



## Commander Tower UPS

PSCM1100 / PSCM2000

# USER MANUAL

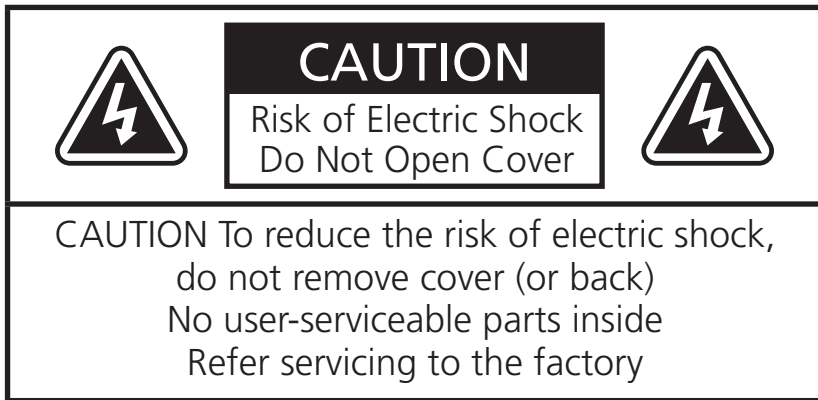


Thank you for choosing PowerShield. This Commander Tower 1100/2000 UPS is designed to provide safe and reliable usage with minimal maintenance. Before you start please read this manual. It contains instructions relating to safety, installation, operation, maintenance and warranty of this UPS. Please keep this manual in a safe place for future use.

The Commander UPS series are designed to provide comprehensive protection for your valuable electronic equipment, hardware, software and data from harmful disturbances found on AC power lines including blackouts, power sags, power surges, under voltage, over voltage, line noise, frequency variation, switching transients and harmonic distortions. The Commander will continuously protect your equipment from unreliable utility power ensuring that all your equipment always receives clean, uninterrupted and stable power.

## SPECIAL SYMBOLS

The following are examples of symbols used on the UPS to alert you the important information.



### **RISK OF ELECTRIC SHOCK**

Indicates that a risk of electric shock is present and the associated warning should be observed.



### **CAUTION; REFER TO OPERATOR'S MANUAL**

Refer to your operator's manual for additional information, such as important operating and maintenance.



### **SAFETY EARTHING TERMINAL**


Indicates the primary safety ground.



**Pb**

This symbol indicates that you should not discard the UPS or the UPS batteries in the trash. The UPS may contain sealed, lead-acid batteries. Batteries must be recycled.

## TABLE OF CONTENTS

1.  Important Safety Warning .....	4
1-1. Transportation .....	4
1-2. Preparation .....	4
1-3. Installation .....	5
1-4. Operation .....	5
1-5. Maintenance, service and faults .....	5
2. Installation And Setup .....	8
2-1. Rear Panel View .....	8
2-2. Setup the UPS .....	8
3. Operations .....	9
3-1. Button Operation .....	11
3-2. LCD Panel .....	11
3-3. Audible Alarm .....	13
3-4. LCD Display Wordings Index .....	13
3-5. UPS Setting .....	14
3-6. Operating Mode Description .....	17
3-7. Faults Reference Code .....	18
3-8. Warning Indicator .....	19
4. Troubleshooting .....	20
5. Service .....	22
6. Storage and Maintenance .....	22
6-1. Operation .....	22
6-2. Storage .....	23
7. Contacting PowerShield .....	23
8. Specifications .....	24

## 1 IMPORTANT SAFETY WARNING

Please comply with all warnings and operating instructions in this manual. Save this manual properly and read carefully the following instructions before installing the unit. Do not operate this unit before reading through all safety information and operating instructions carefully.

### Handling Safety

As the UPS can weight up to 22 kgs please lift correctly.



### 1-1. Transportation and Storage

- Please transport the UPS system only in the original packaging to protect against shock and damage.
- The UPS must be stored in a facility where the temperature is well regulated. Ambient temperatures should be between 0–40°C and relative humidity shall be 0–95% non-condensing.

### 1-2. Preparation

- Condensation may form if the UPS system is moved immediately from cold to warm environment. The UPS system must be dry before being installed. Please allow at least two hours for the UPS system to acclimatise to the environment prior to energisation.
- If the UPS might be exposed to temperatures over 40°C, please contact PowerShield for further advise.
- Do not install the UPS where the relative humidity exceeds 95%, and it must also be non-condensing.
- Do not install the UPS near bodies of water or salt water (conformal coating may be required to protect your UPS).
- Do not install the UPS in high dust, conductive dust environments (conformal coating may be required to protect your UPS).
- Do not install the UPS system where it would be exposed to direct sunlight or nearby heat source.
- Do not block ventilation holes on the UPS housing.

### 1-3. Installation

- Do not connect appliances or devices which would overload the UPS system (e.g. laser printers) to the UPS output sockets.
- Do not place cables in such a way to form a trip hazard.
- The UPS can be operated by any individuals with no previous experience.
- Connect the UPS system only to an earthed shockproof outlet which must be easily accessible and close to the UPS system.
- Please use the supplied cable to connect the UPS system to the building wiring outlet.
- Please use only VDE-tested, CE-marked power cables to connect the loads to the UPS system.

### 1-4. Operation

- Do not disconnect the mains cable on the UPS system or the building general purpose outlet during operation since this will cancel the protective earthing of the UPS system and of all connected loads.
- The UPS system features its own, internal current source (batteries). The UPS output sockets or output terminals block may be electrically live even if the UPS system is not connected to the building wiring outlet.
- In order to fully disconnect the UPS system, first press the OFF/Enter button then disconnect the mains.
- Prevent no fluids or other foreign objects from entering the UPS system.

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

#### MAINTENANCE

Commanders contain no user-serviceable parts other than battery pack. If the battery service life (3–5 years at 25°C ambient temperature) has been exceeded, the batteries must be replaced. Be sure to deliver the spent battery to a recycling facility or ship it to your dealer in the replacement battery packing material. Please contact your dealer or visit the Power Shield website: **[www.powershield.com.au/support](http://www.powershield.com.au/support)**.

**STORAGE**

Before storing, charge the UPS 6 hours. Store the UPS covered and upright in a cool, dry location. During storage, recharge the battery in accordance with the following table:

Storage Temperature	Recharge Frequency	Charging Duration
-25°C - 40°C	Every 3 months	1-2 hours
40°C - 45°C	Every 2 months	1-2 hours

**SAFETY CAUTION**

Please read carefully the following safety instructions before using the Commander UPS.

**SAFETY INSTRUCTION WARNING**

This is a category C2 UPS product. In a residential environment, this product may cause radio interference, in which case the user may be required to take additional measures.

**CAUTION**

- A) The mains socket outlet that supplies the UPS shall be installed near the UPS and shall be easily accessible.
- B) Please replace the fuse or circuit breaker only with the same type and amperage in order to avoid fire hazards.
- C) CAUTION RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.
- D) When replacing batteries, replace with the same type and number of batteries or battery packs.
- E Servicing of batteries should be performed or supervised by personnel knowledgeable about batteries and the required precautions.
- F CAUTION: Do not dispose of batteries in a fire. The batteries may explode.
- G) CAUTION: Do not open or mutilate batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.

## 1 IMPORTANT SAFETY WARNING continued

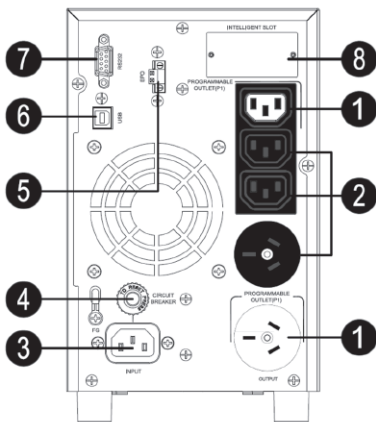
- H) CAUTION: A battery can present a risk of electrical shock and high short circuit current. The following precautions should be observed when working on batteries.
- a) Remove watches, rings or other metal objects.
  - b) Use tools with insulated handles.
  - c) Wear rubber gloves and boots.
  - d) Do not lay tools or metal parts on top of batteries.
  - e) Disconnect the charging source prior to connecting or disconnecting battery terminals.
  - f) Determine if battery is inadvertently grounded. If inadvertently grounded, remove source from ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance (applicable to equipment and remote battery supplies not having a grounded supply circuit).



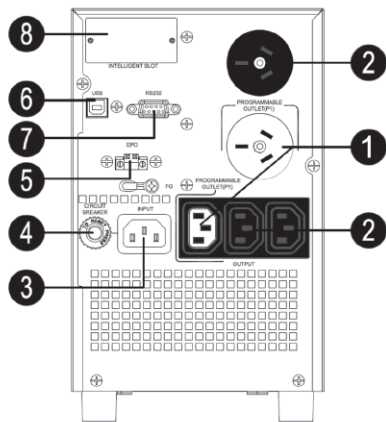
## 2 INSTALLATION AND SETUP

**NOTE:** Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. Please keep the original package in a safe place for future use.

### 2-1. Rear Panel View



**PSCM1100**

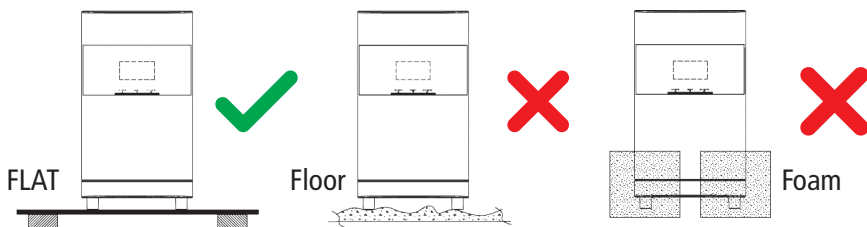


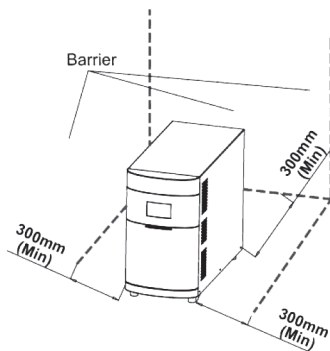
**PSCM2000**

1. Programmable outlets: connect to non-critical loads.
2. Output receptacles: connect to mission-critical loads.
3. AC input
4. Input circuit breaker
5. Emergency power off function connector (EPO)
6. USB communication port
7. RS-232 communication port
8. SNMP intelligent slot

### 2-2. Setup the UPS

Before installing the UPS, please read below to select a proper location to install. The UPS should be placed on a flat, clean surface. Place it in an area away from vibration, dust, humidity, high temperature, flammable liquids, gases, corrosive and conductive contaminants.





Place the UPS in a well-ventilated area. It is required to maintain a minimum clearance of 100mm in the front of the UPS and 300mm in the back and two sides of the UPS for heat dissipation.

Maintain an ambient temperature range of 0°C to 40°C for UPS optimal operation.

### Step 1: UPS input connection

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

### Step 2: UPS output connection

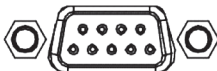
There two kinds of outputs: programmable outlets (**white coloured outlets**) and general outlets (**black coloured outlets**).

During power failure, you may extend the backup time by turning off the white coloured outlets before the general outlets.

### Step 3: Communication connection Interface ports:



**USB Port**



**RS-232 port**



**Intelligent slot**

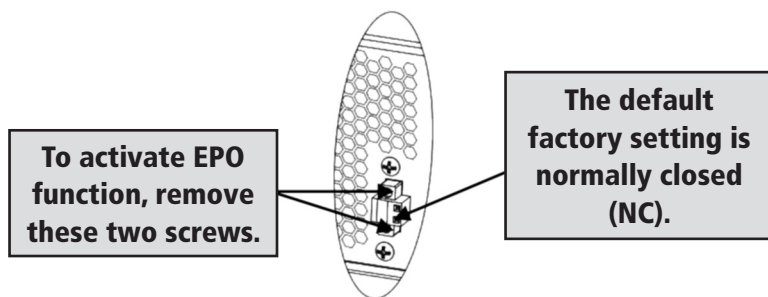
To allow for unattended UPS shutdown/start-up and status monitoring, connect the communication cable at one end to the USB/RS-232 port and the other to the communication port of your PC. With the monitoring software installed, you can schedule UPS shutdown/start-up and monitor UPS status through PC.

The Commander series are equipped with an intelligent slot for either SNMP, AS400 or MODbus cards.

### Step 4: EPO (Emergency Power OFF) function

This UPS is equipped with EPO function. By default, the UPS is delivered from factory with Pin 1 and Pin 2 closed (a metal plate is connected to Pin 1 and Pin 2) for UPS normal operation. To activate EPO function, remove the two screws on the EPO port, then remove the green connector.

**Note:** The EPO function logic can be set up via LCD setting. Please refer to program 8 in UPS setting for the details.



### Step 5: Turn on the UPS

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

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

### Step 6: Install software

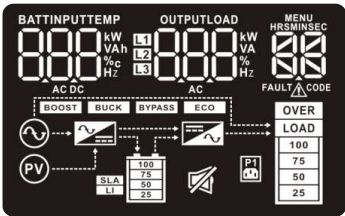
Install NetGuard UPS monitoring software to fully configure UPS shutdown. Please follow steps below to download and install monitoring software:


1. Go to the website **[www.powershield.com.au/downloads](http://www.powershield.com.au/downloads)**
2. Click NetGuard software icon and then choose your required OS to download the software.
3. Follow the on-screen instructions to install the software.
4. When your computer restarts, the monitoring software will appear as an orange plug icon located in the system tray, near the clock.

### 3-1. Button Operation

Button	Function
ON/MUTE Button	<ul style="list-style-type: none"> <li>Turn on the UPS: Press and hold ON/Mute button for at least 2 seconds to turn on the UPS.</li> <li>Mute the alarm: After the UPS is turned on in battery mode, press and hold this button for at least 3 seconds to disable or enable the alarm system. But it's not applied to the situations when warnings or errors occur.</li> <li>Up key: Press this button to display previous selection in UPS setting mode.</li> <li>Switch to UPS self-test mode: Press and hold ON/Mute button for 3 seconds to enter UPS self-testing while in AC mode</li> </ul>
OFF/ENTER Button	<ul style="list-style-type: none"> <li>Turn off the UPS: Press and hold this button at least 2 seconds to turn off the UPS</li> <li>Confirm selection key: Press this button to confirm selection in UPS setting mode</li> </ul>
SELECT Button	<ul style="list-style-type: none"> <li>Switch LCD message: Press this button to change the LCD message for input voltage, input frequency, battery voltage, battery capacity, ambient temperature, output voltage, output frequency, load current and load percentage</li> <li>Setting mode: Press and hold this button for 3 seconds to enter UPS setting mode when UPS is off</li> <li>Down key: Press this button to display next selection in UPS setting mode</li> </ul>

### 3-2. LCD Panel



Display	Function
<b>Backup Time Information</b>	
	<p>Indicates the backup time in numbers. HRS: hours, MIN: minutes, SEC: seconds</p>

#### Warning & Fault Information



Indicates that the warning and fault occurs.



Indicates the warning and fault codes, and the codes are listed in details in 3-5 section.

#### Setting Operation



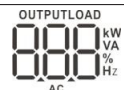
Indicates the setting operation.

#### Battery, Input, Temperature, Output and Load Information



Indicates the input voltage, input frequency, battery voltage, battery capacity and ambient temperature.

k: kilo, W: watt, V: voltage, A: ampere, %: percent, °C: centigrade degree, Hz: frequency, AC: alternating current, DC: direct current



Indicates the output voltage, output frequency, load current and load percentage. k: kilo, W: watt, V: voltage, A: ampere, %: percent, Hz: frequency, AC: alternating current

#### Load Information



Indicates the load level by 0-25%, 26-50%, 51-75%, and 76-100%.



Indicates overload.

#### UPS Status



Indicates that programmable management outlets are working.



Indicates that the UPS alarm is disabled.



Indicates the UPS powers the output directly from the mains.



Indicates the UPS is working in boost mode.



Indicates the UPS is working in buck mode.



Indicates the UPS connects to the mains.




Indicates the UPS connects to the PV.



Indicates the AC to DC circuit is working.



Indicates the inverter circuit is working.

Battery Information	
	Indicates the Battery level by 0-25%, 26-50%, 51-75%, and 76-100%.

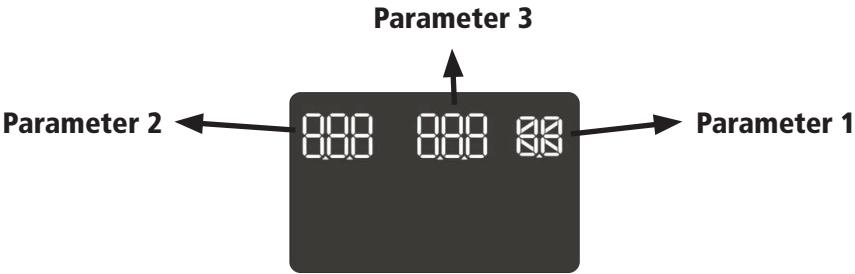
3-3. Audible Alarm

Battery Mode	2 beeps every 30 seconds
Low Battery	Rapid one beep every second
Overload	2 short beeps every 2 seconds
Fault	Continuously sounding

3-4. LCD Display Wordings Index

Abbreviation	Display Content	Meaning
ENA	ENA	Enable
DIS	DIS	Disable
ST1	ST1	Sensitive 1
ST2	ST2	Sensitive 2
ST3	ST3	Sensitive 3
AUT	AUT	Automatic
AON	AON	Always on
BAH	BAH	Battery AH
EPO	EPO	Emergency Power Off
AC	AC	Active Close
AO	AO	Active Open
ESC	ESC	Escape
ON	ON	ON
OK	OK	OK
EP	EP	EPO
TP	TP	Temperature
CH	CH	Charger
BF	BF	Battery Fault
BR	BR	Battery Replace
EE	EE	EEPROM error

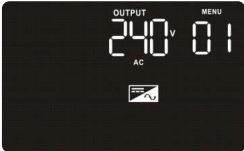


3-5. UPS Setting



There are three parameters to set up the UPS.

**Parameter 1:** For program alternatives. Refer to below table.

**Parameter 2 & 3:** The setting options or values for program.

01 Output voltage setting	
Interface	Setting
	For 208/220/230/240 VAC models, you may choose the following output voltage: 208: presents output voltage is 208Vac 220: presents output voltage is 220Vac 230: presents output voltage is 230Vac 240: presents output voltage is 240Vac (Default setting)
02 Programmable outlets enable/disable	
Interface	Setting
	ENA: Programmable outlets enable DIS: Programmable outlets disable (Default setting)
03 Programmable outlets setting	
Interface	Setting
	Set up the backup time limits in minutes from 0-999 for programmable outlets which connect to non-critical devices on battery mode. (Default setting: 999)

#### 04 Input Waveform Sensitivity setting

Interface

Setting



Set up input waveform sensitivity.

St1: Input voltage waveform detection is highly sensitive.

St2: Input voltage waveform detection is middle sensitive.  
(Default setting)

St3: Input voltage waveform detection is low sensitive.

#### 05 LCD display backlight setting

Interface

Setting



Set up the working mode for the LCD display backlight.

Aon: LCD display backlight is on all the time

Aut: LCD display backlight will be off after pressing the buttons 60 seconds. (Default setting)

#### 06 Autonomy limitation setting

Interface

Setting



Set up backup time on battery mode for general outlets.

0-999: setting the backup time in minutes from 0-999 for general outlets on battery mode.

DIS: Disable the autonomy limitation and the backup time will depend on battery capacity. (Default setting)

**Note:** When setting as "0", the backup time will be only 10 seconds.

#### 07 Battery total AH setting

Interface

Setting

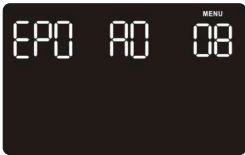
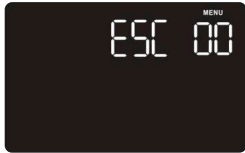


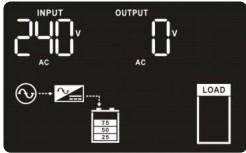
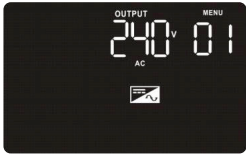

Set up the battery total AH of the UPS.

7-999: setting the battery total capacity from 7-999 in AH.

Please set the correct battery total capacity if external battery bank is connected.



08 EPO logic setting	
Interface	Setting
	<p>Set up the EPO function control logic.</p> <p>AO: Active Open. When AO is selected as EPO logic, it will activate EPO function with Pin 1 and Pin 2 in open status. (Default setting)</p> <p>AC: Active Close. When AC is selected as EPO logic, it will activate EPO function with Pin 1 and Pin 2 in close status.</p>
00 Exit setting	
Interface	Setting
	<p>Exit the setting mode.</p>

Steps for setting programmable outlet (White Coloured Outlets)	
<p><b>Step 1</b></p> <p>Before entering setting mode, the UPS should be in Stand-by mode (off-charging) and make sure the battery is connected. The LCD display is shown as right.</p>	
<p><b>Step 2</b></p> <p>Press and hold the "Selection" button for 5 seconds to enter Setting mode.</p>	
<p><b>Step 3</b></p> <p>Press the "Up" button (ON/MUTE) to switch to "02" of program list. Then press "Enter" button to enter value setting of parameter 2. Press the "Up" button to change the value to "ENA" to enable the programmable outlet function. Then press "Enter" button again to confirm the setting.</p>	

**Step 4**

Press the “Up” button (ON/MUTE) again to switch to “03” of program list. Then press “Enter” button for setting programmable outlet time. Push “Up” button to change the value of backup time according your demand. Then press “Enter” to confirm the setting.



**Step 5**

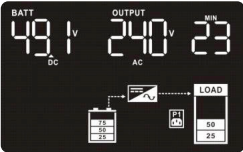
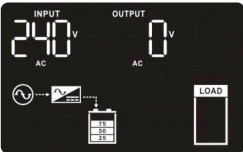
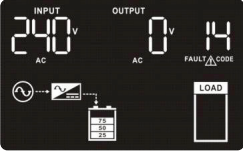
Press “Up” button (ON/MUTE) to switch to “00” of program list. Then press “Enter” button to exit setting menu.

**Step 6**

Disconnect AC input and wait until the LCD display is off. The new setting will be activated when turning on the UPS again.

**3-6. Operating Mode Description**












Operating Mode	Description	LCD Display
ECO mode	When the input voltage is within voltage regulated range, UPS will power the output directly from the mains. ECO is an abbreviation of <b>Efficiency Corrective Optimizer mode</b> . In this mode, when battery is fully charged, the fan will stop working for energy saving.	The LCD display for ECO mode shows 'INPUT 240 V', 'OUTPUT 240 V', and 'BATT 23'. A diagram below the display shows the power flow: AC input goes through an 'ECO' block to the load. The battery is shown as fully charged.
Buck mode when AC is normal.	When the input voltage is higher than the voltage regulation range but lower than high loss point, the buck AVR will be activated.	The LCD display for Buck mode shows 'INPUT 265 V', 'OUTPUT 231 V', and 'BATT 23'. A diagram below the display shows the power flow: AC input goes through a 'BUCK' block to the load. The battery is shown as fully charged.
Boost mode when AC is normal.	When the input voltage is lower than the voltage regulation range but higher than low loss point, the boost AVR will be activated.	The LCD display for Boost mode shows 'INPUT 210 V', 'OUTPUT 242 V', and 'BATT 23'. A diagram below the display shows the power flow: AC input goes through a 'BOOST' block to the load. The battery is shown as fully charged.

Operating Mode	Description	LCD Display
Battery mode	When the input voltage is beyond the acceptable range or power failure and alarm is sounding 2 beeps every 30 seconds, UPS will backup power from battery.	
Standby mode	UPS is powered off and no output supply power, but still can charge batteries.	
Fault mode	When a fault has occurred, the ERROR icon and the fault code will be displayed.	

3-7. Faults Reference Code










Fault Event	Fault Code	Icon	Fault Event	Fault Code	Icon
Bus start fail	01	x	Inverter output short	14	x
Bus over	02	x	Battery voltage too high	27	x
Bus under	03	x	Battery voltage too low	28	x
Inverter soft start fail	11	x	Over temperature	41	x
Inverter voltage high	12	x	Over load	43	OVER LOAD
Inverter voltage low	13	x	Charger failure	45	x

## 3-8. Warning Indicator

Warning	Icon (flashing)	Alarm
Low Battery		Rapid one beep every second
Overload		2 short beeps every 2 seconds
Battery is not connected		2 short beeps every 2 seconds
Overcharge		Continuously sounding
Site wiring fault		2 short beeps every 2 seconds
EPO enable		2 short beeps every 2 seconds
Over temperature		Continuously sounding
Charger failure		Continuously sounding
Battery Fault		Continuously sounding (At this time, UPS is off to remind users of something wrong with battery)
Replace Battery		2 short beeps every 2 seconds
EEPROM error		2 short beeps every 2 seconds

## 4 TROUBLESHOOTING

If the Commander series do not operate correctly, please solve the problem by using the table below.

Sympton	Possible Cause	Remedy
No indication and alarm even though the mains is normal.	The AC input power is not connected well.	Check if input power cord firmly connected to the mains.
	The AC input is connected to the UPS output.	Plug AC input power cord to AC input correctly.
The  icon and the  warning code flashing on LCD display and alarm is sounding 2 short beeps every 2 seconds.	EPO function is activated.	Set the circuit in close position to disable EPO function.
The  icon and  flashing on LCD display and alarm is sounding 2 short beeps every 2 seconds.	Line and neutral conductors of UPS input are reversed.	Rotate mains power socket by 180° and then connect to UPS system.
The  icon and  flashing on LCD display and alarm is sounding 2 short beeps every 2 seconds.	The external or internal battery is incorrectly connected.	Check if all batteries are connected well.
Fault code is shown as 27 and alarm is continuously sounding.	Battery voltage is too high or the charger is fault.	Contact your dealer.
Fault code is shown as 28 and alarm is continuously sounding.	Battery voltage is too low or the charger is fault.	Contact your dealer.
The  icon and  are flashing on LCD display and alarm is sounding 2 short beeps every 2 seconds.	UPS is overloaded.	Remove excess loads from UPS output.
Fault code is shown as 43 and the  icon is lighting on LCD display and alarm is continuously sounding.	The UPS shut down automatically because of overload at the UPS output.	Remove excess loads from UPS output and restart it.
Fault code is shown as 14 and alarm is continuously sounding.	The UPS shut down automatically because short circuit occurs on the UPS output.	Check output wiring and if connected devices are in short circuit status.

Sympton	Possible Cause	Remedy
Fault code is shown as 01, 02, 03, 11, 12, 13 and 41 on LCD display and alarm is continuously sounding.	A UPS internal fault has occurred.	Contact your dealer
Battery backup time is shorter than nominal value.	Batteries are not fully charged.	Charge the batteries for at least 5 hours and then check capacity. If the problem still persists, consult your dealer.
	Batteries defect.	Contact your dealer to replace the battery.
Fault code is shown as 45 on LCD display. At the same time, alarm is continuously sounding.	The charger does not have output and battery voltage is less than 10V/PC.	Contact your dealer.

### WARRANTY CONDITIONS

The standard warranty is two (2) years from the date of purchase. For Warranty Conditions please visit:

**[www.powershield.com.au/wp-content/uploads/Warranty/PowerShield-WARRANTY.pdf](http://www.powershield.com.au/wp-content/uploads/Warranty/PowerShield-WARRANTY.pdf)**

### WARRANTY CLAIMS

First please follow the troubleshooting procedure described above. If you are unable to solve your problem then please call **1300 305 393**. You will be required to provide the following details:

The model number, serial number, and the date of purchase of the UPS. Be prepared to troubleshoot the problem over the telephone with technical support. If unsuccessful the technical support team will issue a Returned Material Authorization (RMA) Number & Warranty Procedure Document. Our technical support personnel will also guide you through the process.

### WARRANTY REGISTRATION

Please register your warranty by visiting: **[www.powershield.com.au](http://www.powershield.com.au)**

## 6 STORAGE AND MAINTENANCE

### 6-1. Operation

The Commander series contains no user-serviceable parts. If the battery service life (3~5 years at 25°C ambient temperature) has been exceeded, the batteries must be replaced.

Please contact your dealer or visit the PowerShield web site:

**[www.powershield.com.au/support](http://www.powershield.com.au/support)**



**Pb**



**Pb**

**Be sure to deliver the spent battery to a recycling facility or ship it to your dealer in the replacement battery packing material.**

## 6 STORAGE AND MAINTENANCE continued

### 6-2. Storage

Before storing, charge the UPS 5 hours. Store the UPS covered and upright in a cool, dry location. During storage, recharge the battery in accordance with the following table:

Storage Temperature	Recharge Frequency	Charging Duration
-25°C - 40°C	Every 3 months	1-2 hours
40°C - 45°C	Every 2 months	1-2 hours

## 7 CONTACTING POWERSHIELD

Refer to the information provided at the PowerShield internet site:

**[www.powershield.com.au](http://www.powershield.com.au)**

or

Phone **1300 305 393**



## 8 SPECIFICATIONS

### COMMANDER TOWER

MODEL		Commander 1100		Commander 2000		
Model Number		PSCM1100		PSCM2000		
Capacity (PF = 0.9)		1100 VA / 990 W		2000 VA / 1800 W		
INPUT						
Nominal Voltage		240Vac				
Acceptable Voltage Range		162-290 VAC				
Frequency Range		50/60Hz ± 5Hz (auto sensing)				
OUTPUT						
Voltage Regulation (AC Mode)		240Vac (Selectable 208/220/230Vac) ± 10% AVR				
Voltage Regulation (Batt. Mode)		± 1.5% (before battery alarm)				
Frequency Range (Batt. Mode)		50 Hz or 60 Hz ± 1 Hz				
Current Crest Ratio		3:1				
Total Harmonic Distortion		2% max @ 100% linear load, 5% max @ 100% non-linear load (before low battery alarm)				
Transfer Time		6ms (Typical), 10ms max.				
Waveform (Batt. Mode)		Pure Sine Wave				
EFFICIENCY						
AC Mode		98% (Advanced ECO design)				
Battery Mode		89%		91%		
BATTERY						
Standard Model	Battery Type & Number		12V / 9AH (x2)		12V / 9AH (x4)	
	Recharge Time		4 hours recover to 90% capacity			
PROTECTION						
Full Protection		Overload, thermal, short circuit, discharge and overcharge protection				
Surge Protection		1968 Joules / 39000 Amps				
ENVIRONMENT						
Operation Temperature		0 - 40°C				
Relative Humidity		0-90% (RH non-condensing)				
Noise Level		< 45dB				
COMMUNICATIONS & MANAGEMENT						
Interface		USB and RS-232 as standard, Intelligent slot for PSSNMP, PSModbus or PSAS400 dry contact				
Software		PowerShield NetGuard® software - supports Windows based operating system, Linux, Unix and Mac				
HID		Supports Windows, Apple, Linux, NAS and various industrial controllers				
LCD Display/Alarm		AC mode, Batt. Mode, Load Level, Input Voltage, Output Voltage, Overload, Fault, Battery Replacement, Low Batt., Batt. Time Remaining				
Audible Alarm		Battery Mode, Low Battery (Batt. Mode), Battery Replacement, Fault, Overload				
PHYSICAL						
Standard Model	Dimension D x W x H (mm)		397 x 145 x 220		455 x 145 x 220	
	Weight Nett/Gross (kg)		12.9 / 14.4		20.5 / 22.5	
COMPLIANCE						
Safety		EN62040-1 -1 2003, IEC 60950-1 -1				
EMC		EN62040-2 2006				
RoHS		Directive 2011/65/EU				

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



For more information, please visit [www.powershield.com.au](http://www.powershield.com.au) or phone 1300 305 393