm sounding that there's power coming into the unit.	The AC input power is not connected well.	Check if input power cable firmly connected to the mains.
	The AC input is connected to the UPS output.	Plug the AC input power cable into the AC input.
The icon  and the warning code EP are flashing on LCD screen and alarm is sounding every 2 seconds.	EPO (emergency power off) function is activated.	Set the circuit in close position to disable EPO function.
The icon  and  are flashing on LCD screen and alarm is sounding every 2 seconds.	Line and neutral conductors of UPS input are reversed.	Rotate mains power socket by 180° and then connect to UPS system.
The icon  and  are flashing on LCD screen and alarm is sounding every 2 seconds.	The external or internal battery is incorrectly connected.	Check if all batteries are connected well.
Fault code is shown as 27 and the alarm is continuously sounding.	Battery voltage is too high or the charger is fault.	Contact your dealer.
Fault code is shown as 28 and the alarm is continuously sounding.	Battery voltage is too low or the charger is faulty.	Contact your dealer.
The icon  and the icon  are flashing on LCD screen and alarm is sounding every second.	UPS is overloaded	Remove excess loads from UPS output.
Fault code is shown as 43 and the icon  is lighting on LCD screen and alarm is continuously sounding.	The UPS shut down automatically because of an overload at the UPS output.	Remove excess loads from UPS output and restart it.
Fault code is shown as 14 and alarm is continuously sounding.	The UPS shut down automatically because a short circuit occurred at the UPS output.	Check output wiring and if connected devices are in short circuit status.
Fault code is shown as 01, 02, 03, 11, 12, 13 and 41 on the LCD screen and alarm is continuously sounding.	A UPS internal fault has occurred.	Contact your dealer
The battery backup time is shorter than the nominal value.	The batteries are not fully charged.	Charge the batteries for at least 5 hours, and then check capacity. If the problem still persists, consult your dealer.
	The batteries are defective.	Contact your dealer to replace the battery.
Fault code is shown as 45 on LCD screen. At the same time, alarm is continuously sounding.	The charger does not have output and the battery voltage is less than 10V/PC.	Contact your dealer.

5. Maintenance and Storage

Maintenance

The UPS system contains no user-serviceable parts. If the battery service life (3~5 years at 77°F, 25°C ambient temperature) has been exceeded, the batteries must be replaced. Contact technical support.

 Be sure to bring discharged batteries to a recycling facility or ship it to your dealer in the replacement battery packing material.

Storage

Before storing your UPS for long periods of time, charge the system for 5 hours. Store the UPS covered and upright in a cool, dry location. While in storage, recharge the battery as follows:

Storage Temperature	Recharge Frequency	Charging Duration
-13°F to 104°F (-25°C to 40°C)	Every 3 months	1-2 hours
104°F to 113°F (40°C to 45°C)	Every 2 months	1-2 hours

6. Specifications

NOTE: Product specifications are subject to change without notice.

Input

MODEL/CAPACITY	1100VA 990W	1500VA 1350W	2000VA 1800W	3000VA 2700W
Acceptable Voltage Range	81-145 Vac			
Frequency Range	60/50 Hz (auto sensing)			

Output

MODEL/CAPACITY	1100VA 990W	1500VA 1350W	2000VA 1800W	3000VA 2700W
Voltage Regulation (Battery Mode)	110/115/120/127 Vac ±1.5% (before battery alarm)			
Frequency Range (Battery Mode)	50 Hz or 60 Hz ± 1 Hz			
Current Crest Ratio	3:1			
Harmonic Distortion	2% max @ 100% linear load, 5% max @ 100% non-linear load (before low battery alarm)			
Transfer Time	Typical 2-6 ms, 10ms max.			
Waveform (Battery Mode)	Pure Sine Wave			

Efficiency

MODEL/CAPACITY	1100VA 990W	1500VA 1350W	2000VA 1800W	3000VA 2700W
AC Mode	95%			
Buck & Boost Mode	93%			
Battery Mode	88%	90%		90%

Battery

MODEL/CAPACITY	1100VA 990W	1500VA 1350W	2000VA 1800W	3000VA 2700W
Battery Type & Number	12 V/9 Ahx2	12 V/7 Ahx4	12 V/9 Ahx4	12 V/9 Ahx6
Charging Voltage	27.4 VDC ± 1%	54.8 VDC ± 1%		82.1 VDC ± 1%
Recharge Time	4 hours recover to 90% capacity			
Charging Current	1.5A			

Protection

MODEL/CAPACITY	1100VA 990W	1500VA 1350W	2000VA 1800W	3000VA 2700W
Full Protection	Overload, short, discharge, and overcharge protection			

Alarm

MODEL/CAPACITY	1100VA 990W	1500VA 1350W	2000VA 1800W	3000VA 2700W
Battery Mode	Sounding every 10 seconds			
Low Battery	Sounding every 2 seconds			
Overload	Sounding every second			
Battery Replacement Alarm	Sounding every 2 seconds			
Fault	Continuously sounding			

Physical

MODEL/CAPACITY	1100VA 990W	1500VA 1350W	2000VA 1800W	3000VA 2700W
Dimension, D x W x H (inches)	16.1 x 17.2 x 3.4	20.0 x 17.2 x 3.4		24.8 x 17.2 x 3.4
Dimension, D x W x H (mm)	410 x 438 x 88	510 x 438 x 88		630 x 438 x 88
Net Weight (lbs)	29.5	42.9	47.3	64.5
Net Weight (kgs)	13.4	19.5	21.5	29.3

Environment

MODEL/CAPACITY	1100VA 990W	1500VA 1350W	2000VA 1800W	3000VA 2700W
Operating Humidity	0-90 % RH @ 32 – 104°F or 0 – 40°C (non-condensing)			
Acoustic Noise Level	Less than 45dBA @ 1 Meter			

Management

MODEL/CAPACITY	1100VA 990W	1500VA 1350W	2000VA 1800W	3000VA 2700W
Smart RS-232/USB	Supports Windows® 2000/2003/XP/Vista/2008, 7/8, Linux, Unix, and MAC			
Optional SNMP	Power management from SNMP manager and web browser			

Expandable Battery Box Specification

MODEL/CAPACITY	18Ah24V	18Ah48V	18Ah72V
Used with UPS Models	1.1K	1.5~2K	3K
Battery Type	12V 9Ah	12V 9Ah	12V 9Ah
Battery Numbers	4	8	12
Dimension, D x W x H (inches)	16.1 x 17.2 x 3.5	20.1 x 17.2 x 3.5	24.8 x 17.2 x 3.5
Dimension, D x W x H (mm)	410 x 438 x 88	510 x 438 x 88	630 x 438 x 88
Net Weight (lbs)	37.69	63.93	90.83
Net Weight (kgs)	17.1	29	41.2

NOTE: Battery pack should be used with corresponding UPS.