



**AMETEK**<sup>®</sup>  
ELECTRONIC SYSTEMS PROTECTION

## Online Battery Backup



**UPS-1000-OL - 1000 VA UPS**

**UPS-2000-OL - 2000 VA UPS**

**UPS-3000-OL - 3000 VA UPS**

## User Manual

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## 1. Introduction

Thank you for selecting this uninterruptible power supply (UPS). SurgeX offers the most reliable protection from the harmful effects of electrical line disturbances for your computing and communications equipment.

### 1.1 Technical Support

Tel: (800) 645-9721

Email: Order.desk@ametek.com

Please check with technical support before attempting to repair or return any UPS product. If a UPS needs repair or replacement, technical support will issue a return material authorization (RMA) number along with instructions on how to return the UPS.

### 1.2 FCC Compliance



**ATTENTION:** Changes or modifications to this unit not expressly approved by the party responsible or in FCC compliance could void the user's authority to operate the equipment.

The 700-3kVA models have been tested and comply with the limits for a Class A digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the UPS is operating in a commercial environment. The UPS generates, uses, and can radiate radio frequency energy. If installation and use is not in accordance with the instruction manual, it may cause harmful interference to radio communications.

### 1.3 Safety Compliance

UL/cUL listing to UL1778, 4th Edition

CE

CAN/CSA C22.2 No 170.3-05, 2nd Edition

### 1.4 About This Manual

This manual contains information regarding the installation, operation, and maintenance of the uninterruptible power supply (UPS).

The following symbols are used in this manual:



**ATTENTION:** Indicates instructions, which if not observed, may endanger reliability of your UPS or security of your data.



**CAUTION:** Indicates instructions, which if not observed, present risk of electric shock, may endanger your life, your health, reliability of your UPS or the security of your data.

## 1.5 Safety

### 1.5.1 Safety Intended Use

- This device serves as an uninterruptible power supply for connected loads. The device is in compliance with all relevant safety regulations concerning information technology equipment for use in an office environment.
- Depending on the type and rating of UPS device, certain configurations of battery extensions may be connected. These battery extensions may only be connected to the compatible basic UPS unit.

### 1.5.2 General Warnings



**CAUTION:** The manufacturer considers the safety of personnel to be of paramount importance. For this reason, it is essential that procedures relating to safety in this manual be carefully reviewed before commencing work, and properly adhered to later. The user or operator may intervene in the operation of the UPS provided that the instructions laid out in Section 3 “Installation” are strictly followed.

**CAUTION: Even when all switches and/or circuit breakers are open, dangerous voltages are present within this unit!** There are no user-serviceable parts inside. Only factory authorized technical personnel may carry out any operation that requires protection panels to be opened and/or removed.

Any repairs or modifications by the user may result in out-of-warranty repair charges, unsafe electrical conditions, or violation of electrical codes.

### 1.5.3 Safety Notices

#### **IMPORTANT SAFETY INSTRUCTIONS SAVE THESE INSTRUCTIONS**



**CAUTION: SAVE THESE INSTRUCTIONS** - This Manual Contains Important Instructions that should be followed during installation and maintenance of the UPS and batteries.

- Temperature Rating - Units are acceptable for use in a maximum ambient of 40 °C (104°F).
- For PLUGGABLE EQUIPMENT, the socket-outlet shall be installed near the equipment and shall be easily accessible.



**CAUTION:** To reduce the risk of fire, connect model **UPS-3000-OL** only to a circuit provided with 30 amperes maximum branch circuit overcurrent protection in accordance with the National Electric Code, ANSI/NFPA 70.



**CAUTION:** To reduce the risk of fire, connect models **UPS-1000-OL and UPS-2000-OL** only to a circuit provided with 20 amperes maximum branch circuit overcurrent protection in accordance with the National Electric Code, ANSI/NFPA 70.

- The units are heavy. Lifting the units into the rack requires a minimum of two people.
- When installing units in racks, do not allow racks to become “top heavy”. Install heaviest equipment (typically the external battery pack) near bottom of rack, and install this equipment before installing equipment higher in the rack.
- This equipment services power from more than one source. The output terminals and/or receptacles may have voltage present even when the unit is unplugged. UPS’s present a different safety issue than most electrical equipment because unplugging the UPS puts it into battery mode. Unplugging the UPS does not remove the electrical charge.
- The UPS must be connected to an earthed mains outlet-socket.
- When installing the equipment, ensure that the sum of the leakage current of the UPS and the connected devices does not exceed 3.5mA.
- Make sure that no objects (e.g. pins, necklaces, paper clips, etc.) get inside the device. In emergencies (e.g. damaged case, controls or power cables, penetration of liquids or foreign matter) switch off the device and contact technical support for assistance.
- Transport the unit only in suitable packaging (protected against jolts and shocks).
- If the equipment is moved from a cold environment to a warmer operation location, condensation may occur. Before you switch on the equipment it must be absolutely dry. An acclimatization period of at least two hours is required.
- Place all cords so that nobody can stand on or trip over them. When connecting the device to the power supply, follow the instructions in Section 3 “Installation”.
- Do not connect equipment that will overload the UPS or demand DC-current.
- When cleaning the unit, follow the instructions in Section 8 “Maintenance”.
- Emergency power off (EPO) is located on the rear of the unit (see Section 2.7 “Rear Panel View”). When this connection is open, the logic circuit will immediately shut down the UPS output.

#### 1.5.4 Battery Safety

### IMPORTANT SAFETY INSTRUCTIONS SAVE THESE INSTRUCTIONS



**CAUTION:** The batteries installed in the UPS and within the extended battery packs contain electrolyte. Under normal conditions the containers are dry. A damaged battery may leak electrolyte that can be dangerous when in contact with the skin and cause irritation to the eyes. Should this happen, wash the affected part with copious amounts of water and seek immediate medical attention.

- Voltage is always present on the battery terminals.
- Even when discharged, a battery has the capacity to supply a high short circuit current, which in addition to causing damage to the battery itself and to associated cables, may expose the operator to the risk of burns.
- Batteries should not be kept in storage for periods exceeding 6 months at 25°C without being recharged (having been charged to 100% at the beginning of any such period). If these conditions are not respected, the performance of the battery can no longer be guaranteed. It is advisable to recharge the batteries at least once every 4 months.
- Since new batteries often do not provide full capacity after an initial charge, it may be necessary to carry out a number of discharge/recharge cycles before optimum performance is achieved.
- In order to protect the environment, batteries must be disposed of in accordance with the regulations governing disposal/recycling of toxic and harmful waste.

#### 1.5.5 Repacking of Unit

Do not pack equipment until at least two (2) hours have elapsed since the last recharge.

Place the equipment in bags made of material sufficiently porous to allow it to breathe (e.g. 100µm polyethylene).

Do not remove air from the packaging.

When packing the unit for movement by common carrier, place in original or equivalent packaging container.

## 2. Overview

**NOTE:** The equipment has been thoroughly checked before shipment. Upon receipt, check the packaging and ensure that the contents are undamaged and that no items are discarded. Any damage must be reported to the shipper and any missing parts must be reported to the supplier immediately. Please keep the original package in a safe place for future use.

### 2.1 UPS Devices and Batteries

The following table provides an overview of the various versions of the device:

SurgeX UPS Model	Battery Pack Model
UPS-1000-OL	UPS-BPX-1000
UPS-2000-OL	UPS-BPX-2000
UPS-3000-OL	UPS-BPX-3000

### 2.2 Packing List

Unpack the package and check the package contents. The shipping package contains:

UPS Shipping Package	Optional Extended Battery Pack
<ol style="list-style-type: none"> <li>1. One UPS</li> <li>2. One User Manual</li> <li>3. Mounting Ears</li> <li>4. Two Sets of Tower Stands (Feet)</li> <li>5. Rail Kit</li> <li>6. USB Cable</li> </ol>	<ol style="list-style-type: none"> <li>1. One Battery Pack</li> <li>2. One Battery Cable</li> <li>3. Mounting Ears</li> <li>4. Two Sets of Tower Stands (Feet and Extensions)</li> <li>5. Rail Kit</li> </ol>

### 2.3 Storage

If the UPS is to be stored prior to use, it should be stored in a clean, dry environment and away from temperature extremes. It is recommended that the equipment be stored in a temperature controlled, moderate humidity environment. The table below provides the temperature and humidity storage limits:

Storage Data	
Temperature Limits	32°F to 104°F (0°C to +40°C)
Relative Humidity (Non-Condensing)	0% to 90%

**NOTE:** When storing equipment, every 8°C above 25°C reduces the shelf life of the battery by 50%. More frequent battery charging is required to maintain the batteries in storage at these greater temperatures.

## 2.4 Recharging the UPS During Storage

Before storing, charge the UPS for five hours. During storage, recharge the battery in accordance with the following table:

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

## 2.5 Environmental Conditions

The UPS must be installed on a level and even surface. Install in an area protected from extremes of temperature, water, humidity and the presence of conductive powder or dust. Do not stack units and do not place any objects on top of a unit.

The functional temperature range of the UPS is 32°F to 104°F (0°C to +40°C).

The ideal ambient temperature range is 60°F to 77°F (15°C to 25°C).

Expected battery runtimes and battery life is based on operational temperatures between 68°F and 77°F (20°C and 25°C). Operation of the equipment above 77°F (25°C) reduces the service life of the batteries dramatically.

## 2.6 Floor Loading

Taking into consideration the weight of the UPS, extended battery packs, and any other equipment that may be mounted in an associated rack. Confirm that the floor chosen location is capable of supporting the weight of the combined units.

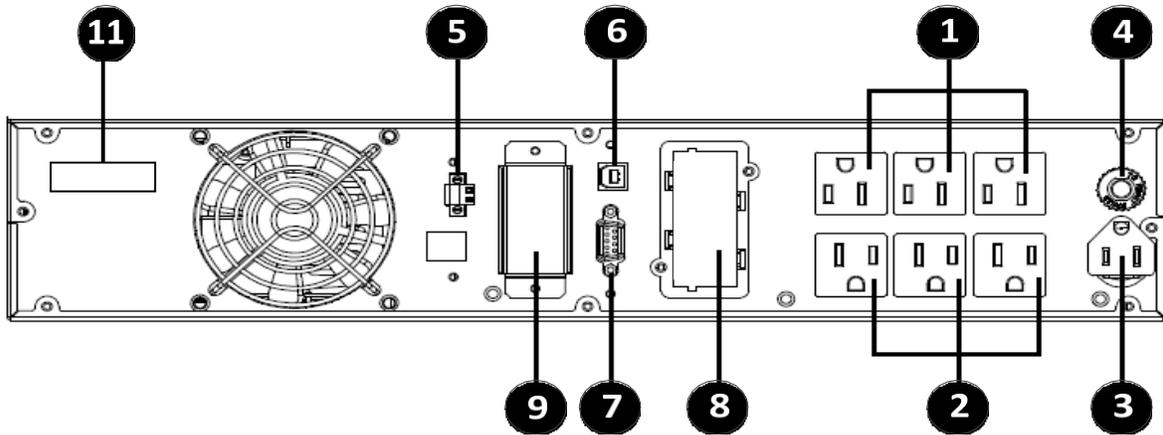
## 2.7 Ventilation

It is necessary to leave a minimum space of at least two inches (50 mm) in front and rear of the UPS to allow a flow of air.

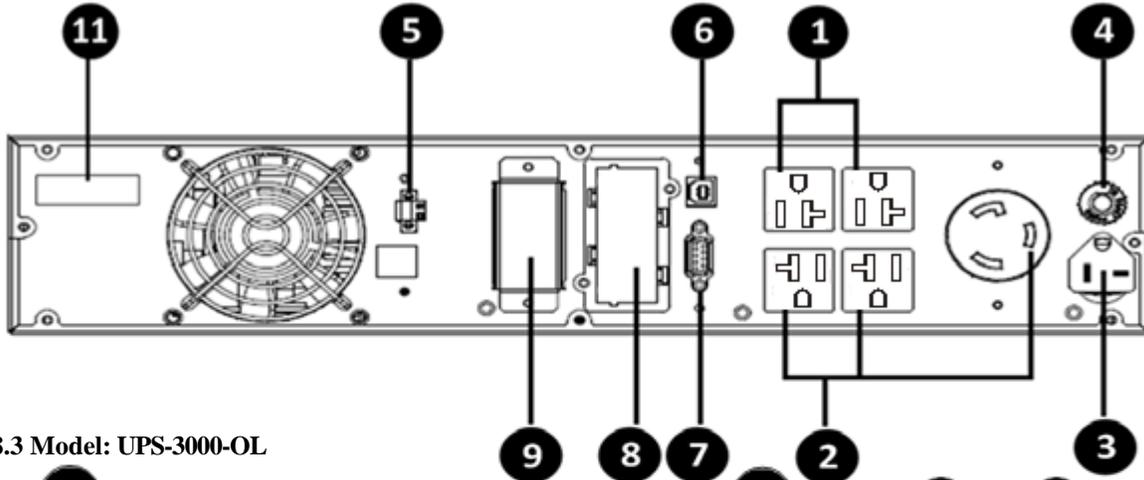
## 2.8 Rear Panel View

- |   |                               |
|---|-------------------------------|
| 1. Programmable Output Receptacles              | 7. RS232 Communication Port   |
| 2. Direct Output Receptacles                    | 8. SNMP Intelligent Slot      |
| 3. AC Input                                     | 9. External Battery Connector |
| 4. Input Circuit Breaker                        | 10. Output Circuit Breaker    |
| 5. Emergency Power Off Function Connector (EPO) | 11. Serial Number             |
| 6. USB Communication Port                       |                               |

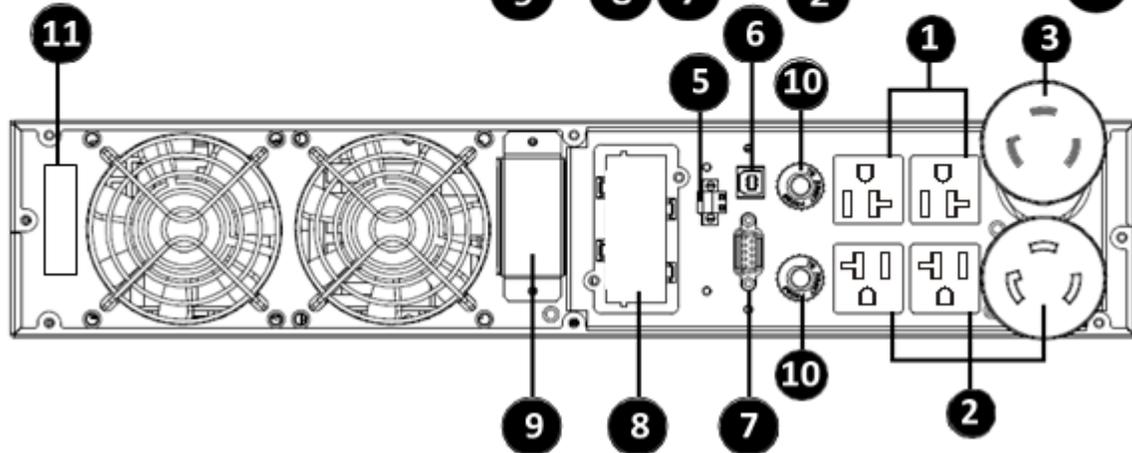
### 2.8.1 Models: UPS-1000-OL



### 2.8.2 Model: UPS-2000-OL

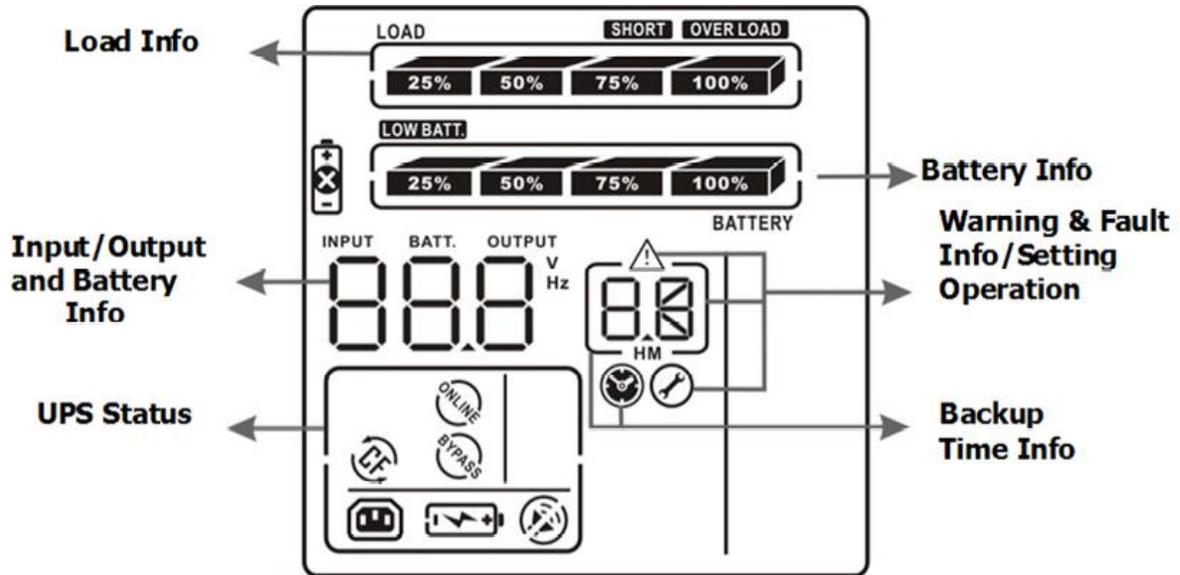


### 2.8.3 Model: UPS-3000-OL

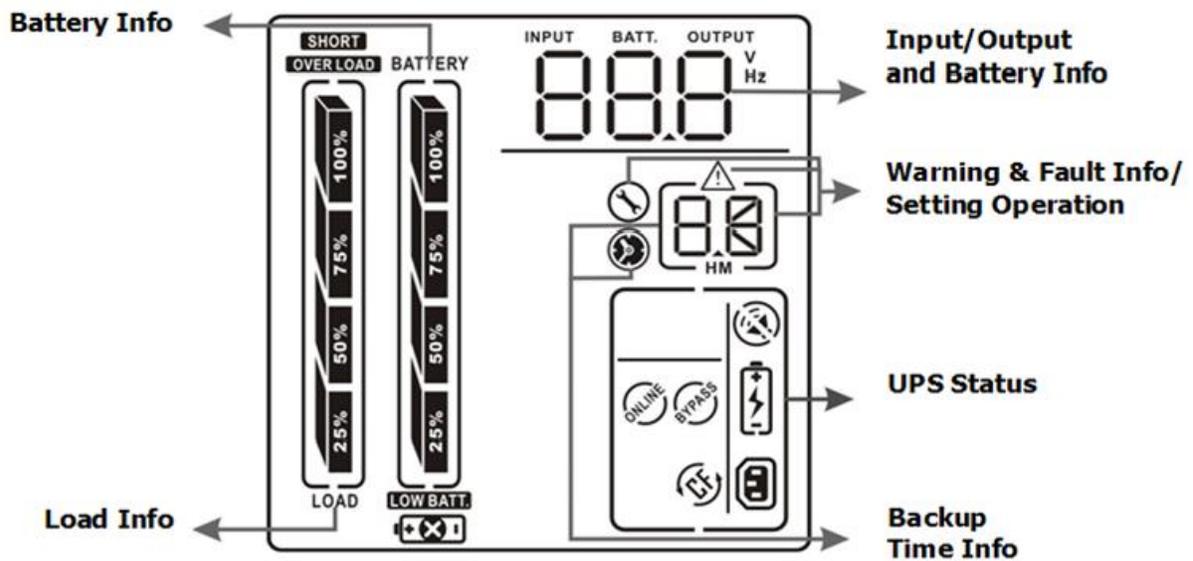


## 2.9 LCD Display

### 2.9.1 Rack Display



### 2.9.2 Tower Display



## 2.10 LCD: Display and Functional Description

Display	Function
<b>Backup time information</b>	
	Indicates the backup time.
	Indicates the backup time. H: hours, M: minutes
<b>Warning &amp; Fault information</b>	
	Indicates that a warning and/or fault has occurred.
	Indicates the warning and fault codes. The codes are listed in sections 9.4 and 9.5.
<b>Setting Operation</b>	
	Indicates the setting information.
<b>Input/Output &amp; Battery information</b>	
	Indicates the input/output voltage, input/output frequency, and battery voltage. V: voltage, Hz: frequency
<b>Load information</b>	
	Indicates load level by 0-25%, 26-50%, 51-75% and 76-100%.
	Indicates overload.
	Indicates that the load or the UPS output is short circuited.
<b>UPS Status</b>	
	Indicates that the programmable outlets are working.
	Indicates that the UPS is in on-line mode.
	Indicates that the UPS is in converter mode.
	Indicates that the UPS is in bypass mode.
	Indicates that the UPS alarm is disabled.
	Indicates that the battery charger is working.
<b>Battery information</b>	
	Indicates the battery level by 0-25%, 26-50%, 51-75%, and 76 - 100%.
	Indicates low battery.
	Indicates that there is something wrong with the battery.

### 3. Installation

The UPS and external battery pack are designed to be rack-mounted in four post frames or to be floor standing in a tower configuration.

#### 3.1 Tower Installation



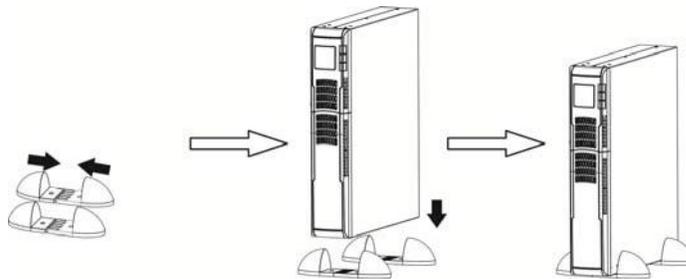
**ATTENTION:** Use all supplied mounting hardware on each UPS and extended battery pack.

A. To install standalone, refer to the figure directly below:

Assemble two feet as one tower stand.

Align the two stands.

Put the UPS module in the stands.

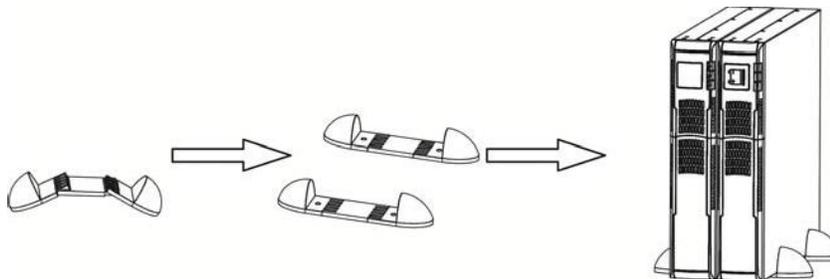


B. To install a UPS module and one extended battery pack, refer to the figure directly below :

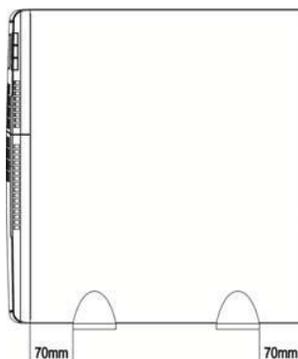
Assemble two feet each with an extension as one tower stand.

Align the two stands.

Put the UPS module and external battery pack in the stands.



**NOTE:** When installing the UPS or external battery pack with feet, please keep both feet a distance of 2.75in (70mm) from the edge of the unit. See figure below:



## 3.2 Rack Installation

The UPS and the external battery packs are designed to be rack-mounted in four post frames. The UPS and external battery pack use identical mounting hardware and procedures.

**NOTE:** The rack-mount UPS draws air from the front. If the rack has a door on the front, make sure that there is some clearance between the UPS vents and the rack door.

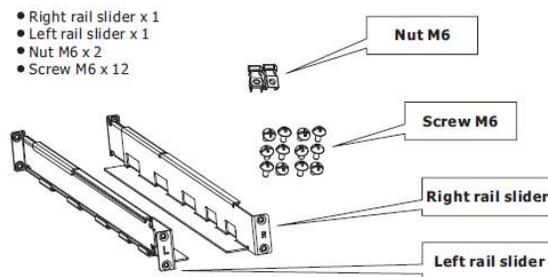
Because of the weight of these units, two people are recommended to lift and hold into position while all fasteners are secured. Please use the supplied fasteners to attach the supplied mounting brackets to the UPS or external battery pack.

If external batteries are included in your installation, please mount them first and as low as possible. Start with the lowest available position and work up. Your UPS should be installed last and end up on the top of all the battery packs for proper cable routing.



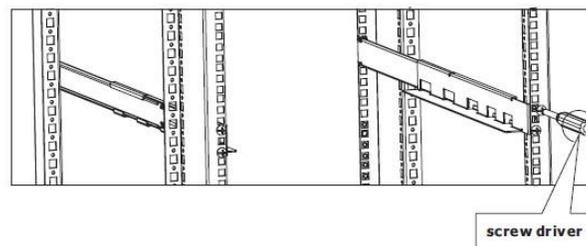
**ATTENTION:** Use all supplied mounting hardware on each UPS and external battery pack. NEVER depend on lower devices to support other devices.

Included in each rack-mount carton is a rail kit. The rail kit consists of the following components:

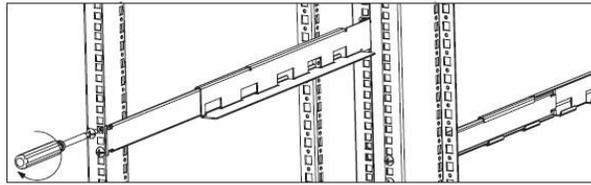


### 3.2.1 Assembly Steps

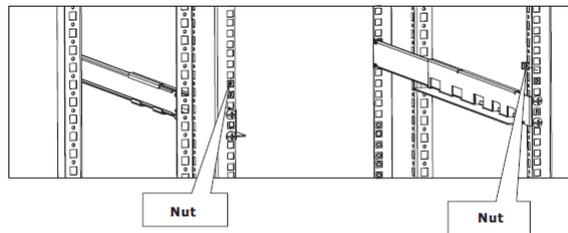
**Step 1:** Use four M6 screws to mount the right and left rail sliders to the two front posts of the four-post rack. Refer to the figure directly below:



**Step 2.** Use four M6 screws to mount the right and left rail sliders to the two back posts of the four-post rack.  
Refer to the figure directly below:

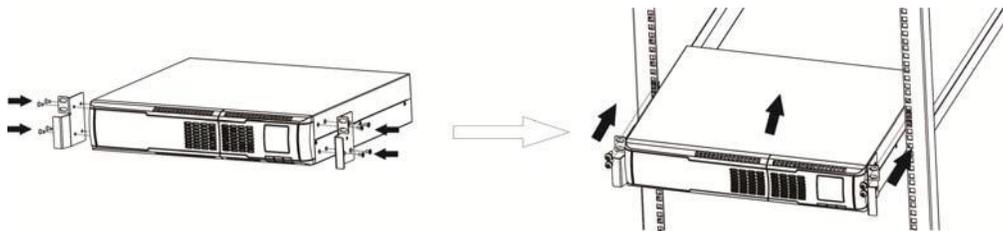


**Step 3.** Insert one M6 nut into the right and left front posts of the four-post rack for a 2U installation.  
Refer to figure directly below:



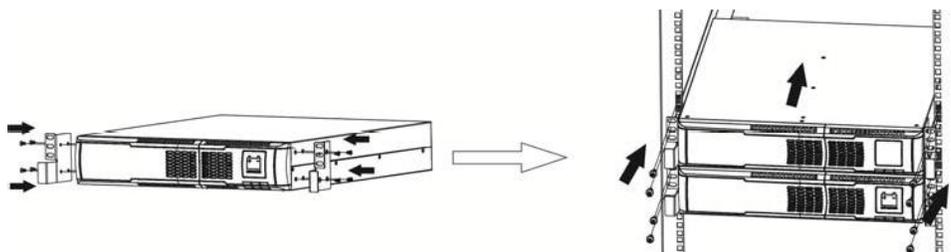
**Step 4.** Install UPS alone.

Add mounting ears to both sides of the unit and refer to figure directly below:



**Step 5.** Install UPS and external battery pack.

Refer to figure directly below:



### 3.3 Electrical Preparations



**CAUTION:** Before connecting any input wiring to the UPS, take precautions to ensure that all circuits being used are the proper voltage and current required for the UPS.



**CAUTION:** UPS output receptacles are energized when the UPS is connected to the mains and the bypass is enabled.



**CAUTION:** Electrical shock hazard. Even when the UPS is disconnected from the mains, hazardous voltages may still exist at the output receptacles of the UPS. The UPS receives power from more than one source - AC input and DC input from batteries. All input sources (AC and DC) must be disconnected before carrying out maintenance work inside the UPS.

#### 3.3.1 Battery Connections



**CAUTION:** Column one in the table below lists each of the UPS models and column two displays the corresponding model of the extended battery pack which must be used with the UPS. **DO NOT USE** any other extended battery pack for the corresponding UPS.

UPS Model	Battery Pack Model
UPS-1000-OL	UPS-BPX-1000
UPS-2000-OL	UPS-BPX-2000
UPS-3000-OL	UPS-BPX-3000

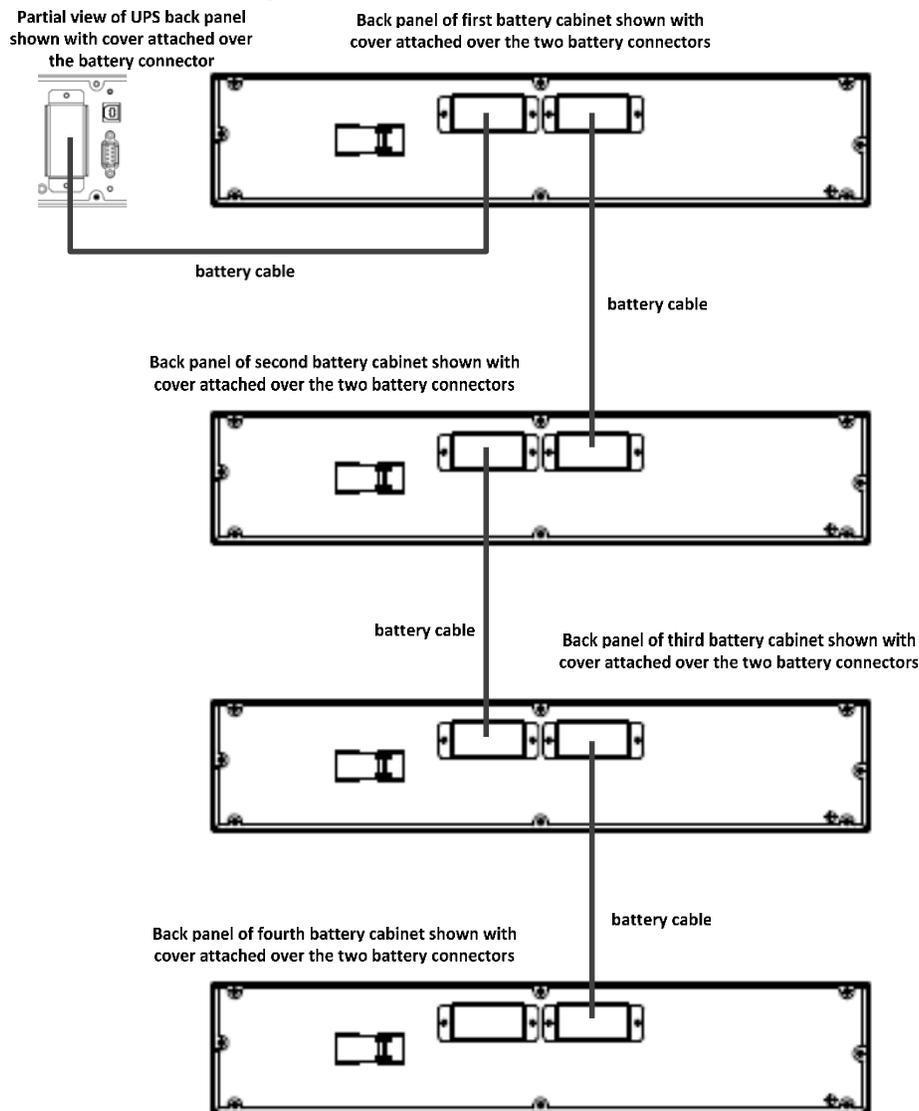


**CAUTION:** Before connecting a battery pack to the UPS, the circuit breaker of the battery pack must be switched to “OFF”. After electrical connection with the UPS is established, the breaker must be switched to “ON”.

**NOTE:** Each battery pack contains two battery connectors. The first battery pack is connected to the UPS using the cable supplied with the pack. Each additional extension battery pack is connected by attaching its cable to the previous pack. Refer to the figure below.

If additional battery packs (up to 4) are to be used, they should be connected prior to connecting the UPS to the input power. To connect external battery packs, follow the steps below:

1. Set the circuit breaker to the “OFF” position.
2. Remove the battery connector cover from the UPS.
3. Remove the battery connector cover from the extended battery pack.
4. If there are multiple extended battery packs, remove the additional battery connector covers. If not, proceed to Step 5.
5. Connect the supplied battery cable to the extended battery pack.
6. Connect the other end of the battery cable to the UPS.
7. For multiple extended battery packs, connect the supplied battery cables as shown in the figure below.
8. Set the circuit breaker to the “ON” position.



**Wiring of four battery cabinets to a single UPS**

## 4. Setting Up UPS Parameters

### 4.1 Factory Default Settings

The UPS is shipped with the following default factory settings. Refer to the table below and also to the table “LCD Display Abbreviation Index” in Section 9.3.

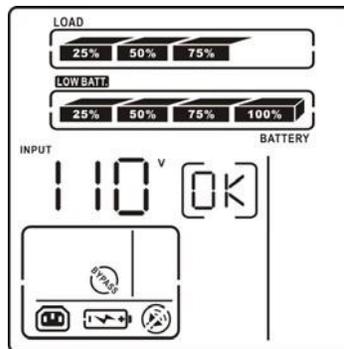
PARAMETER	FACTORY DEFAULT SETTING
	100 - 120 Volt Models
Output Voltage	120
Frequency Converter	DIS
Output Frequency	60
Bypass Mode	ENA
Programmable Outlets	DIS
Programmable Outlets Backup Time Setting	2
LCD Display Direction Setting	RAC
Acceptable Input Voltage Range Setting	85-135
Number of External Battery Packs	0

If the factory default settings are acceptable, proceed directly to Section 5 “UPS OPERATION”. To change any of the default settings proceed directly to Section 4.2 “Changing Default Settings”.

### 4.2 Changing Default Settings

Plug the input of the UPS into a two-pole, three-wire, grounded receptacle. Avoid using extension cords. If the mains voltage is within the acceptable range, the UPS will enter bypass mode. “BYPASS” will be displayed in the UPS status window on the LCD display.

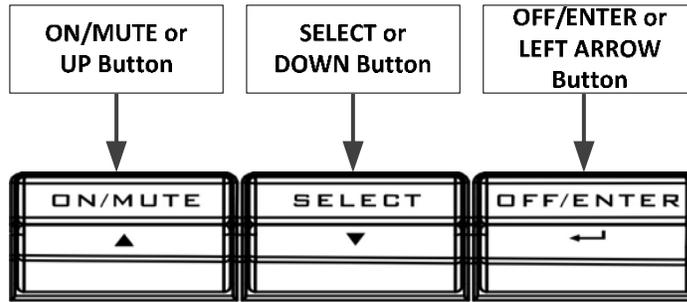
#### LCD Display in Bypass Mode



**Rack Display**

**NOTE:** The LCD will display the actual input voltage in the input/output and battery window.

1. Press and hold the “SELECT” button for at least five seconds to enter the UPS setting mode.



2. Press the “UP” or the “DOWN” button to scroll thru all of the parameters itemized as (01, 02, 03, 06, 07, 08, 09, 10 and 11).
3. When you see the item of the parameter that you want changed press the “LEFT ARROW” button. In the “Setting Operation” window on the LCD display the item will blink depending on the selected parameter.
4. Press the “UP” or the “DOWN” button to scroll thru all of the available settings for that parameter.
5. When you see the setting that you want for that parameter press the “LEFT ARROW” button to choose that setting.
6. To exit the UPS setting mode press the “UP” or “DOWN” button and scroll to the ESCAPE function (item 00).
7. Press the “LEFT ARROW” button.

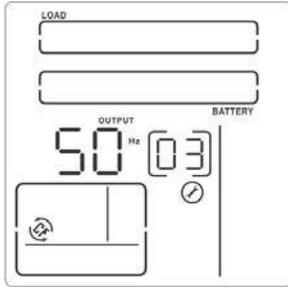
**4.2.1 Output Voltage Setting (Item 01)**

Interface	Setting
	<p>The following output voltage can be chosen for on-line mode operation:</p> <p>100 - 120 Volt Models</p> <p>100: Output Voltage is 100VAC</p> <p>110: Output Voltage is 110VAC</p> <p>115: Output Voltage is 115VAC</p> <p>120: Output Voltage is 120VAC</p>

**4.2.2 Frequency Converter Enable/Disable (Item 02)**

Interface	Setting
	<p>ENA: frequency converter mode is enabled. When the input frequency is at or between 40Hz to 70Hz the output frequency will be constant and equal to the value (50 Hz or 60Hz) chosen in section 4.2.3 and the output voltage will be constant and equal to the value chosen in section 4.2.1. The bypass will be disabled in this mode.</p> <p>DIS: converter mode is disabled. The output frequency is equal to the input frequency and the output voltage will be equal to the value chosen in section 4.2.1.</p>

### 4.2.3 Output Frequency Setting (Item 03)

Interface	Setting
	<p>You may set the initial frequency on battery mode:            50: output frequency is 50Hz            60: output frequency is 60Hz</p> <p>If converter mode is enabled, the following output frequency can be chosen:            50: output frequency is 50Hz            60: output frequency is 60Hz</p>

### 4.2.4 Bypass Mode Enable /Disable when the UPS is off (Item 06)

Interface	Setting
	<p>ENA: Bypass mode is enabled when the UPS is turned off. When the UPS is first plugged in, it will enter bypass mode, or if the UPS is in on-line mode and then turned off, it will enter bypass mode.</p> <p>DIS: Bypass mode is disabled when the UPS is turned off. When the UPS is first plugged in, it will enter standby mode with no output, or if the UPS is in on-line mode and then turned off, it will enter standby mode with no output.</p>

### 4.2.5 Programmable Outlets Enable /Disable (Item 07)

Interface	Setting
	<p>ENA: Programmable outlets are enabled. When the UPS goes to Battery mode the programmable outlets will supply power to the connected load for a duration equal to the timer setting in section 4.2.6 or until the battery becomes depleted, whichever occurs first.</p> <p>DIS: Programmable outlets are disabled. When the UPS goes to battery mode the programmable outlets will supply power to the connected load until the battery becomes depleted.</p>

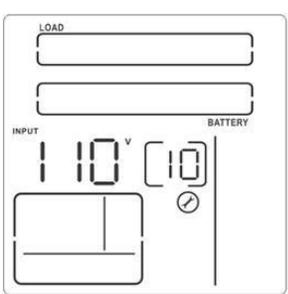
**4.2.6 Programmable Outlets Setting (Item 08)**

Interface	Setting
	<p>0-999: Backup time in minutes that programmable output receptacles will operate in battery mode.</p>

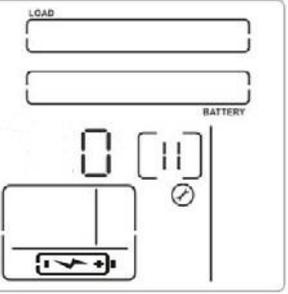
**4.2.7 LCD Display Direction Setting (Item 09)**

Interface	Setting
	<p>RAC: the LCD display is horizontal. TOE: the LCD display is vertical.</p>

**4.2.8 Acceptable Input Voltage Range Setting (Item 10)**

Interface	Setting				
	<p>Display alternates between low and high voltage of the range. The following acceptable input voltage range may be chosen:</p> <table border="1" data-bbox="537 1220 943 1430"> <tr> <td>100 - 120 Volt Models</td> </tr> <tr> <td>85/135: 85-135 V Input Range</td> </tr> <tr> <td>80/130: 80-130 V Input Range</td> </tr> <tr> <td>55/150: 55-150 V Input Range</td> </tr> </table>	100 - 120 Volt Models	85/135: 85-135 V Input Range	80/130: 80-130 V Input Range	55/150: 55-150 V Input Range
100 - 120 Volt Models					
85/135: 85-135 V Input Range					
80/130: 80-130 V Input Range					
55/150: 55-150 V Input Range					

**4.2.9 Number of External Battery Packs (Item 11)**

Interface	Setting
	<p>The following number of external battery packs can be chosen: 0: No External Battery Pack. 1: One External Battery Pack. 2: Two External Battery Packs. 3: Three External Battery Packs. 4: Four External Battery Packs.</p>

## 5. UPS Operation

### 5.1 UPS Input Connection

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

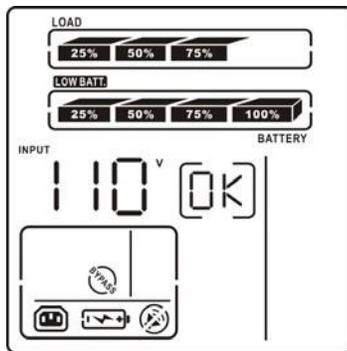


**ATTENTION:** This UPS is supplied with standard power cords and receptacles suitable for use in your area of operation. It may be installed and operated by non-technical personnel.

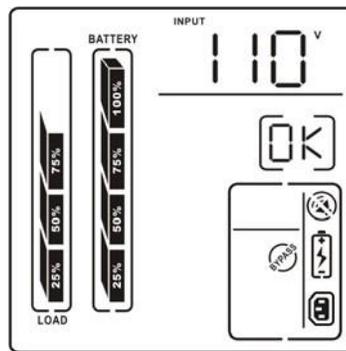
If the mains voltage is within the acceptable range, and the bypass is enabled the UPS will enter bypass mode. “BYPASS” will be displayed in the UPS status window on the LCD display. See Section 5.1.1 “LCD Display in Bypass Mode”.

If instead the bypass is disabled, the UPS will enter standby mode. In this mode the UPS will not supply output power to the load. See Section 5.1.2 “LCD Display in Standby Mode”.

#### 5.1.1 LCD Display in Bypass Mode

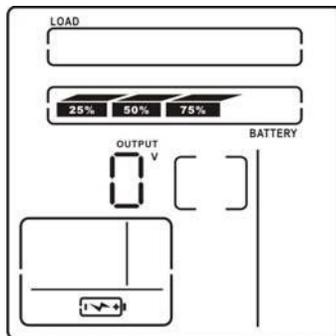


Rack Display

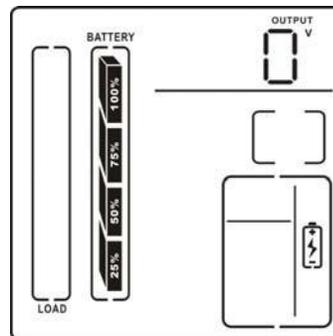


Tower Display

#### 5.1.2 LCD Display in Standby Mode



Rack Display

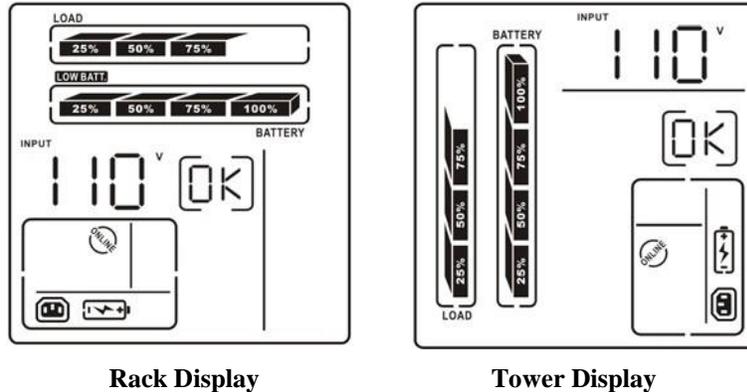


Tower Display

## 5.2 Turn on the UPS (Put the UPS in On-Line Mode)

When the input voltage is within the acceptable range press and hold the “ON/Mute” button for at least two seconds. A few seconds later the UPS will turn on and enter on-line mode. “ONLINE” will be displayed in the UPS status window on the LCD display. The UPS will provide pure and stable AC power to the output. The UPS will also charge the batteries.

### 5.2.1 LCD Display in On-Line Mode



**Rack Display**

**Tower Display**

## 5.3 Connect Devices to the UPS

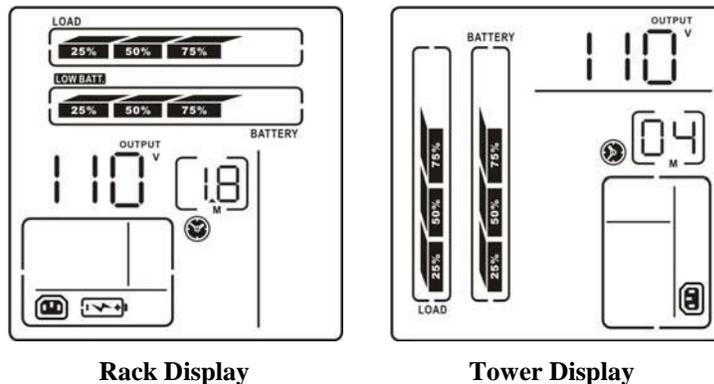
After the UPS has been turned on, devices (load) can now be connected to the UPS. For socket-type outputs, there are two kinds of outputs: programmable outlets and general purpose outlets. Connect non-critical devices to the programmable outlets and critical devices to the general outlets. During power failure, you may extend the backup time to critical devices by enabling the programmable outlets (see Sections 4.2.5 and 4.2.6).

- 1) With the UPS on-line switch on the load devices one by one. The LCD display panel will display the load level by 0-25%, 26-50%, 51-75% and 76-100%.
- 2) If the UPS is overloaded the audible alarm will beep twice every second and the LCD display panel will display “OVERLOAD”.
- 3) When the UPS is overloaded remove some load immediately.
- 4) When the UPS is in on-line mode, and the overload time exceeds the duration listed in the specification, the UPS will automatically transfer to bypass mode. At this time, if the bypass is enabled, the UPS will supply power to the load via bypass. If the bypass function is disabled, or the input voltage is not within the bypass acceptable range, the UPS will cutoff power to the load. After the overload is removed the UPS will return to on-line mode.
- 5) After repetitive overloads, the UPS will be locked in bypass mode. Remove excess loads from the UPS output. Then restart the UPS.

## 5.4 The UPS in Battery Mode

- 1) When the input voltage is not within the acceptable range or there is a mains failure the UPS will enter battery mode. The batteries will continue to provide an uninterrupted supply of energy to the load.
- 2) When the UPS is in battery mode the LCD display panel will display the battery level by 0-25%, 26-50%, 51-75% and 76-100% and the battery voltage. The audible alarm will beep according to the battery capacity. Normally, the audible alarm will beep once every four seconds. When the battery voltage drops to low battery voltage level, the audible alarm will beep once per second and the UPS will automatically shut down. At this time, users could switch off any non-critical loads to disable the shutdown alarm and prolong the backup time. If no more load can be removed at this time, then all loads should be shut down as soon as possible to protect the devices or to save data. Otherwise, there is a risk of data loss or load failure.
- 3) When the UPS is in battery mode, overloaded, and the overload time exceeds the duration listed in the specification, the UPS will enter a fault status. At this time, if the bypass is enabled, the UPS will supply power to the load via bypass. If the bypass function is disabled, or the input voltage is not within the bypass acceptable range, the UPS will cutoff power to the load.

### 5.4.1 LCD Display in Battery Mode



**Rack Display**

**Tower Display**

## 5.5 Turn Off the UPS

Press and hold the “OFF/ENTER” button for at least two seconds.

At this time, if the bypass is enabled and if the mains voltage is within the acceptable range, the UPS will enter bypass mode supplying power to the loads via bypass. The UPS will also charge the batteries. “BYPASS” will be displayed in the UPS status window on the LCD display. See Section 5.1.1 “LCD Display in Bypass Mode”.

If instead the bypass is disabled, the UPS will enter standby mode. In this mode the UPS will not supply power to the load. The UPS will also charge the batteries. See Section 5.1.2 “LCD Display in Standby Mode”.

## 6. INTERFACES

The UPS's are equipped with a serial interface COM 3, USB and an interface slot COM. These interfaces can be used for:

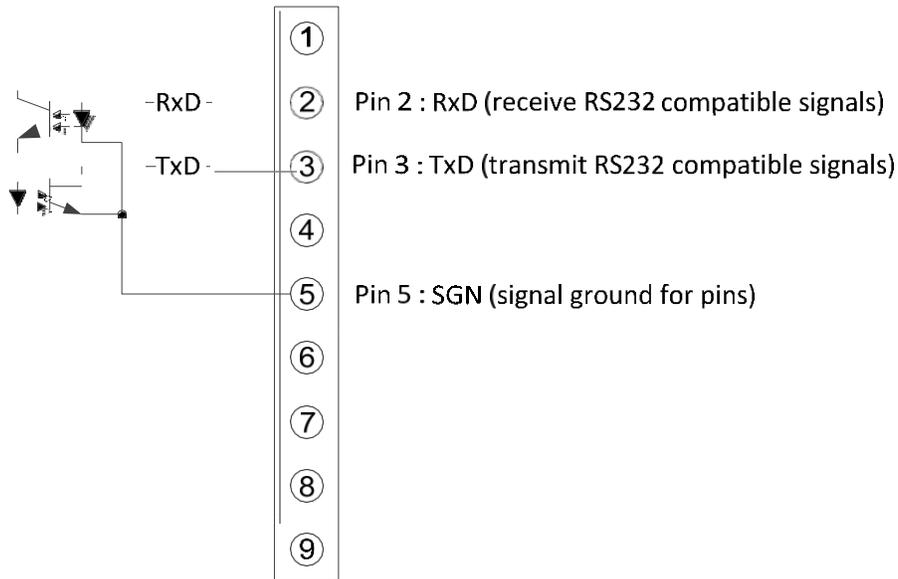
1. Direct communication between UPS and a workstation/server.
2. Integration of the UPS as client into a network with centralized monitoring via a Manage UPSNET SNMP adaptor in the slot COM.
3. Transfer of operational states to external alarm systems via voltage-free contacts: with interface card SIC in the slot COM.

The necessary communication software packages and interface cables are available as options.

### 6.1 Serial Interface COM 3

The 9-pole SUB-D connector (pin contacts) contains RS232 compatible signals.

**NOTE:** The interface COM RS232 is electrically isolated from primary UPS circuits.



### 6.2 Interface Slot COM

The interface slot COM can be fitted with various optional interface cards. Interface cards include:

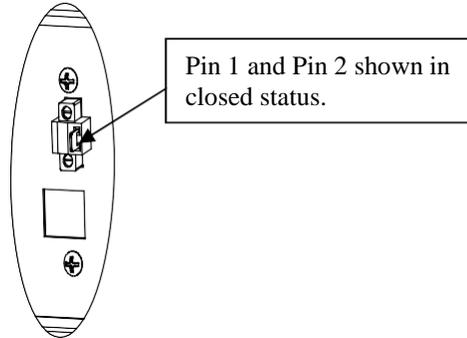
- SNMP adapter (Manage UPSNET) for Connecting the Device to a Network
- Isolated Contacts Card

Refer to the installation guide supplied with the optional interface card.

## 7. Emergency Power Off (EPO)

### Disable and Enable the EPO Function

Keep Pin 1 and Pin 2 closed (shorted) for UPS normal operation. To activate the EPO function, remove the wire between Pin 1 and Pin 2.



## 8. Maintenance

### 8.1 Cleaning

1. Do not use scouring powder or plastic dissolving solutions to clean the UPS.
2. Do not allow liquid to get inside the UPS.
3. Make sure that the air vents on the UPS are not obstructed. Remove dust from the air vents with a vacuum cleaner.
4. Clean the outside of the UPS housing by wiping with a dry or slightly damp cloth.

### 8.2 UPS Storage

1. For extended storage at ambient temperatures  $< 77^{\circ}\text{F}$  ( $25^{\circ}\text{C}$ ), the batteries should be charged for five hours once every four months. At higher storage temperatures it is advised that this period be reduced to two months.
2. To charge the batteries, connect the UPS to an appropriate power source and allow the batteries to charge for about five hours. After charging, note the date recharging was performed on the UPS packaging.

### 8.3 Battery Testing

1. The UPS does not require maintenance by the user; however, the battery should be checked periodically.

## 8.4 Replacing Batteries

The UPS does not require maintenance by the user, however, battery maintenance is recommended in accordance with IEEE Recommended Practice for Maintenance, Testing and Replacement of Valve-Regulated Lead-Acid (VRLA) Batteries for Stationary Applications (IEEE Std 1188-1996). When the batteries expire, trained battery service personnel must replace them. A certified disposal/recycling company should carry out disposal/recycling of the UPS and/or batteries. Exhausted rechargeable batteries are classified as “harmful toxic waste” and as such the law demands that they be disposed of/recycled by an authorized recycling center. The manufacturer’s service center is fully equipped to deal with such batteries, in accordance with the law and with the greatest respect for the environment. Contact Technical Support to arrange for maintenance and or battery replacement.

The typical battery life cycle is three to five years, at an ambient temperature of 77°F (25°C), but is also dependent on the frequency and duration of mains failure.

Once the battery has reached the end of its useful life, follow the procedure for battery replacement later in this section.

After the batteries have been replaced, a certified disposal/recycling company should carry out disposal/recycling of the used batteries.

Exhausted rechargeable batteries are classified as “harmful toxic waste” and as such the law demands that they be disposed of/recycled by an authorized recycling center.

The manufacturer’s service center is fully equipped to deal with such batteries, in accordance with the law and with the greatest respect for the environment. Contact technical support to arrange for maintenance and/or battery replacement. See page 1 for contact information.

0



### **CAUTION:**

- Servicing of batteries should be performed or supervised by personnel knowledgeable about batteries and the required precautions.
  
- The batteries installed in the UPS and in the external battery packs contain electrolyte. Under normal conditions the containers are dry. A damaged battery may leak electrolyte that can be dangerous in contact with skin and cause irritation to the eyes. Should this happen, wash the affected part with copious amounts of water and seek immediate medical attention.
  
- When replacing batteries, replace with the same type and number of batteries or battery packs.
  
- Do not dispose of batteries in a fire. The batteries may explode.
  
- Do not open or damage the battery cases. Released electrolyte is harmful to the skin and eyes and may be toxic.
  
- A battery can present a risk of electrical shock and high short-circuit current. The following precautions should be observed when working on batteries:
  - Remove watches, rings or other metal objects.
  
  - Use tools with insulated handles. Do not lay tools or metal parts on top of batteries.

This UPS is equipped with internal batteries. The user can replace the batteries without shutting down the UPS or connected loads (hot-swappable battery design). Replacement is a safe procedure - isolated from electrical hazards.

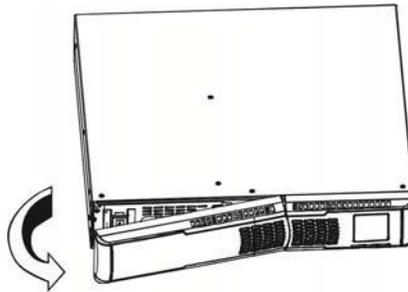


**ATTENTION:** Consider all warnings, cautions, and notes before replacing batteries.

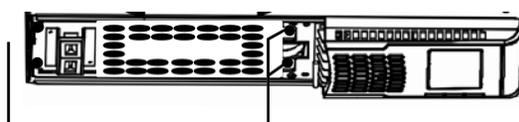
- The load attached to the UPS will not be protected against loss of input power during this procedure.
- Battery pack is heavy. Use two hands when removing pack from unit.
- The battery packs for the UPS-3000-OL are not user replaceable. Contact technical support to arrange for maintenance and battery replacement.

To replace internal batteries:

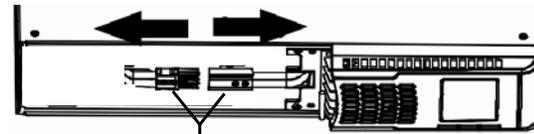
1. Place the UPS in bypass mode.
2. Place fingers on the left hand side of the front cover and pull forward until the left side of the front cover “snaps” out of position. Remove the left side of the front cover and place it in a safe place. Refer to the figure directly below:



3. Remove the four screws securing the battery retention plate to the UPS enclosure. Set the battery retention plate and retaining screws aside for later reuse. Cut the tie holding the two halves of the battery pack connector. Disconnect the battery connectors. Refer to the figures directly below:

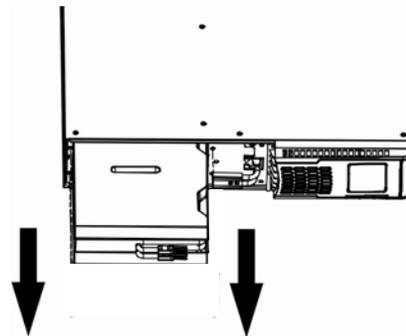


Battery Retention Plate Screws

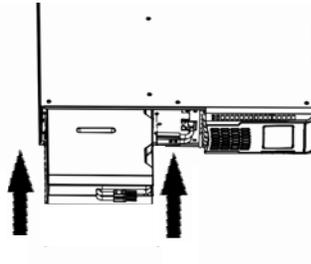


Battery pack connector

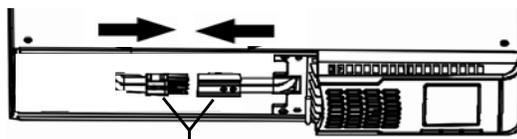
4. Pull out the battery pack. Refer to the figure directly below:



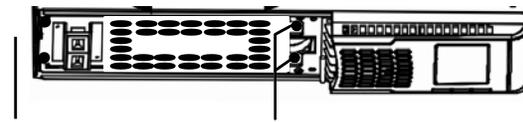
5. Slide in replacement battery pack. Refer to the figure directly below:



6. Reconnect the battery connectors. Use the tie wrap supplied with the replacement battery kit to secure the two halves of the battery connector together. Re-install the battery retention plate using the screws removed in step 3. Refer to the figures directly below :

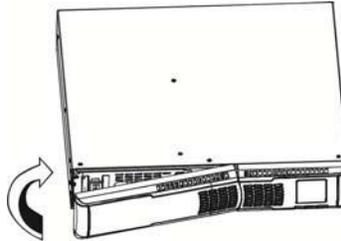


Battery pack connector



Battery Retention Plate Screws

7. Align left plastic front cover and snap into place. Refer to the figure directly below:



9. Carefully pack used battery pack and send to authorized recycle center.



Do not discard waste electrical or electronic equipment (WEEE) in the trash. For proper disposal, contact your local recycling/reuse or hazardous waste center.

## 9. Troubleshooting

### 9.1 Troubleshooting Table

If the UPS does not function properly, resolve the problem by referring to the table below.

Symptom	Possible cause	Remedy
No warning or fault indication and no alarm even though the mains is normal.	The AC input power cord may not be firmly connected to the input of the UPS or to the mains.	Confirm that the AC input power cord is firmly connected to the input of the UPS and also to the mains.
	The AC input is connected to the UPS output.	Plug the AC input power cord firmly to the AC input.
The icon  is flashing and the warning code  appears on the LCD display. The alarm beeps once every second.	EPO function has been activated.	Set pin 1 and pin 2 on the EPO connector in a closed (shorted) position to disable the EPO function.
The icon  is flashing and the warning code  appears on the LCD display. The alarm beeps once every second.	The Line and neutral conductors of the UPS input are reversed.	Rotate the mains power socket by 180° and then reconnect to the UPS system.
The icon  and  are flashing and the warning code  appears on the LCD display. The alarm beeps once every second.	The external or the internal battery is not connected properly.	Check if all batteries are properly connected.
Fault code is shown as 27 and the icon  appears on the LCD display. The alarm beeps continuously.	The battery voltage is too high or the charger may be at fault.	Contact your dealer.
Fault code is shown as 28 and the icon  appears on the LCD display. The alarm beeps continuously.	The battery voltage is too low or the charger may be at fault.	Contact your dealer.
The icon  and <b>OVERLOAD</b> are flashing and the warning code  appears on the LCD display. The alarm beeps twice every second.	UPS is overloaded.	Remove excess loads from UPS output.
	UPS is overloaded. Devices connected to the UPS are fed directly by the electrical network via the bypass.	Remove excess loads from UPS output.
	After repetitive overloads, the UPS is locked in the bypass mode. Connected devices are fed directly by the mains.	Remove excess loads from the UPS output. Then shut down the UPS and restart it.

Symptom	Possible cause	Remedy
Fault code is shown as 43 and the icon <b>OVERLOAD</b> appears on the LCD display. The alarm beeps continuously.	The UPS shut down automatically because of an overload on the output of the UPS.	Remove excess loads from UPS output and restart it.
Fault code is shown as 14 and the icon <b>SHORT</b> appears on the LCD display. The alarm beeps continuously.	The UPS shut down automatically because of a short circuit on the output of the UPS.	Check the output wiring and connected devices for a short circuit. Remove the short circuit.
Fault code is shown as 01, 02, 03, 04, 11, 12, 13 and 41 on the LCD display and the alarm beeps continuously.	A UPS internal fault has occurred. There are two possible results: 1. The load is still supplied, but directly from AC power via bypass. 2. The load is no longer supplied by power.	Contact your dealer.
Battery backup time is shorter than the specified value.	Batteries are not fully charged.	Charge the batteries for at least five hours and then check capacity. If the problem still persists, consult your dealer.
	Batteries are defective.	Contact your dealer to replace the battery.
Fault code is shown as 05 on the LCD display. At the same time, the alarm is beeping continuously and the output of the UPS is cut off.	A UPS internal fault has occurred and the BUS is short circuited.	Consult your dealer. If power is supplied again to the UPS before the UPS is repaired then the DC/DC mosfet will be damaged.

## 9.2 Audible Alarm

<b>Battery Mode</b>	Alarms Beeps Once Every Four Seconds
<b>Low Battery</b>	Alarm Beeps Once Every Second
<b>Overload</b>	Alarm Beeps Twice Every Second
<b>Fault</b>	Alarm Beeps Continuously

## 9.3 LCD Display Abbreviation Index

Abbreviation	Display Content	Meaning
<b>ENA</b>	ENA	Enable
<b>DIS</b>	DIS	Disable
<b>ESC</b>	ESC	Escape
<b>RAC</b>	RAC	Rack Display
<b>TOE</b>	TOE	Tower Display
<b>B.L</b>	B.L	Low Battery
<b>O.L</b>	O.L	Overload
<b>N.C</b>	N.C	Battery is Not Connected
<b>O.C</b>	O.C	Overcharge
<b>SF</b>	SF	Site Fault
<b>E.P</b>	E.P	EPO
<b>T.P</b>	T.P	Over Temperature
<b>C.H</b>	C.H	Charger Failure
<b>B.B</b>	B.B	Battery Fault
<b>F.U</b>	F.U	Frequency is Unstable in Bypass Mode
<b>B.V</b>	B.V	Input Voltage is Out of Bypass Range
<b>E.E</b>	E.E	EEPROM Error

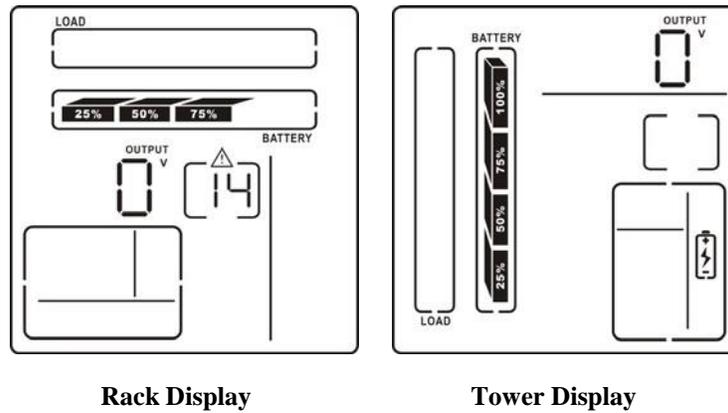
## 9.4 Warning Indicators

Warning	Icon (flashing)	Code	Alarm
Low Battery		b.L	Beeps Once Every Second
Overload		o.L	Beeps Twice Every Second
Battery is Not Connected		n.C	Beeps Once Every Second
Overcharge		o.C	Beeps Once Every Second
Site Wiring Fault		S.F	Beeps Once Every Second
EPO Enable		E.P	Beeps Once Every Second
Over Temperature		E.P	Beeps Once Every Second
Charger Failure		C.H	Beeps Once Every Second
Battery Fault		b.b	Beeps Once Every Second
Bypass Out Range		b.U	Beeps Once Every Second
Bypass Frequency Unstable		F.U	Beeps Once Every Second
EEPROM Error		E.E	Beeps Once Every Second

## 9.5 UPS Fault

When there is a fault with the UPS the fault icon flashes on the LCD display. A fault code will also be displayed directly below the flashing fault icon. When a fault occurs no output power is supplied from the UPS.

### 9.5.1 LCD Display in Fault Mode



### 9.5.2 Fault Reference Code

Fault Event	Fault Code	Icon	Fault event	Fault Code	Icon
Bus Start Fail	01	x	Low Inverter Voltage	13	x
Bus Over	02	x	Inverter Output Short	14	<b>SHORT</b>
Bus Under	03	x	Battery Voltage Too High	27	x
Bus Unbalance	04	x	Battery Voltage Too Low	28	
Bus Short Circuited	05	x	Over Temperature	41	x
Inverter Soft Start Fail	11	x	Overload	43	<b>OVER LOAD</b>
High Inverter Voltage	12	x			

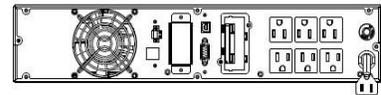
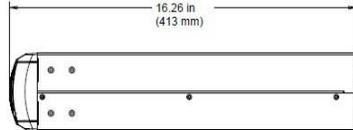
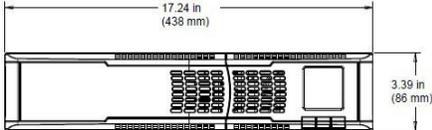
## 10 APPENDIX A: SPECIFICATIONS

### 10.1 SURGEX UPS (100 - 120 Volt UPS's) Specifications

# SPECIFICATIONS

## SurgeX UPS

### 1000 VA Low Voltage



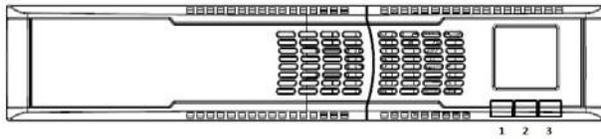
Model	UPS-1000-OL
Type	SurgeX
Power Rating	1000 VA / 900 W
Topology	On-Line Double Conversion
Heat Dissipation (BTU/Hour)	520 at 100% Load
Input Voltage (Nominal) Range	100-120 VAC 90-150 VAC
Input Frequency	50/60 Hz $\pm$ 4 (Auto Sense on Start-Up)
Input Power Factor	>0.95
Input Current THD	<9.0%
Efficiency	>84.0%
Output Voltage	120 VAC (Default) 100/110/115 VAC (Selectable)
Output Current	8.3 A (Default) 8.0/8.2/8.3 A (Selectable)
Voltage Regulation	$\pm$ 1.0%
Overload Online Mode	100-105%: Continuous; Warning Only 105-130%: 2 Minutes 130-200%: 10 Seconds >200%: 250 Milliseconds
Overload Battery Mode	100-105%: Continuous; Warning Only 105-130%: 10 Seconds >130%: 250 Milliseconds
Overload Bypass Mode	100-110%: Continuous; Warning Only 110-120%: 30 Minutes 120-130%: 10 Minutes >130%: 1 Minute
Battery Voltage (Float / Nominal)	27.4/24.0 VDC
Charger Current	1.0 A
Backup Time (Full Load)	>3.5 Minutes
Communications Interface	USB / RS-232
Shipping Weight	37.0 lbs. / 16.8 kg.

**SPECIFICATIONS CONT.**

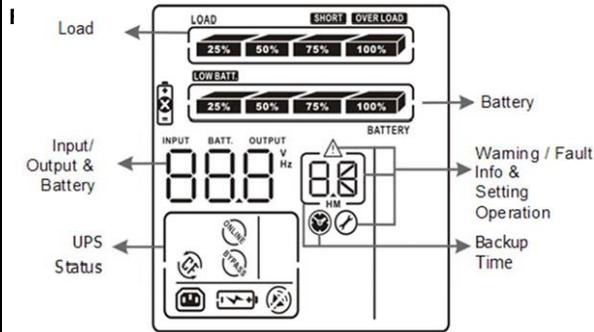
**SURGEX UPS (100 - 120 Volt UPS's) specifications cont.**

# SPECIFICATIONS

**Front Panel Controls**



1. ON / MUTE - UP KEY (Previous Selection)
2. SELECT - DOWN KEY (Next Selection)
3. OFF / ENTER - CONFIRM KEY



**Rear Panel Information and Controls**

- (1) NEMA 5-15P Input Cord, 6'
- (3) NEMA 5-15R
- (3) NEMA 5-15R Programmable
- USB & RS-232 Communication
- SNMP Adapter (Optional)
- Internal Relay Contact Card (Optional)
- Circuit Breaker

**Internal Batteries**

- User Hot-Swappable (See Instruction Manual)
- Type - 12 V, 8.5 AH
- Quantity - 2 Batteries
- Recharge time - 12 Hours to 100%

**Environmental**

- Temperature: 0 to 40°C (32 to 104°F) Operating  
-20 to 50°C (-40 to 122°F) Shipment, Storage
- Humidity: <90% Non-Condensing (Operating, Shipment, Storage)
- Altitude: <1000m Operating, No De-Rating  
>1000m De-Rate Output 1% per 100m

**Safety Agency and EMC Compliance**

All units are listed by UL, and marked with the UL/cUL marking.

**Product Listings**

- UL1778
- cUL to CSA22.2 No.107.1

**Product Compliances**

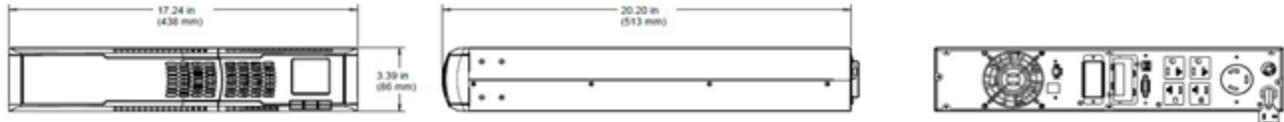
- FCC Part 15J Class A
- IEC61000-4-2, Electrostatic Discharge
- IEC61000-4-3, Radiated Electromagnetic Field Immunity
- IEC61000-4-4, Electrical Fast Transient/Burst Immunity
- IEC61000-4-5, Surge Immunity
- IEC61000-4-6, CS
- IEC61000-4-8, Power Frequency Magnetic Field
- IEC61000-2-2, Low Frequency Signal
- RoHS

SPECIFICATIONS CONT.

SURGEX UPS (100 - 120 Volt UPS's) specifications cont.

# SPECIFICATIONS

## SurgeX UPS 2000 VA Low Voltage



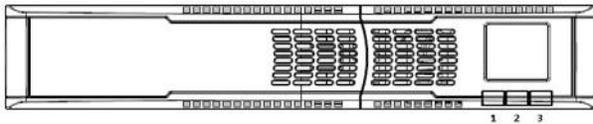
Model	UPS-2000-OL
Type	SurgeX
Power Rating	2000 VA / 1800 W
Topology	On-Line Double Conversion
Heat Dissipation (BTU/Hour)	1171 at 100% Load
Input Voltage (Nominal) Range	100-120 VAC 105-150 VAC
Input Frequency	50/60 Hz $\pm$ 4 (Auto Sense on Start-Up)
Input Power Factor	>0.95
Input Current THD	<9.0%
Efficiency	>84.0%
Output Voltage	120 VAC (Default) 100/110/115 VAC (Selectable)
Output Current	16.7 A (Default) 16.0/16.4/16.5 A (Selectable)
Voltage Regulation	$\pm$ 1.0%
Overload Online Mode	100-105%: Continuous; Warning Only 105-130%: 2 Minutes 130-200%: 10 Seconds >200%: 250 Milliseconds
Overload Battery Mode	100-105%: Continuous; Warning Only 105-130%: 10 Seconds >130%: 250 Milliseconds
Overload Bypass Mode	100-110%: Continuous; Warning Only 110-120%: 30 Minutes 120-130%: 10 Minutes >130%: 1 Minute
Battery Voltage (Float / Nominal)	54.7/48.0 VDC
Charger Current	1.0 A
Backup Time (Full Load)	>3.6 Minutes
Communications Interface	USB / RS-232
Shipping Weight	58.0 lbs. / 26.4 kg.

**SPECIFICATIONS CONT.**

**SURGEX UPS (100 - 120 Volt UPS's) specifications cont.**

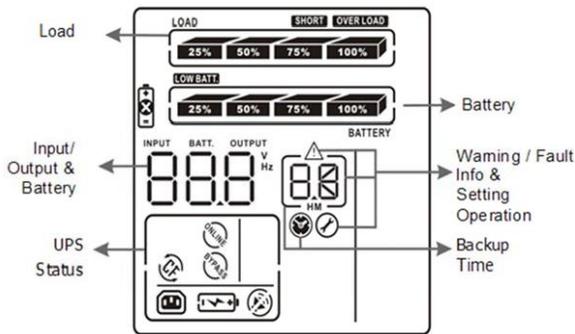
**SPECIFICATIONS**

**Front Panel Controls**



1. ON / MUTE - UP KEY (Previous Selection)
2. SELECT - DOWN KEY (Next Selection)
3. OFF / ENTER - CONFIRM KEY

**Front Panel Display**



**Rear Panel Information and Controls**

- (1) NEMA L5-20P Input Cord, 6'
- (2) NEMA 5-20R
- (1) NEMA L5-20R
- (2) NEMA 5-20R Programmable
- USB & RS-232 Communication
- SNMP Adapter (Optional)
- Internal Relay Contact Card (Optional)
- Circuit Breaker

**Internal Batteries**

- User Hot-Swappable (See Instruction Manual)
- Type - 12 V, 8.5 AH
- Quantity - 4 Batteries
- Recharge time - 12 Hours to 100%

**Environmental**

- Temperature: 0 to 40°C (32 to 104°F) Operating  
-20 to 50°C (-40 to 122°F) Shipment, Storage
- Humidity: <90% Non-Condensing (Operating, Shipment, Storage)
- Altitude: <1000m Operating, No De-Rating  
>1000m De-Rate Output 1% per 100m

**Safety Agency and EMC Compliance**

All units are listed by UL, and marked with the UL/cUL marking.

**Product Listings**

- UL1778
- cUL to CSA22.2 No.107.1

**Products Compliances**

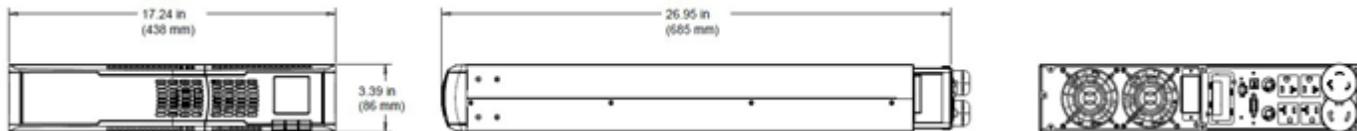
- FCC Part 15J Class A
- IEC61000-4-2, Electrostatic Discharge
- IEC61000-4-3, Radiated Electromagnetic Field Immunity
- IEC61000-4-4, Electrical Fast Transient/Burst Immunity
- IEC61000-4-5, Surge Immunity
- IEC61000-4-6, CS
- IEC61000-4-8, Power Frequency Magnetic Field
- IEC61000-2-2, Low Frequency Signal
- RoHS

SPECIFICATIONS CONT.

SURGEX UPS (100 - 120 Volt UPS's) specifications cont.

# SPECIFICATIONS

## SurgeX UPS 3000 VA Low Voltage



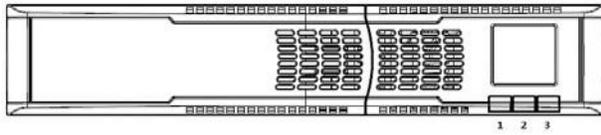
<b>Model</b>	<b>UPS-3000-OL</b>
<b>Type</b>	SurgeX
<b>Power Rating</b>	3000 VA / 2700 W
<b>Topology</b>	On-Line Double Conversion
<b>Heat Dissipation (BTU/Hour)</b>	1756 at 100% Load
<b>Input Voltage (Nominal) Range</b>	100-120 VAC 90-150 VAC
<b>Input Frequency</b>	50/60 Hz $\pm$ 4 (Auto Sense on Start-Up)
<b>Input Power Factor</b>	>0.95
<b>Input Current THD</b>	<9.0%
<b>Efficiency</b>	>84.0%
<b>Output Voltage</b>	120 VAC (Default) 100/110/115 VAC (Selectable)
<b>Output Current</b>	25.0 A (Default) 24.0/24.5/24.8 A (Selectable)
<b>Voltage Regulation</b>	$\pm$ 1.0%
<b>Overload Online Mode</b>	100-105%: Continuous; Warning Only 105-130%: 2 Minutes 130-200%: 10 Seconds >200%: 250 Milliseconds
<b>Overload Battery Mode</b>	100-105%: Continuous; Warning Only 105-130%: 10 Seconds >130%: 250 Milliseconds
<b>Overload Bypass Mode</b>	100-110%: Continuous; Warning Only 110-120%: 30 Minutes 120-130%: 10 Minutes >130%: 1 Minute
<b>Battery Voltage (Float / Nominal)</b>	82.1/72.0 VDC
<b>Charger Current</b>	1.0 A
<b>Backup Time (Full Load)</b>	>3.6 Minutes
<b>Communications Interface</b>	USB / RS-232
<b>Shipping Weight</b>	81.0 lbs. / 36.8 kg.

**SPECIFICATIONS CONT.**

**SURGEX UPS (100 - 120 Volt UPS's) specifications cont.**

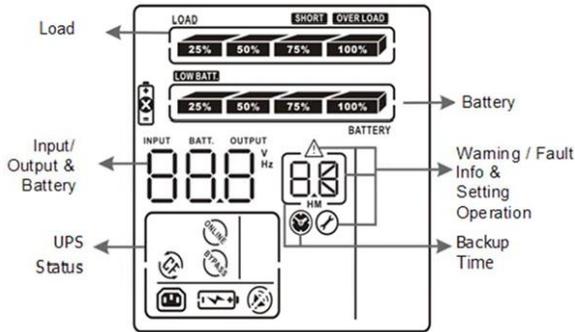
**SPECIFICATIONS**

**Front Panel Controls**



1. ON / MUTE - UP KEY (Previous Selection)
2. SELECT - DOWN KEY (Next Selection)
3. OFF / ENTER - CONFIRM KEY

**Front Panel Display**



**Rear Panel Information and Controls**

- (1) NEMA L5-30P Input Cord, 6'
- (1) NEMA L5-30R Output Cord, 1'
- (2) NEMA 5-20R
- (2) NEMA 5-20R Programmable
- USB & RS-232 Communication
- SNMP Adapter (Optional)
- Internal Relay Contact Card (Optional)
- (2) Circuit Breakers

**Internal Batteries**

- User Hot-Swappable (See Instruction Manual)
- Type - 12 V, 8.5 AH
- Quantity - 6 Batteries
- Recharge time - 12 Hours to 100%

**Environmental**

- Temperature: 0 to 40°C (32 to 104°F) Operating  
-20 to 50°C (-40 to 122°F) Shipment, Storage
- Humidity: <90% Non-Condensing (Operating, Shipment, Storage)
- Altitude: <1000m Operating, No De-Rating  
>1000m De-Rate Output 1% per 100m

**Safety Agency and EMC Compliance**

All units are listed by UL, and marked with the UL/cUL marking.

**Product Listings**

- UL1778
- cUL to CSA22.2 No.107.1

**Product Compliances**

- FCC Part 15J Class A
- IEC61000-4-2, Electrostatic Discharge
- IEC61000-4-3, Radiated Electromagnetic Field Immunity
- IEC61000-4-4, Electrical Fast Transient/Burst Immunity
- IEC61000-4-5, Surge Immunity
- IEC61000-4-6, CS
- IEC61000-4-8, Power Frequency Magnetic Field
- IEC61000-2-2, Low Frequency Signal
- RoHS

SPECIFICATIONS CONT.

10.2 Extension battery packs for use with SurgeX UPS

# SPECIFICATIONS

## SurgeX Battery Pack 1000 VA Low Voltage

<b>Model</b>	<b>UPS-BPX-1000</b>
<b>Type</b>	SurgeX
<b>Compatible UPS</b>	UPS-1000-OL
<b>Voltage (Nominal)</b>	24.0 VDC
<b>Battery Type</b>	12V Flame Retardant Sealed Lead-Acid
<b>Battery Quantity</b>	2 x 2 Strings
<b>Recharge Time</b>	24 Hours (Single Battery Pack, 1A Charger)
<b>Length</b>	17.25 in / 438 mm
<b>Height</b>	3.39 in / 86 mm
<b>Depth</b>	16.26 in / 413 mm
<b>Unit Weight</b>	38.0 lbs. / 17.3 kg.
<b>Shipping Weight</b>	47.0 lbs. / 21.4 kg.
<b>Safety Agencies</b>	UL1778 cUL to CSA22.2 No. 107.1

Percent Capacity	Watts	Number of Battery Cabinets				
		Internal	INT+1 EXT	INT+2 EXT	INT+3 EXT	INT+4 EXT
Runtimes are expressed in minutes Typical runtimes based on fully charged, new batteries, operating under typical load conditions Times estimated assuming a switch mode power supply Runtimes are affected by battery age, ambient temperature, site specific usage patterns and load conditions						
0	0	203	893	>16 hrs	>16 hrs	>16 hrs
10	80	48	211	419	659	925
20	160	24	107	212	334	468
30	240	15	68	135	213	298
40	320	11	49	97	152	213
50	400	8.4	37	74	116	163
60	480	6.7	30	59	93	130
70	560	5.6	24	49	77	107
80	640	4.7	20	41	64	90
90	720	4.1	17	35	55	78
100	800	3.5	15	31	48	68

**SPECIFICATIONS CONT.**

**Extension battery packs for use with SurgeX specifications cont.**

# SPECIFICATIONS

## SurgeX UPS Battery Pack 2000 VA Low Voltage

<b>Model</b>	<b>UPS-BPX-2000</b>
<b>Type</b>	SurgeX
<b>Compatible UPS</b>	UPS-2000-OL
<b>Voltage (Nominal)</b>	48.0 VDC
<b>Battery Type</b>	12V Flame Retardant Sealed Lead-Acid
<b>Battery Quantity</b>	4 x 2 Strings
<b>Recharge Time</b>	24 Hours (Single Battery Pack, 1A Charger)
<b>Length</b>	17.25 in / 438 mm
<b>Height</b>	3.39 in / 86 mm
<b>Depth</b>	20.20 in / 513 mm
<b>Unit Weight</b>	65.0 lbs. / 29.5 kg.
<b>Shipping Weight</b>	75.5 lbs. / 34.3 kg.
<b>Safety Agencies</b>	UL1778 cUL to CSA22.2 No. 107.1

Percent Capacity	Watts	Number of Battery Packs				
		Internal	INT+1 EXT	INT+2 EXT	INT+3 EXT	INT+4 EXT
Runtimes are expressed in minutes Typical runtimes based on fully charged, new batteries, operating under typical load conditions Times estimated assuming a switch mode power supply Runtimes are affected by battery age, ambient temperature, site specific usage patterns and load conditions						
0	0	517	> 16 hrs	> 16 hrs	> 16 hrs	> 16 hrs
10	160	60	267	532	836	> 16 hrs
20	320	27	121	242	380	533
30	480	16	74	147	232	325
40	640	11	52	103	162	227
50	800	8.9	39	77	122	171
60	960	7.0	31	61	96	135
70	1120	5.7	25	50	79	111
80	1280	4.8	21	42	66	93
90	1440	4.1	18	36	57	80
100	1600	3.6	16	31	49	69

SPECIFICATIONS CONT.

Extension battery packs for use with SurgeX specifications cont.

# SPECIFICATIONS

## SurgeX UPS Battery Pack 3000 VA Low Voltage

<b>Model</b>	<b>UPS-BPX-3000</b>
<b>Type</b>	SurgeX
<b>Compatible UPS</b>	UPS-3000-OL
<b>Voltage (Nominal)</b>	72.0 VDC
<b>Battery Type</b>	12V Flame Retardant Sealed Lead-Acid
<b>Battery Quantity</b>	6 x 2 Strings
<b>Recharge Time</b>	24 Hours (Single Battery Pack, 1A Charger)
<b>Length</b>	17.25 in / 438 mm
<b>Height</b>	3.39 in / 86 mm
<b>Depth</b>	24.92 in / 633 mm
<b>Unit Weight</b>	91.5 lbs. / 41.6 kg.
<b>Shipping Weight</b>	105.0 lbs. / 47.4 kg.
<b>Safety Agencies</b>	UL1778 cUL to CSA22.2 No. 107.1

Percent Capacity	Watts	Number of Battery Packs				
		Internal	INT+1 EXT	INT+2 EXT	INT+3 EXT	INT+4 EXT
0	0	351	> 16 hrs	> 16 hrs	> 16 hrs	> 16 hrs
10	240	56	247	491	772	> 16 hrs
20	480	26	117	232	365	512
30	720	16	72	144	226	318
40	960	11	51	101	159	223
50	1200	8.8	38	77	120	169
60	1440	7.0	31	61	96	134
70	1680	5.7	25	50	78	110
80	1920	4.8	21	42	66	93
90	2160	4.1	18	36	57	80
100	2400	3.6	16	31	49	69

Runtimes are expressed in minutes  
 Typical runtimes based on fully charged, new batteries, operating under typical load conditions  
 Times estimated assuming a switch mode power supply  
 Runtimes are affected by battery age, ambient temperature, site specific usage patterns and load conditions

