

# CyberPower<sup>®</sup>

**Reliability. Quality. Value.**

## **User's Manual**

### **CPS1500PIE/CPS1500PRO**

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## SAFETY AND EMC INSTRUCTIONS

This manual contains important safety instructions. Please read and follow all instructions carefully during installation and operation of the unit. Read this manual thoroughly before attempting to unpack, install, or operate your Emergency Power System (EPS).

**CAUTION!** To prevent the risk of fire or electric shock, install in a temperature and humidity controlled indoor area free of conductive contaminants. (Please see specifications for acceptable temperature and humidity range).

**CAUTION!** To reduce the risk of electric shock, do not remove the cover.

**CAUTION!** EPS must be connected to an AC power outlet with circuit breaker protection. Do not plug into an outlet that is not grounded. If you need to de-energize this equipment, turn off and unplug the unit.

**CAUTION!** To avoid electrical shock, turn off the unit and unplug it from the AC power source before servicing EPS, replacing the external battery or installing equipment.

**CAUTION!** To reduce the risk of fire, only connect the EPS to a circuit with 16 amperes (CPS1500PIE/CPS1500PRO Series) maximum branch circuit over-current protection in accordance with the CE requirement.

CPS1500PIE Series include CPS1500PIE 、CPS1500PIE-FR 、CPS1500PIE-UK and other versions  
CPS1500PRO Series include CPS1500PRO 、CPS1500PRO-FR 、CPS1500PRO-UK and other versions

**CAUTION!** The building wiring socket outlet (shockproof socket outlet) must be easily accessible and close to the EPS.

**CAUTION!** Please use only VDE-tested, CE-marked mains cable (e.g. the mains cable of your equipment) to connect the EPS to the building wiring socket outlet (shockproof socket outlet).

**CAUTION!** Please use only VDE-tested, CE-marked power cables to connect the loads to the EPS.

**CAUTION!** When installing the equipment, ensure that the sum of the leakage current of the EPS and the connected equipment does not exceed 3.5mA.

**CAUTION!** This is permanently connected equipment and only qualified maintenance personnel may carry out installations.

**CAUTION!** Do not disconnect the mains cable on the EPS or the building wiring socket outlet (shockproof socket outlet) during operations since this would remove the protective ground of the EPS and of all connected loads.

**CAUTION!** THE EPS shall be connected to the emergency switching device.

**DO NOT USE FOR MEDICAL OR LIFE SUPPORT EQUIPMENT!**

DO NOT use in any circumstance that would affect operation or safety of any life support equipment or with any medical applications or patient care.

**DO NOT USE WITH OR NEAR AQUARIUMS!** To reduce the risk of fire or electric shock, do not use with or near an aquarium. Condensation from the aquarium can cause the unit to short out.

**DO NOT USE WITH LASER PRINTERS!** The power demands of these devices will overload and possibly damage the unit.

**DO NOT INSTALL THE EPS WHERE IT WOULD BE EXPOSED TO DIRECT SUNLIGHT OR NEAR HEAT!**

**DO NOT BLOCK OFF VENTILATION OPENINGS IN THE EPS'S HOUSING!**

**DO NOT CONNECT DOMESTIC APPLIANCES SUCH AS HAIR DRYERS TO EPS OUTPUT SOCKETS.**

**SAFETY:**

EN62040-1-1

**EMI:**

Conducted Emission: IEC/EN 62040-2...Category C2

Radiated Emission: IEC/EN 62040-2.....Category C2

Harmonic Current: IEC/EN61000-3-2

Voltage Fluctuations and Flicker: IEC/EN61000-3-3

**EMS:**

IEC/EN61000-4-2(ESD)

IEC/EN61000-4-3(RS)

IEC/EN61000-4-4(EFT)

IEC/EN61000-4-5(lightning surge)

IEC/EN61000-4-6(CS)

IEC/EN61000-4-8(Magnetic)

IEC/EN61000-2-2 (Immunity to low frequency signals)

## INSTALLING YOUR EPS

### **UNPACKING**

Inspect the EPS upon receipt. The box should contain the following:

EPS unit x 1; Installation Guide x 1; User manual x 1; Battery Wiring Arrangement manual x 1;

### **AUTOMATIC VOLTAGE REGULATOR**

When utility power is inconsistent, the EPS would increase low voltage or decrease high voltage to safe 220 volts. The EPS automatically provides battery backup (External battery connection required) if the voltage drops below 140 volts or exceeds 300 volts.

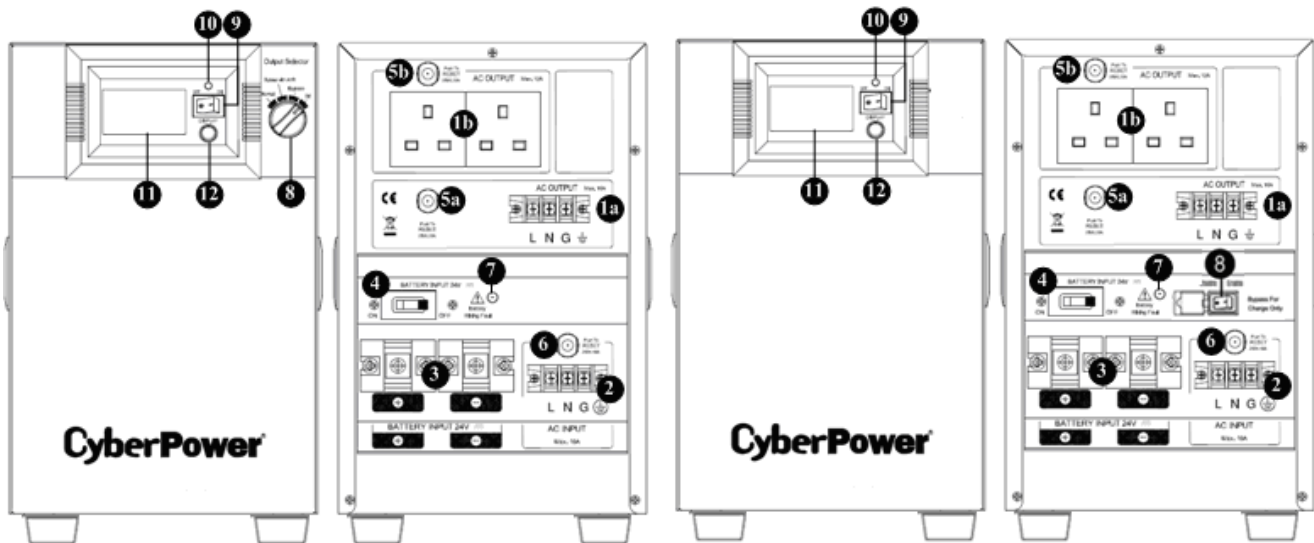
### **HARDWARE INSTALLATION GUIDE**

1. Your new EPS may be used immediately upon receipt. However, recharging the external battery for at least 8 hours is recommended to ensure that the battery's maximum charge capacity is achieved (Charging time varies with capacity and a 100Ah or greater battery is recommended). To recharge the external battery, simply leave the unit plugged into an AC outlet. Your EPS is equipped with an auto-charge feature. When the EPS is plugged into an AC outlet, the external battery will automatically recharge. The unit will charge in both the ON and OFF positions.
2. **DO NOT plug a laser printer, paper shredder, copier, space heater, vacuum or other large electrical device into the EPS. The power demand of these devices may overload and damage the unit. DO NOT use with medical or life support equipment. DO NOT use with or near aquariums as condensation may cause the unit to short.**
3. After connecting the hard wires, plug the EPS into a 2 pole, 3 wire grounded receptacle (wall outlet). Make sure the wall branch outlet is protected by a fuse or circuit breaker and does not service equipment with large electrical demands (e.g. refrigerator, copier, etc...). The warranty prohibits the use of extension cords, outlet strips, and surge strips.
4. Press the power switch to turn the unit on. The power on indicator light will illuminate and the unit will beep once.
5. If an overload is detected, an audible alarm will sound and the unit will emit one long beep. To correct this, turn the EPS off and unplug at least one piece of equipment from the battery power supplied outlets. Wait 10 seconds. Make sure the circuit breaker is depressed and then turn the EPS on.
6. To maintain optimum battery charge performance, make the EPS plugged into an AC outlet at all times. Enabling the switch provides the bypass for charge only.

## BASIC OPERATION

CPS1500PRO

CPS1500PIE



### **DESCRIPTION**

#### **1. AC Outlets**

EPS PRO Series have two general plug-in outlets (UK/Schuko/France) and one terminal outlet. EPS PIE Series have one general plug-in outlets (UK/Schuko/France) and one IEC (C13 x 4) outlet for connected equipment which ensures temporary uninterrupted operation of the equipment during a power failure.

Max. Output of 1a is 16A for terminal block or 10A for IEC C13 ; Max. Output of 1b is 12A for UK socket, 16A for Schuko/France socket.

Max. Output wattage of (1a+1b) is 1050W .

**\*Note:** Maximum cord length is 10 meters and the cable O.D. must be 14AWG.

#### **2. AC Inlet**

AC input terminals

**\*Note :** The O.D. of the distribution cables must be 14AWG or greater.

#### **3. DC Inlet**

Battery input terminals

**\*Note :** Maximum battery wiring cable length is 2 meters and the cable O.D. must be 6AWG or greater.

#### **4. DC Circuit Breaker**

Located on the side of the EPS, the circuit breaker serves to provide overload and fault protection.

#### **5. AC Output Circuit Breaker**

Located on the side of the EPS, the circuit breaker serves to provide overload and fault protection.

**\*Note:** Circuit breaker 5a provide 1a socket max 16A protection for CPS1500 series.

**\*Note:** Circuit breaker 5b provide max 12A protection for UK socket or 16A for Schuko and France

socket.

## 6. AC Input Circuit Breaker

Located on the side of the EPS, the circuit breaker serves to provide overload and fault protection.

## 7. Battery Input Wiring Fault LED

Battery input wiring fault LED will illuminate and make an audible alarm to indicate the wiring polarity is reversed.

## 8. Output Selector

Output Selector provides four most common operation situations for switch include Normal, Bypass with AVR, Bypass, Off. No matter under what situations, the charger would keep charging external batteries if utility power is still alive.

Normal :The unit will provide all functions of uninterruptible power supply include charger.

Bypass with AVR: The unit will bypass the utility power with voltage regulator and shutdown the unit when the utility power exceeds 300Vac or below 140Vac.

Bypass: The unit will bypass the utility power to output directly.

**\*Note:** Bypass model wouldn't provide any overvoltage protection .Utility power may damage equipments plugged to EPS, make sure equipment safe before switch to this model.

Off: The unit will interrupt all outlets power output.

**\*Note:** The charger would still work under these four switch modes.

**\*For PIE Series, the unit provides specific Bypass function.**

Bypass: The switch provides the bypass for charge only and shutdown the unit when the utility power exceeds 300Vac or below 140Vac. In charger only mode, AVR and battery backup will not work.

## 9. Power Switch

Used as the master on/off switch for equipment connected to the battery power supplied outlets.

## 10. Power On Indicator

This LED is above the power switch. It illuminates when the utility condition is normal and the EPS outlets are providing power, free of surges and spikes.

## 11. Multifunction LCD Readout

High resolution and intelligent LCD display shows all the EPS information with icons and messages. For more information please check the DEFINITIONS FOR ILLUMINATED LCD INDICATORS section.

## 12. LCD Display Toggle / Selected Switch

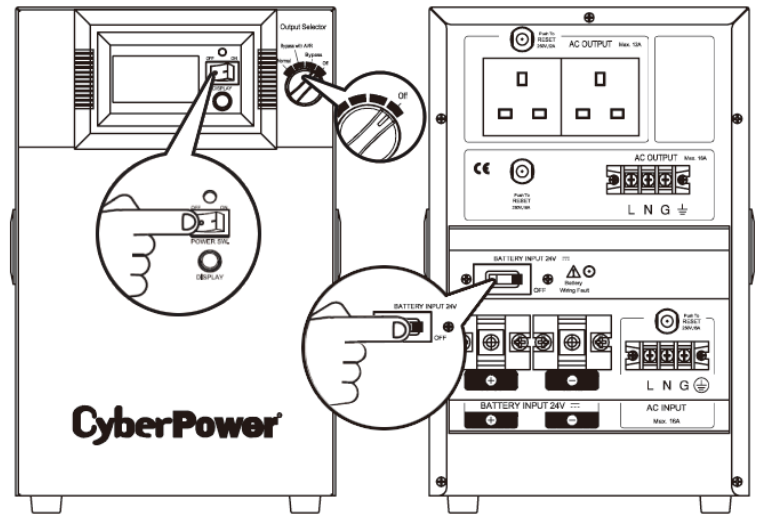
Users can monitor EPS status and set up functions using the toggle.

**INSTALLATION GUIDE**

Note: The installation must be done by professionals.

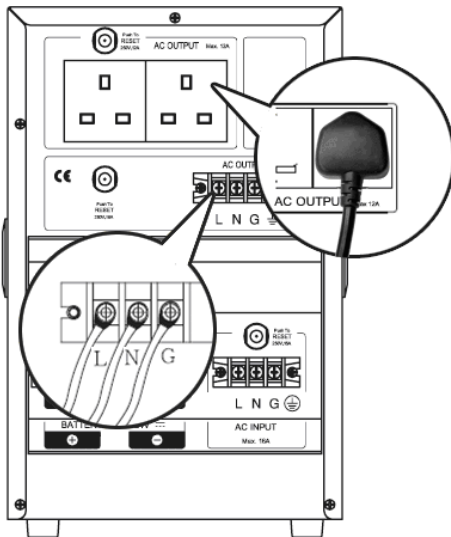
**Step 1**

1. Remove the cover from the back of the machine.
2. Make sure the POWER SW, Output Selector, and the BATTERY SW. are turned off. (Step1)

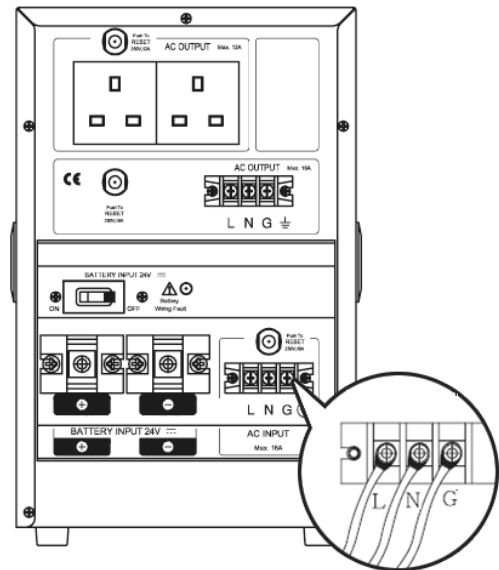


EPS will not function if the Output Selector is OFF. Make sure the Selector on Normal position after all installation procedures.

**Step 2**

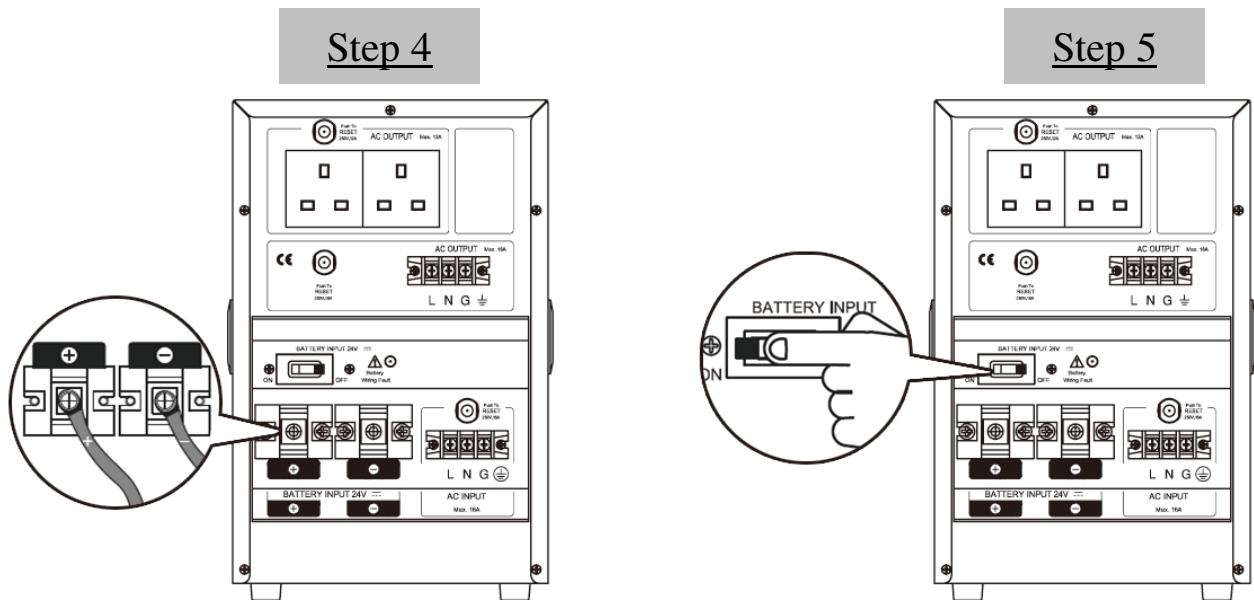


**Step 3**



3. Connect the AC OUTPUT connections (AC plugs or terminal connections). (Step2)
4. Connect the AC power source to AC INPUT (Make sure AC power is off first). (Step3)





5. Connect the batteries to the BATTERY INPUT. (Step4)



WIRING FAULT LED will illuminate and make an audible alarm to indicate the wiring polarity is reversed.

6. If the battery box or the battery connection has a switch, please turn it on first.

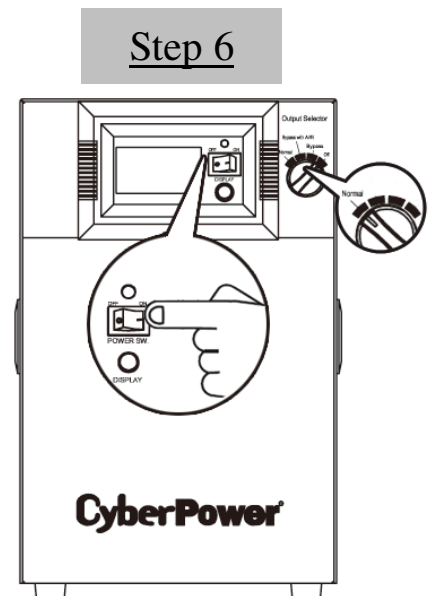
7. Turn on the BATTERY SW. on the back of the machine (Step 5)

8. Turn on the Power Switch and switch the Output Selector to Normal on the front panel. The Power On Indicator and the LCD Module Display will blink 4 times. Press the Display toggle (Selected Switch) once. The output voltage showing on the LCD Module Display should be 220V. This completes the start-up process. (Step 6)

9. Press and hold the Display toggle switch for 4 seconds then release. The machine will begin a self test and enter Battery Mode for 6 seconds before returning to Line Mode. Make sure the self test is ready, or see the Definitions for illuminated LCD on page 10 for a list of alarm code definitions.

10. After ensuring the machine works normally, reassemble the back cover. The installation is now complete.

11. When the external battery needs to be maintained or replaced remember to turn the machine off. Once off, remove the AC power source and switch off the BATTERY SW. before maintenance or replacing the batteries. When the work is complete, please start from Step 1 to re-install the machine.



## REPLACING THE BATTERY

**CAUTION!** Read and follow the IMPORTANT SAFETY INSTRUCTIONS before servicing the battery. Battery service should only be done by qualified professionals.

**CAUTION!** Use only the specified type and number of external batteries. Please see the technical specifications for replacement batteries.

**CAUTION!** The battery may present a risk of electrical shock. Do not dispose of battery in a fire as it may explode. Follow all local ordinances regarding proper disposal of batteries. Lead-acid batteries should be recycled.

**CAUTION!** Do not open or mutilate the batteries. Released electrolyte is harmful to skin and eyes and may be toxic.

**CAUTION!** The external battery cabinet must be provided with 100A / 80V for models CPS1000PIE CPS1000PRO, CPS1500PIE and CPS1500PRO.

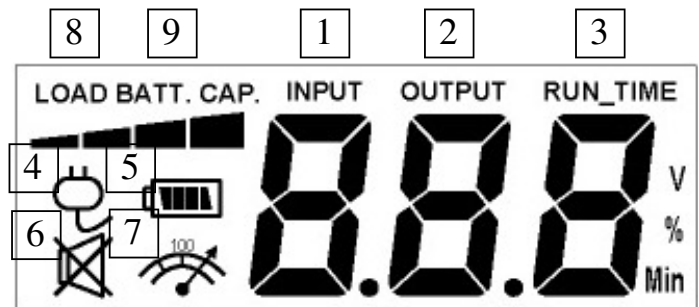
**CAUTION!** A battery can present a high risk of short circuit current and electrical shock.

Take the following precautions before replacing the battery:

1. Remove all watches, rings or other metal objects.
2. Only use tools with insulated handles.
3. Do not lay tools or metal parts on top of battery or any terminals.
4. Wear rubber gloves and boots.
5. Determine if the external battery is inadvertently grounded. If grounded, remove the source of ground. **CONTACT WITH GROUNDED BATTERY CAN RESULT IN ELECTRICAL SHOCK!**

## DEFINITIONS FOR ILLUMINATED LCD

The LCD Display indicates a variety of EPS operational conditions. All descriptions apply when the EPS is plugged into an AC outlet and turned on or when the EPS is on battery.



**1. INPUT VOLTAGE Meter:** This meter measures the AC voltage that the EPS is

receiving from the utility wall outlet. The EPS is designed, through the use of automatic voltage regulation, to continuously supply connected equipment with stable, 220 output voltages. In the event of a complete power loss, severe brownout or over-voltage the EPS will rely on its external battery to supply consistent 220 output voltage. The Input Voltage Meter can be used as a diagnostic tool to identify poor quality input power.

**2. OUTPUT VOLTAGE Meter:** This meter measures, the AC voltage that the EPS is providing to the equipments. It displays normal line mode, AVR mode, and battery backup mode.

**3. RUNTIME Meter:** This meter displays the run time estimate of the EPS with the current battery capacity and load.

**Note!** This function of specified models cannot work.

**4. NORMAL MODE Icon:** This icon will illuminate when the EPS is working under normal conditions.

**5. ON BAT (On Battery) Icon:** When a severe brownout or blackout, this icon appearing and an alarm (two short beeps) activated indicate that the EPS is working via its external batteries. Once the batteries are running out of power, for a period of time, an alarm (two short beeps) will appear continuously. If this occurs, it is recommended that save your files and turn off your equipment manually as soon as possible.

**6. SILENT MODE Icon:** This icon appearing indicates that the buzzer does not beep in the silent mode until the low battery capacity.

**7. OVER LOAD Icon:** This icon appearing and an alarm activated indicate that the overload condition. To relieve the overload, unplug your equipment from the EPS outlets until the icon disappears and the alarm stops being activated.

**8. LOAD CAPACITY:** Load CAPACITY is also shown on the bar chart; equal 25% load capacity for each segment.

**9. BATTERY CAPACITY:** BATT. CAPACITY is also shown on the bar chart; equal 25% battery capacity for each segment.

## EPS Status Inquiry and Functions Setup

### 1. GENERAL MODE

- a. Press the “Display” button to check the status of the EPS

Items	Unit
Input Voltage	V
Output Voltage	V
Load Capacity	%
Battery Capacity	%

- b. Press and hold the **Display** toggle for 4 seconds.

- If the machine is in the Battery Mode, it enters the silent mode.
- If the machine is in the Line Mode, it proceeds to Self Test.

- c. If the **Display** toggle remains untouched for over 30 seconds, the LCD backlight will turn off automatically.

### 2. SET-UP MODE

**Step 1:** Hold the Display toggle for 10 seconds to enter the EPS set-up Mode. Icon 1, 2 lights indicate that Set-Up Mode.

**Step 2:** By pressing the Display toggle, users can switch between setup functions. User configurable functions are as follows:

- a. Delay Time: The time delay between switching from Battery Mode to Line Mode. There are 9 different settings. The default setting is 0 minutes.

**Function description:** The machine will switch from Battery Mode to Line Mode after the AC power transmission reaches stability within the preset delay time.

- b. Battery AH: The function adjusts the battery charging current according to the capacity of the connected batteries. It can be configured for 25, 50, 75 and 100AH. The default setting is 100AH.

**Function description:** The charger will automatically adjust current to setting value.

- c. Nominal Output Voltage: Configures the correct electricity/voltage supplied in the area/country where the EPS will be used. 220V, 230V and 240V may be selected. The system default setting is 220V.

**Function description:** AVR Dynamic Voltage Compensation works automatically based on the system voltage settings.

- d. Static Frequency Tolerance: There are 6 settings (1,2,4,6,8,10%), and the default setting is +/-10%.

**Function description:** The settings may be adjusted to the quality of the electricity in use.

- e. Slew Rate: Also called Dynamic Frequency Tolerance. There are 5 different settings (0.25,0.5,1,2,4 Hz/Sec). The default value is 4Hz/sec.

**Function description:** “Slew Rate” indicates the tolerance of a device in accepting frequency variances. The lower “Slew Rate” results in less tolerance but better protection for the connected loads.

- f. Low Battery Shutdown Voltage: This function adjusts the EPS shutdown point according to the battery voltage. There are 5 setting(19V,19.5V,20V,20.5V,21V) and the default setting is 20V.

- g. Mode Select: There are 2 settings( Robust{1},Standard{2} ) ,The robust mode and the standard mode are provided to select. Using the generators is suggested to select the robust mode, and using the computers is suggested to select the standard mode. The default setting is robust{1}.

The settable items are sorted by unit as in the following table :

Items	Unit	Icon Lit
Delay Time	Min	ON BAT
Battery AH	None	ON BAT
Nominal Output Voltage	V	NORMAL MODE
Static Frequency Tolerance	%	NORMAL MODE
Slew Rate	%	None
Low Battery Shutdown Voltage	V	ON BAT
Mode Select	None	None

**Step 3:** Press and hold the toggle for 4 seconds. When the icons blink, the value of each item can be changed by slightly pressing the toggle.

**Step 4:** To save the value and return to general mode, press and hold the toggle for 4 seconds.



**Note:** If the machine is left idle for over 30 seconds during setup, it will turn off the backlight and return to general mode automatically.

**Note:** If user wants to return to general mode without saving changes, there are two methods:

1. Wait for the backlight to turn off
2. Press and hold the “Display” toggle for 10 seconds

## FAULT WARNING DISPLAY AND ALARM

1. **Overheat Protection** : The machine shut down and the LCD display output voltage is zero.
2. **Over-Load Protection** : The machine shut down and Over Load and FAULT Icon lights on the LCD display.
3. **Battery Missing** : The machine sounds long and rapid beep and Battery icon flashes.
4. The following table shows each corresponding warning message on the LCD display and the alarm reacts during the machine shut down :

 <b>LCD Warning Display</b>	 <b>Alarm</b>	<b>Condition</b>	<b>Solution</b>
Over Load Icon	Long Beep	Over Load Output-Off - Load exceed the rating of EPS.	Check total load to confirm the rating of EPS.
Battery Icon Flash	Rapid Beep	Battery Missing- In Line Mode Battery Missing.	Turn the EPS off, check battery wiring and presence of battery
Zero Output Voltage	Rapid Beep	High Temperature Output-Off	Check fans function and air vent clearances.
		Low Battery Output-Off -- Insufficient battery capacity.	Recharge the battery.
	Recurring Beep	Over Charge or AVR Error-- In Line Mode, battery is overcharged or AVR is faulty.	Inform service agents.
	Long Beep	Short Output-Off -- Output Short Circuit Protection	Check the EPS output to see if there is a short circuit.
Can Not Start Up	None	Line Input/ Output Error Output-Off -- incorrect Input/ Output connection	Check Input/ Output connection.
		Cold Start Battery High Voltage Output-Off -- the battery voltage is too high during cold start.	Check the reason for battery over-voltage.

## TROUBLESHOOTING

Problem	Possible Cause	Solution
Outlet does not provide power to equipment.	Circuit breaker has tripped due to an overload.	First, turn the EPS off and unplug at least one piece of equipment. Wait 10 seconds, reset the circuit breaker by pressing the button, and then turn the EPS on.
	Batteries are discharged.	Recharge the unit for at least 4 hours.
	Unit has been damaged by a surge or spike.	Contact CyberPower Systems about replacement batteries at <a href="mailto:service@cyberpower-eu.com">service@cyberpower-eu.com</a>
	Uncritical outlets have turned off automatically due to an overload.	Push the toggle button to make the uncritical outlets turn on.
The EPS will not turn on.	The on/off switch is designed to prevent the damage that rapidly turns it off and on.	Turn the EPS off. Wait 10 seconds and then turn the EPS on.
	The unit is not connected to an AC outlet.	The unit must be connected to a 220/230/240v outlet.
	The battery is worn out.	Contact CyberPower Systems about replacement batteries at <a href="mailto:service@cyberpower-eu.com">service@cyberpower-eu.com</a>
	Mechanical problem.	Contact CyberPower Systems via phone or visit our website at <a href="http://www.cyberpowersystems.com">www.cyberpowersystems.com</a>

**TECHNICAL SPECIFICATIONS**

<b>Model</b>	<b>CPS1500PIE/CPS1500PRO</b>
Capacity (VA)	1500VA
Capacity (Watts)	1050W
Operation Technology	AVR ( Double Boost & Single Buck )
<b>AC Input</b>	
Nominal Input Voltage	220Vac – 240Vac
Input Voltage Range	140Vac – 300Vac
Input Frequency Range	50/60 Hz +/- 5 Hz (auto sensing)
<b>AC Output</b>	
Number of Phase	Single Phase
On Battery Typical Output Voltage	Pure Sine Wave at 220Vac +/- 5%
Nominal Output Voltage Configuration Note	Configurable for 220 / 230 / 240Vac
On Battery Output Frequency	50 / 60 Hz +/- 1%
Overload Protection	On Utility: Circuit Breaker On Battery: Internal Current Limiter
Transfer Time	< 10 ms ( Typical )
Output Receptacles	UK Type *2 + Terminal Block Note! Schuko * 2 + Terminal Block (for Germany type)
<b>External Battery</b>	
Voltage x Recommended Rating x Quantity	12V x 100Ah X 2
External Battery Rating	24V
External Battery Type	Sealed Maintenance Free Lead Acid Battery
External Battery Protection	DC Circuit Breaker
Hot Swappable External Battery	Yes
Extended Runtime	Yes
<b>Status Indication</b>	
Indicators	Power On, LCD Display
Audible Alarms	On Battery, Low Battery, Overload
<b>Environmental</b>	
Operating Temperature	32°F to 104°F ( 0°C to 40°C )
Operating Relative Humidity	0 to 95% Non-Condensing
<b>Physical</b>	
Dimensions (L*W*H)( mm )	261 * 206 * 325
Weight (Kg)	18.6
<b>Agency</b>	
Certificated	CE/SONCAP





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