

**2-year  
warranty**

**forza**<sup>®</sup>  
POWER TECHNOLOGIES



# User Manual

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Uninterruptible Power Supply System

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FDC-1511RUL / FDC-3011RUL

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## 1. Introduction

Thank you for purchasing the Forza **FDC-1511RUL/ FDC-3011RUL** Online UPS. To enjoy all the features and benefits of this unit, please read and follow all installation and operation instructions thoroughly before unpacking, installing or operating this device. After you have read this manual, keep it in a safe place for future reference.

The information contained in this manual covers the 1500VA/3000VA uninterruptible power system, its basic functions, operating procedures, options available and troubleshooting guide. It also includes information on how to ship, store, handle, and install the equipment.

### 1-1. Transportation

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

### 1-2. Preliminary steps

- Water condensation may occur if the UPS is unpacked in a very cold environment and then moved to a warmer location.
- The UPS must be thoroughly dry before being installed. Failure to do so may increase the risk of electric shock.
- Do not install the UPS system near water or in moist environments.
- Do not install the UPS system where it would be exposed to direct sunlight or near a heater or heating vent.
- Do not block ventilation holes in the UPS housing.

### 1-3. Initial setup

- Do not connect appliances or equipment that may overload the UPS system (such as a laser printer) to the output sockets.
- Place cables in such a way that no one can step on or trip over them.
- Do not connect domestic appliances, such as hair dryers, to the UPS output sockets.
- Connect the UPS system only to an earthed shockproof outlet which must be easily accessible and close to the UPS system.
- Please only use certified electrical cables for input and output connections.
- During the installation of this equipment, make sure that the sum of the leakage currents of the UPS and the connected loads shall not exceed 3.5 mA.

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

### 1-4. Important safety instructions

- Do not disconnect the mains cable on the UPS system or the building wiring outlet (shockproof socket outlet) at any time, since this would cancel the protective earth of the UPS system and of all connected loads.
- Connect the UPS only to a grounded socket that meets electrical safety guidelines.
- Locate the UPS near a wall socket. Do not use an extension cord between the UPS and the socket.
- In the event of an emergency, press the OFF/Enter button and disconnect the power cord from the AC mains to properly disable the UPS.
- Do not allow any kind of liquid or foreign object to enter this UPS unit. Do not place beverages or any other containers with liquid on or nearby the unit.
- The UPS can be operated by any individual with no previous experience

**NOTE:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, it 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.

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

### 1-5. Maintenance, service and faults

- The voltage used by this UPS may be hazardous. The unit contains no user serviceable parts; do not attempt to disassemble the unit. Only qualified service technicians can perform maintenance on the unit. Failure to adhere to this could cause personal injury or equipment malfunction and void the warranty.

- **Caution:** - risk of electric shock. Even after the unit is disconnected from the mains, components inside the UPS system are still connected to the battery packs which are potentially dangerous.
- Before carrying out any kind of service and/or maintenance, disconnect the batteries and verify that no current is present and no hazardous voltage exists in the terminals of high capacity capacitors, such as BUS-capacitors. Servicing of batteries should be performed or supervised by experts who possess the knowledge to closely follow all required precautions.
- To avoid electrical shock, turn off the unit and unplug it from the AC power source before servicing the battery.
- **Caution:** potentially hazardous voltages from the battery can still be present even after disconnecting the UPS from the AC mains. Therefore, the positive and negative terminals of the battery shall be disconnected prior to performing any maintenance or repair inside the unit.
- A battery can present the risk of short-circuit current and electrical shock. The following precautions should be taken:
  - Remove wristwatches, rings and other metal objects
  - Use only tools with insulated grips and handles.
  - Wear rubber gloves and boots.
  - Do not lay tools or metal parts on top of batteries.
  - Disconnect charging source prior to connecting or disconnecting battery terminals.
  - Determine if battery is inadvertently grounded. If inadvertently grounded, remove source from ground.
  - Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance.

- When replacing the battery, make sure to use the same type and number of sealed lead-acid batteries specified.
- Do not dispose of batteries in a fire. Batteries may explode if exposed to high temperatures.
- Never try to open a battery. The cell contains a toxic electrolyte which is harmful to the skin and eyes.
- Replace the fuse only with the same type and amperage in order to avoid fire hazards.
- Do not dismantle the UPS system.

## 2. Operation

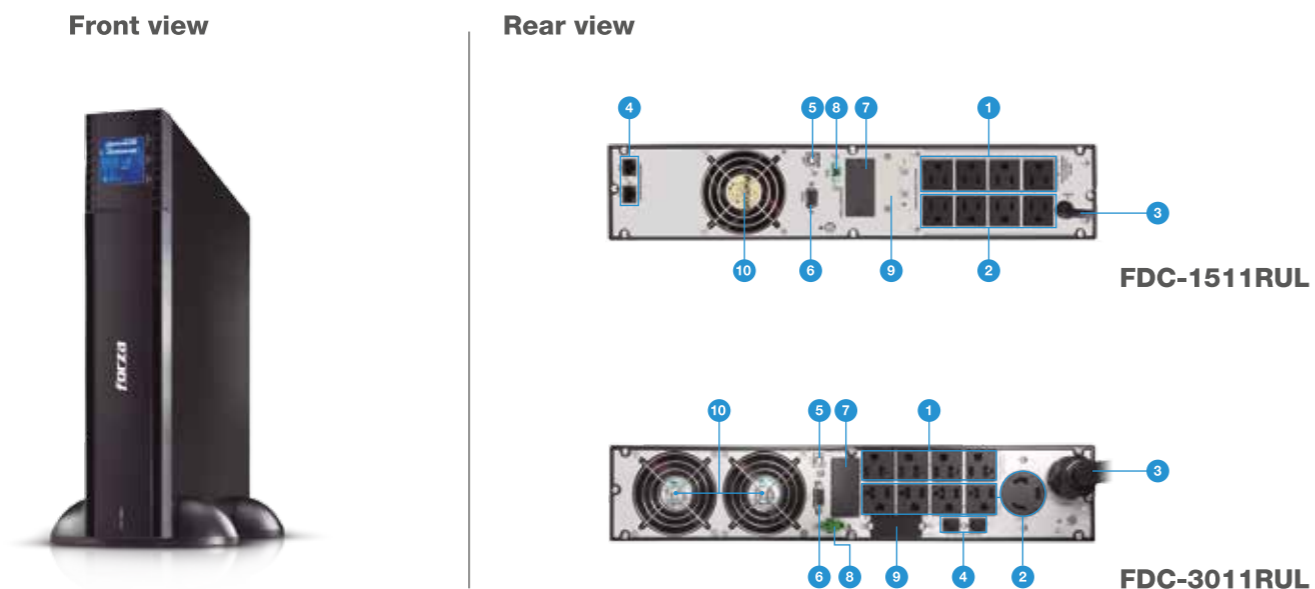
### 2-1. Unpacking and inspection

Remove the UPS from its package and make sure that all the following items are included:

- UPS unit
- CD with ForzaTracker monitoring software
- USB cable
- Rack mounting hardware
- Tower support base
- One user manual
- Warranty certificate

Carefully inspect the UPS to check for any damages that may have occurred during shipping. Should any evidence of damage be found or if some parts are missing, do not turn the UPS on; you must immediately notify the carrier or dealer where you purchased the unit.

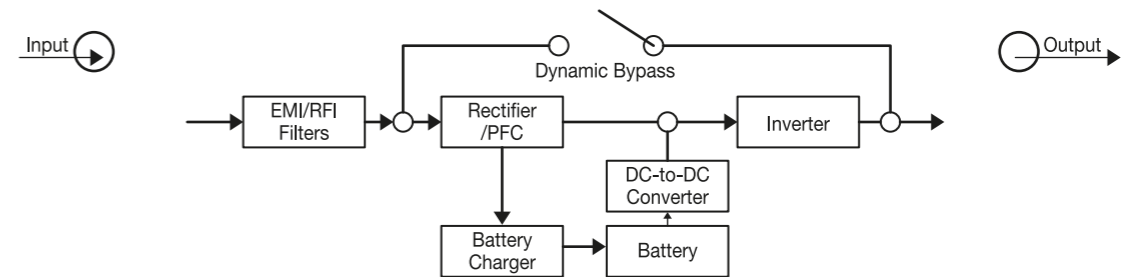
### 2-2. UPS diagram



1. Programmable outlets for non-critical loads
2. Dedicated outlets for critical loads
3. AC input
4. Modem/Phone/Network surge protection
5. USB communication port
6. RS-232 communication port
7. SNMP intelligent slot
8. Emergency Power off connector (EPO)
9. External battery connection
10. Cooling fan(s)

### 2.2.1 Operating principle

The operating principle of the UPS is shown below.



The UPS is composed of mains input, EMI/RFI filters, rectifier/PFC, inverter, battery charger, DC-to-DC converter, battery, dynamic bypass and UPS output.

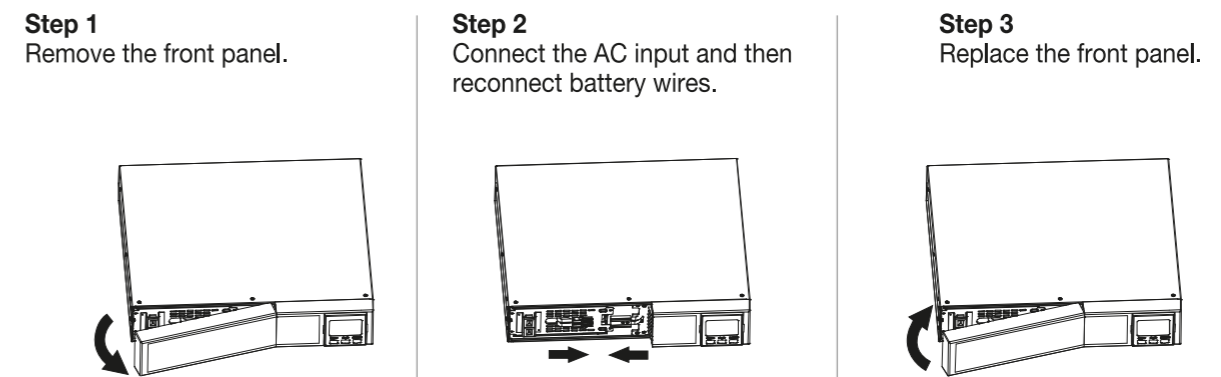
### 2.3. Installation procedure

#### Choose location

Install the UPS unit in any protected environment that provides adequate airflow around the unit, and free from excessive dust, corrosive fumes and conductive contaminants. Do not operate your UPS in an environment where the ambient temperature or humidity is high. For best performance, keep the indoor temperature between 0° C and 45° C. Place the UPS unit at least 20cm away from monitors to avoid interference.

#### 2.3.1 Initial setup

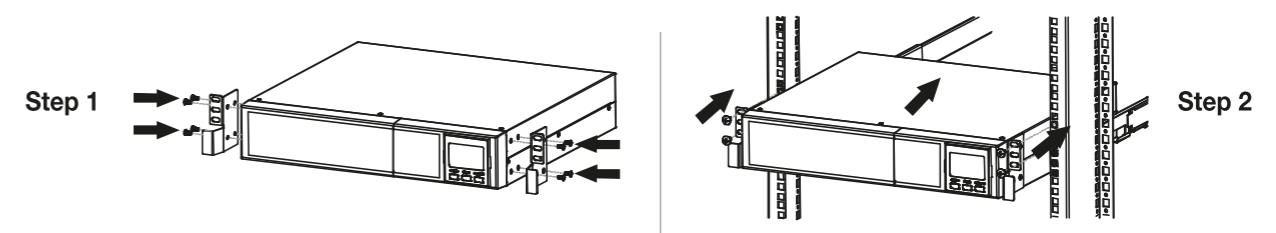
- For safety considerations, the UPS is shipped out from the factory with battery wires disconnected.
- Before installing the UPS, the user must first reconnect the wires. To do so, follow the steps illustrated below.



This UPS can be either placed on a desktop, mounted in a rack or installed in an upright position. Define the proper display orientation based on the configuration chosen to install this UPS.

#### Rack-mount installation

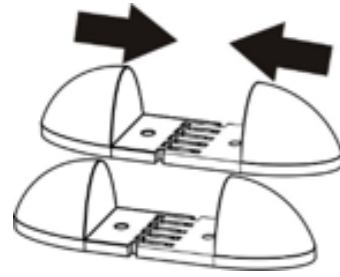
The unit comes with mounting brackets for the standard 19-inch (46.5cm) rack.



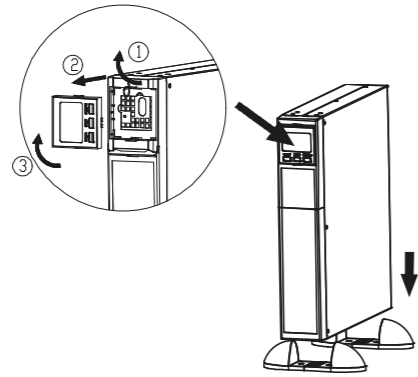
## Tower installation

Allows the user to install the UPS in the upright position.

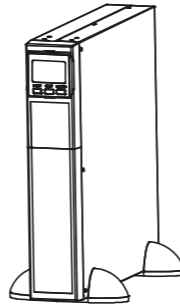
**Step 1**  
Unfold and align the tower support base.



**Step 2**  
Place the UPS vertically on the base.

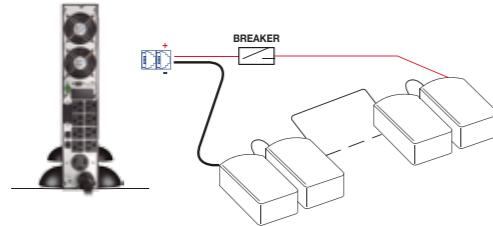


**Step 3**  
Verify that the UPS is stable and firmly attached to the base.



## 2-5. UPS connections

### 2.5.1 Connection to an external battery pack



Make sure to follow the correct polarity when connecting external battery packs. Connect the positive pole of the battery pack to the positive pole of the external battery terminal in the UPS, and negative pole of the battery pack to negative pole of the external battery terminal of the unit.

Reverse polarity may cause an internal fault. It is recommended to add one breaker between the positive pole of battery pack and the positive pole of external battery connector in UPS to prevent damaging the batteries.

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

Choose the battery size and quantity based on the backup time requirement and the UPS specifications. To extend battery life, the operating temperature range should be between 15°C and 25°C.

### 2-4.2 UPS input connection

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

**Note:** Verify if the site wiring fault indicator lights up in the LCD panel. It will be illuminated when the UPS is plugged into an improperly wired utility power outlet (Refer to the troubleshooting section). Also check if there is a circuit breaker against overcurrent and short circuit between the mains and AC input of the UPS.

The recommended protection value is 15 amperes for the 1.5K model and 30 amperes for the model.

### 2-4.3 UPS output connection

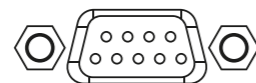
For socket-type outputs, there are two kinds of outputs: programmable outlets and critical devices to the general outlets. During power failure, you may extend the backup time to critical devices by setting shorter backup times for non-critical devices.

#### Communication ports

USB port



RS-232 port



Intelligent slot



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

The UPS is equipped with an intelligent slot perfect for either SNMP or AS400 card. When installing either SNMP or AS400 card in the UPS, it will provide advanced communication and monitoring options.

**Note:** The USB port and RS-232 port cannot be used at the same time.

### Connect the network surge protection

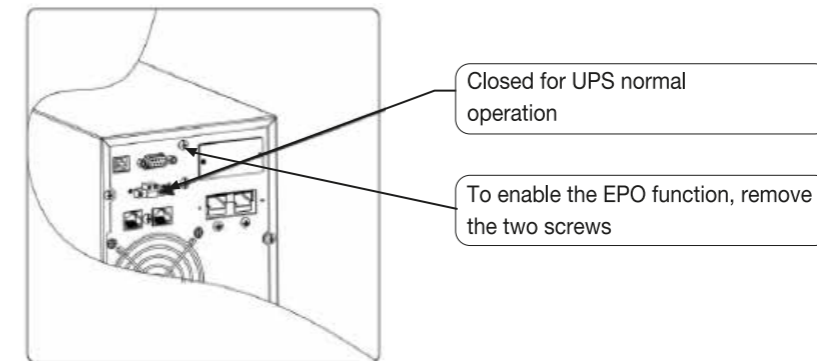
The UPS has two network cable RJ45 connectors for network lines.



- Connect a single line modem/phone/fax cable into the network surge-protection “IN” jack on the rear panel of the UPS.
- Connect a network cable from the OUT jack on the rear of the UPS to a port on a PC or network device such as router.

### 2.4.4 Disabling and enabling the EPO function

Keep pins 1 and 2 closed for UPS normal operation. To activate the EPO feature, remove the wire between pin 1 and 2.



## 2.5 Turning on the UPS

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

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

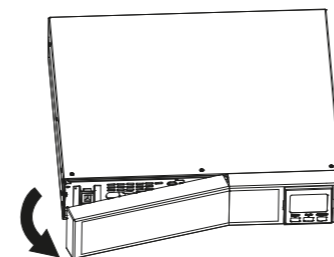
## 2.6 Battery replacement (Service personnel only)

**NOTICE:** This UPS is equipped with internal batteries and only qualified service personnel shall be allowed to replace the batteries.

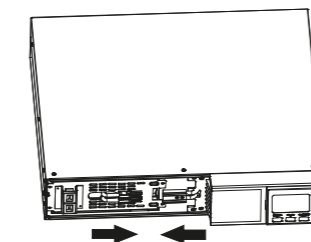
**Note:** Once the batteries are removed, the connected equipment is no longer protected from power outages.

**CAUTION!** Make sure to follow all safety precautions and warnings during the replacement procedure.

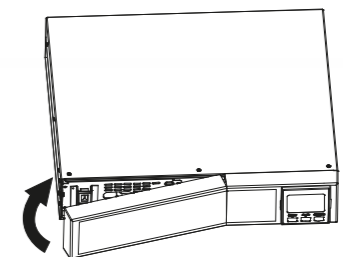
**Step 1**  
Remove the front panel of the UPS.



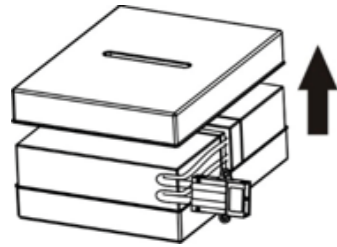
**Step 2**  
Disconnect the battery wire.



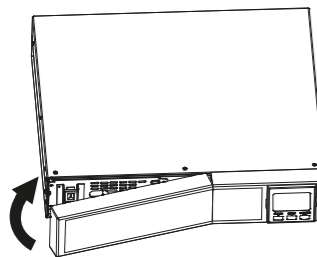
**Step 3**  
Remove the two screws and proceed to pull out the battery compartment



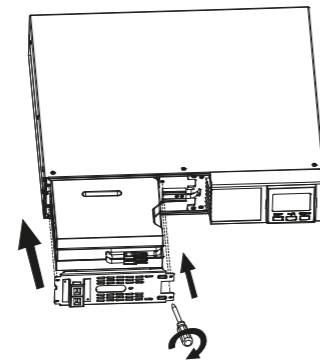
**Step 4**  
Remove the top cover of the compartment and replace the batteries.



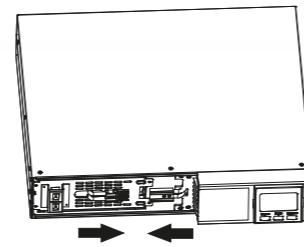
**Step 7**  
Replace the front panel of the UPS.



**Step 5**  
When done, replace the cover of the battery compartment and screw it to the unit chassis.



**Step 6**  
Reconnect the battery wires



## 2.8 ForzaTracker monitoring software

ForzaTracker is a new generation of UPS monitoring software, which provides user-friendly interface to monitor and control your UPS system. This unique software provides safe auto-shutdown for multi-computer systems during power failures. With this software, users can monitor and control any UPS on the same LAN no matter how far they might be from the UPS.

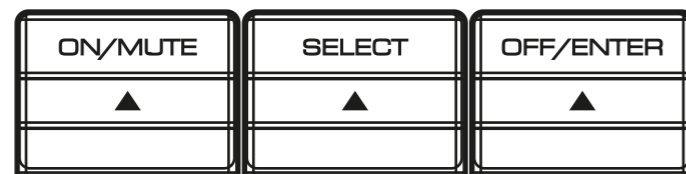
### Installation procedure for Windows users:

1. Use the supplied CD or go to the website: <http://www.forzaups.com/us/driver-downloads/>.
2. After clicking the software icon, choose the required operation system.
3. Follow the on-screen instructions to install the software.
4. When you finished downloading all required files, enter the serial No (installation password): **5242-87f6-64re-di8d-986u** to install the software (include the hyphens).
5. In order to access as Administrator, input the password: **111296**.
6. When your computer restarts, the management software will appear as a light blue round icon located in the system tray, near the clock.

**Note:** For Mac and Linux users, please refer to the ForzaTracker user guide found in our website.

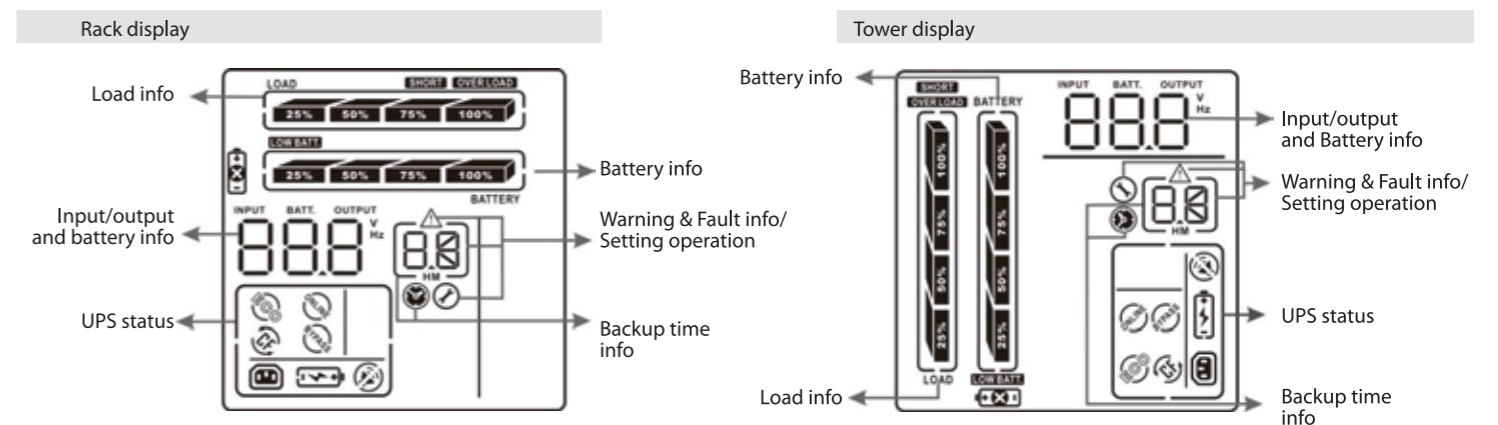
## 3. Advanced operation

### 3-1. Description of buttons and functions



Button	Function
ON/Mute button	<ul style="list-style-type: none"> <li>• <b>Turn on the UPS:</b> Press and hold the <b>ON/Mute</b> button for at least 2 seconds to turn on the UPS.</li> <li>• <b>Mute the alarm:</b> When the UPS is on battery mode, press and hold this button for at least 3 seconds to disable or enable the alarm system. This command would not apply when warnings or errors occur.</li> <li>• <b>Up key:</b> Press this button to display previous selection in the UPS configuration menu.</li> <li>• <b>Switch to UPS self-test mode:</b> Press and hold <b>ON/Mute</b> button for 3 seconds to perform the self-test in AC mode, ECO mode, or converter mode.</li> </ul>
OFF/Enter button	<ul style="list-style-type: none"> <li>• <b>Turn off the UPS:</b> Press and hold this button for at least 2 seconds to turn off the UPS in battery mode. The UPS will remain in standby mode under normal power conditions or transfer to Bypass mode provided it has been enabled previously by pressing this button.</li> <li>• <b>Confirm selection key:</b> Press this button to confirm the selection in the UPS configuration menu.</li> </ul>
Select button	<ul style="list-style-type: none"> <li>• <b>Switch LCD message:</b> Press this button to change the LCD message for input voltage, input frequency, battery voltage, output voltage and output frequency.</li> <li>• <b>Setting mode:</b> Press and hold this button for 3 seconds to enter the UPS configuration menu while UPS is in standby or bypass mode.</li> <li>• <b>Down key:</b> Press this button to display the next selection in the UPS configuration menu.</li> </ul>
ON/Mute + Select button	<ul style="list-style-type: none"> <li>• <b>Switch to bypass mode:</b> When the utility power is normal, press <b>ON/Mute</b> and <b>Select</b> buttons simultaneously for 3 seconds to transfer the UPS to bypass mode. This action will be ineffective if the input voltage is not within an acceptable range.</li> <li>• <b>Exit setting mode or return to the upper menu:</b> When the UPS is on setting mode, press the <b>ON/Mute</b> and <b>Select</b> buttons simultaneously for 0.2 seconds to return to the upper menu. If it is already in top menu, press these two buttons at the same time to exit the setting mode</li> </ul>
Select + OFF/Enter button	<ul style="list-style-type: none"> <li>• <b>Rack or Tower display switch:</b> Press the <b>Select</b> and <b>OFF/Enter</b> buttons simultaneously for 3 seconds. The display changes from/to Rack to/from Tower.</li> </ul>

### 3-2. LCD panel



Display	Function
<b>Backup time information</b>	
	Indicates the remaining backup time in pie chart or in numbers H: hour, M: minute.
<b>Configuration and fault information</b>	
	Indicates that configuration parameters are being set.
	Warning and fault code indicators. The meaning of the codes is listed in the section below.
<b>Mute function</b>	
	Indicates that the UPS alarm is disabled
<b>Input/Output and battery information</b>	
	Indicates input voltage, input frequency, battery voltage, output voltage and output frequency. V: voltage, Hz: frequency
<b>Load information</b>	
	Load level indicator at 0-24%, 25-49%, 50-74%, and 75-100% of its capacity
	Overload indicator
	Indicates the load or the UPS output is short circuited.
<b>Programmable outlet status</b>	
	Indicates that the programmable management outlets are working.
<b>Mode of operation</b>	
	Indicates that the UPS is connected to utility power
	Indicates that the battery is working
	Indicates the charging status
	Indicates the UPS is working in bypass mode.
	Indicates the UPS is working in ECO mode.
	Indicates the UPS is working in converter mode.
<b>Battery information</b>	
	Battery level indicator at 0-24%, 25-49%, 50-74%, and 75-100% of its capacity.
	Low battery level indicator.
	Battery fault indicator.

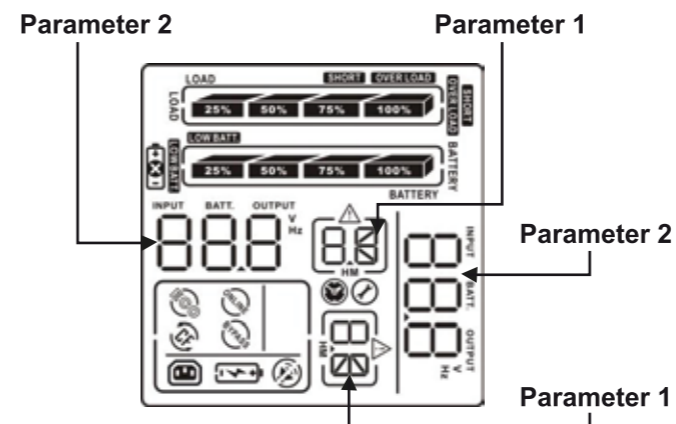
### 3-3. Audible alarm

Battery mode	Sounds every 5 seconds
Low battery	Sounds every 2 seconds
Overload	Sounds every second
Fault	Continuous sound
Bypass mode	Sounds every 10 seconds

### 3-4. Abbreviations on the LCD display

Abbreviation	Display content	Meaning
ENA	ENR	Enable
DIS	dIS	Disable
ESC	ESC	Escape
HLS	HLS	High loss
LLS	LLS	Low loss
AO	AO	Enable when opened
AC	AC	Enable when closed
EAT	EAT	Estimated runtime
RAT	RAT	Remaining runtime
OK	OK	OK
ON	ON	ON
SD	Sd	Shut down
BL	bL	Battery low
OL	OL	Over load
OI	OI	Input current exceeds allowable limit
NC	NC	No battery connected
OC	OC	Overcharge
SF	SF	Site wiring fault
EP	EP	EPO
TP	TP	Temperature
CH	CH	Charger failure
BF	bF	Battery fault
BV	bV	Input voltage is out of bypass range
FU	FU	Frequency is unstable in bypass mode
BR	bR	Replace battery
EE	EE	EEPROM error

### 3-5. UPS parameter settings




Two parameters need to be configured in order to set up the UPS. Refer to the following diagram.


**Parameter 1:** it is used for the different configuration options. Please refer to the table below.

**Parameter 2:** it represents the setting information or values of each program.

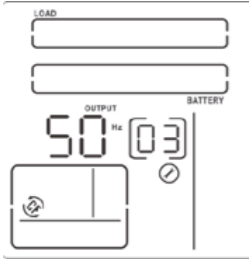
### 01: Output voltage settings

Interface	Setting
	<p><b>Parameter 2: Output voltage</b></p> <p>For 100/110/115/120/127, VAC, you may choose any of the following output voltages</p> <p><b>100:</b> the output voltage is 100VAC  <b>110:</b> the output voltage is 110VAC  <b>115:</b> the output voltage is 115VAC  <b>120:</b> the output voltage is 120VAC (Default)  <b>127:</b> the output voltage is 127VAC</p>


### 02: Frequency converter enable/disable

Interface	Setting
	<p><b>Parameter 2:</b> Activates or cancels the converter mode. You may choose one of the options below:</p> <p><b>CF ENA:</b> Enable converter mode  <b>CF DIS:</b> Disable converter mode (Default)</p>

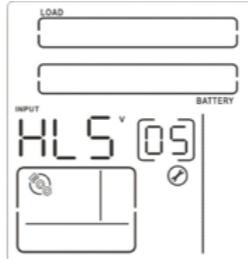

### 03: Output frequency settings

Interface	Setting
	<p><b>Parameter 2:</b> Use this menu to define the initial frequency on battery mode:</p> <p><b>BAT 50:</b> The output frequency is set to 50Hz  <b>BAT 60:</b> The output frequency is set to 60Hz</p> <p>If the converter mode is enabled, the following options will be available:</p> <p><b>CF 50:</b> The output frequency is set to 50Hz  <b>CF 60:</b> The output frequency is set to 60Hz</p>


### 04: ECO enable/disable

Interface	Setting
	<p><b>Parameter 2:</b> Activates or cancels the ECO mode. Two options are available:</p> <p><b>ENA:</b> ECO mode enable  <b>DIS:</b> ECO mode disable (Default)</p>



### 05: ECO voltage range setting

Interface	Setting
 	<p><b>Parameter 2:</b> Use this menu to set the acceptable high voltage point and low voltage point for ECO mode by pressing the Down key or Up key.</p> <p><b>HLS:</b> High loss voltage in ECO mode.  For 100/110/115/120/127 VAC models, the setting range in parameter 3 is from +3V to +12V of the nominal voltage. (Default: +6V)</p> <p><b>LLS:</b> Low loss voltage in ECO mode:  For 100/110/115/120/127 VAC models, the setting range in parameter 3 is from -3V to -12V of the nominal voltage. (Default: -6V)</p>


### 06: Bypass enable/disable

Interface	Setting
	<p><b>Parameter 2:</b> Use it to activate or cancel the bypass feature when the UPS is off.</p> <p><b>ENA:</b> Bypass enabled  <b>DIS:</b> Bypass disabled</p>


### 07: Bypass voltage range setting

Interface	Setting
 	<p><b>Parameter 2:</b> Press the UP or Down key to choose the acceptable high and low voltage values for Bypass operation</p> <p><b>HLS:</b> High voltage adjustment in bypass mode  For 100/110/115/120/127VAC:  <b>120-140:</b> High voltage setting ranges from 120VAC to 140VAC as set in parameter 3. (Default: 132VAC)</p> <p><b>LLS:</b> Low voltage adjustment in bypass mode  For 100/110/115/120/127VAC:  <b>85-115:</b> Low voltage setting ranges from 85VAC to 115VAC as set in parameter 3. (Default: 85VAC)</p>

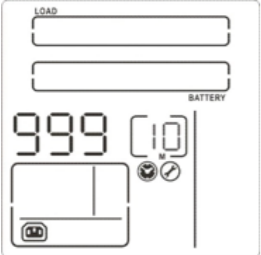
### 08: Bypass frequency range setting

Interface	Setting
	<p><b>Parameter 2:</b> Use this menu to set the acceptable high frequency point and acceptable low frequency point for Bypass mode by pressing the <b>Down</b> key or <b>Up</b> key.</p> <p><b>HLS:</b> Bypass high frequency point For 50Hz output frequency models: <b>51-55Hz:</b> Sets the frequency high loss point from 51Hz to 55Hz (Default: 53.0Hz) For 60Hz output frequency models: <b>61-65Hz:</b> Sets the frequency high loss point from 61Hz to 65Hz (Default: 63.0Hz)</p> <p><b>LLS:</b> Bypass low frequency point For 50Hz output frequency models: <b>45-49Hz:</b> Sets the frequency low loss point from 45Hz to 49Hz (Default: 47.0Hz) For 60Hz output frequency models: <b>55-59Hz:</b> Sets the frequency low loss point from 55Hz to 59Hz (Default: 57.0Hz)</p>

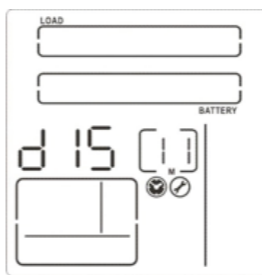
### 09: Programmable outlets enable/disable

Interface	Setting
	<p><b>Parameter 2:</b> Activates or cancels the programmable outlet feature.</p> <p><b>ENA:</b> Programmable outlets enabled <b>DIS:</b> Programmable outlets disabled (Default)</p>

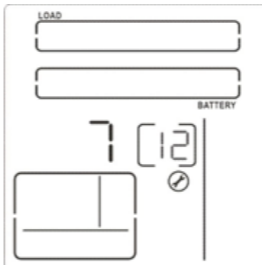
### 10: Backup time setting for programmable outlets

Interface	Setting
	<p><b>Parameter 2:</b> Sets the backup time limits for the programmable outlets.</p> <p><b>0-999:</b> Use this setting to define the programmable outlets backup time in minutes, from 0-999, in order to connect non-critical devices on battery mode. (Default:999)</p>

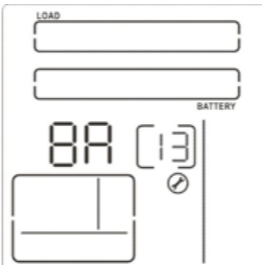
### 11: Backup time limit for general outlets

Interface	Setting
	<p><b>Parameter 2:</b> Use this setting to configure the backup time on battery mode for general outlets.</p> <p><b>0-999:</b> Sets the backup time in minutes, from 0-999 for general outlets on battery mode.</p> <p><b>DIS:</b> Disables the runtime limit timer, in which case backup time will depend on battery capacity. (Default)</p> <p><b>Note:</b> When setting this parameter to "0", the backup time will only last 10 seconds.</p>

### 12: Battery total Ah setting


Interface	Setting
	<p><b>Parameter 2:</b> Use this setting to configure the total battery capacity in Ah for the UPS system.</p> <p><b>7-999:</b> Sets the battery total capacity from 7-999 in Ah. Please set the correct battery total capacity if an external battery bank is connected.</p>

### 13: Maximum charger current setting


Interface	Setting														
	<p><b>Parameter 2:</b> Use this setting to configure the charger current to be applied.</p> <p>For low voltage models with 24/36/48VDC <b>1/2/4/6/8:</b> sets the charger maximum current to 1/2/4/6/8 amperes. (Default: 2A)</p> <p>For high voltage models with 24/36/48VDC <b>1/2/4/6/8/10/12:</b> sets the charger maximum current to 1/2/4/6/8/10/12 amperes. (Default: 2A)</p> <p>For low voltage and high voltage model with 72/96VDC <b>1/2/4/6/8:</b> sets the charger maximum current to 1/2/4/6/8 amperes. (Default: 2A)</p> <p><b>Note:</b> You should set the appropriate charger current based on the capacity of the battery used. The recommended charging rate of 0.1C~0.3C according to battery capacity is included in the table below:</p> <table border="1" data-bbox="2097 1643 2828 1864"> <thead> <tr> <th>Battery capacity(Ah)</th> <th>Total charging current (A)</th> </tr> </thead> <tbody> <tr> <td>7~20</td> <td>2</td> </tr> <tr> <td>20~40</td> <td>4</td> </tr> <tr> <td>40~60</td> <td>6</td> </tr> <tr> <td>60~80</td> <td>8</td> </tr> <tr> <td>80~100</td> <td>10</td> </tr> <tr> <td>100~150</td> <td>12</td> </tr> </tbody> </table>	Battery capacity(Ah)	Total charging current (A)	7~20	2	20~40	4	40~60	6	60~80	8	80~100	10	100~150	12
Battery capacity(Ah)	Total charging current (A)														
7~20	2														
20~40	4														
40~60	6														
60~80	8														
80~100	10														
100~150	12														



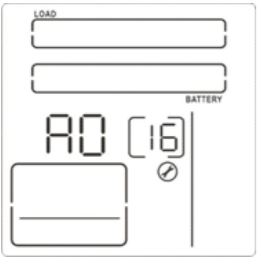
#### 14: Charger boost voltage setting

Interface	Setting
	<p><b>Parameter 2:</b> Use this setting to configure the boost voltage level.</p> <p><b>2.25-2.40:</b> Sets the charger boost voltage from 2.25 to 2.40 V/cell. (Default is set at 2.36V/cell)</p>

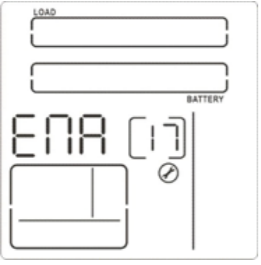
#### 15: Charger float voltage setting

Interface	Setting
	<p><b>Parameter 2:</b> Use this setting to determine the float voltage level.</p> <p><b>2.20-2.33:</b> Sets the charger float voltage from 2.20 to 2.33V/cell (Default is set at 2.28V/cell)</p>


#### 16: EPO relay setting

Interface	Setting
	<p><b>Parameter 2:</b> Use this setting to configure the EPO circuit control.</p> <p><b>AO:</b> Active Open (Default). When AO is selected as the normal configuration, it will enable the EPO function when Pin 1 and Pin 2 are opened.</p> <p><b>AC:</b> Active Close. When AC is selected as the normal configuration, it will enable the EPO function when Pin 1 and Pin 2 are closed.</p>

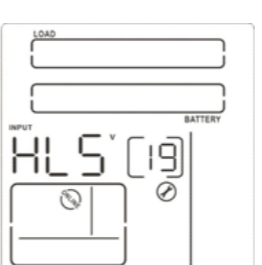
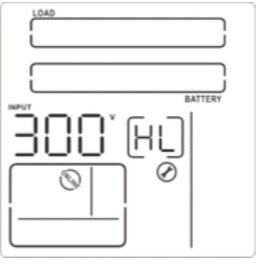
#### 17: External output isolation transformer

Interface	Setting
	<p><b>Parameter 2:</b> Allow or disallow the connection of an external output isolation transformer</p> <p><b>ENA:</b> If selected, the UPS will be allowed to connect to an external output isolation transformer.</p> <p><b>DIS:</b> If selected, the UPS will be denied to connect to external output isolation transformer. (Default)</p>

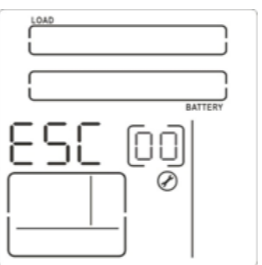
#### 18: Runtime setting display

Interface	Setting
	<p><b>Parameter 2:</b> Use this setting to configure the runtime on the display.</p> <p><b>EAT:</b> If EAT is selected, it will show the estimated runtime on the screen (Default)</p> <p><b>RAT:</b> If RAT is selected, it will show the runtime accumulated up to this point.</p>

#### 19: Acceptable input voltage range setting

Interface	Setting
	<p><b>Parameter 2:</b> Use this menu to set the acceptable high voltage point and acceptable low voltage point for the input voltage by pressing the Down or Up key.</p> <p><b>HLS:</b> Input high-voltage point For 100/110/115/120/127 VAC models: <b>140/145/150:</b> sets the high-voltage point in parameter 2. (Default: 110VAC)</p> <p><b>LLS:</b> Bypass low-voltage point For 100/110/115/120/127 VAC models: <b>55/60/65/70/75/80:</b> sets the low-voltage point in parameter 2. (Default: 55VAC)</p>
	

#### 00: Exit setting

Interface	Setting
	Exits the configuration mode.

### 3-6. Operation mode description

Operation mode	Description	LCD display	
		Rack display	Tower display
<b>Online mode</b>	When the input voltage is within acceptable range, the UPS will supply pure and stable AC power to connected loads. The UPS will also charge the battery while in online mode.		
<b>ECO mode (Efficiency Corrective Optimizer)</b>	Energy saving mode: When the input voltage is within the voltage regulation range, the UPS will bypass voltage to loads for energy saving. The UPS will also charge the battery while in ECO mode.		
<b>Frequency converter mode</b>	When input frequency is between 40Hz and 70Hz, the UPS can be set at a constant output value of 50Hz or 60Hz. The UPS will still charge the battery while in this mode.		
<b>Battery mode</b>	When the input voltage exceeds the acceptable range or during a power failure, the UPS will start supplying power from the battery while the alarm will beep every 5 seconds.		
<b>Bypass mode</b>	When input is within acceptable voltage range but the UPS is overloaded, the UPS will transfer to bypass mode or it can be manually changed to bypass mode using the front panel controls. The alarm will sound once every 10 seconds in this case.		
<b>Standby mode</b>	The UPS is powered off and there is no power supplied to the loads; batteries, however, can still be charged.		
<b>Fault</b>	The UPS is in fault mode when it fails to provide output power to the loads. The ERROR icon and the fault code is displayed on the screen.		

### 3-7. Fault codes

Fault event	Fault code	Icon	Fault event	Fault code	Icon
Bus start failure	01	x	Battery voltage too high	27	
Bus over	02	x	Battery voltage too low	28	
Bus under	03	x	Charger output shorted	2A	x
Inverter soft start failure	11	x	Over temperature	41	x
High inverter voltage	12	x	Overload	43	
Low inverter voltage	13	x	Charger failure	45	x
Inverter output shorted	14		Input current above the acceptable limits	49	x

### 3-8. Warning indicators

Warning	Icon (blinking)	Code	Alarm
Low battery		BL	Beeps once every 2 seconds
Overload		OL	Beeps once every second
Excessive input current		CI	Beeps twice every 10 seconds
Battery is not connected		BC	Beeps once every 2 seconds
Overcharge		OC	Beeps once every 2 seconds
Site wiring fault		SF	Beeps once every 2 seconds
EPO enable		EP	Beeps once every 2 seconds
Over temperature		TP	Beeps once every 2 seconds
Charger failure		CH	Beeps once every 2 seconds
Battery fault		BF	Beeps once every 2 seconds. (In this case, the UPS turns off to remind users there is something wrong with the batteries)
Bypass voltage out of range		BV	Beeps once every 2 seconds
Unstable bypass frequency		FU	Beeps once every 2 seconds
Battery replacement		BR	Beeps once every 2 seconds
EEPROM error		EE	Beeps once every 2 seconds

**Note:** The **Site wiring fault** function can be enabled/disabled via software.

#### 4. Troubleshooting guide

If the UPS system does not operate correctly, use the table below to troubleshoot the problem.

Symptom	Possible cause	Solution
Even though the mains supply is normal, there are no status indicators or alarms	The AC input cable is not properly connected	Check to make sure the power cord is firmly connected to a AC wall socket
	The AC input is connected to the UPS outlet	Plug the power cord to a wall socket
The  icon and the warning code <b>EP</b> become illuminated on the LCD display, and the alarm starts beeping once every 2 seconds	EPO function is enabled	Set the circuit in its closed position to disable the EPO function
The  icon and the <b>SF</b> warning code become illuminated on the LCD display, and the alarm starts beeping once 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  and  icons become illuminated on the LCD display and the alarm starts beeping once every 2 seconds	The external or internal battery connection is incorrect	Check if all batteries are properly connected
Fault code 27 and the  icon become illuminated on the LCD display, and the alarm starts beeping continuously	Battery voltage is too high or the charger fails	Contact your dealer or service center
Fault code 28 and the  icon become illuminated on the LCD display and the alarm starts beeping continuously	Battery voltage is too low or the charger fails	Please contact the dealer or service center
The , <b>OVERLOAD</b> icons and the <b>SF</b> become illuminated on the LCD display, and the alarm starts beeping every second	UPS is overloaded	Remove excess loads from UPS output
	UPS is overloaded. Devices connected to the UPS are fed directly from utility power via the Bypass	Remove excess loads from the UPS output
	After repetitive overloads, the UPS is locked in Bypass mode. Connected devices are fed directly from utility power	Remove excess loads from the UPS output first. Shut down the UPS completely before restarting the unit once again
Fault code 49 becomes illuminated and the alarm starts beeping continuously	Input current is above the acceptable limits	Remove excess loads from the UPS output
Fault code 43 becomes illuminated along with the <b>OVERLOAD</b> icon on the LCD display, and the alarm starts beeping continuously	The UPS shuts down automatically upon detecting the overload condition in the output	Remove excess loads from the UPS output and restart the unit once again
Fault code 14 becomes illuminated and the alarm starts beeping continuously	The UPS shuts down automatically upon detecting the overload condition in the output	Check the output wiring and if connected devices are short-circuited
Fault codes 01, 02, 03, 11, 12, 13 and 41 become illuminated on the LCD display, and the alarm starts beeping continuously	A UPS internal fault has occurred. There are two possible causes: 1. Power is continued to be supplied to the load, but is done directly from the AC grid via a bypass 2. Power is no longer supplied to the load	Please contact the dealer or service center

Battery backup time is shorter than its nominal value	Batteries are not fully charged	Charge the batteries for at least 5 hours and then check their capacity. If the problem persists, consult your dealer
	Defective batteries	Contact your dealer for a replacement
Fault code 2A appears on the LCD display while the alarm beeps continuously	Short circuit detected on the charger output	Check to make sure that the wiring of the external battery pack connected is not shorted
Fault code 45 appears on the LCD display while the alarm beeps continuously	There is no output voltage from the charger and the battery voltage is below 10V/PC	Please contact the dealer or service center

#### 5. Storage and maintenance

##### Maintenance

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



Batteries must not be discarded as regular household waste! As part of the company's eco-friendly approach, we encourage you to follow all applicable local waste regulations to dispose of your used devices and batteries properly.

##### Storage

Charge the UPS for at least 5 hours before storing the unit. Cover the UPS, and place it upright in a cool, dry location. During storage, recharge the battery in accordance with the following table

Storage temperature	Recharge frequency	Runtime
-25°C - 40°C	Every 3 months	1-2 hours
-40°C - 45°C	Every 2 months	1-2 hours

## 6. Technical specifications

MPN	FDC-1511RUL	FDC-3011RUL
<b>General</b>		
Capacity	1500VA/1450W (at 127V input) 1500VA/1430W (at 125V input) 1500VA/1300W (at 120V input) 1500VA/1270W (at 115V input) 1500VA/1200W (at 110V input)	3000VA/2880W (at 127V input) 3000VA/2850W (at 125V input) 3000VA/2740W (at 120V input) 3000VA/2650W (at 115V input) 3000VA/2500W (at 110V input)
Topology	Double conversion	
<b>Input</b>		
Nominal voltage	100-127VAC	
Voltage range (low line transfer)	80VAC/70VAC/60VAC/55VAC ± 5 % ( based on load percentage 100% - 80% / 80% - 70% / 70 - 60% / 60% - 0)	
Voltage range (low line comeback)	87VAC/77VAC/67VAC/62VAC ± 5 %	
Voltage range (high line transfer)	150VAC ± 3%	
Voltage range (high line comeback)	High line transfer voltage - 5V	
Frequency	40Hz-70Hz	
Power factor	0.99 at 100% load	
Total harmonic distortion (THDi)	≤5% @ 100% load THDU <1.6%	
AC plug style	5-15P	L5-30P
<b>Output</b>		
Nominal voltage	100/110/115/120/127VAC	
AC voltage regulation (battery mode)	± 1%	
Frequency (synchronized range)	47-53Hz at 50Hz system / 57-63Hz at 60Hz system	
Frequency (battery mode)	50Hz ± 0.1Hz or 60Hz ± 0.1Hz	
Power factor	1	
Efficiency (AC mode)	≥89%	≥91%
Efficiency (battery mode)	≥88%	≥90%
Overload (shutdown)	100%-110%: Warning / 110%-130%: 5min / 130%-140%: 30sec / >140%: 1sec	
Transfer time (line to battery)	0ms	
Transfer time (inverter to bypass)	4ms	
Crest ratio	3:1 (max)	
Harmonic distortion	≤2% THD (linear load) / ≤4% THD (non-linear load)	
Waveform	Pure sine wave	
Total outlets	8 (5-15R)	8 (5-20R) 1 (L5-30R)
<b>Battery</b>		
Battery type and quantity	12V / 9Ah (3)	12V / 9Ah (6)
Recharge time	3 hours to 95% capacity	
Charging current	2A±10% to 2A ±20%	
Charging voltage	41VDC ± 1%	82.1VDC ± 1%
<b>Communications</b>		
LCD display	Graphical LCD with blue backlight	
Audible	Battery mode: Sounds every 5 seconds Low battery: Sounds every 2 seconds Overload: Sounds once every second Fault: Continuous sound	
Communication ports	SNMP, RS-232, USB	
Power management software	ForzaTracker	
<b>Environment</b>		
Operating temperature	32°F-104°F	
Storage temperature	-4°F-122°F	
Relative humidity	20-90% non-condensing	
Operating altitude	<1000m Every 100m above 1000m decreases output power 1% up to 4000m	

MPN	FDC-1511RUL	FDC-3011RUL
Audible noise	<50dB at 1 meter	
<b>Physical appearance</b>		
Dimensions	17.3x3.5x16.1in	17.3x3.5x24.8in
Weight	34.2lb	60.6lb
Cord length	6.0ft	
<b>Additional information</b>		
Warranty	2 years	

\*Derate capacity to 80% when the output voltage is adjusted to 100VAC.

\*\* If the UPS is installed or used in a place where the altitude is above than 1000m, the output power must be derated one percent per 100m.

\*\*\*Product specifications are subject to change without further notice.

