

ups

LEVEL 3

**CENTOR** UNINTERRUPTIBLE POWER SUPPLY

ONLINE DOUBLE CONVERSION TECHNOLOGY

6kVA - 15kVA



**USER'S MANUAL**

power**technique**

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Revision 2

Revised May 07

# Introduction

## Save these instructions

### Please read and save this manual

Thank you for selecting this uninterruptible power supply (UPS). The manual is a guide to the correct installation and use of the UPS system. It includes important safety instructions for the operation and correct installation of the UPS. If you should have any problems with the UPS, please refer to this manual before calling the Powertecnicque customer service department for further assistance.

### Please save or recycle the packaging materials

The UPS's shipping materials have been designed with great care to provide protection whilst in transit. As these materials will be invaluable should you ever have to return the UPS for service, we would recommend that they be kept in a safe place for future use.

### Intelligent microprocessor control

The Centor series is an on-line UPS, based on a dual-microprocessor control UPS system. The system has been designed utilising the newest technology providing high performance and powerful functions.

The Centor series provides pure, reliable AC power to the critical loads - protecting them from utility power blackout, swells, sags, surges and interference.

### Advanced battery management

The visual and audible indications provided by the Centor UPS present the battery's status including capacity and battery condition. The Centor UPS is fitted with a self-test function which will indicate any failures within the battery source requiring remedial works. The Centor UPS will perform a self-test during initial start up procedures and can also be manually conducted via the ON/TEST switch at any time.

### Advanced monitoring software

The on-line UPS and UPS-MON series monitoring software (optional kits) allows the status of the UPS system to be monitored via remote computer systems. The software is available for most operating platforms and is supplied with a communication cable that connects between the UPS system and computer serial port.

Note: There is no guarantee that interference to radio/TV will not occur in a particular installation. If this UPS causes interference to radio or television reception, which can be determined by turning the UPS off and on, the user is encouraged to try to correct the interference by one or more of following measures:

Connect the equipment to an outlet at a circuit different from the connected radio/TV.

Increase the separation between the equipment and the receiver or reorient the receiving antenna.

# 1. Important Safety Instructions

**CAUTION (UPS contains internal batteries):**

Risk of electric shock - Hazardous live parts exist within this unit, which are energised from the battery supply even when the input AC power is disconnected.

**CAUTION (No user serviceable parts):**

Risk of electric shock - do not remove cover. No user serviceable parts inside. Refer servicing to approved, qualified service personnel only.

**CAUTION (Non-isolated battery supply):**

Risk of electric shock, the battery circuit is not isolated from the AC input, hazardous voltage may exist between the battery terminals and the ground. Test before touching.

**WARNING (Fuses):**

To reduce the risk of fire, replace only with the same type and rating of fuse.

**WARNING:**

Installation is intended within a controlled environment.

**CAUTION:**

Do not dispose of the batteries in a fire, as they are liable to explode.

**CAUTION:**

Do not open or tamper with the battery, as released electrolyte can be harmful to the skin and eyes.

**CAUTION:**

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

- Remove watches, rings or other metal objects.
- Use insulated tools
- Wear rubber gloves and boots.
- Do not lay tools or metal parts on top of batteries.

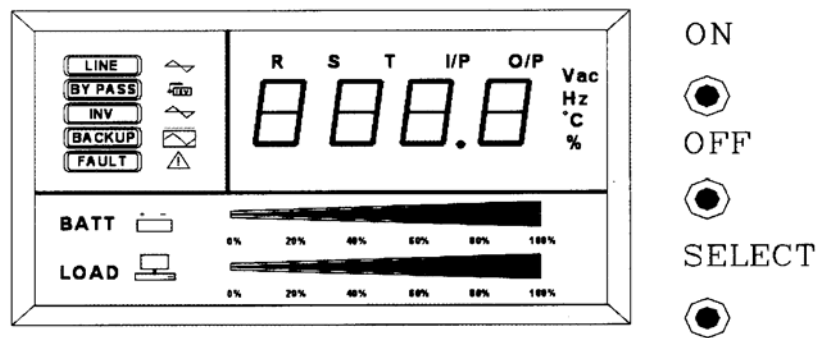
Disconnect charging source prior to connecting or disconnecting the battery terminals

Servicing of the batteries should be performed by trained engineers only.

The correct procedure to de-energise the UPS system in an emergency is to press the OFF button until the UPS switches off and disconnect the input power from the mains supply.

## 2. Presentation

### Front LCD Panel



#### 2.1 LINE indicator

The LED illuminates when the input voltage is normal.

#### 2.2 BY PASS indicator

The LED illuminates when loads are supplied from the utility power, through the UPS bypass facility.

#### 2.3 INV indicator

The LED illuminates when the output power of UPS is supplied from the inverter circuit.

#### 2.4 BACKUP indicator

The LED illuminates when power is supplied from the batteries.

#### 2.5 FAULT indicator

The LED illuminates when a failure within the UPS system has occurred.

#### 2.6 ON/TEST button

With the UPS plugged in, press the ON button to turn the UPS and power to the loads. ON also activates the UPS's self-test and utility voltage displays.

#### 2.7 OFF button

Press the OFF button to turn the UPS off.

## 2.8 SELECT button

The relevant value appears on the upper screen. There are four display modes, which can be selected:

- Output voltage display
- Input voltage display
- Input frequency
- UPS internal temperature

## 2.9 BATT bar graph (rectangle indicator)

The rectangle indicator shows the percentage of the battery capacity.

## 2.10 LOAD bar graph (rectangle indicator)

The indicator shows the percentage of load connected to the UPS system.

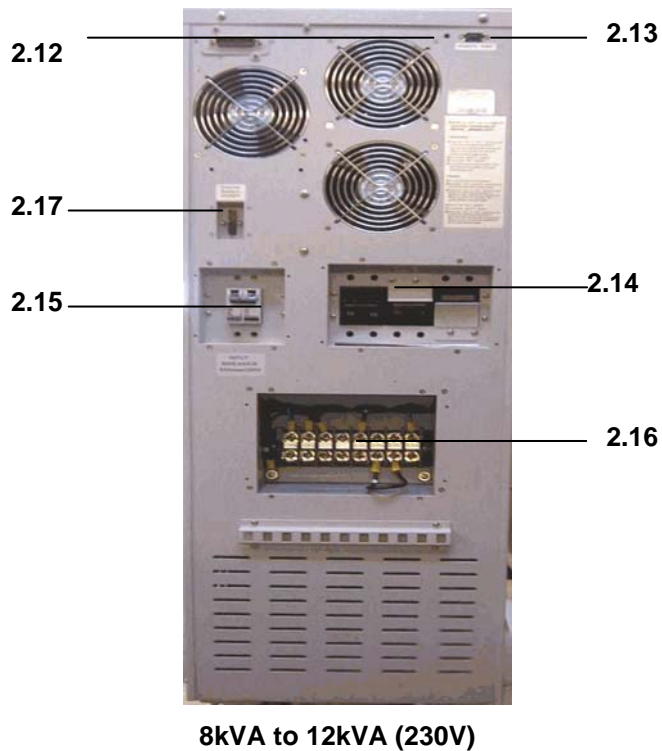
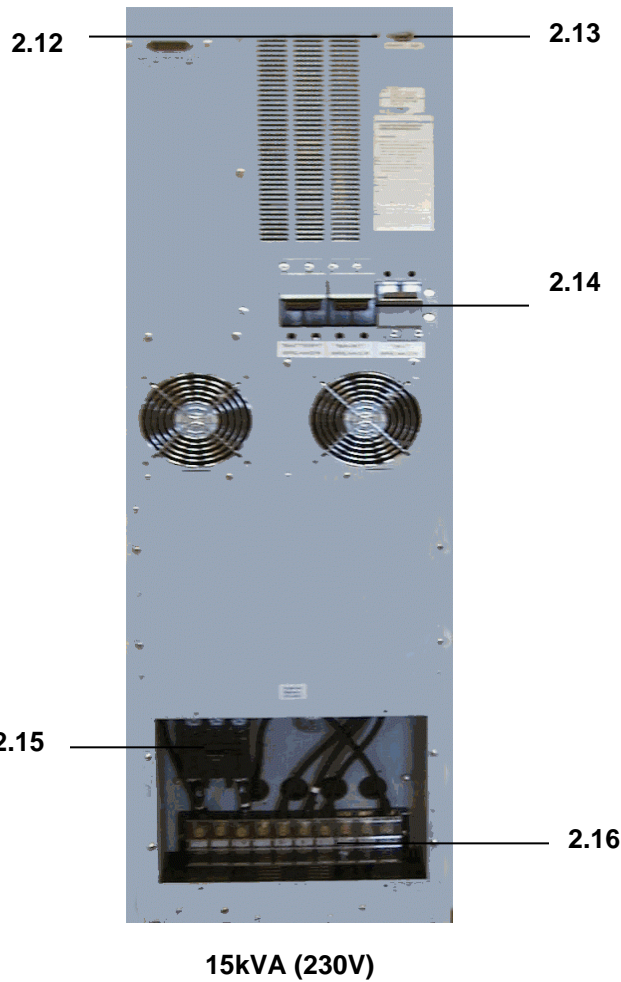
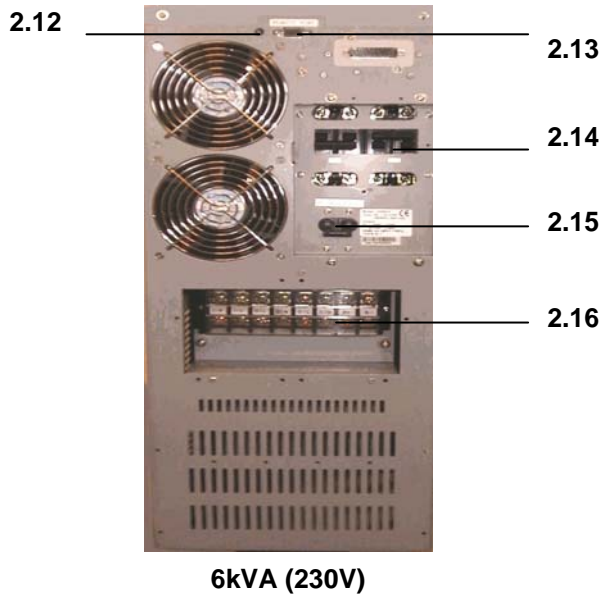
Load Indicator	% of Load Value	Battery Indicator	% of Bat Level
Light no.5	over 96%	Light no.5	over 91 %
Light no.4	76-95 %	Light no.4	76-90 %
Light no.3	51-75 %	Light no.3	51-75 %
Light no.2	26-50 %	Light no.2	26-50%
Light no.1	10-25 %	Light no.1	0-25%

## 2.11 FAULT codes

The relevant value appears on the upper screen. There are seven kinds of fault modes, which can be displayed:

- E01: Warning of output failure
- E02: Warning of temperature outside of normal parameters
- E03: Warning of output short circuit
- E04: Warning of overload (exceeding 150%)
- E05: Warning of incorrect +/- DC Bus
- E06: Warning of incorrect recharging voltage
- E07: Warning of battery failure

**Rear Views**



## **2.12 OUTPUT VOLTAGE calibration**

**Attention:** Only trained service engineers are authorised to use this button. For further details please contact the Powertecnicque service department.

## **2.13 COMPUTER INTERFACE connector**

This provides both RS232 and relay signals offering support to most operating platforms. For further details please contact the Powertecnicque sales department.

## **2.14 SWITCH**

Inverter Switch (6kVA/8kVA/10kVA/12kVA/15kVA)

Bypass/Maintenance Switch (6kVA/8kVA/10kVA/12kVA/15kVA)

Battery Switch (6kVA/8kVA/10kVA/12kVA/15kVA)

## **2.15 INPUT SWITCH and CIRCUIT BREAKER**

The circuit breaker will trip when the connected loads exceed the maximum rated power.

## **2.16 TERMINAL**

**Input:** Connection of the input supply cabling

**Output:** Connection of the output supply cabling

The connection procedure can be changed if there is an output isolation transformer present. **Batteries:** Can be connected with external batteries.

## **2.17 EXTERNAL BATTERY PACK connector (6kVA/8kVA/10kVA/12kVA/15kVA)**

Batteries: Can be connected with external battery pack.

**Caution:** The external battery cabinets should only be connected to the UPS system using the authorised cables provided.

## **2.18 UNPACKING AND INSPECTION**

If you should find any damage on the outer carton, please contact the Powertecnicque service department immediately.

## 3. Installation

Please inspect the UPS upon receipt. The packaging is recyclable and should be kept for future use or disposed of properly.

### 3.1 Positioning of the UPS

Install the UPS in a protected environment. It must be free of excessive dust and with an adequate airflow. Do not operate the UPS where the temperature and humidity is outside the specified limits.

### 3.2 Connect computer interface (optional)

UPS-MON series software (or other power management software) and interface kits can be used with this UPS. Only kits supplied or approved by Powertecnicque should be connected. If used, connect the interface cable and the computer (load) with downloaded UPS-MON to the 9-pin (DB9) computer interface port on the back panel of the UPS.

**Note:** The computer interface connection is optional. The UPS works properly without a computer interface connection.

**Caution:** Use only Powertecnicque supplied or authorised UPS monitoring cables.

### 3.3 Connect external battery pack (optional)

Before connecting, make sure the external battery pack and the connector cable are compatible.

**Note:** External battery connection is not necessary. The UPS works properly without external battery pack connection. (For standard models only)

**Caution:** Use only Powertecnicque supplied or authorised external battery connection cables.

### 3.4 Charge the battery

The UPS charges its battery whenever it is connected to utility power. For best results, charge the battery for 8 hours prior to use.

### 3.5 Connect to utility

Adequate sized cabling should be used when installing the UPS system, in accordance with relevant wiring regulations.

See figure a & b below. Please check the following items to connect AC input power to the terminal block and power up the UPS.

3.5.1 The capacity of the breaker on the wiring board must be over 50A (6kVA, 230V); 75A (6kVA, 110V/8kVA/10kVA/12kVA); 125A (15kVA).

3.5.2 Please use the wiring cords whose diameter is over 8AWG (6kVA, 230V); 6AWG (6kVA, 110V/8kVA/10kVA/12kVA); 4AWG (15K)(soft cord) or 16mm<sup>2</sup> (6K, 230V); 25mm<sup>2</sup> (6kVA, 110V/8kVA/10kVA/12kVA); 35mm<sup>2</sup> (15k) (hard cord).

3.5.3 If the switchboard of the environment is 3Φ/3 wires (Δ type), another isolated transformer at the input side should be added.

Figure A

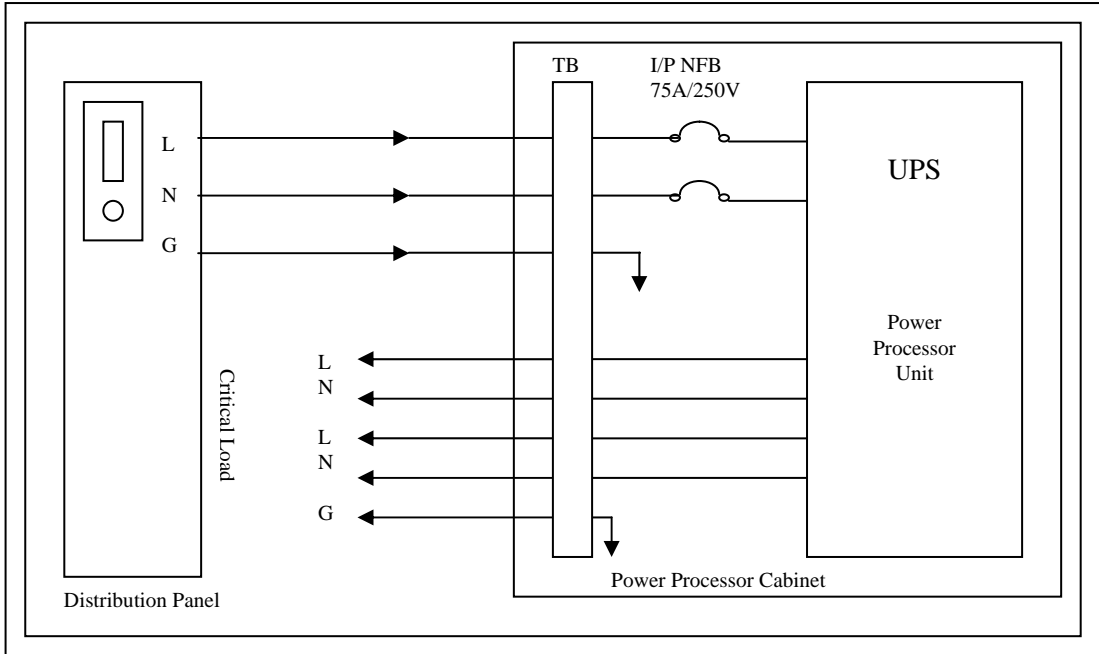
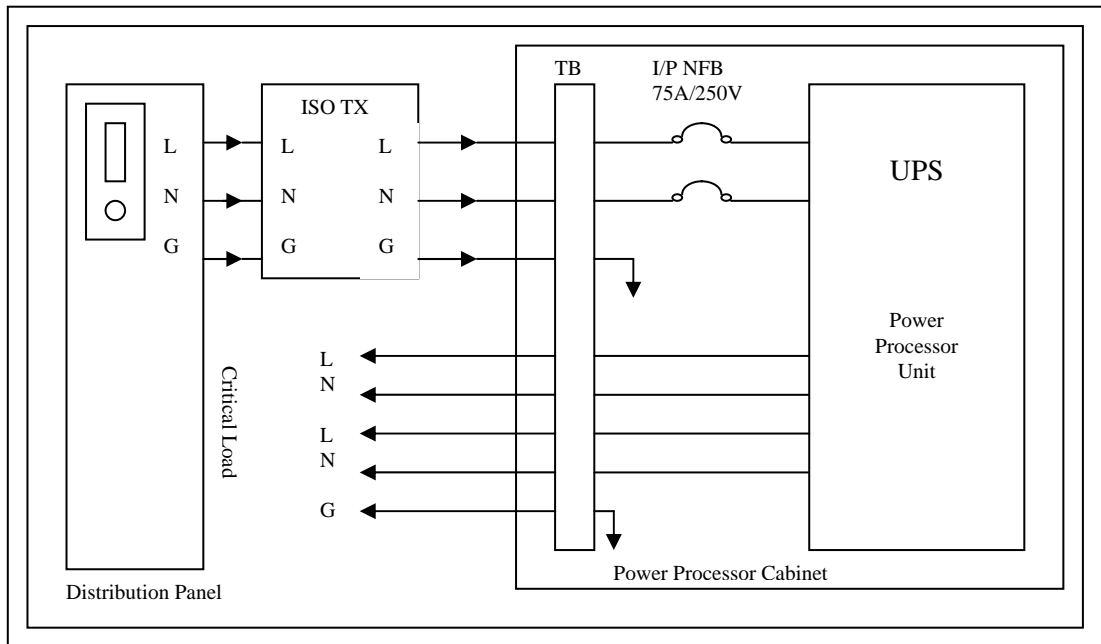


Figure B



### 3.6 Connect the loads

Connection of the loads should be made within the terminal block at the rear of the UPS.

**Caution:** It is recommended that laser printers are not connected to the UPS system as they can periodically draw significantly more power during start up which may cause an overload condition.

### 3.7 Wiring

If you choose to adapt with an isolated transformer, you should see the following figure 1-3 for reference.

**Attention:** The output cord can be Single-phase-2-wire and Single-phase-3-wire.

1. Install it to be Single-phase-2-wire for the users who use 110V facilities only. It will not burn down the internal transformer of UPS when the UPS is operating with full load status.
2. If the output is set-up to be 110V, please use the wiring cords whose diameter is over 8AWG (soft cord) / 16mm<sup>2</sup> (hard cord) for 6kVA, 230V model, 6AWG (soft cord) / 25mm<sup>2</sup> (hard cord) for 6kVA, 110V/8kVA/10kVA/12kVA models, and 4AWG (soft cord) / 35mm<sup>2</sup> (hard cord) for 15kVA model.
3. If there isn't any insulated transformer, see the following figure 5 for the set-up

Figure 1. 1Φ / 2 wires (230V)

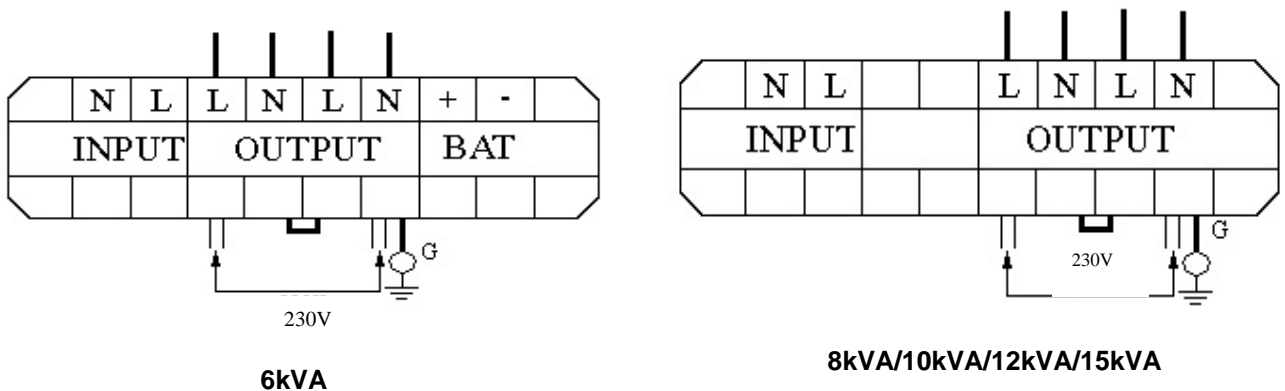


Figure 2. 1Φ / 2 wires (110V)

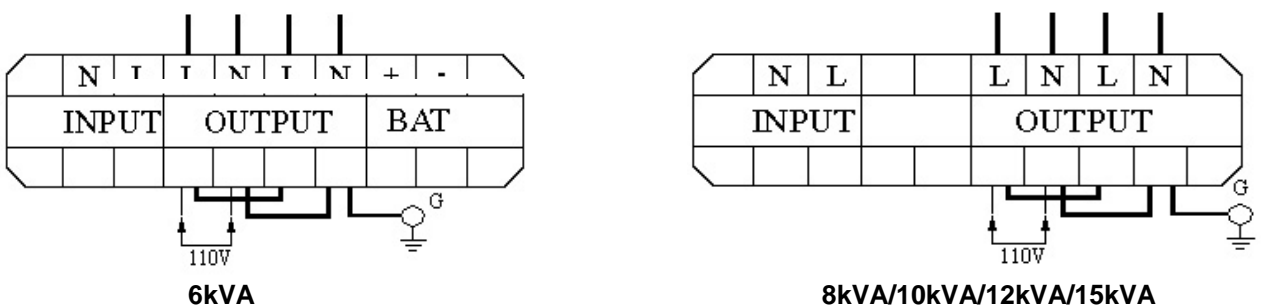
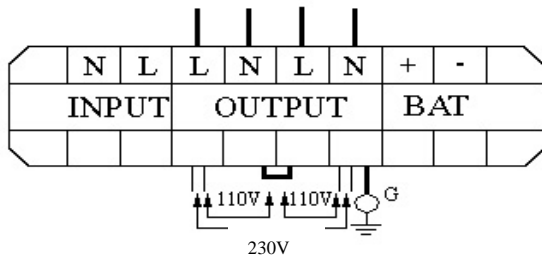
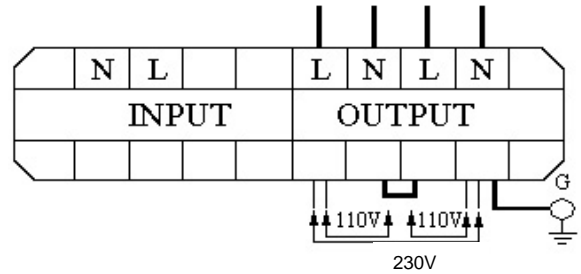


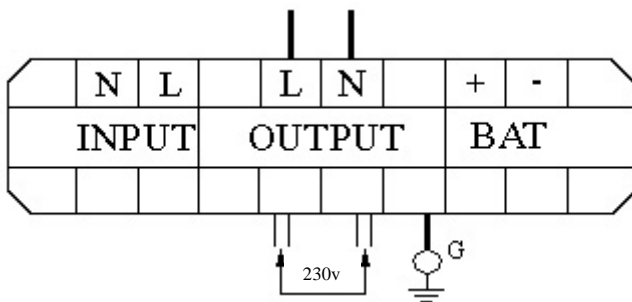
Figure 3. 1  $\Phi$  / 2 wires (110V)



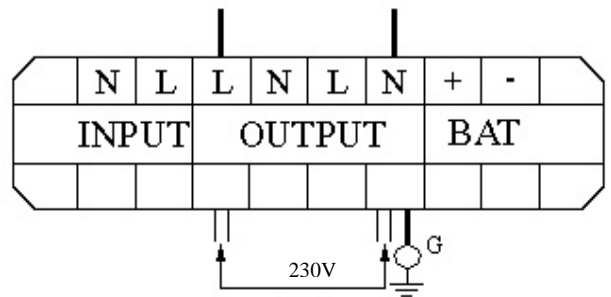
**6kVA**



**8kVA/10kVA/12kVA/15kVA**



**6kVA**



**8kVA/10kVA/12kVA/15kVA**

## 4. Operation

### 4.1 Switch on

With the utility input power connected to the UPS, press the ON button, keeping it pressed for more than 0.5 seconds.

In the event that the UPS system is overloaded an audible alarm will sound indicating a fault condition. The UPS system may also automatically shutdown whilst in this condition.

**Attention:** If utility power is unavailable, the UPS system can be cold started, using its internal battery. To cold start the system, press and hold the ON button for more than 3 seconds.

### 4.2 Switch off

By pressing and holding the OFF button until the LINE NORMAL or BACKUP LED turns off.

### 4.3 Silence

When the UPS system is in the BACKUP mode, press and hold the ON button for more than 1 second to silence the audible alarm. (This function is disabled when the UPS system is under a LOW BATTERY or OVERLOAD condition).

### 4.4 Internal bypass

The UPS will internally switch to internal bypass if you press and hold both the ON and the OFF button until the beep stops.

### 4.5 Normal operation

Whilst in bypass mode, pressing and holding the ON and OFF button until the beep stops will return the UPS to NORMAL mode. (Can take up to 45 secs. Please wait)

## 5. Alarms

### 5.1 BACKUP (slow alarm)

When the UPS is working in BACKUP mode, the UPS will emit an audible alarm. The alarm stops when the UPS is returned to LINE mode operation.

**Attention:** The BACKUP audible alarm will sound every four seconds. (Slow-speed beep).

**Attention:** The UPS system provides a mute function for this condition. When the beeping sound occurs, pressing ON will silence the alarm; pressing ON again will once again sound the alarm.

### 5.2 LOW BATTERY (rapid alarm)

Should the battery capacity become too low (about 20% - 30%) whilst in the BACKUP mode the UPS system will emit an audible alarm. When the battery has discharged to a pre-set level the UPS system will automatically shutdown.

**Attention:** The LOW BATTERY alarm will sound every second. (Fast-speed beep).

**Attention:** The LOW BATTERY alarm cannot be silenced.

### 5.3 FAULT (continuous alarm)

Examples of some possible FAULT conditions are:

**5.3.1 FAULT code E04** An audible alarm will be emitted should the UPS system be overloaded.

**5.3.2 FAULT code E07** An audible alarm will be emitted and the FAULT LED will illuminate should the battery fail during the self-test procedure. Please contact the Powertecniqe service department for further details.

## 6. Software Options & Computer Interface Port

### 6.1 Power monitoring software

The UPS-MON series software (or other power monitoring software) is a standard RS232 interface used to perform monitoring functions, and/or orderly shutdowns of computer systems in the event of prolonged power failures. The UPS-MON can also be used to remotely monitor the UPS Voltage, Frequency, Battery level etc. The software is available for most operating platforms such as Windows 3.1x, Windows 95, Windows NT, Novell Netware etc. For further details please contact the Powertecnicque sales department.

### 6.2 Interface kits

Additional interface kits for the UPS system are available on request, subject to specification.

**Caution:** Only factory supplied interface kits should be used with the UPS system.

### 6.3 The characteristics of computer interface port

The computer interface port has the following characteristics:

The communication port on the back of the UPS system may be connected to a host computer. This port allows the computer to monitor the status of the UPS and control the operation of the system in some cases. Its major functions normally include some or all of the following:

- To broadcast a warning that the utility power has failed.
- To systematically shutdown any open files.
- To turn the UPS system off.

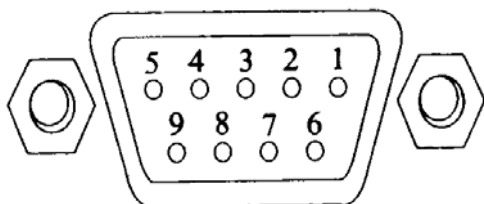
## 6.4 Computer interface port pin out configuration

The pin out configuration of the interface port is as follows:

- 6.4.1 Pins 5 and 2 are open collector outputs that must be pulled up to a common referenced supply no greater than +40VAC. The transistors are capable of a maximum non-conductive load of 25mA DC. Pin 7 only should be used as the common.
- 6.4.2 Pin 5 generates a High to Low signal when the internal battery has less than 5 minutes autonomy time left.
- 6.4.3 Pin 2 generates a High to Low signal when a mains failure condition is present.
- 6.4.4 The UPS will shut down when a high RS232 level is sustained on pin 6 for >0.36 seconds.
- 6.4.5 Pin 9 is the RS232 data output.
- 6.4.6 Pin 6 is RS232 data input (RxD)

NOTE:

- 1. Switch rating +40V, 0.15A non-inductive.
- 2. Pin 7 should be connected to ground only.



## 6.5 Communicating Interface Port

A standard RS232 serial port is available on the rear panel of UPS. The serial port provides various signals as explained below:

Pin#	Function	I/O
2	Power Failure - normally open status which will become closed during active	OUTPUT
4	Reference GND for pin 2 & 5	OUTPUT
5	Battery Low - normally open status which will become closed during active	OUTPUT
6	Remote shutdown UPS - keep this pin at high voltage (+5V to +12V) 500ms to shutdown UPS. Available whilst in battery mode	INPUT
7	Reference GND for pin 6	INPUT

## **7. Maintenance & Storage**

### **7.1 Maintenance**

- 7.1.1 The unit should be kept clean.
- 7.1.2 The unit should be wiped clean with a soft damp cloth.
- 7.1.3 The UPS connections should be regularly inspected.
- 7.1.4 The UPS should not be used on uneven surfaces.
- 7.1.5 The UPS system should be positioned with at least 10cm of clearance between the rear panel and the wall. The ventilation intake areas should be clear at all times.
- 7.1.6 Avoid direct sunlight, rain and high humidity.
- 7.1.7 The UPS unit should be positioned away from open fires and extremely hot environments.
- 7.1.8 Materials should not be stacked on top of the UPS unit.
- 7.1.9 The unit should not be exposed to corrosive air.
- 7.1.10 The normal operating temperature of the UPS unit is between 0-40°C.

### **7.2 Storage conditions**

The UPS system should be stored upright in a cool and dry location, with its battery fully charged. Before storing the battery should be charged for at least 4 hours.

### **7.3 To extend the storage**

Where the ambient temperature of the environment is between -15 to +30°C the batteries should be charged every 6 months.

Where the ambient temperature of the environment is between +30 to +45°C the batteries should be charged every 3 months.

## 8. Battery Pack

### 8.1 Battery's Life of UPS

The battery's life of UPS is about 3-6 years under normal usage.

### 8.2 Battery Replacement

See figure. UPS and external battery pack.

Once the UPS's battery is no longer useful and must be replaced. Please follow the instructions for easy battery replacement.

8.2.1 Unplug unit from AC power source and disconnect all connected equipment.

8.2.2 Disconnect AC power cord from UPS.

8.2.3 Make serial connection of the battery packs (20 pcs). Make sure they are at proper voltage.

8.2.4 First, connect the electric wire with the ends of the battery packs.

**Attention:** Do not connect it with the end of UPS, or it will cause an electrical shock. The red wire with a tag should be connected with the positive end (+) of the battery packs; connect the black wire with the negative end (-) of the battery packs.

8.2.5 Connect with the utility while the UPS is at its no-load position.

8.2.6 Connect the battery terminals on the rear panel connector of the UPS with the electrical wires of battery series. (See the following picture.)

**Attention:** The positive/negative ends of the electric wire of batteries should be at the same position as the positive/negative ends of the connector on UPS rear panel. That is, the positive ends of the electrical wire of batteries should be connected with the positive ends of the connector on UPS rear panel; the negative ones with the negative ones of the connector. If not, there will be a dangerous explosion.

8.2.7. You can now easily remove the battery from the UPS.

**CAUTION:** Do not dispose of battery in fire.

**CAUTION:** Do not attempt to open the battery.

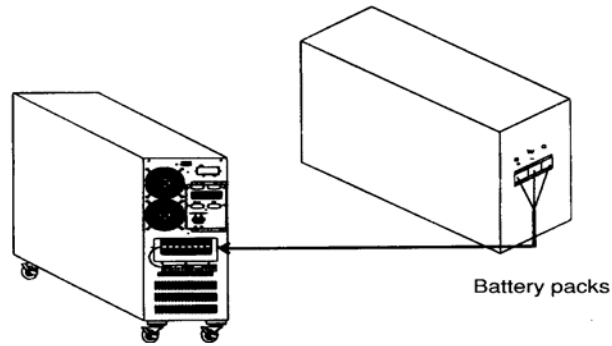
**CAUTION:** The following precautions should be taken when replacing the battery

- a. Remove watches, rings, etc...
- b. Use tools with insulated handles

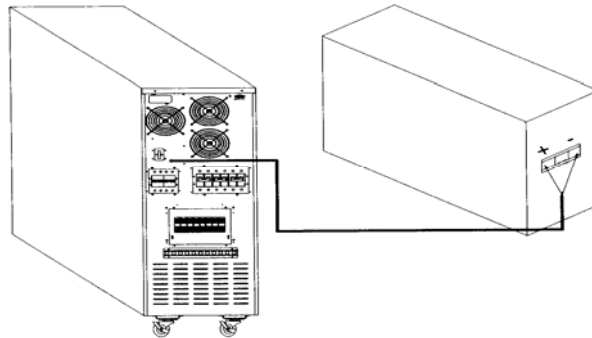
8.2.8 Place your new battery in the same position/direction and reconnect the red wires to positive (+) polarity and black wire to negative (-) polarity.

8.2.9 Please follow steps 5,4 and 3 (in that order) to reconnect the entire unit.

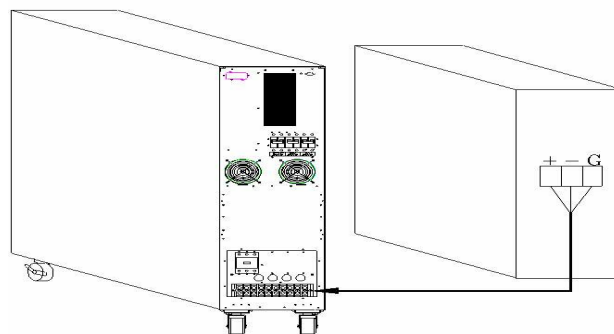
8.2.10 Please follow manual instructions to reconnect your equipment.



UPS and external battery pack (6kVA)



UPS and external battery pack 8kVA/10kVA/12kVA



(K)

UPS and external battery pack (15kVA)

## 9. Warranty

All Powertecnicque UPS systems have been designed and manufactured to the highest standards. Each unit and all its components have been extensively tested and Powertecnicque guarantees that your UPS is free from manufacturing defects for a period of 24 months as of purchase.

The Powertecnicque warranty covers the replacement or the repair of components where a manufacturing defect has occurred. To benefit from the repair warranty, the fault should be reported to our Powertecnicque customer service department.

Please include the following information:

- Order number
- Date of Purchase
- Name and address of installation
- Contact name, address and telephone number
- Model of the faulty UPS
- VA Rating
- Serial Number
- Fault symptoms

Once this information has been provided you will be allocated a call log number. Shortly afterwards you will be contacted by one of our service engineers, who will then provide the necessary support.

The warranty does not apply:

- to products that have been misused; mishandled; modified; damaged by act of God or any other sources external to the product; repaired by others or whose serial number has been removed or altered.
- to replacement or extension of warranty when assistance has previously been given.
- to claims for damages whether direct or indirect of any nature whatsoever to persons, animals and things during the use or non-use of the equipment.

### Contact details

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	Email	sales@powertecnicque.com
<b>Service</b>	Telephone	+ +44 (0) 1489 560700
	Fax	+44 (0) 1489 560742
	Email	service@powertecnicque.com
<b>International sales</b>	Telephone	+44 (0) 1489 560700
	Fax	+44 (0) 1489 560742
	Email	international@powertecnicque.com

## Appendix A Troubleshooting

Problems	Possible reasons	Solutions
UPS can not operate after pressing On/Off switches No lights on, no warning sounds	Incorrect Input power supply	Check input power supply
	Input circuit breaker on the rear panel hasn't been closed	Close the input circuit breaker
	Time of pressing the ON button is too short	Press and hold the ON button for more than 1 second
	Output short circuit or overload on UPS	Turn off the UPS and remove all loads. Press and hold the ON button for more than 1 second
Indicates no utility power is available with an audible alarm	No input power supply	Check input power supply
	Input circuit breaker on the rear panel hasn't been closed	Close the input circuit breaker
Fault LED is illuminated with an audible alarm	UPS is unserviceable	Contact the Powertecnicque service department for assistance
Audible alarm continues to sound	Overload	Remove non essential output equipment
Battery autonomy is too short	Batteries haven't been charged	Keep the UPS ON for over 3 hours to ensure that the batteries are fully charged. Check that the UPS system is not overloaded and remove any non essential equipment, if necessary
	UPS overload	
	Batteries require investigation	Contact the Powertecnicque service department for assistance
The charger is faulty		
The battery LED is flashing when the UPS system is being supplied via utility power	The voltage of batteries is too low or the batteries haven't been connected	Check that the batteries have been connected correctly.

## APPENDIX B SPECIFICATIONS

Model	CEN6000	CEN8000	CEN10000	CEN12000	CEN15000
Rated power	6KVA	8KVA	10KVA	12KVA	15KVA
Rated voltage	220V/230V/240Vac +/-25%				
No. of Phases	Single Phase				
Output power	6KVA	8KVA	10KVA	12KVA	15KVA
Output active power	4.2KW	5.6KW	7KW	8.4KW	10.5KW
<b>INPUT</b>					
Voltage Range	170V – 276Vac				
No. of Phases	Single Phase				
Efficiency load	>85%				
Current Protection	30A	63A			100A
Frequency	50/60Hz +/-3Hz				
Power Factor	0.98				
<b>OUTPUT</b>					
Voltage	220V/230V/240Vac +/-2%				
No. of Phases	Single Phase				
Nominal Current	19A	25A	31A	38A	47A
Frequency	50/60Hz +/-0.5Hz Auto-selection				
Power Factor	0.7 Lagging				
Crest Factor	3 : 1				
Transient response 100% load step	+/-4% , recovery to +/-1% within 2ms				
Harmonic Distortion	<3% Linear Load THD				
Permissible Overload	105% for 10secs, 130% +/-10% for 300ms				
<b>BYPASS</b>					
Voltage	220V/230V/240Vac				
No. of Phases	Single Phase				
Nominal Current	19A	25A	31A	38A	47A
Transfer Time	Electronic no break 0ms				
<b>BATTERY</b>					
Voltage	240Vdc				
No. of cells	120				
Type	VRLA Sealed Lead Acid Maintenance Free				
Recharge Time	Approx. 8hours to 90% following full discharge				
<b>INTERFACE</b>					
Remote signalling	Three voltage free contacts (Battery Low, Mains Fail/Battery Discharging & Auto Shutdown)				
Computer interface	RS232 Serial Port				
Shutdown Software	Standard – includes UPS Power Status and UPS ON/OFF Scheduling				
Warnings/Alarms	Mains Fail & UPS Fault				
SNMP interface	optional				
<b>ENVIRONMENT</b>					
Operating temperature	0 ± 40 °C				
Relative humidity max.	0 - 95 % (non-condensing)				
Maximum operating altitude	3000m at rated power (-1% rated power for each 100m over 3000m, max 4000m)				
Cooling	Forced ventilation (fan speed function of the load)				
Acoustic noise, as measured at 1m from front of equipment (depend on load and temperature) [dBA]	< 47dBA	<55dBA			
Dimension HWD (mm)	700x260x555		980x340x640		1160x340x760
Weight [kg]	114	250			255
Protection degree	IP20				
Cable input	Bottom / rear				
Applicable standards	Safety EN 50091-2-3, EN 60950, CE, CEI 74-2				
LCD Display	Indicates Mains, Bypass, Inverter, Battery Voltage & Frequency, Battery Capacity, Load Percentage, Alarms and Temperature				
Build Quality	ISO9000				