

# User's Guide

## OPTI-UPS<sup>TM</sup>

Line Interactive UPS's

Models 280E, 420E, 650E, 1000E, 1400E

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### **For your records**

**The serial number of your UPS is on the rear panel. You should note the serial number in the space provided below. Retain this booklet as a permanent record of your purchase to aid in identification in the event of theft or loss.**

**Model No:**

**Serial No.:**

**Purchase Date:**

## LICENSE AGREEMENT

YOU SHOULD CAREFULLY READ THE FOLLOWING TERMS AND CONDITIONS BEFORE USING THIS HARDWARE/SOFTWARE PACKAGE. IF YOU DO NOT AGREE WITH THEM, YOU SHOULD PROMPTLY RETURN THE PACKAGE TO YOUR DEALER AND YOUR MONEY WILL BE REFUNDED.

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## LIMITED WARRANTY

### ***What the warranty covers:***

We warrant this product to be free from defects in material and workmanship during the warranty period. If a product proves to be defective in material or workmanship during the warranty period, we will at our sole option repair or replace the product with a like product.

### ***How long the warranty is effective:***

Our UPS and products are warranted for three (3) years for parts, two (2) years for labor and two (2) years for the batteries from the date of the first consumer purchase. The product warranty will be honored in the United States for product purchased within the United States only. For ViewSonic products sold outside of the U.S.A., contact your ViewSonic dealer for warranty information and service.

### ***Who the warranty protects:***

This warranty is valid only for the first consumer purchaser.

### ***What the warranty does not cover:***

- I. Any product on which the serial number has been defaced, modified or removed.
- II. Damage, deterioration or malfunction resulting from:
  - A. Accident, misuse, neglect, fire, water, or other acts of nature, unauthorized product modification, or failure to follow instructions supplied with the product.
  - B. Repair or attempted repair by anyone not authorized.
  - C. Any damage of the product due to shipment.
  - D. Removal or installation of the product.
  - E. Causes external to the product.
  - F. Use of supplies or parts not meeting our specifications.
  - G. Normal wear and tear.
  - H. Any other cause which does not relate to a product defect.
- III. Removal, installation and set-up service charges.

### ***How to get service:***

- I. To contact ViewSonic Customer Support, call one of the following phone numbers:

U.S. or Canada only	1-800-888-8583
From Outside the U.S.	909-869-7976

If you need to return your UPS, you will be issued a Return Merchandise Authorization (RMA) number.

- II. Either return the product in its original container to your dealer or ship it (freight prepaid) to ViewSonic. If you choose to ship it to ViewSonic, please enclose a copy of your proof of purchase and clearly mark all shipping labels with your RMA number. The product should be securely packed in the original box with all packaging materials, manuals, cables, etc...
- III. When the product arrives, it will be inspected and repaired or replaced at our option. We will pay the shipping charges to return the unit to you via UPS ground. Swifter delivery is available for an additional fee.

*Limitation of implied warranties:*

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, WHICH EXTEND BEYOND THE DESCRIPTION CONTAINED HEREIN INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

***Exclusion of damages:***

OUR LIABILITY IS LIMITED TO THE COST OF REPAIR OR REPLACEMENT OF THE PRODUCT. WE SHALL NOT BE LIABLE FOR:

- I. DAMAGE TO OTHER PROPERTY CAUSED BY ANY DEFECTS IN THE PRODUCT\*, DAMAGES BASED UPON INCONVENIENCE, LOSS OF USE OF THE PRODUCT, LOSS OF TIME, LOSS OF PROFITS, LOSS OF BUSINESS OPPORTUNITY, LOSS OF GOODWILL, LOSS OF DATA, LOSS OF SOFTWARE, COSTS OF SUBSTITUTE EQUIPMENT, INTERFERENCE WITH BUSINESS RELATIONSHIPS, CLAIMS BY THIRD PARTIES, OR OTHER COMMERCIAL LOSS, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.
- II. ANY OTHER DAMAGES, WHETHER INCIDENTAL, CONSEQUENTIAL OR OTHERWISE.
- III. ANY CLAIM AGAINST THE CUSTOMER BY ANY OTHER PARTY.

***Effect of state law:***

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Some states do not allow limitations on implied warranties and/or do not allow the exclusion of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

***Life Support:***

We do not recommend the use of our UPS products for life support equipment or direct care where failure of a UPS product could cause failure of, or diminished effectiveness of the life support equipment or patient care.

OPTI-UPS 280E / 420E / 650E / 1000E / 1400E



\*Except as expressly provided for by the OPTI-UPS™ “Equipment Protection Policy”

**EFFECTIVE January 1, 1996**

# IMPORTANT SAFETY INSTRUCTIONS

## SAVE THESE INSTRUCTIONS

- WHEN REPLACING BATTERIES, USE THE SAME NUMBER AND THE FOLLOWING TYPE BATTERIES: SEALED LEAD-ACID MAINTENANCE FREE (280E: 1 7AH/12V) (420E: 1 7AH/12V) (650E: 1 11AH/12V) (1000E: 3 11AH/6V) (1400E: 2 11AH/12V)
- PROPER DISPOSAL OF BATTERIES IS REQUIRED. REFER TO YOUR LOCAL CODES FOR DISPOSAL REQUIREMENTS.

### INSTRUCTIONS IMPORTANTES CONCERNANT LA SÉCURITÉ

- CONSERVER CES INSTRUCTIONS. CETTE NOTICE CONTIENT DES INSTRUCTIONS IMPORTANTES CONCERNANT LA SÉCURITÉ.
- POUR LE REMPLACEMENT UTILISER LE MÊME NOMBRE DE BATTERIES DU MODÈLE SUIVANT: (280E: 1 7AH/12V) (420E: 1 7AH/12V) (650E : 1 11AH/12V) (1000E : 3 11AH/6V) (1400E : 2 11AH/12V)
- L'ÉLIMINATION DES BATTERIES EST RÈGLEMENTÉE. CONSULTER LES CODES LOCAUX À CET EFFET.

**DIESE ANLEITUNG ENTHÄLT WICHTIGE  
SICHERHEITSANWEISUNGEN. DIESE ANLEITUNG ZUR  
WEITERLEITUNG GRIFFBEREIT BEHALTEN.**

- BEIM AUSTAUSCHEN DER BATTERIEN DIESELBE NUMMER UND FOLGENDES BATTERIENTYP BENUTZEN: BLEI-SÄURE WARTUNGSFREI (280E: 1 7AH/12V) (420E: 1 7AH/12V) (650E : 1 11AH/12V) (1000E : 3 11AH/6V) (1400E : 2 11AH/12V)
- RICHTIGE VERÄUßERUNG DER BATTERIEN IST ERFORDERLICH. IN DEN LOKALKODIZES UM DIE VERÄUßERUNGSERFORDERNISSE NACHSCHAUEN.

## CAUTION:

**THE UPS CONTAINS VOLTAGES WHICH ARE POTENTIALLY HAZARDOUS. ALL REPAIRS SHOULD BE PERFORMED BY QUALIFIED SERVICE PERSONNEL.**

**THE UPS HAS ITS OWN INTERNAL ENERGY SOURCE (BATTERY). THE OUTPUT RECEPTACLES MAY BE ALIVE EVEN WHEN THE UPS IS NOT CONNECTED TO AN AC SUPPLY.**

Safe and continuous operation of the UPS depends partially on the care taken by users. Please observe the following precautions.

- Do not disassemble the UPS.
- Do not attempt to power the UPS from any receptacle except a 2-pole 3-wire grounded receptacle.
- Do not place the UPS near water or in environments of excessive humidity.
- Do not allow liquid or any foreign objects to get inside the UPS.
- Do not block air vents on the side of the UPS.
- Do not plug appliances, such as hair dryers, into the UPS receptacles.
- Do not place the UPS under direct sunshine or close to heat-emitting sources.
- This UPS is intended for installation in a temperature controlled, indoor area free of conductive contaminants.

***A certified detachable power supply cord is to be used with this equipment. For the 280E, 420E, 650E and 1000E a type not lighter than SJT 18 AWG should be used.***

***For the 1400E a type not lighter than SJT 16 AWG should be used.***



## **VORSICHT:**

**DIE UPS\* ENTHÄLT SPANNUNGEN, DIE MÖGLICHERWEISE GEFÄHRLICH SIND. ALLE REPARATUREN SOLLTEN VON QUALIFIZIERTEN MONTEUREN DURCHGEFÜHRT WERDEN.**

**DIE UPS HAT EINE EIGENE INNERE STROMVERSORGUNG (BATTERIE). DIE AUSGANGSANSCHLÜSSE KÖNNEN ALSO UNTER STROM STEHEN, SELBST DANN, WENN DIE UPS NICHT AN EINEN WECHSELSTROMKREIS ANGESCHLOSSEN IST.**

Um die UPS auf Dauer sicher bedienen zu können, sollte der Benutzer auf folgende Vorsichtsmaßnahmen genau achten:

- Die UPS nicht auseinandernehmen.
- Die Stromversorgung sollte nur durch einen 2-poligen, dreiadrigen, geerdeten Anschluß erfolgen.
- Die UPS nicht in der Nähe von Wasser oder in Umgebungen übermäßiger Feuchtigkeit aufstellen.
- Flüssigkeiten oder Fremdobjekte dürfen nicht in das Innere der UPS dringen.
- Lufteinfuhr an der Vorderseite und Luftaustritt an der Rückseite sollten nicht behindert sein.
- Elektrogeräte, wie z. B. Haartrockner u.a. sollten nicht an die UPS angeschlossen werden.
- Die UPS nicht direkter Sonnenbestrahlung oder Heizgeräten aussetzen.
- Die Steckdose sollte nahe dem Gerät installiert und gut zugänglich sein, um sie vom Wechselstromeingang zu isolieren. Zur Trennung vom Wechselstromkreis den Stecker aus der Steckdose ziehen.

Zur Stromzufuhr sollte ein gesichertes, trennbares Kabel benutzt werden. Für eine Stromstärke bis 10A sollte dieses mit H05VV-F 3C; 0.75 mm<sup>2</sup> benutzt werden.

\*UPS (Uninterrupted Power Supply) = Unterbrechungsfreie Stromversorgung

## ATTENTION:

**L'UPS contient de la haute tension qui peut poser risques. Toute réparation doit être exécutée par du personnel de service qualifié.**

**L'UPS a sa propre alimentation secteur interne (batterie). Les prises femelles peuvent être chargées même si l'UPS n'est pas relié à une alimentation secteur.**

La sécurité de l'opération de l'UPS dépend des soins de l'utilisateur. Veuillez lire les précautions ci-dessous:

- Ne jamais démonter l'UPS.
- Ne jamais essayer de brancher l'UPS à une prise femelle sauf à une qui possède une terre et 2 poles.
- Ne jamais mettre l'UPS près de l'eau ou dans un milieu trop humide.
- Ne jamais faire entrer du liquide ou d'objet étranger dans l'UPS.
- Ne jamais boucher les ventilations d'air de l'UPS ou l'aération arrière.
- Ne jamais brancher d'appareils, comme les sèche-cheveux, à la prise femelle de l'UPS.
- Ne jamais placer l'UPS aux rayons directs du soleil ou près d'autre source de chaleur.
- La fiche d'alimentation secteur doit être installée tout près de cet appareil. Elle doit être facilement accessible pour l'isoler de la prise secteur de sortie. Pour couper la connexion, enlever la fiche de la prise femelle.

Un câble d'alimentation secteur amovible et certifié est utilisé avec cet appareil. Pour un courant jusqu'à 10A, un câble qui n'est pas plus léger que 0,75mm<sup>2</sup> doit être utilisé.

## **FEDERAL COMMUNICATIONS COMMISSION (FCC)**

### **WARNING:**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## **CANADIAN DEPARTMENT OF COMMUNICATIONS (DOC)**

This equipment does not exceed Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulation of the Canadian Department of Communications. Operation in a residential area may cause Unacceptable interference to radio and TV reception requiring the owner or operator to take whatever steps are necessary to correct the interference.

Cet équipement ne dépasse pas limites de Classe B d'émission de bruits radioélectriques pour les appareils numériques, telles que prescrites par le Règlement sur le brouillage radioélectrique établi par le Ministère des Communications du Canada. L'exploitation faite en milieu résidentiel peut entraîner le brouillage des réceptions radio et télé, ce qui obligerait le propriétaire ou l'opérateur à prendre les dispositions nécessaires pour en éliminer les causes.

# TABLE OF CONTENTS

## 1. INTRODUCTION

1.1	Overview	1
1.2	Smart Buck and Boost Line Conditioning	1
1.3	User Replaceable Battery Design	1
1.4	Advanced Interface to Communicate with Computer	2
1.5	User Configurable Settings	2
1.6	Site Wiring Fault Indicator	2
1.7	SNMP Application Ready	2
1.8	Schedule Shutdown & Startup	2
1.9	Data-Line Surge Protection	2

## 2. UPS Controls

2.1	External Views	3
	<b>Front Panel Controls</b>	
2.2	Test/Silence Button	7
2.3	Status Indication	7
	<b>Rear Panel Controls</b>	
2.4	Site Wiring Fault Indicator	9
2.5	User Configurable Settings	9
2.6	Communication Port and Pin Assignments	10
2.7	Data-Line Surge Suppression	12

## 3. INSTALLATION AND OPERATION

3.1	Unpacking and Inspection	13
3.2	Placement	13
3.3	Determining How Much Equipment You Can Connect to Your UPS	14
3.4	Powering Up Your UPS	14
3.5	Connecting Your Equipment to the UPS	15
3.6	Operation and Functional Test	16
3.7	Storage Instructions	16

## 4. SPECIFICATIONS

4.1	Electrical Specifications	17
4.2	Mechanical Specifications	19
4.3	Environmental Specifications	19

## 5. TROUBLESHOOTING

5.1	Troubleshooting Chart	22
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## 6. User Replaceable Battery

6.1	Warning	25
6.2	Battery Replacement Procedure for 280E/420E	26

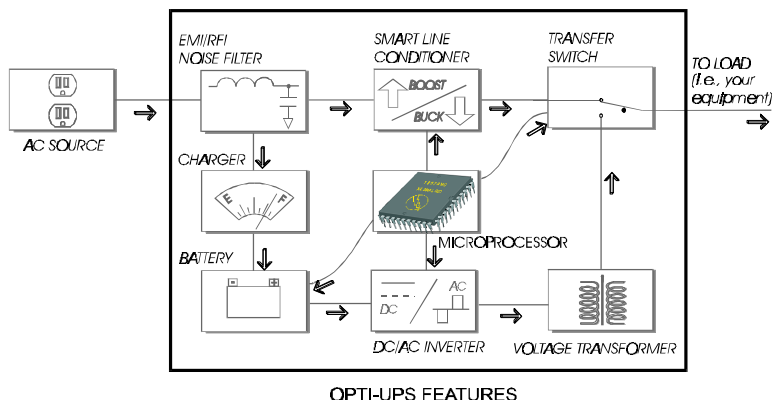




## 1. INTRODUCTION

### 1.1 Overview

The *OPTI-UPS™* is an advanced line-interactive uninterruptible power system (UPS) which is designed to prevent spikes, surges, sags, transients and blackouts from reaching your sensitive equipment. This includes such items as computers, telecommunication systems, and computerized instruments. When AC power is present, the UPS filters small fluctuations continuously. When power fails, the unit employs its internal maintenance-free battery to supply back-up power without interruption.



### 1.2 Smart Buck and Boost Line Conditioning

This microprocessor controlled UPS provides line conditioning via both buck (*step-down voltage*) and boost (*step-up voltage*) functions. The voltage from your AC power source can fluctuate above and below the standard 120V. For example, if the voltage fluctuates up to 132V, the buck function in your UPS steps it down so that your equipment receives approximately 120V. If the voltage fluctuates down to 108V, the boost function steps it up so that your equipment receives approximately 120V. This provides your equipment with excellent voltage regulation with less possibility for the UPS to drain its internal battery.

### 1.3 User Replaceable Battery Design

The battery is the most critical part in a UPS. The average lifetime of a battery is between 3 and 5 years. The special user-replaceable battery design of this UPS provides significant savings and gives the UPS an almost unlimited life. You can replace the battery very easily, and without turning off your UPS or the equipment it is protecting (see *Chapter 6*).

### **1.4 Advanced Interface to Communicate with Computer**

Many UPS's provide only a basic power failure warning. All *OPTI-UPS™* UPS's, together with the appropriate UPS communication software (*such as OPTI-SAFE™+*), also provide you with important operating information. From your computer screen, you can determine input/output voltage and current, frequency, battery voltage, etc., and analyze power problems (*see Section 2.6*). *OPTI-SAFE™+* is included with the following models: 650E, 1000E, 1400E. If *OPTI-SAFE™+* is not part of your UPS package, you can purchase it from ViewSonic or your local dealer.

### **1.5 User Configurable Settings**

You can configure the operating parameters of your UPS to meet your individual needs (*see Section 2.5*).

### **1.6 Site Wiring Fault Indicator (for 100/120V versions only)**

The red Site Wiring Fault LED Indicator on the rear panel lights up if your UPS is plugged into an improperly wired AC power outlet (*see Section 2.4*). This feature warns you if the ground wire is missing, if the input line and neutral wires are reversed, or if the neutral wire is overloaded. As a result, your safety is insured and all your computer peripherals can be safely connected to the UPS.

### **1.7 SNMP Application Ready**

To facilitate the increasing demand for UPS's in both Local Area Network (LAN) and Wide Area Network (WAN) applications, all *OPTI-UPS™* UPS's support the Simple Network Management Protocol (SNMP). With a proper external adapter (*such as the OPTI-UPS™ SNMP adapter*), a network manager can monitor any local or remote UPS from a Network Management Station (NMS). This makes the power management of network systems quick and simple. You can obtain more information about or order the *OPTI-UPS™* SNMP adapter from ViewSonic or your local dealer.

### **1.8 Schedule Shutdown & Startup**

Using *OPTI-SAFE™+*, you can locally or remotely control the shutdown and startup of equipment connected to a UPS. A customized schedule can be developed to meet your specific requirements (*see the OPTI-SAFE™+ User's Guide*).

### **1.9 Data-Line Surge Protection**

The built-in data-line surge suppression on the rear panel completes your system protection. It provides an easy way to protect a network (RJ45) or modem (RJ11) connection from hazardous spikes (*see Section 2.7*).

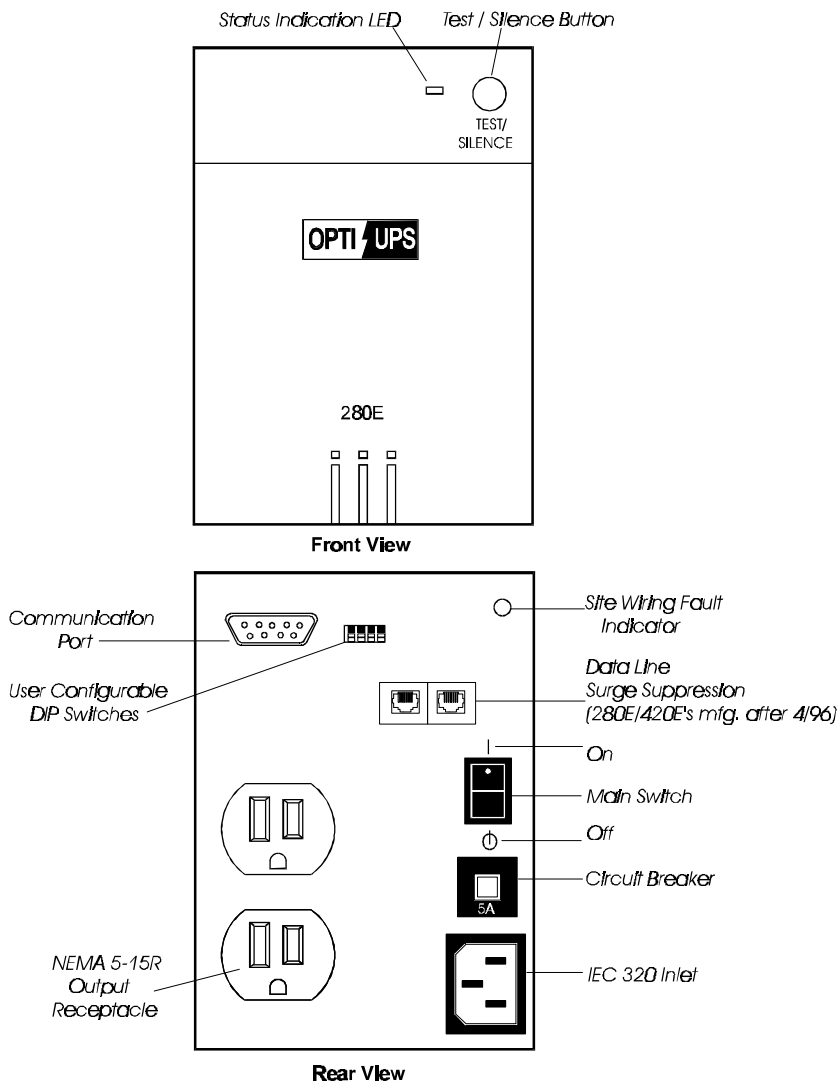


## 2. UPS Controls

### 2.1 **External Views** (see Sections 2.2 through 2.6 for more information, and Section 4.2 for the dimensions of all models)

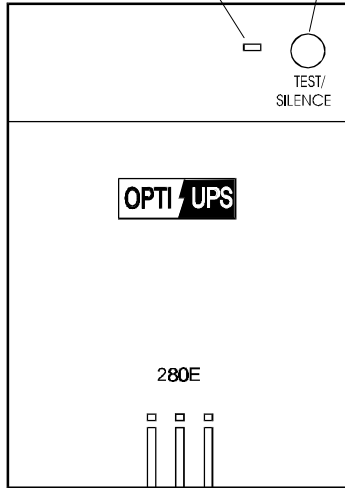
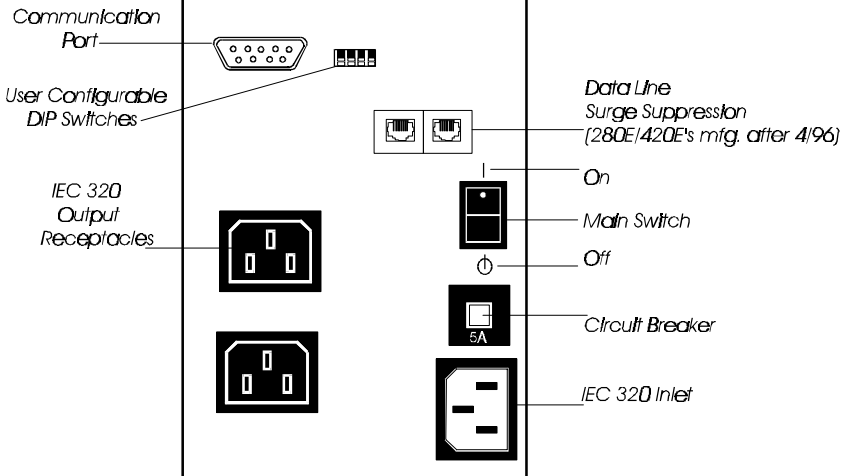
**MODEL: 280E, 420E.**

#### 100/120V Version



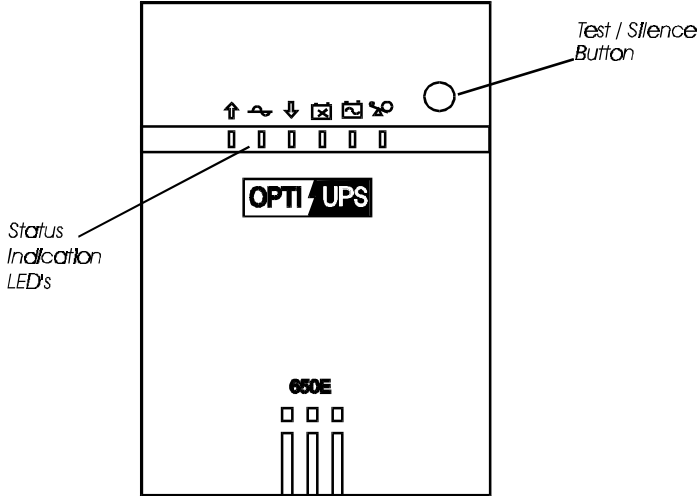
**MODEL: 280E, 420E.****230V Version**

Status Indication LED      Test / Silence Button

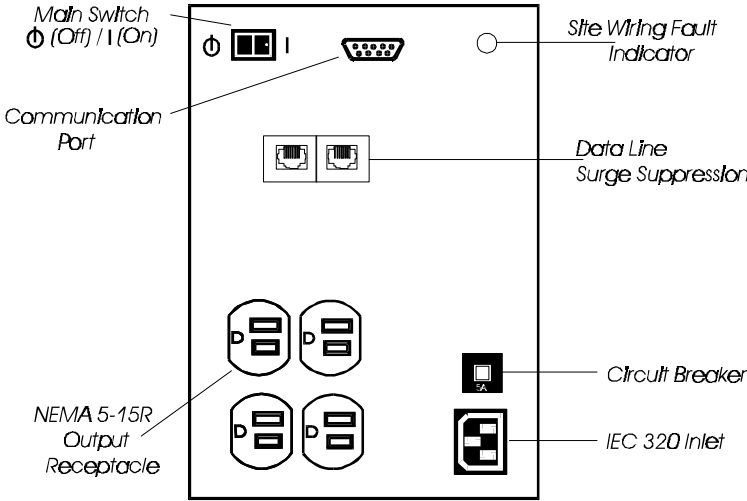
**Front View****Rear View**

**MODEL: 650E, 1000E, 1400E.**

**100/120V Version**



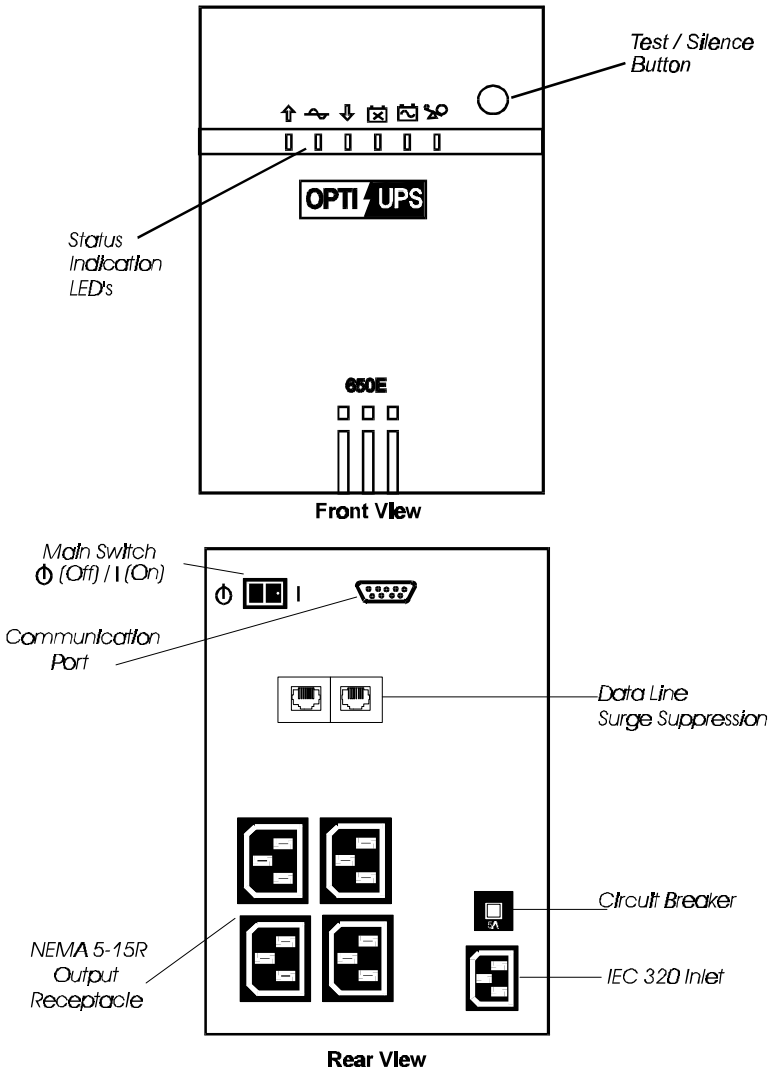
**Front View**



**Rear View**

MODEL: 650E, 1000E, 1400E.

230V Version



## **Front Panel Controls**

### **2.2 Test/Silence Button**

The Test/Silence Button has two functions:


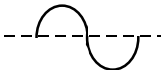




1. If you press the Test/Silence Button when AC power is available, the UPS tests itself by switching to its internal battery for a few seconds. We recommend you close all your open files before initiating this test.
2. If AC power fails, the UPS warns you with an audible alarm. To silence the alarm, press the Test/Silence Button. The alarm returns, beeping faster, when the UPS battery is low. To silence the alarm again, press the Test/Silence Button.

### **2.3 Status Indication**

#### **Models 280E / 420E: Front Panel LED**

AC normal	Green ( <i>continuous</i> )
Battery discharge at power failure	Orange ( <i>flash every 4 seconds</i> )
Battery approaches final discharge	Orange ( <i>flash every second</i> )
Overload	Orange ( <i>continuous</i> )
UPS faulty	Orange ( <i>continuous</i> )
Self Test	Orange ( <i>flash twice</i> ), then Green ( <i>continuous</i> )

**Models 650E / 1000E / 1400E: Front Panel LED's**

	<b>Boost Mode:</b> When this LED is lit, the UPS is correcting a brownout. The UPS raises the output voltage approximately 12% higher than the input voltage without using any battery power.
	<b>Normal Mode:</b> When this LED is lit, the UPS is in normal mode, and providing power to your equipment. The output voltage will be equal to the input voltage. The UPS will continue to filter and provide surge protection.
	<b>Buck Mode:</b> When this LED is lit, the UPS is correcting an overvoltage. The UPS lowers the output voltage approximately 12% lower than the input voltage without using any battery power.
	<b>Battery Mode:</b> When this LED is lit, the UPS is providing power from its battery. Also, this LED is lit when you press the Test/Silence Button to test the battery (see <i>Section 2.2</i> ). After the UPS beeps twice, it will resume Normal Mode.
	<b>Battery Weak:</b> When this LED is lit, the battery voltage is low. This indicates that the battery either needs to be recharged or replaced.
	<b>Overload:</b> When this LED is lit, the UPS is overloaded. You must remove the least critical components connected to your UPS.

## **Rear Panel Controls**

### **2.4 Site Wiring Fault Indicator**

The red Site Wiring Fault LED Indicator on the rear panel lights up if your UPS is plugged into an improperly wired AC power outlet. Check this indicator during installation of your UPS, or whenever the wiring in your building has been serviced. If the red LED is lit, call a qualified electrician.

The Indicator warns you if the ground wire is missing, if the input line and neutral wires are reversed, or if the neutral wire is overloaded. Faulty wiring prevents the safety features and surge protection circuits built into the UPS from operating properly.

If your building's wiring has been checked and is OK and the Indicator is still lit, call Customer Service for assistance.

**Note:**

1. Do not leave the UPS ungrounded by using a 3-pin to 2-pin plug adapter.
2. The site wiring fault indicator is not a feature of the 230V models.

### **2.5 User Configurable Settings**

You can configure the operating parameters of your UPS to meet your application or geographical requirements. For the 280E and 420E models, use the DIP switches on the rear panel (*see the chart on the next page*). For the 650E, 1000E and 1400E models, use *OPTI-SAFE™+* (*see the OPTI-SAFE™+ User's Guide*).

Two of the adjustable parameters are low and high voltage "transfer points." A transfer point is the predetermined voltage at which the UPS transfers to battery power. On the 120V *OPTI-UPS™* models, the low transfer point set by the factory is approximately 92.6V. The high transfer point is approximately 144V.

In a few locations, voltage may fluctuate widely, and a UPS may transfer to battery operation too often. As a result, the battery may not be at full capacity if there is a complete power failure. If this is the case for you, you may adjust the low and high voltage transfer points so that your battery capacity is not unnecessarily drained.

*The adjustable parameters for all models are:*

- **Low Voltage Transfer Point:** lowers the transfer point by 5V
- **High Voltage Transfer Point:** raises the transfer point by 5V
- **Low Battery Warning Time:** increases from two minutes to five minutes the low battery warning before shutdown. This adjustment is useful if your UPS is protecting a computer system that requires the extra time to shut down before power loss.
- **Delay Audible Alarm in Backup Mode:** disables the audible alarm during a power failure until the battery power is low. This adjustment is useful in areas in which the alarm may be annoying because of frequent short power interruptions.

Function	Switch Up	Switch Down
Low Transfer Point	5V lower	default
High Transfer Point	5V higher	default
Low Battery Alarm	5 minutes	2 minutes
Delay Audible Alarm	enabled	disabled

**Dip Switch Settings (Models: 280E, 420E)**

## **2.6 Communication Port and Pin Assignments**

The communication port on the back of the UPS is for connection to a host computer. Many UPS's provide only a basic power failure warning. All *OPTI-UPS™* UPS's, together with *OPTI-SAFE™+* UPS communication software also provide you with important operating information. From your computer screen, you can determine input/output voltage, AC frequency, battery voltage, etc. (see the chart on the next page), and analyze power problems. *OPTI-SAFE™+* also automatically initiates graceful shutdown of the computer during a power failure.

*OPTI-SAFE™+* and a communication cable are included with the following models: 650E, 1000E, 1400E. If *OPTI-SAFE™+* is not part of your UPS package, you can purchase it from ViewSonic or your local dealer. The pin assignments for the connector on the communication cable are shown on page 12.



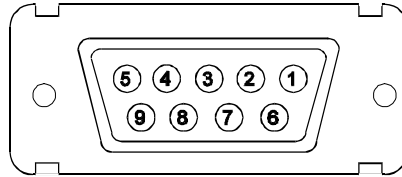
Using *OPTI-SAFE™*+, the following are some of the parameters you can monitor:

Input Voltage	Indicates the actual input voltage to the UPS when AC power is present
Output Voltage	Indicates the actual output voltage of the UPS
AC Frequency	Indicates the actual output frequency of the UPS
Battery Voltage	Indicates the actual DC voltage of the UPS battery
Change Battery	Indicates that the battery is dead and needs to be replaced
Percent Load	Indicates the percentage of UPS Voltage-Ampere (VA) capacity being utilized by your equipment
Temperature	Indicates the actual temperature inside the UPS ( <i>not available on 280E/420E</i> )

*OPTI-UPS™* UPS's also support UPS communication software which rely on basic "contact closure signals." The major functions of this type of software normally include some or all of the following:

- To broadcast a warning when power fails.
- To close any open files before the battery reserves are exhausted.
- To turn off the UPS.

Note: You can connect your computer to your UPS without also connecting to the communication port. In this case, your UPS warns you of a power failure by beeping, but you have to manually shut down your UPS and computer.

**Pin Assignment:**

<b>PIN1</b>	Remote Turn-on
<b>PIN2</b>	UPS simulates a relay closing between pin 2 and pin 4 when input power fails.
<b>PIN3</b>	Not connected
<b>PIN4</b>	Common for pin 2 and pin 5.
<b>PIN5</b>	UPS simulates a relay closing between pin 5 and pin 4 when the battery inside the UPS has less than 2 minutes backup time left.
<b>PIN6</b>	User sends a RS232 high level (5-15V) for 3 secs. This signal will turn off the UPS until proper input voltage returns. It can operate only if UPS is in battery mode. This pin is also used as the RS232 receiver pin ( <i>RXD</i> ).
<b>PIN7</b>	Common for pin 6 and pin 9.
<b>PIN8</b>	Not connected
<b>PIN9</b>	RS232 transmitter pin ( <i>TXD</i> ).

**Note:**

1. Pin 2 and pin 5 are open collector outputs which must be pulled up to a common referenced supply, switch rating: +40V, 0.15A non-inductive.
2. Pin 4 and pin 7 should only be connected to ground.

**2.7 Data-Line Surge Suppression**

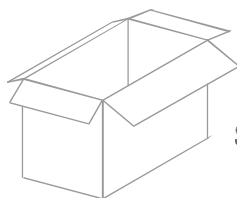
The data-line surge suppression on the rear panel provides an easy way to protect a network (*RJ45*) or modem (*RJ11*) connection from hazardous spikes. Connect a 10/Base-T network cable or a single line telephone into the "IN" socket. To complete the connection, connect another network cable or telephone line into the "OUT" socket. The network cable and telephone line are optional accessories, which may be purchased from your local dealer.

### 3. INSTALLATION AND OPERATION

*Before installation, please read and understand the following instructions:*

#### 3.1 Unpacking and Inspection

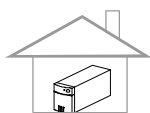
Examine the packing carton for damage. Notify the carrier immediately if damage is observed.



save the box

#### 3.2 Placement

1. This unit is intended for indoor use only. Although your UPS is very rugged, its internal components are not sealed from the environment.
2. The UPS must be installed in a protected environment away from heat-emitting appliances such as a radiator or heat register. Do not install this product where excessive moisture is present.



3. The location should provide adequate air flow around the UPS with one inch minimum clearance on all sides for proper ventilation.

### 3.3 Determining How Much Equipment You Can Connect to Your UPS

1. Make a list of all equipment that requires protection.
2. Each piece of equipment has voltage and current (VA) ratings printed on the back label (see *examples below*). Your equipment may have a voltage rating such as 88-264V. Since the standard voltage in the United States is 120V, you should use 120V in your calculations.

ViewSonic 21PS  $U_L$   
 SN: 30955555  
 120VAC 1.7A  
 50/60Hz

Computer Co.  $U_L$   
 486DX-4  
 SN: 123-456  
 120VAC 2.0A

3. Multiply the voltage and current of each piece of equipment (VA requirements); for example,  $120V \times 1.7A = 204VA$ ,  $120V \times 2.0A = 240VA$ .

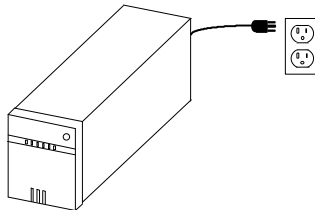
Add up the VA requirements for each device; for example,  $204VA + 240VA = 444VA$ .

4. Make sure that your UPS has at least as much VA capacity as your equipment requires.

Note: Normally 20% capacity reservation is recommended, i.e. connect 520VA (MAX.) load to a 650VA UPS

### 3.4 Powering Up Your UPS

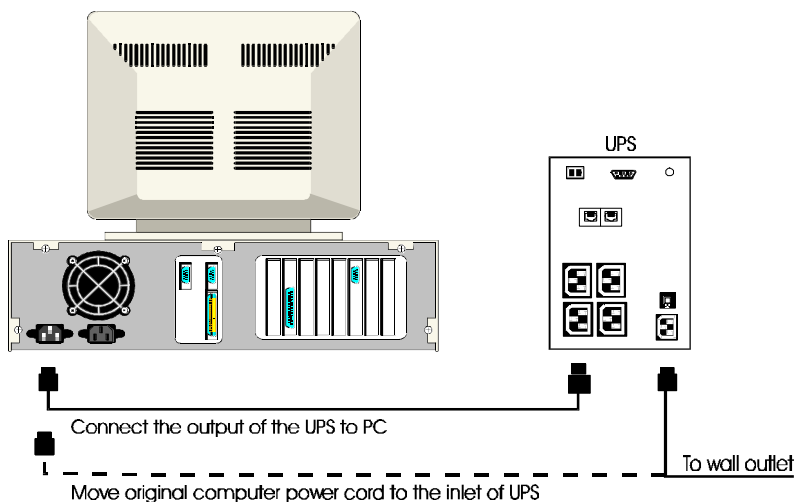
1. For 100/120V versions, connect the power cord to a verified grounded 3-wire receptacle. For 230V versions, please refer to Sec 3.5 .



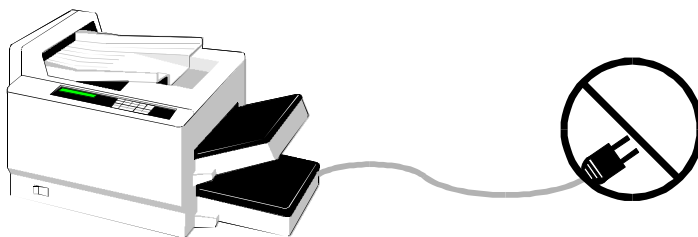
2. Power up the UPS by turning on the main switch on the rear panel.
3. **We recommend that you charge the battery for six (6) hours before first use of your UPS.** You may use the UPS immediately without charging the battery, but the backup time may be less than the rating. The UPS recharges the battery automatically whenever AC power is available.

### 3.5 Connecting Your Equipment to the UPS

1. For all *OPTI-UPS™* models except the 230V versions: connect the power cord(s) of your computer equipment to the output receptacle(s) of the UPS. Switch on the computer equipment.
2. For 230V versions, as shown in the illustration below: connect the input power cord of your computer equipment to the inlet of the UPS and the wall socket. Use the power cord supplied with the UPS to connect from the outlet of the UPS to your equipment. Switch on the computer equipment.



3. **DO NOT PLUG LASER PRINTERS INTO THE UPS BECAUSE THEY TYPICALLY DRAW TOO MUCH POWER**



### 3.6 Operation and Functional Test

1. Turn on the UPS by setting the rear panel main switch into position "I" or "on". On the 280E and 420E models, the UPS will beep and the front panel LED will light. On the 650E, 1000E, and 1400E models, the UPS will beep and the front panel Normal Mode LED will light.
2. The UPS may be overloaded if the following occurs:
  - On the 280E and 420E models, the buzzer sounds continuously and the LED is a constant orange color.
  - On the 650E, 1000E, and 1400E models, the buzzer sounds continuously and the Overload LED lights.

Unplug the least critical devices, such as a printer, etc. If the buzzer is still sounding, the battery or UPS may be faulty. Contact ViewSonic for assistance.

**Note:** *Backup all unsaved files before you perform the following functional test.*

3. To test the backup function, you may unplug the power cord of the UPS or simply press the Test/Silence Button on the front panel. During this test, observe that your equipment operates properly and without interruption. If you leave your UPS on continuously, it is a good idea to perform a backup function test at least once a month. You can configure OPTI-SAFE™+ to automatically perform this periodic test.

If you unplug the power cord, all models will beep once every 4 seconds. You can press the Test/Silence Button to silence the alarm. In addition, on the 280E and 420E models, the LED will flash on and off. On the 650E, 1000E, and 1400E models, the Battery Mode LED will light. Plug the power cord back in after a few seconds.

If you press the Test/Silence Button, all models will beep twice. In addition, on the 280E and 420E models, the LED will flash twice. On the 650E, 1000E, and 1400E models, the Battery Mode LED will light. When the test is over, the Normal Mode LED will light.

### 3.7 Storage Instructions

For extended storage in moderate climates, the battery should be charged for 12 hours every 3 months. Repeat it every 2 months in high temperature locations. On the 280E and 420E models, plug the power cord into the wall receptacle and turn on the main power switch. On the

650E, 1000E, and 1400E models, plug in the power cord. The main power switch does not need to be turned on.

## 4. SPECIFICATIONS

### 4.1 Electrical Specifications

Product Name	Frequency (Hz)	Output	
		Voltage (V)	Current (I)
UPS-280E	50/60	100	2.80
	50/60	120	2.33
	50/60	230	1.22
UPS-420E	50/60	100	4.20
	50/60	120	3.50
	50/60	230	1.83
UPS-650E	50/60	100	6.50
	50/60	120	5.42
	50/60	230	2.83
UPS-1000E	50/60	100	10.00
	50/60	120	8.33
	50/60	230	4.35
UPS-1400E	50/60	100	14.00
	50/60	120	11.67
	50/60	230	6.10

### Input/Output Voltage

AC Line Voltage		
Version	Lower Limit	Upper Limit
100V	78.0	120
120V	92.6	144
230V	179.4	264

Output voltage regulation:  $\pm 5\%$  (Backup Mode),  $\pm 10\%$  (AC Mode)

### Input/Output frequency range

Input	47.5 Hz ~ 52.5 Hz / 57.5 Hz ~ 62.5 Hz
Output (Inverter mode)	50 Hz / 60 Hz $\pm 0.1$ Hz

Wave form :



<b>AC Mode</b>	sine wave
<b>Back-Up Mode</b>	step-sine



**Transfer time:**

<b>Power failure AC <math>\Rightarrow</math> inverter</b>	<b>2 ms (typical)</b>
-----------------------------------------------------------	-----------------------

**Spike/Surge protection:**

Version	Continuous Voltage Vrms	Single pulse 8/20us	
		I <sub>max</sub>	Joules
100/120	150V	6500A	270
230	150V	6500A	90

**Data-Line Surge Suppression:**

<b>Telephone Line Surge Protection</b>	<b>+/- 6KV Peak (1.2mS/50 Waveform)</b>
<b>10 Base-T Protection Let Through Rating</b>	<b>&lt;1% (From 6KV/125A Normal Mode Surge)</b>

**Audible alarm:**

<b>Battery discharge at power failure</b>	<b>Beep every 4 seconds</b>
<b>Battery approaches final discharge</b>	<b>Beep every second</b>
<b>Overload</b>	<b>Continuous buzzer</b>
<b>UPS faulty</b>	<b>Continuous buzzer</b>

**BATTERY AND CHARGER**

Battery type: Maintenance-free sealed-lead acid. Recharge time 6 to 8 hours typical from total discharge. *(UPS may be used immediately after discharge but will provide shorter backup time)*

**Battery Specifications:**

	<b>280E</b>	<b>420E</b>	<b>650E</b>	<b>1000E</b>	<b>1400E</b>
DC voltage	12V	12V	12V	18V	24V
Type	12V 7AH	12V 7AH	12V 11AH	6V 11AH	12V 11AH
Quantity	1	1	1	3	2
Recharge time	8 hours		6 hours		

**4.2 Mechanical Specifications:**

Product Name	Dimensions	Weight (Kg)	
		Net	Gross
<b>UPS-280E</b>	103x298x148	6.7	7.3
<b>UPS-420E</b>	103x298x148	7.4	8.0
<b>UPS-650E</b>	139x427x195	13 Kg	14.5 Kg
<b>UPS-1000E</b>	139x427x195	16 Kg	17.5 Kg
<b>UPS-1400E</b>	139x427x195	19.5 Kg	21 Kg

**4.3 Environmental Specifications:**

	Operating	Storage and Shipment
<b>Temperature</b>	0 ~ 40°C (32° ~ 104°F)	-20° ~ +60°C (-4° ~ +140°F)
<b>Humidity</b>	5 ~ 90% (non-condensing)	5 ~ 90% (non-condensing)
<b>Altitude</b>	3,000 m (10,000 ft) (Max.)	12,000 m (40,000 ft) (Max.)



## 5. TROUBLESHOOTING

The TROUBLESHOOTING CHART on the next page covers most of the difficulties that you may encounter under normal working conditions. If the UPS fails to operate properly, please review the following steps before calling the repair center:

1. Is the UPS plugged into a proper working outlet?
2. Is the line voltage within the rating specified?
3. Does the circuit breaker on the rear panel need to be reset?



*Please do not open the metal cover.  
There are no user serviceable parts inside.*

## 5.1 Troubleshooting Chart

### Models 280E / 420E Troubleshooting

Problem	Possible Cause	Corrective Action
UPS can not turn on and has no audible alarm	UPS rear panel main switch is off.	Turn on switch.
LED flashes orange and UPS beeps every 4 seconds when incoming line is thought to be normal	No incoming line or very low or very high line voltage.	Check the wall socket and test the input line voltage.
	UPS input power cord is not plugged in.	Plug in input power cord.
	Rear panel circuit breaker is tripped.	Reduce the load and reset the circuit breaker.
UPS has an orange LED & continuous beeping alarm.	UPS is overloaded.	Remove the least critical devices from the load.
UPS has an orange LED & continuous beeping alarm.	UPS is faulty.	Call for ViewSonic Customer Support.
Front panel LED is always orange color.	Too low battery voltage. Dead Battery.	Recharge the battery and reset.
Site Wiring Fault LED is on.	Site wiring problem	Call an electrician to check your wiring.
UPS transfers to the back-up mode easily.	Transfer point voltage is set too low or too high.	Set dip switch #1 and #2 to the up position.
Back-up time is less than the rating.	Battery is not fully charged or the battery is dead.	Recharge the battery for 6 hours and retest the backup time.
UPS is normal but the computer won't turn on.	Computer input power cord is loose or not connected.	Reconnect computer input power cord.
UPS is in Back-up mode but the alarm is not beeping.	Dip switch #4 is set to the up position.	Turn dip switch #4 down.
Communication function not working	Wrong interface cable	Purchase the correct one from your distributor
	The serial port of the computer has not been configured properly.	Check to see that the settings match those of OPTI-SAFE™+.
	The I/O card is defective	Replace I/O card.

## Models 650E / 1000E / 1400E Troubleshooting

Problem	Possible Cause	Corrective Action
UPS can not turn on and has no alarm.	UPS rear panel main switch is off.	Turn on switch.
Battery LED ( <i>amber</i> ) is lit and UPS beeps every 4 seconds when incoming line is thought to be normal.	No incoming line or very low or very high line voltage.	Check the wall socket and test the input line voltage.
	UPS input power cord is not plugged in.	Plug in input power cord.
	Rear panel circuit breaker is tripped.	Reduce the load and reset the circuit breaker.
The UPS Overload LED ( <i>red</i> ) is always lit & there is a continuous sounding alarm.	UPS is overloaded.	Remove the least critical devices from the load.
The UPS Battery Weak LED ( <i>red</i> ) is always lit.	Too low battery voltage. Dead battery.	Recharge the battery and reset.
Site Wiring Fault LED is on.	Site wiring problem.	Call an electrician to check your wiring.
UPS transfers to back-up mode easily.	Transfer point voltage is set too high or too low.	Use <i>OPTI-SAFE™+</i> to reprogram the EEPROM accordingly. (See Sec. 2.5)
Backup time is less than the rating.	Battery is not fully charged or battery is dead.	Recharge the battery for 24 hours and re-test the backup time. If problem remains, replace the battery.
UPS is normal but the computer won't turn on.	Computer input power cord is loose or not connected.	Check the computer input power cord.
UPS is in back-up mode but the alarm is not beeping	The EEPROM of the UPS has been set to Delay Audible Alarm.	Use <i>OPTI-SAFE™+</i> to reprogram the EEPROM of the UPS. (See Sec. 2.5)
Communication function not working	Wrong interface cable.	Purchase the correct one from your distributor
	The serial port of the computer has not been configured properly.	Check to see that the settings match those of <i>OPTI-SAFE™+</i> .
	The I/O card is defective	Replace I/O card.



## 6. User Replaceable Battery

The Batteries inside this UPS should last from between 3 to 5 years. If you suspect that the batteries are weak, allow the UPS to charge the batteries for at least six hours and then test the backup time. If the UPS still does not provide adequate backup time, follow the procedures below to replace the batteries. Please read section 6.1 before performing the procedure in sections 6.2 or 6.3.

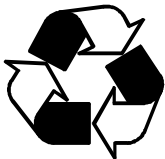
### 6.1 Warning

**Servicing of batteries should always be performed or supervised by personnel knowledgeable of batteries and required precautions. Please read the following cautions before replacing the batteries. Keep un-knowledgeable (i.e., unauthorized) personnel away from the batteries.**

**CAUTION:** Except for the battery, the unit contains no user serviceable parts. Repairs should be performed only by factory trained service personnel.

**CAUTION:** A battery can present a risk of electrical shock and high short-circuit current. The following precautions should be observed when working on batteries:

- (1) Remove watches, rings, or other metal objects.
- (2) Use tools with insulated handles.



*The batteries contained in this Uninterruptible Power System are recyclable. The batteries contain lead and pose a hazard to the environment and human health if not disposed of properly.*

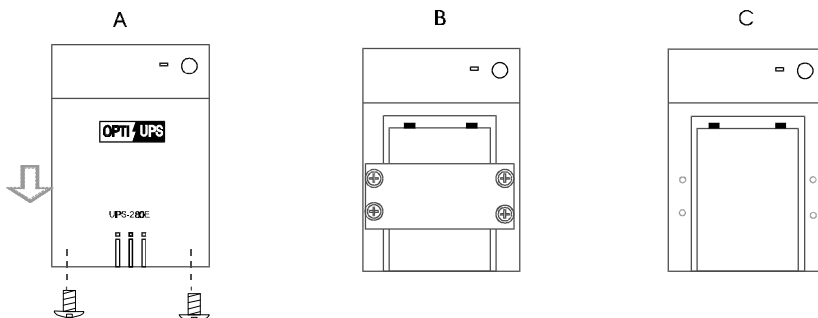
**CAUTION:** Do not dispose of batteries in a fire. The batteries may explode.

**CAUTION:** Do not open or mutilate batteries. They contain an electrolyte which is toxic and harmful to the skin and eyes.

**CAUTION:** When replacing batteries, use the same number and the following type batteries: sealed Lead-Acid Maintenance Free (280E: **one 7AH/12V**) (420E: **one 7AH/12V**) (650E: **one 11AH/12V**) (1000E: **three 11AH/6V**) (1400E : **two 11AH/12V**)



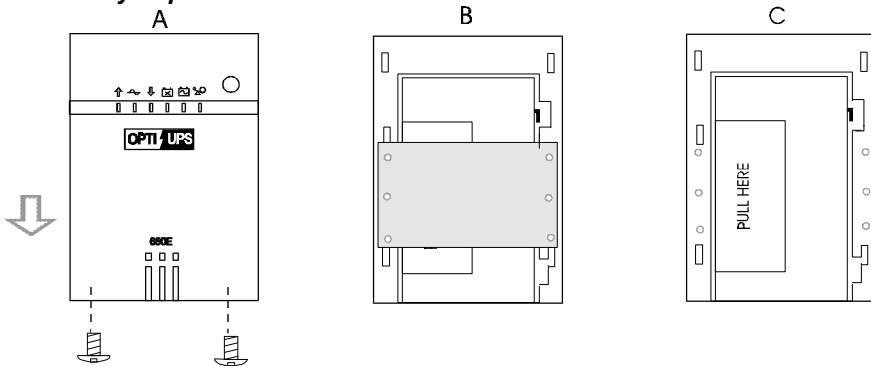
## 6.2 Battery Replacement Procedure for 280E / 420E



Changing the batteries in your *OPTI-UPS™* is a safe and easy procedure. Since the battery is isolated from the AC input you may leave your UPS and computer or other equipment on during the following procedure. Please note that if you choose to leave the UPS on when the battery is removed, it will not be able to power your equipment if a power failure occurs. Please read the cautions in section 6.1 before performing the following steps.

1. Remove the two small screws from the bottom of the front panel.
2. Gently slide the front panel off. (*diagram A*)
3. Remove the battery retaining plate by loosening the four screws holding it in place. (*diagram B*)
4. Gently pull out the battery.
5. Disconnect the two wires connecting the battery to the UPS; try to avoid crossing the wires.
6. Connect the wires to the new battery (**the red wire is +, the black wire is -**).
7. Push the new battery into place.
8. Reposition the battery retaining plate and tighten the four screws.
9. Slide the front panel back into place.
10. Tighten the two small screws on the bottom of the front panel.

### 6.3 Battery Replacement Procedure for 650E / 1000E / 1400E



Changing the batteries in your *OPTI-UPS™* is a safe and easy procedure. Since the battery is isolated from the AC input you may leave your UPS and computer or other equipment on during the following procedure. Please note that if you choose to leave the UPS on when the battery is removed, it will not be able to power your equipment if a power failure occurs. Please read the cautions in section 6.1 before performing the following steps.

1. Remove the two small screws from the bottom of the front panel.
2. Gently slide the front panel off. (*diagram A*)
3. Remove the battery retaining plate by loosening the six screws holding it in place. (*diagram B*)
4. Gently pull out the battery by the tape attached to it. (*diagram C*)
5. Disconnect the two wires connecting the battery to the UPS; try to avoid crossing the wires.
6. Connect the wires to the new battery (**the red wire is +, the black wire is -**).
7. Push the new battery into place.
8. Reposition the battery retaining plate and tighten the six screws.
9. Slide the front panel back into place.
10. Tighten the two small screws on the bottom of the front panel.