

# **Fiskars PowerServer 10 User's manual**

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# **Fiskars PowerServer 10**

## **User's manual**

FP-number 1003752  
Revision E

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# Introduction

Congratulations! By purchasing Fiskars' PowerServer 10™ Uninterruptible Power Supply (UPS), you now own superior quality power protection equipment. Your sensitive electrical equipment will be protected from problems associated with poor quality utility power, or a complete loss of utility power. The PowerServer 10 UPS will provide you with outstanding performance and reliability as it protects your personal and business computer systems, workstations, file servers, small medical equipment, small telecommunication equipment, or other compact electrical devices.

PowerServer 10 UPS uses highly advanced stand-by technology with sophisticated features like

- Advanced Battery Management™
- Line voltage regulation for high and low line
- High performance electric noise filter
- Intelligent and fast transfer logic
- Multipurpose communication port

## PowerServer 10 UPS has two operational modes:

In normal operation (line operation) PowerServer 10 regulates and filters the utility power and feeds it to the protected load system.

In case of too low or too high or complete loss of utility power PowerServer 10 quickly transfers to battery operation, in which the inverter supplies the load with clean sinewave voltage. Information about battery operation can be transferred to the protected computer, for example for automatic computer shutdown by using the communication facilities of the UPS in conjunction with optional cables and software. The use of batteries can also be optimized by shutting down the UPS after computer shut-down via the computer connection or automatically, when the load is disconnected.

This manual contains all the necessary information for the user to install and operate PowerServer 10 UPS. If questions rise or service is needed contact your local PowerServer 10 dealer for assistance.

# Preparation

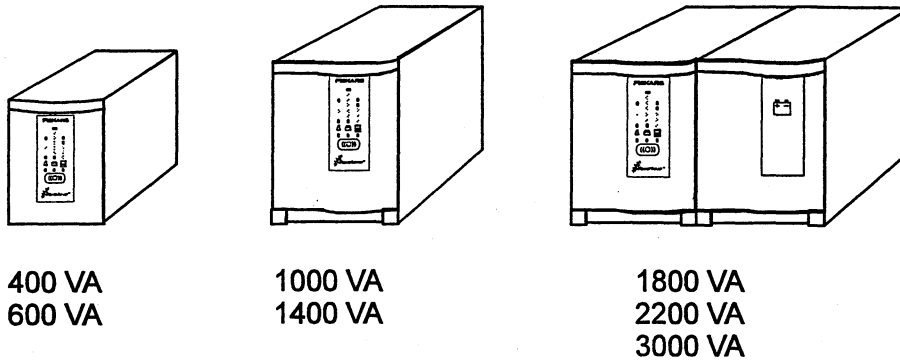
It is important to become familiar with your UPS and understand its different parts and functions. This chapter briefly describes some important information that you need to know before using your equipment.

## Check your equipment

Check your equipment for damage. If any equipment has been damaged during shipment, keep the shipping cartons and packing materials for the carrier or place of purchase, and file a claim for shipping damage within 7 days. If you discover damage after acceptance, file a claim for concealed damage.

## Overview of Equipment

PowerServer 10 product family consists of seven different power ratings: 400 VA, 600 VA, 1000 VA, 1400 VA, 1800 VA, 2200 VA and 3000VA. Output outlets of all models are IEC320 connectors. The 1800 VA, 2200 VA and 3000 VA systems consist of two modules, a UPS module and a battery module, which are connected together onsite. The UPS module can be placed either beside or on top of the battery module.

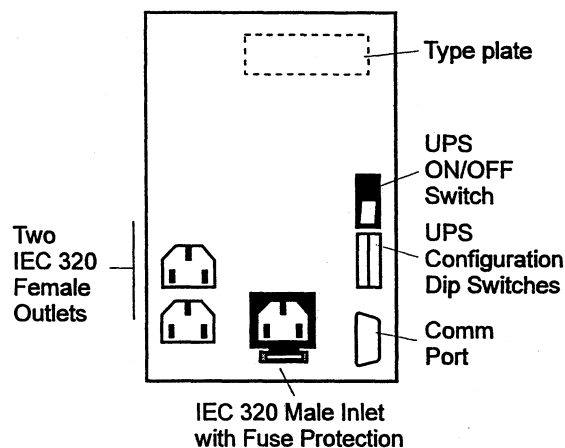


## Rear Panels

Although similar, the rear panels of the various models have different configurations. Find here the drawing of the rear panel for your unit and become familiar with it.

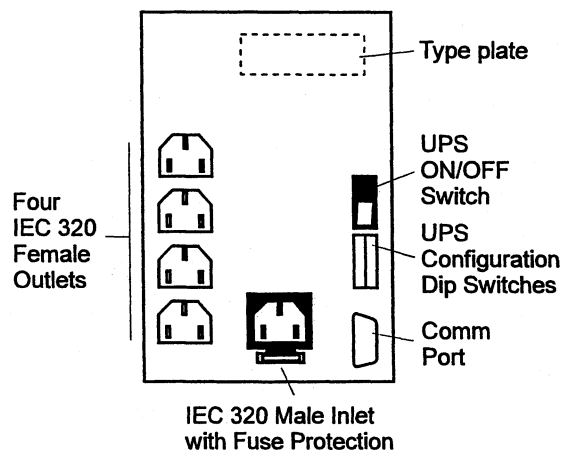
### Models:

PS10/0.4 - IEC



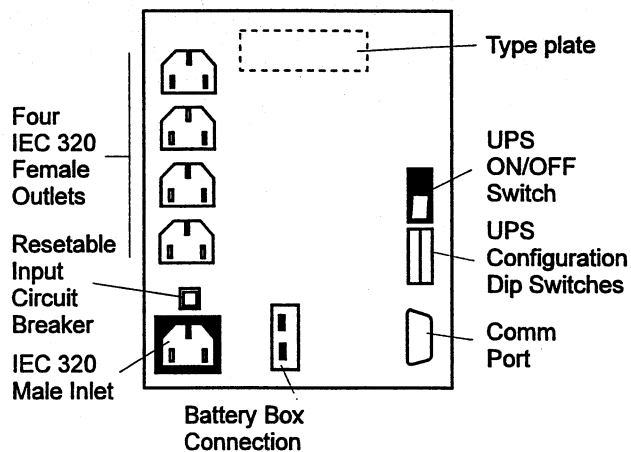
### Models:

PS10/0.6 - IEC



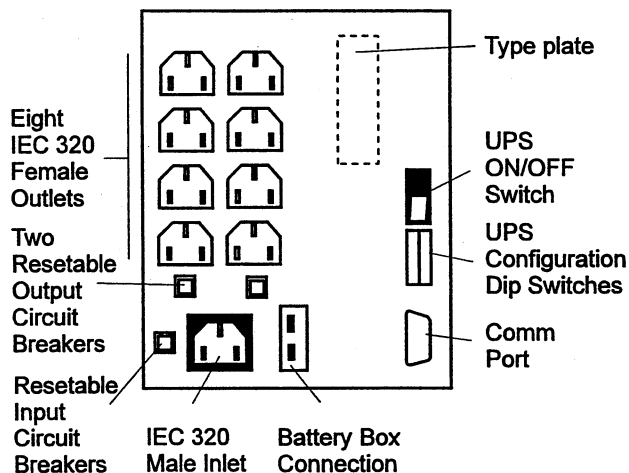
### Models:

PS10/1.0 - IEC  
PS10/1.4 - IEC  
PS10/1.8 - IEC  
PS10/2.2 - IEC



### Models:

PS10/3.0 - IEC



## Rear Panel Controls

This section briefly describes the three items that are common to all models of PowerServer 10 products. These items will also be described in more detail in the installation and operation sections of this manual.

### UPS ON/OFF Switch

This switch is located at the rear of each UPS unit. When the switch is ON, it allows the UPS to operate normally when the UPS is plugged into the mains supply. When the switch is OFF, it prevents the UPS from operating.

### UPS Configuration DIP Switches

All PowerServer 10 UPSs have a set of DIP switches located on the rear panel. DIP switches are user-defined and are used to configure the UPS. If any of the switches are changed during UPS operation, these changes will not be noticed until the UPS is powered down and powered up again.

### Communication Port

Also located on all rear panels is the Communication Port (D-9 female connector). This port allows the UPS to report its status to a remote host computer when connected. The UPS will work normally whether or not you use the port. The port operates either in contact or RS232 mode depending on the application.

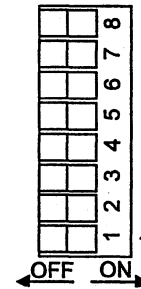
## Front Panel Display

The front panel display of all units contains LEDs (or lights) that give you information and warnings about the unit's operation. The display functions are discussed in more detail in the operation section.

# Installation Instructions

Follow the simple step-by-step instructions for installation:

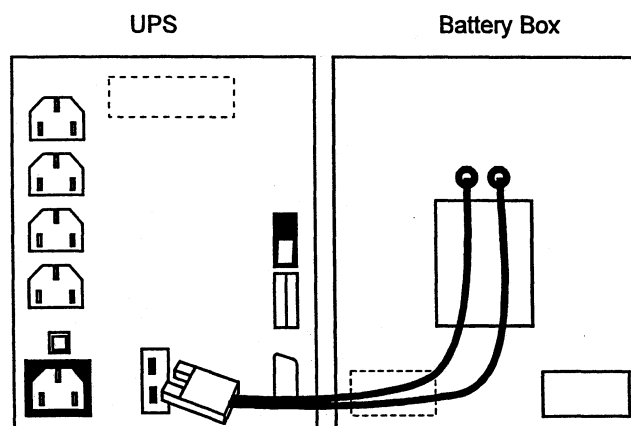
- 1 Set up the Dip Switches according to the following Dip Switch Configurations table. If any switches are changed while the unit is running, the changes will not take effect until the unit is completely powered down and then turned back on.



## Dip Switch Configurations

No	Position	Function
1&2	OFF	230 V
1	ON	240 V
2	OFF	220 V
1	OFF	220 V
2	ON	230 V with extended operating voltage range
1&2	ON	Enable alarm for site wiring fault
3	OFF	Disable alarm for site wiring fault
3	ON	Approximately 2 minutes backup after low battery alarm
4	OFF	Approximately 5 minutes backup after low battery alarm
4	ON	Enable < 5% load auto shutdown (after 5 mins on battery)
5	OFF	Disable < 5% load auto shutdown
5	ON	Shutdown delay 5 sec
6	OFF	Shutdown delay 180 sec
6	ON	Enable audio alarm for AC input failure
7	OFF	Disable audio alarm for AC input failure
7	ON	Auto-frequency selection priority 50 Hz
8	OFF	Auto-frequency selection priority 60 Hz
8	ON	

- 2 For the 1800 VA, 2200 VA and 3000 VA units attach the PRA battery box plug into the UPS battery box connection.



### Caution!

**DO NOT** disconnect the battery box from the UPS while the UPS is ON. This can damage equipment.

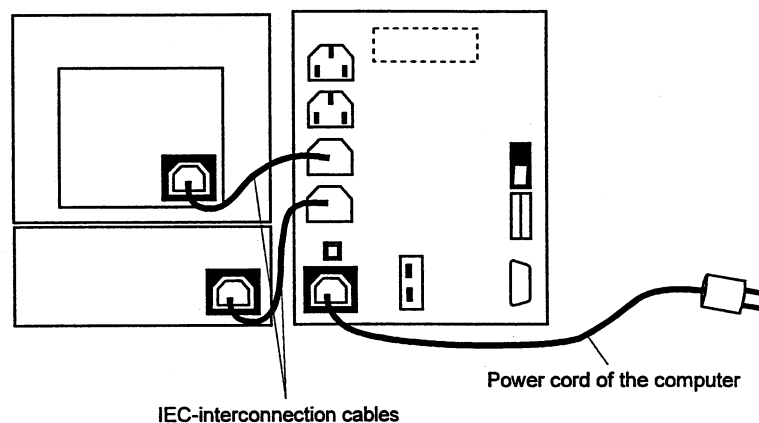
- 3 To establish communication between the UPS and the computer, plug an optional UPS/Computer interface cable into the Communication Port and into the UPS dedicated port at the computer. Use only the optional factory-supplied cable and software. The UPS will operate normally whether or not you use the Communication Port.

- 4 The actual line and load connections depend on the UPS model:

To maximise the reliability of your system make sure that the outlet used has its own fuse according to the table in page 10 and that the fuse is not feeding any other load.

The models are connected to the utility mains by using the input power cord of the main load equipment, for example the microcomputer. (Make sure the power cord can handle the rated input current of the UPS.) The load or loads are then connected to the UPS using the IEC interconnection cables provided with the UPS.

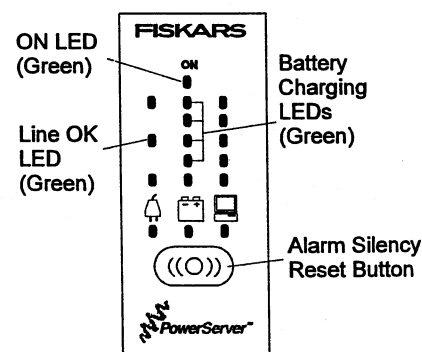
Example:



- 5 Move the UPS ON/OFF-switch to the ON position. Wait for a few seconds while the UPS performs its initial self-diagnostic check-up.

ON ☒ 1  
OFF ☐ 0

- 6 Wait for the green ON, LINE OK, and BATTERY Charging LEDs to appear on the front panel of the UPS. Push the Alarm Silence/Reset Button, if any red LEDs appear. If any red LEDs still appear, see Operation and Troubleshooting sections.



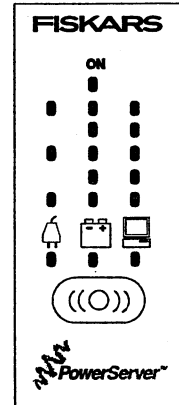


# Operation


As the unit powers up, it will go through a self-diagnosis for the first few seconds. The diagnostics looks at the utility line to see if the grounding is properly connected. If the grounding is OK, the unit will start up. If there are any problems, the front panel LEDs will indicate the problem, an audio alarm will sound, and, depending on the nature of the problem, the unit may not start up. This section explains the operation of the UPS. See the Troubleshooting Section for more information.

## Front Panel


The front panel of all PowerServer 10 UPSs is the same. Each front panel contains LEDs that give you information and warnings about the unit's operation. Also on the front panel there is the Alarm Silence/Reset Button. The following descriptions explain the LEDs and the Alarm/Silence/Reset Button.



### ON


 (green)

The green **ON LED** is on when output voltage is available. The LED may blink during diagnostics even if output is present.


 (red)

The four **AC Input LEDs** indicate input line connections and conditions.

**Top LED: Red.** This LED will be solid red, when the **Line is Too High** (overvoltage condition) and the UPS is in battery operation. After the battery backup is used up, the LED will flash for 10 minutes. It will also flash when the normal line returns until you push reset button. If the normal line returns before battery shutdown, the LED will turn off.


 (green)

**Middle LED: Green.** This LED will be on when the **Line is OK**.

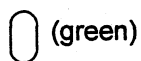
 (red)

**Bottom LED: Red.** This LED will be solid red when the **Line is Too Low** (undervoltage or line failure condition) and the UPS is in battery operation. After the battery backup is used up, the LED will flash for 10 minutes. It will also flash when the normal line returns until you push reset button. If the normal line returns before battery shutdown, the LED will turn off.



 (red)

**LED below: Red. Site Wiring Fault LED** will be on, if either the ground connection does not exist or the line and neutral wires are reversed in the line receptacle. This LED will stay on until the condition is fixed or the alarm disabled by the customer using the dip switches(see the DIP Switch Configuration tables in Installation section). The unit may not start if this LED is on.

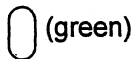


The first five **Battery LEDs** describe battery charge conditions in the form of a bar graph.



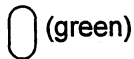
**Normal operation:**

One or more of the green LEDs are on depending on the battery charging state.



**Transfer to battery operation at AC Input fault:**

The top four LEDs will be on (green). As the battery energy declines, the bar graph reduces, with the LEDs turning off from top to bottom.



**Battery low and impending shut-down:**

The top four LEDs are off and the red LED is on when there is about 2 or 5 minutes of battery backup left. (Dip Switch 4)



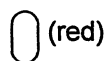
**Battery exhausted before line returns:**

The red LED will flash for 10 minutes. It will also flash when the line returns until reset button is pushed.

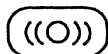


**Line returns:**

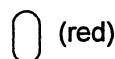
The red LED turns off and the remaining four light up from bottom to top as the batteries are charging. Once the batteries are fully charged, the four green LEDs will remain on unless there are further problems.



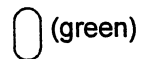
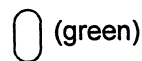
The red **Battery Problem LED** will be on when a potential battery problem is detected. If the reset is pushed, this LED will continue to flash until service is performed.



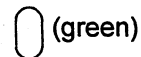
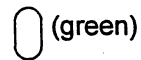
**Alarm Silence/Reset Button.** The alarm will sound at any new alarm condition. If the problem is resolved or the Alarm Silence/Reset is pushed, the buzzer will go off. But, if you push the Alarm Silence/Reset button and the problem still exists, the alarm will sound every 4 seconds until the problem is removed. A long pressing of this button will activate internal self-test, including a battery discharge test for about 30 seconds.



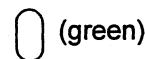
The first five **Load LEDs** describe information about the amount of load in the form of a bar graph.



The four green LEDs show either the load current or load watts (whichever is higher) in steps of (over) 5%, 25%, 50% and 75% of full rating.



The top (red) LED turns on when load current or wattage exceeds full (100%) load (overload condition). When normal load is restored, this top LED will turn off.



The green **Communication LED** will turn on after the UPS receives a command code from a computer to establish serial communication. This LED will flash during data transfer via the Communication Port. (The Communication LED is activated only, when using the optional software at the computer.)

## Communication Port Configurations

The Communication Port operates in two modes, a relay interface mode and a serial interface mode. The default mode is the relay mode, but it changes automatically to the serial mode if a valid serial UPSCode command is detected. To return to relay mode, the UPS must be turned off. The pins of the D-9 connector have the following functions depending on the operating mode:

Pin	Function	Relay interface mode	Serial interface mode
1	Input	UPS shutdown  - During battery operation user can send a high RS232 level for 4-5 seconds to turn off the UPS until proper mains voltage returns. Active only if UPS is in battery operation.  - If user sends a serial UPSCode command into this pin, the interface automatically changes to serial interface mode.	RS232 Serial input  - Accepts commands in UPSCode serial format  - User can send a high RS232 level for 4-5 seconds to turn off the UPS until proper mains voltage returns. Active only if UPS is in battery operation.
2	Output	Line failure (RS232 level)  - UPS sends a high RS232 level within 1 second of a line failure. This pin is normally low..	RS232 Serial output  - UPS sends UPSCode messages through this pin.
3	Output	Line failure closing contact  - UPS simulates a relay closing between pin 3 and pin 4 (common) during line failure.	Not valid
4	Common	Common terminal  - Common terminal for pins 1,2,3,5,6,7 and 8	RS232 Ground
5	Output	Battery low closing contact  - UPS simulates a relay closing between pin 5 and pin 4 (common) when the battery has 2 or 5 minutes of backup time left.	Not valid
6	Output	Line failure opening contact  - UPS simulates a relay opening between pin 6 and pin 4 during line failure. Operates simultaneously with pins 2 and 3.	Not valid
7	Input	UPS output off  - UPS output can be turned OFF by maintaining the pin low or common. UPS output returns when pin is high or open. UPS ON/OFF switch must be ON.	Not valid
8	Output	Unregulated +24Vdc  - Voltage is present whenever the UPS is ON. Short circuit protected.	Not valid
9	Ground	Chassis ground	Chassis ground

**NOTE! Switch rate max 24 VDC 50 mA non-inductive.**

The RS232 port operates in UPSCode II mode and has the following format:

Baud rate: 1200  
Bits: 8  
Parity: none  
Start: 1 bit  
Stop : 1 bit  
Handshake: Xon/Xoff

More information about Fiskars Serial Interface Protocol of the PowerServer 10 Series (UPSCode) is available in FPS document no. 1003553.

## Maintenance

### Preventive Maintenance

The best preventive measure is to keep the area around the unit clean and relatively dust free.

### Battery Life Expectancy

The batteries are designed to last between 3 and 6 years. By keeping the unit at an ambient temperature below 25°C, the full battery life can be achieved providing that battery usage is not abnormal. For better overall system reliability and battery monitoring, the UPS must remain plugged into AC power with its ON/OFF Switch in the ON position even if the load is off or disconnected.

### Battery Recharging

If the UPS ON/OFF Switch is left in the ON position, the UPS will automatically start recharging the battery when AC power is returned after a power failure.

### Storing the UPS

If you are going to store the UPS unplugged, turn the UPS ON/OFF Switch OFF. If you store the UPS for a long period, recharge the battery every six months by plugging the UPS into the utility power and turning the UPS ON/OFF Switch ON. If you continue to store the UPS, turn the UPS ON/OFF Switch OFF after charging the UPS for 8 to 12 hours.

### Regular Maintenance

There is no user maintenance other than battery charging. If there are any problems, repairs must be carried out by the factory or a factory-authorized service organisation.



**Warning!**

**HAZARDOUS MATERIALS.** Batteries may be contain HIGH VOLTAGES, and CAUSTIC, TOXIC and FLAMMABLE substances. Batteries can injure or kill people and damage equipment if used improperly. **DO NOT DISCARD unwanted batteries or battery material in the public waste disposal system. Follow ALL applicable, local regulations for the storage, handling and disposal of batteries and battery materials.**



## Technical specifications:

### Electrical Input

Voltage	220, 230 or 240 Vac $\pm$ 20% (selectable) or extended 230 Vac $\pm$ 25% (selectable)
Frequency	50 Hz/60 Hz $\pm$ 5% (autoselection)
Current	see table
Power Connection	IEC 320, 10 A male connector

### Electrical Output

Power	see table
Voltage	220, 230 or 240 Vac (selectable) 230 Vac on battery operation
Regulation	$\pm$ 5% on battery operation + 6/-10% on line operation +10/-15% on extended (230 V) range
Distortion	< 5% on linear load (inverter) until 'battery low'

Frequency	50 Hz/60 Hz (autoselection)
Transfer delay	typ 2 ms max 4 ms
Overcurrent protection	Active current limit and short-circuit protection
Power Connections	2 or 4 or 8 pcs IEC 320, 10 A female connectors

### Battery

Type	sealed lead-acid batteries
Backup time	> 5 min with rated loads (see table and Appendix 1)
Recharge time	< 5 hours

### Physical

Temperature	0 - 40°C, operating, recommended 20 - 25°C
Humidity	0 - 95% non-condensing
Audible noise	less than 40 dBA, normal operation
Radio interference	according to EN 55022 level B
Safety	according to IEC 950 and EN 50091-1

Dimensions	see table
------------	-----------

Model	Output (VA)	(W)	Input (A)	Full NLL back-up time (min)	Dimension (W x H x L)mm	Weight (kg)
PS10/0.4	400	280	2.6/2.5/2.4	8	114 x 165 x 400	12
PS10/0.6	600	420	3.7/3.5/3.4	5	114 x 165 x 400	12
PS10/1.0	1000	700	5.9/5.7/5.4	6	178 x 229 x 426	19
PS10/1.4	1400	980	8.0/7.7/7.5	6	178 x 229 x 426	25
PS10/1.8	1800	1260	9.3/8.9/8.6	12	2 x 178 x 229 x 426	14 + 30
PS10/2.2	2200	1540	10/10/10	10	2 x 178 x 229 x 426	14 + 30
PS10/3.0	3000	2100	13.6/13.0/12.5	8	2 x 178 x 229 x 426	19 + 30

# Troubleshooting Guide

If you have followed the instructions in this manual but are having problems operating your equipment, read this section.

Sympton	Possible cause	What to do
UPS will not start	Line cord is not connected  UPS ON/OFF Switch is OFF  Wall socket is dead  Battery Box is missing or not plugged in  Nominal Input Voltage is too high  Nominal Input Voltage is too low	Connect line cord  Turn Switch ON  Test wall socket  Plug in Battery Box  For 240 V: Dip Switch 1=ON, 2=OFF  For 220 V: Dip Switch 1=OFF, 2=ON
Low Battery Alarm does not give enough warning time before battery runs low	Dip Switch 4 is ON	Put Dip Switch 4 OFF
Site Wiring Fault LED is red	Wrong input plug polarity  Ground wire or connection does not exist in wall socket  Line & neutral wires are reversed in wall socket  Dip Switch 3 is OFF	Turn the input plug around in wall socket  Have a qualified electrician establish ground connection  Have a qualified electrician correct the wiring  Put Dip Switch 3 ON if you want to ignore the fault condition. Follow your local codes
Site Wire Fault LED is off when there is a problem	Dip Switch 3 is ON	Put Dip Switch 3 OFF
Alarm continues to sound after Silence Button is pushed	Serious problem still exists	Fix problem according to LEDs or contact service centre.
Battery Problem LED is red	Potential battery failure or old battery	Save your work but leave it powered up. Initiate the self-diagnostics procedure by pressing the reset button. If the LED stays on after the test, contact service center.

Top LED above Load symbol is solid red	Overload condition	Determine if load(s) is defective or too many loads are connected to the UPS
Bottom LED above Battery symbol is solid red	2 or 5 minutes of battery backup left (with normal load and full charge)	Be prepared to lose power to load
Top LED above AC Input symbol is solid red*	Line voltage is too high; UPS in battery operation	Correct input voltage if possible or be prepared to lose power to load.
Top LED above AC Input symbol is flashing red	Battery is discharged and inverter has stopped. Line has returned but reset was not pushed	Wait until power returns to normal  Press reset
Bottom LED above AC Input symbol is solid red*	Line voltage is too low; UPS in battery operation	Re-establish input voltage if possible or be prepared to lose power to load.
Bottom LED above AC Input symbol is flashing red	Battery is discharged and inverter has stopped. Line has returned but reset was not pushed	Wait until power returns to normal  Press reset

\* If the UPS continuously displays a solid red top or bottom LED above the AC Input symbol, the Dip Switches for the nominal input may be set incorrectly. Have the mains voltage checked over 24 hours then reset Dip Switches 1 and 2.

# Appendix

## Typical run times and examples of computers supported

Load	Typical run time in minutes for UPS models:							Computer example
(VA)	UPS 400VA	UPS 600VA	UPS 1000VA	UPS 1400VA	UPS 1800VA	UPS 2200VA	UPS 3000VA	
75	50	50	76					Typical ASCII terminal
100	40	40	60					Macintosh SE/30
150	26	26	43					Sun Sparc-Station IPC
200	18	18	33	60	180			IBM PC/XT or PC/AT
250	15	15	27	45	140			IBM PS/2 55sx w/VGA
300	11	11	22	35	120	120	120	DEC Station 3100
350	9	9	19	28	100	100	100	HP Vectra 486 w/VGA
400	8	8	16	24	80	80	80	Compaq 486/33 w/monitor
450		77	14	21	65	65	65	2 IBM PC/XT or PC/AT
500		6	13	18	55	55	55	Compaq SystemPro Server
550		6	11	17	50	50	50	HP 9000/837S
600		5	10	15	45	45	45	2 Compaq 386/33 w/VGA
700			8	14	40	40	40	IBM RS/6000-53 w/color monitor
800			7	13	34	34	34	IBM AS/400 D20 Minicomputer
900			6	12	28	28	28	DEC MicroVax 3600
1000			6	10	25	25	25	3 HP Vectra 486 w/VGA
1200				7	21	21	21	SUN 4/280
1400				6	17	17	17	DEC VAX 4000/300
1600					14	14	14	5 DEC Station 3100
1800					12	12	12	6 Mac IIFX w/monitor
2000						11	11	6 IBM PS/2-90 w/VGA
2200						10	10	5 Compaq 486/33 w/monitor
2400							9	4 HP 9000/837S
2600							8	8 Compaq 386/33 w/VGA
2800							7	3 DEC MicroVax 3600
3000							6	10 Mac IIFX w/monitor

### Note.

The power requirements and the back-up times may differ due to the actual system configuration