

**LOTUS**<sup>®</sup>  
Performance, Delivered.<sup>™</sup>



**400W  
Power Station**

**PR400X**

Made in China/Fabriqué en Chine  
Lotus Tool Group (Philippines)  
[www.lotustoolworks.com](http://www.lotustoolworks.com)



## INTRODUCTION

This product has been carefully engineered and manufactured to give you dependable operation. Please read this manual thoroughly before operating your new product as it contains the information you need to become familiar with its features and obtain the performance that will bring you continued enjoyment for many years. Please keep this manual on file for future reference.

## I. IMPORTANT SAFETY INSTRUCTIONS

1. To reduce risk of injury, charge only with the provided AC adaptor and charging cord. Other chargers may cause battery to burst causing injury to persons and damage.
2. Do not expose the power station to rain and moisture.
3. Use of an attachment not recommended or sold by the manufacturer may result in a risk of fire, electric shock, or injury to persons.
4. To reduce the risk of damage to the cigarette lighter connector and cord, disconnect the cigarette lighter connector rather than the cord when disconnecting charger.
5. Make sure the cord is safe from being stepped on, tripped over, or otherwise subjected to damage or stress.
6. Do not operate charger with damaged cord or cigarette lighter connector - replace it immediately.
7. Do not operate the power station if it has received a sharp blow, been dropped, or otherwise been damaged or changed in any way; take it to a qualified service person.
8. Do not disassemble the power station or charger; take it to a qualified service technician when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire.
9. To reduce risk of electric shock, unplug charger before attempting any maintenance or cleaning. Turning off controls will NOT reduce this risk.
10. Always correctly orient the power station in a vertical or floor position.
11. Do not expose the device to direct sunlight, high temperature ( $>35^{\circ}\text{C}$ ) or extreme cold ( $<0^{\circ}\text{C}$ ).
12. Keep it away from dust and dirt.
13. Warning – Risk of explosive gases.
  - a. Working in vicinity of a lead-acid battery is dangerous. Batteries generate explosive gases during normal battery operation. For this reason, it is of utmost importance that each time you use your power station, you read this manual and follow the instructions exactly.
  - b. To reduce risk of explosion, follow these instructions and those published by the vehicle or battery manufacturer and manufacturer of any equipment you intend to use in vicinity of battery. Review cautionary markings on these products and on the engine.
  - c. Do not expose power station or battery to fire to intense heat as it may explode.
14. Personal precautions
  - a. Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
  - b. If skin or clothing comes in contact with battery acid, wash immediately with soap and water. If acid enters eyes, immediately flush with running cold water for at least 10 minutes and get medical attention immediately.

### FIRST AID:

**SKIN:** If battery acid comes in contact with skin, rinse immediately with running water, then wash thoroughly with soap and water. If redness, pain or irritation occurs, seek immediate medical attention.

**EYES:** If battery acid comes in contact with eyes, flush eyes immediately - for a minimum of 10 mins - seek immediate medical attention.

- c. Never smoke or allow a spark or flame in the vicinity of battery or engine.
- d. Use power station on a 12 volt LEAD-ACID battery only. Do not connect to a 6 volt or 24 volt battery system. Use DC socket socket to operate 12 volt appliances equipped with a cigarette lighter plug.

## II. SPECIFICATIONS

Dimensions (cm): 28.7x25x29.8

Weight: 11.8 kg

Output:

12V DC socket

AC inverter

USB 5V socket

Charging:

DC(Vehicle) charging port

AC charging port

Solar charging port

Battery: 12V 24Ah sealed lead acid battery

### INVERTER SPECIFICATIONS:

Output Power Continuous: 400W

Operating Voltage: DC 11-14.5V

AC Output Voltage (RMS Meter): 220V  $\pm$ 10%

Output Wave Form: Filtered Modified Sine Wave

Low Battery Alarm: DC 10.3V  $\pm$  0.3V

Low Battery Shut Down: DC 8.5V  $\pm$  0.3V

Frequency: 60 Hz  $\pm$  3

Efficiency: 85%

No Load Current Draw: < 0.65A

Over Temperature Protection: 100°C  $\pm$ 10%



### LOCATION OF CONTROLS

1. Rubberized handle
2. Digital display
3. AC/DC charging port
4. Solar charging port
5. 12V power socket
6. Three 5V 2.1A USB sockets
7. USB power switch
8. AC power socket switch
9. AC power socket
10. Digital display switch
11. Jump-start cable clamps
12. LED area light

### III. CHARGING THE POWER STATION

**NOTE:** Power station must be fully charged for 24 hours before first use. Failure to do so may permanently damage battery.

#### TO READ THE POWER STATION'S BATTERY VOLTAGE / INVERTER STATUS

1. Press the "ON" switch button of the power inverter
2. Press test button to read the Power Inverter/Battery Voltage status  
"VAC" – Output AC voltage"  
"Hz" - Output AC frequency  
"Watt" - Power consumption of the device  
"VDC"- Battery voltage of power station
3. Recharge the unit when "VDC" reads < 12V
4. Switch Power inverter to "OFF" before recharging the unit.

#### CAUTION

This unit has a maintenance free, built-in sealed lead acid battery. Although the power station arrives partially charged from the factory, it must be fully charged for 24 hours before first use, even if the digital meter indicates "VDC" battery voltage >12.8V, or if the battery is full. This initial charge pre-conditions of the battery is necessary. Failure to follow this procedure may permanently damage the battery.

#### CHARGING WITH AC ADAPTOR

1. Keep all power on/off switches in OFF position while charging.
2. Completely charge your power station before using it for the first time.
3. Press test button to check battery voltage "VDC", if battery voltage reads <12V, it is necessary to recharge the Power Station immediately for smooth running.
4. Before recharging from an AC socket, be sure the source is right. (i.e.220 volts or 230 volts)
5. Use only the chargers provided with unit.
6. Plug the AC charging cord into any standard wall socket and the other end into the AC/DC charging input socket. The RED LED will illuminate which indicates the unit is charging and it will turn into GREEN LED when it is fully charged.

First time charge: ..... 24 hours

Recharge and subsequent charges.....Until charging LED lights to Green

#### CHARGING WITH DC ADAPTOR

Due to safety circuits built into the input-charging jack, DC charging through this port will not fully charge the battery.

1. Keep all power switches in OFF position while charging.
2. Insert DC adapter plug into charging port of power station and the other end into the cigarette lighter socket of your vehicle. The RED LED will illuminate which indicates the unit is charging and it will turn into GREEN LED when it is fully charged.

Vehicle should be running for full charging to take place and to avoid draining the battery.

**NOTE:** This method allows battery to be topped up during a journey but may not fully charge the unit. Disconnect charging cord before turning off engine. NEVER leave vehicle running in an enclosed or poorly ventilated space.

## CHARGING WITH SOLAR PANEL

1. Keep all power switches in OFF position while charging.
2. Insert the Solar panel connection plug into solar charging port of power station and the other end into the solar panel, the RED LED will illuminate which indicates the unit is charging. And it will turn to GREEN LED when it is fully charged.

## CHARGING TIPS AND WARNINGS

Keep battery power topped up, ready for emergencies. Unlike some rechargeable batteries, frequent charging will not harm and in fact, will improve the performance of the internal battery. Recharge battery as soon as possible after each use to prolong battery life. Frequent heavy discharges between recharging will reduce battery life. Do not leave power station in a total discharged state for an extended period of time as this can cause battery failure. All lead acid batteries suffer from self-discharge over time, especially under extreme temperatures.

Store in a cool dry place.

Recharge every 3 months when not in use and more frequently in warmer or colder storage conditions. Do not continuously charge the power station for more than 30 hours. Use only the charging adaptors provided with this unit.

**DO NOT OPERATE THE UNIT WHILE CHARGING**

## IV. BATTERY

### CHECKING THE BATTERY STATUS

Press the Digital display switch to turn on the LED display, then press Display button repeatedly to display the internal battery voltage value – VDC

1. >12.8V “VDC” indicates full charge
2. <12V “VDC” indicates it should be charged as soon as possible. It will be able to operate the AC appliance, LED light, phone accessories, and most 12 Volt Accessories for a limited time. Take care not to let the battery drain completely as it may damage the battery.
3. <11V “VDC” indicates the battery is low and usage must be discontinued immediately. Recharge battery as soon as possible and before further use.

### BATTERY SPECIFICATION

This unit is equipped with a 12 Volt 18 Amp-hour maintenance free, sealed lead acid rechargeable battery, which has a normal life expectancy of up to 500 charging cycles and will give many years of dependable service if properly cared for following the directions above. In the event that the battery needs replacement in the future, the unit will need to be opened up; this service should be performed by a qualified service technician.

Replacement batteries may be purchased from an electrical supply store. Old batteries should be disposed of properly and safely. Please contact your local solid waste authority for recycling information.

## V. OPERATING AS A POWER SUPPLY

The power station is capable of supplying power for 220V AC household devices and 12V DC devices up to the rated capacity of the unit. The length of time the product will operate depends on the condition of the battery and the current draw of the appliance. Low wattage appliances can be operated for several hours while higher wattage products will operate for less time.

## 220V AC SOCKET

### 1.1 Introduction

The Portable Power Station is equipped with two 400 watt power inverter that converts the power from the internal battery to standard 220 volt AC household power. The Power Inverter supplies 400 watts of continuous power. When you turn on an appliance or a tool that operates using a motor or tubes, it requires an initial surge of power to start up. This surge of power is referred to as the "starting load" or "peak load". Once started, the tool or appliance requires less power to continue to operate. This is referred to as the "continuous load" in terms of power requirements.

You will need to determine how much power your tool or appliance requires to start up and how much power it requires for continuous running. Power consumption is rated either in wattages (watts) or in amperes (amps).

Multiply: AMPS X 220 (AC voltage) = Watt

This formula yields a close approximation of the continuous load of your appliances.

Multiply: WATTS x 2 = Starting Load

This formula yields a close approximation of the starting load of your appliances.

Most often the start up load of the appliance or power tool determines whether the inverter has the capability to power it.

### CAUTION

Know the wattage requirement of your appliances. Use only those appliances that do not exceed the capacity of this unit.

The output waveform of this inverter is a MODIFIED SINE WAVE. It has a total harmonic distortion of 28% and maximum single harmonic of 18%. If you choose to measure the AC output voltage, you must use a TRUE RMS VOLT METER such as a Fluke 8060A, Fluke 87, Triplett 4200, Beckman 4410 or any "True RMS" multimeter. Using any other type of voltage measuring device will result in an AC voltage reading of 20 to 30 volts lower than the rated value.

### CAUTION

Do not use this power station with equipment that can be damaged by the inverter's modified sine wave output (non-sinusoidal) including (but not limited to) appliances with speed controllers (such as power tools). O Metal halide arc (MHL) lights can be damaged.

NOTE: If you are unsure about powering any device with the inverter, contact the equipment manufacturer to determine the appliance's compatibility with the modified sine wave (non-sinusoidal) AC waveform. Some rechargeable devices are equipped with a separate charger, which can be connected into this inverter AC receptacle. However certain rechargeable devices are manufactured with built-in chargers (see device owner's manual). This category of devices may cause internal damage to inverters and should not be used with this inverter. The temperature of the device must be monitored for the first 15 minutes of operation. Abnormally elevated temperature of the device is an indication that they should not be used with this inverter.

### 1.2 Operating instructions

Before using the inverter, ensure that the battery of your power station is fully charged. Place the inverter power switch in the on position. The digital display will come on to confirm that the AC socket is powered. If the AC product you are operating has a power switch, we recommend that it be put in the "OFF" position. Plug product into the AC socket and proceed to use according to the directions on the product. The power station will operate most devices rated up to 400 watts. The AC Power supply is equipped with a low battery alarm and an automatic shut down feature to protect the unit if the battery power drops below the safe recharging level. If the alarm sounds while you are operating an AC product, shut off the device immediately and discontinue use until the power station battery can be recharged. Switch inverter "OFF" and disconnect the AC product. Recharge battery as soon as possible and before further use. If you ignore the warning alarm, the power supply will automatically shut down and your AC product will instantly loose power. The AC power supply function is also protected against overloads and overheating. If either of these conditions should occur, the power inverter will shut down automatically.

### **a. Operating a TV**

When operating a TV monitor or TV/DVD combo, please note that picture tubes have a degaussing coil, which uses a high initial surge of power to light up the screen from a "cold start". If the TV does not start up on the first try, switch the TV on every 2-3 seconds until the screen comes on. Some screens may take 2-5 tries before starting.

### **b. Operating with an extension cord**

We recommend that you use an extension cord no longer than 16AWG 50ft. between the AC output and AC appliance. A longer cord may result in reduced output.

### **USB PORT**

NOTE: Prior to connecting the accessory, make sure that the USB port On/Off power switch is in the OFF position. Accessory Connection (IPad, iPhone..., etc.)

1. Connect the USB interface cable (provided with the accessory) into the accessory and the Portable Power Station USB port.
2. Press the USB Port On/Off switch of the unit to the ON position. Turn on the accessory for operation.
3. Press USB Port switch to OFF position when not in use.

NOTE: To avoid draining of the battery while using the USB port, kindly check time to time the battery voltage. And do not let it reach to <11V (below 11V). This will permanently damage the battery.

### **12V DC PORT**

The Power Station is equipped with a socket and can be used to operate most 12 volt auto accessories and appliances (11 AMP maximum) equipped with a cigarette lighter plug. Simply plug in appliance. NOTE: Socket is live so appliance will be instantaneously powered. Length of time appliance will operate depends on the condition of battery and current draw of appliance. Periodically check battery voltage status "VDC" during operation and discontinue use immediately if battery condition falls to 11V. Recharge unit as soon as possible and before further use.

12V DC PORT is protected by an internal circuit breaker to prevent damage to unit in case appliance has a short circuit or exceeds 11 AMPS. If circuit breaker is tripped, disconnect appliance and have it checked. Circuit breaker will automatically reset once it cools down (approx. 15-20 minutes).  
**DO NOT PLUG A CIGARETTE LIGHTER INTO THE socket OF THE POWER STATION.**

### **LED WORKLIGHT (on right side)**

1. Simply open the compartment of the worklight, the worklight will be illuminated.
2. Close the compartment of the worklight.

NOTE: To avoid draining of the battery while using the LED Light, kindly check time to time the battery voltage. And do not let it reach to <11V (below 11V). This will permanently damage the battery.



## VI. JUMPSTARTER



Jump cable terminal

### Warnings

- Lead-acid batteries can release explosive gases. Failure to follow instructions may cause property damage, explosion hazard, and/or personal injury.
- Do not smoke while jumpstarting.
- Jumpstart a vehicle or boat in a well ventilated area.
- Do not attempt to jumpstart a frozen battery.
- This product is not intended for use in the rain or temperatures above 130°F.
- Do not let the jumper cables or other attached appliances get wet.
- Do not wear vinyl clothing when jumpstarting-----friction can cause static electricity sparks.
- Remove all metal jewelry to avoid short circuits.
- Always use safety glasses when jumpstarting battery. Keep battery terminals clean and be careful to keep corrosion from coming in contact with eyes—acid can cause blindness and/or severe burns.
- Never allow red and black clamps to touch or connect to the same piece of metal this can cause short-circuits, power arcing, and/or explosion.
- Make sure someone is available to give assistance if needed.
- Keep out of reach of children.
- This unit is for use with 12 volt systems only.

### Operation

**CAUTION:** If the engine fails to start after three attempts, discontinue jumpstart procedure. Excessive engine cranking can damage the vehicle's starter motor . Look for other problems that may need to be corrected or call for professional service

1. Review the Jumpstarter warnings.
2. Put the vehicle's gear in "park" position and make sure the brake is set.
3. Turn off the vehicle ignition and accessories (e.g. radios, lights, air conditioners), and disconnect all devices such as GPS and mobile phones or tablets.
4. Turn off all switches and disconnect all accessories.
5. Determine the polarity of the vehicle's battery terminals. The positive (POS, P, +) battery terminal is usually larger in diameter than the negative (NEG, N, - terminal. If you are unsure, you should refer to the vehicle owner's manual.
6. Determine the ground system of your vehicle.
  - If vehicle to be started has a negative ground system (this is most common):
    - a. Connect the red (+) cable clamp first to the vehicle's positive (red) battery terminal.
    - b. Next, connect the black (-) clamp to the vehicle chassis or a solid, non-moving, metal vehicle component or body part. **DO NOT** clamp directly to negative battery terminal or a moving part.
  - If vehicle to be started has the positive battery terminal connected to chassis (this is rare and usually found in older car models from the 1950s or earlier):



- a. Connect the black (-) clamp first to vehicle battery's negative (black) terminal.
- b. Connect red (+) clamp to vehicle chassis or a solid, non-moving, metal vehicle component or body part. DO NOT clamp directly to positive battery terminal or a moving part.
7. Be sure that the cables and clamps are securely stored.
8. Recharge the Power Station as soon as convenient.

## VII. MAINTENANCE INSTRUCTIONS

All batteries loose charge with time. AC recharge is recommended after each use or every two months when not in frequent use. Use the AC charger and charge for the recommended time, or until the LED lights turns to GREEN. If the unit gets dirty, gently clean the outer surfaces with a soft cloth moistened with a mild solution of water and detergent. Do not use solvents or other chemical cleaners. Periodically inspect the condition of charging adapters, connectors, and wires. Replace any components that may have become worn or broken. These parts are not serviceable. Do not open or disassemble. Service on Power Station is confined to replaceable parts only. All other servicing should be performed by a qualified service technician only.

## VIII. MOVING AND STORAGE INSTRUCTIONS

Turn OFF all power switches of the power station when not in use. Store in a cool, dry place.

Fuse Replacement - 12 volt adapter plug

This 12 volt plug is fitted with a 2A fuse in the tip. Should the fuse need replacing, unscrew end cap and replace with a new 2A fuse.

CAUTION: For continued protection against risk of fire, replace only with same type and rating of fuse.

### **WARNING! EXPLOSION HAZARD**

Do not expose battery to fire or intense heat as it may explode.  
Battery contains acid: if case should become cracked, dispose of immediately taking adequate safety precautions to prevent injuries or damage to persons or property.

## IX. TROUBLE SHOOTING GUIDE

### **Buzz in Audio Equipment**

Some inexpensive stereo systems have inadequate internal power-supply filtering and may buzz slightly when powered by the power station. The best solution to eliminate the buzzing is to use an audio system with a good quality filter.

### **Television Interference**

The Power Station is shielded to minimize interference with TV signals. If TV signals are weak, you may see interference in the form of lines scrolling across the TV screen. Try one of the following suggestions to minimize or eliminate the interference.

- Use an extension cord to increase the distance between the power station and the TV, antenna, and cables.
- Adjust the orientation of the power station, television, antenna, and cables.
- Maximize TV signal strength by using a better antenna. Use a shielded antenna cable where possible.
- Try a different TV. Different models vary considerably in their susceptibility to interference.

## AC Power Supply Problems

Problem	Possible Cause	Solution
AC product not operating	<ol style="list-style-type: none"> <li>1. AC product is drawing more than 400W</li> <li>2. AC product is rated at less than 400W, but the high starting surge has tripped the safety overload.</li> <li>3. Battery has discharged to <math>8.5V \pm 0.3V</math></li> </ol>	<ol style="list-style-type: none"> <li>1. Use an AC product with power rating less than 400W</li> <li>2. Use an AC product with a starting surge within 400W surge rating of the power station</li> <li>3. Turn the AC outlet off and recharge the power station</li> </ol>
Overload shutdown	Appliance power requirements exceed the capability of the power station	Unplug the appliance and confirm that the appliance's power requirement is 400W or less before attempting to restart the appliance.
Over temperature shutdown	Inverter has overheated due to poor ventilation or excessively warm environmental conditions.	Turn the AC Outlet On/Off switch off and allow power station to cool for 15minutes or more. Clear blocked fan opening or remove objects covering the unit. Move to a cooler environment.
Alarm sounds (When inverter used)	<ol style="list-style-type: none"> <li>1. Internal battery is nearly discharged <math>10.3V \pm 0.3V</math></li> <li>2. If you ignore this warning, the power station will automatically shut down when the battery reaches <math>8.5V \pm 0.3V</math></li> </ol>	Recharge the power station
Run time is less than expected	<ol style="list-style-type: none"> <li>1. Internal battery was not fully charged</li> <li>2. AC product power consumption is higher than expected</li> <li>3. Battery has been damaged</li> </ol>	Recharge using the AC charger, until battery status read $>12.8V$ Check AC product power or wattage rating (or current draw for 12V DC appliances) Note: Start up load will affect running time of appliance

## Charging Problems

Problem	Possible Cause	Solution
Charging Status light is off when AC charger is connected	NO AC power at the AC wall outlet AC charger is faulty	Ensure power is available at the AC wall outlet. Replace the AC charger

### **WARNING! ELECTRIC SHOCK HAZARD**

Do not remove the housing or disassemble the power station except to replace the internal battery. The Power Station does not contain any internal user-serviceable parts and attempting to service the unit yourself could result in electrical shock or burn.