

Model:

PIF-2000

Power Inverter

Converts 12V DC Battery Power to AC Household Power



PLEASE SAVE THIS OWNERS MANUAL AND READ BEFORE EACH USE. This manual will explain how to use the converter safely and effectively. Please read and follow these instructions and precautions carefully.

CONTENTS

IMPORTANT SAFETY INSTRUCTIONS	3
INVERTER FEATURES.....	4
BEFORE USING YOUR POWER INVERTER	4
FASTENING THE INVERTER TO A FLAT SURFACE.....	5
CONNECTING INVERTER CABLES	5
OPERATING INSTRUCTIONS.....	6
POWER SOURCE.....	7
LED INDICATOR AND SHUTDOWN PROTECTION	7
LED DISPLAY.....	8
IF THE INVERTER FUSE BLOWS.....	8
MAINTENANCE INSTRUCTIONS.....	8
TROUBLESHOOTING.....	8
ACCESSORIES.....	9
SPECIFICATIONS	9
LIMITED WARRANTY	10

IMPORTANT: READ AND SAVE THIS SAFETY AND INSTRUCTION MANUAL.

SAVE THESE INSTRUCTIONS – The PIF-2000 offers a wide range of features to accommodate your needs. This manual will show you how to use your inverter safely and effectively. Please read, understand and follow these instructions and precautions carefully, as this manual contains important safety and operating instructions. The safety messages used throughout this manual contain a signal word, a message and an icon.

The signal word indicates the level of the hazard in a situation.

⚠ DANGER Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury to the operator or bystanders.

⚠ WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to the operator or bystanders.

⚠ CAUTION Indicates a potentially hazardous situation which, if not avoided, could result in moderate or minor injury to the operator or bystanders.

IMPORTANT Indicates a potentially hazardous situation which, if not avoided, could result in damage to the equipment or vehicle or property damage.

Safety messages in this manual contain two different type styles.

- Unnumbered type states the hazard.
- Numbered type states how to avoid the hazard.

The icon gives a graphical description of the potential hazard.

⚠ WARNING **California Proposition 65 Warning:**



WARNING: This Product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm (California law requires this warning to be given to customers in the State of California). Wash hands after handling.

1. IMPORTANT SAFETY INSTRUCTIONS – SAVE THESE INSTRUCTIONS.

⚠ WARNING **⚠ WARNING** **RISK OF ELECTRIC SHOCK OR FIRE.**



1.1 Keep out of reach of children.

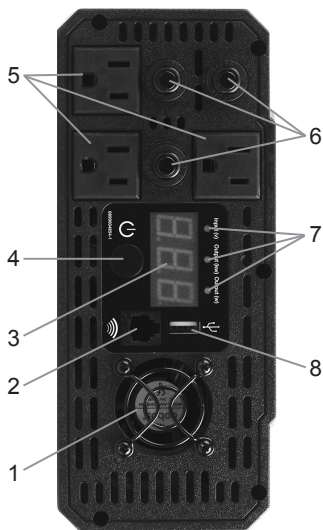
1.2 Keep the inverter well ventilated in order to properly disperse heat generated while it is in use. Make sure there are several inches of clearance around the top and sides and do not block the slots of the inverter.

- 1.3** Make sure the inverter is not close to any potential source of flammable fumes, gases or clothing.
- 1.4** Do not place the inverter in areas such as battery compartments or engine compartments where fumes or gases may accumulate.
- 1.5** Keep the inverter dry.
- 1.6** DO NOT allow the inverter to come into contact with rain or moisture.
- 1.7** DO NOT operate the inverter if you, the inverter, the device being operated or any other surfaces that may come into contact with any power source are wet. Water and many other liquids can conduct electricity, which may lead to serious injury or death.
- 1.8** Do not place the inverter on or near heating vents, radiators or other sources of heat or flammable materials.
- 1.9** Do not place the inverter in direct sunlight. The ideal air temperature for operation is between 50° and 80°F (10° and 27°C).
- 1.10** Only connect the power inverter to a 12 volt battery or power supply. Do not attempt to connect the inverter to any other power source, including an AC power source. Connecting to a 6 volt or 16 volt battery will cause damage to the inverter.
- 1.11** Make sure the AC plug is tight.
- 1.12** Do not modify the inverter in any way including cables, plugs, switches or AC receptacles as it may result in property damage or personal injury.
- 1.13** Incorrect operation of the inverter may result in property damage or personal injury.

⚠ WARNING The inverter output is 110V AC and can shock or electrocute the same as any ordinary household AC wall outlet.

- 1.14 Do not open – No user serviceable parts inside.
- 1.15 This device does not include an internal Ground Fault Circuit Interrupter (GFCI).
- 1.16 To reduce the risk of electric shock, disconnect the inverter from the power source before attempting any maintenance or cleaning. Simply turning off the controls will not reduce this risk.
- 1.17 Do not operate the inverter with damaged cables; have the cables replaced immediately by a qualified service person.
- 1.18 Do not operate the inverter if it has received a sharp blow, been dropped or otherwise damaged in any way; take it to a qualified service person.
- 1.19 Do not disassemble the inverter; take it to a qualified service person when service or repair is required. Incorrect reassembly may result in a risk of fire or electric shock.
- 1.20 Working in the 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 you follow the instructions each time you use the inverter.
- 1.21 This inverter employs parts, such as switches and circuit breakers, that tend to produce arcs and sparks. If used in a garage, locate this inverter 18 inches (46 cm) or more above the floor level.
- 1.22 Do not use the inverter with a product that draws a higher wattage than the inverter can provide, as this may cause damage to the inverter and product.

2. INVERTER FEATURES



1. High speed cooling fan
2. Remote control port
(Remote control sold separately)
3. Digital display
4. ON/OFF button
5. AC outlets
6. Reset buttons
7. LED Indicators (green):
 - DC input voltage
 - Output wattage (kW)
 - Output wattage (W)
8. USB port

3. BEFORE USING YOUR POWER INVERTER

NOTE: Do not use the inverter with a product that draws a higher wattage than the inverter can provide, as this may cause damage to the inverter and product.

When you turn on a device or a tool that runs on a motor, the device goes through two stages:

1. Start Up – Requiring an initial surge of power (commonly known as the “starting” or “peak” load).
 2. Continuous Operation – Power consumption drops (commonly known as “continuous load”).
- The wattage (WATTS) or amperes (AMPS) can normally be found stamped or printed on most devices and equipment, or in the user’s manual. Otherwise, contact the manufacturer to find out whether the device you want to use is compatible with a modified sine wave.

To calculate the wattage: $Wattage = AMPS \times 120$ (AC Voltage).

To calculate the starting load: Starting Load = 2 x WATTS. In general, the start up load of the device or power tool determines whether or not your inverter has the capability to power it.

To calculate the continuous load: Continuous Load = AMPS x 120 (AC Voltage).

IMPORTANT Always run a test to establish whether or not the inverter will operate a particular piece of equipment or device. In the event of a power overload, the inverter is designed to automatically shut down. This safety feature prevents damaging the inverter while testing devices and equipment within the wattage range of the inverter.

If a device does not operate properly when first connected to the inverter, turn the inverter On/ Off switch ON, OFF, and ON again in quick succession. If this procedure is not successful, it is likely that the inverter does not have the required capacity to operate the device in question.

IMPORTANT This inverter uses a nonsinusoidal waveform. Using it with certain devices may cause the device to run warmer or overheat. Therefore, we do not recommend you use it to power the following devices:

1. Switch mode power supplies
2. Linear power supplies
3. Class 2 transformers
4. Line filter capacitors
5. Shaded pole motors
6. Fan motors
7. Microwave ovens
8. Fluorescent and high intensity lamps (with a ballast)
9. Transformerless battery chargers

4. FASTENING THE INVERTER TO A FLAT SURFACE

For your convenience, the inverter can be fastened to a flat surface, horizontally or vertically. The area where the inverter is to be fastened must be dry, well ventilated and away from any combustible material or fumes.

1. Turn off and disconnect the inverter.
2. Place the back of the inverter with the mounting bracket against a flat, secure surface.
3. Attach the inverter to the flat surface using corrosion-resistant screws.

5. CONNECTING INVERTER CABLES

The inverter and power source must be in the OFF mode.

IMPORTANT Make sure to connect the inverter to a 12 volt power supply only.

Inverter Connection:

1. Locate the positive and negative plastic terminals located on the right side of the inverter.
2. Remove the red positive (+) plastic cover by squeezing the two ridged areas.
3. Remove the nut and bolt from the terminal.
4. Slide the red protective cover over the red cable in the correct orientation.
5. Using the nut and bolt you removed, attach the red cable to the positive (+) terminal. Tighten the terminal so that the cable cannot come loose but do not over-tighten.
6. Replace the red protective cover.
7. Remove the black negative (-) plastic cover by squeezing the two ridged areas.
8. Remove the nut and bolt from the terminal.
9. Slide the black protective cover over the black cable in the correct orientation.
10. Using the nut and bolt you removed, attach the black cable to the negative (-) terminal. Tighten the terminal so that the cable cannot come loose but do not over-tighten.
11. Replace the black protective cover.

Connecting Inverter Cable to 12V Battery or 12V Power Source:



**RISK OF CONTACT WITH BATTERY ACID.
BATTERY ACID IS A HIGHLY CORROSIVE
SULFURIC ACID.**



**A SPARK NEAR THE BATTERY MAY CAUSE A BATTERY EXPLOSION.
TO REDUCE THE RISK OF A SPARK NEAR THE BATTERY:**

1. Keep hands, hair, clothing and jewelry clear of battery terminals.
2. Wear eye protection and clothing protection.
3. For a negative-grounded vehicle, connect the POSITIVE (RED) terminal from the inverter to the POSITIVE (POS, P, +) ungrounded post of the battery. Connect the NEGATIVE (BLACK) terminal to the vehicle chassis or engine block away from the battery. Do not connect the terminal to the carburetor, fuel lines or sheet-metal body parts. Connect to a heavy gauge metal part of the frame or engine block.
4. For a positive-grounded vehicle, connect the NEGATIVE (BLACK) terminal from the inverter to the NEGATIVE (NEG, N, -) ungrounded post of the battery. Connect the POSITIVE (RED) terminal to the vehicle chassis or engine block away from the battery. Do not connect the terminal to the carburetor, fuel lines or sheet-metal body parts. Connect to a heavy gauge metal part of the frame or engine block.
5. To disconnect the inverter, reverse the above steps.

NOTE: The internal speaker may make a brief “beep” when the inverter is being connected to or disconnected from the 12 volt power source.

IMPORTANT

Failure to make the correct connections will result in blown fuses and permanent damage to the inverter.

6. OPERATING INSTRUCTIONS

1. Connect the inverter (see CONNECTING INVERTER CABLES section).
2. Switch the inverter On/Off switch to the ON position.
3. The LED indicator will light, verifying the inverter is receiving power.
4. Switch the inverter On/Off switch to the OFF position. (The LED indicator may flash briefly and/or the internal speaker may make a brief “beep”. This is normal.)
5. Make sure the device to be operated is turned OFF.
6. Plug the device into the inverter AC outlet or USB port.
7. Switch the inverter On/Off switch to the ON position.
8. Turn the device on.
9. To disconnect, reverse the above procedure.

NOTE: If more than one device is to be powered, start one device at a time to avoid a power surge and overloading the inverter. The surge load of each device should not exceed the inverter’s Continuous Operation wattage rate.

IMPORTANT

If there is a short circuit or power surge in the device, **OPP** will display and the alarm will sound. Press the ON/OFF switch to turn off the alarm. If the **OPP** displays after several attempts, there is a short circuit or the device requires more “starting” or “peak” load than the inverter is capable of providing.

IMPORTANT

If you are using the power inverter to operate a battery charger, monitor the temperature of the battery charger for about 10 minutes. If the battery charger becomes abnormally warm, disconnect it from the inverter immediately.

NOTE: You can use an extension cord from the inverter to the device without significantly decreasing the power being generated by the inverter. Use an 18 gauge (AWG) (0.75mm²) extension cord. For best operating results, the extension cord should be no longer than 50 feet (15.2m).

Using the USB Port

The USB port provides up to 2.1A at 5V DC.

1. Plug the device into the USB port.
2. Press and hold the ON/OFF switch to turn the inverter on. (The internal speaker will make a brief “beep”. This is normal.)
3. Turn the USB device on.
4. Reverse these steps when finished using the USB port.

Using the Inverter to Operate a TV or Audio Device:

The inverter is shielded and filtered to minimize signal interference. Despite this, some interference may occur with your television picture, especially with weak signals. Below are some suggestions to try and improve reception.

1. Make sure the television antenna produces a clear signal under normal operating conditions (i.e. at home plugged into a standard 120 volt AC wall outlet). Also, ensure that the antenna cable is adequately shielded and of good quality.
2. Try altering the position of the inverter, antenna cables, and television power cord. Add an extension cord from the inverter to the TV so as to isolate its power cord and antenna cables from the 12 volt power source.
3. Try coiling the television power cord and the input cables running from the 12 volt power source to the inverter.
4. Affix one or several “Ferrite Data Line Filters” to the television power cord. Ferrite Data Line Filters can be purchased at most electronic supply stores.
5. Try grounding the inverter with a minimum 18 gauge (AWG) (0.75mm²) wire, using as short a length as possible.

NOTE: You may hear a “buzzing” sound being emitted from inexpensive sound systems when operated with the inverter. This is due to ineffective filters in the sound system’s power supply. Unfortunately, this problem can only be resolved by purchasing a sound system with a higher quality power supply or higher quality filter.

7. POWER SOURCE

When operating a device that draws approximately 60 watts, your average automobile or marine battery at full charge will provide an ample power supply to the inverter for approximately 3 hours when the engine is off. The actual length of time the inverter will function depends on the age and condition of the battery and the power demand being placed by the device being operated with the inverter.

If you decide to use the inverter while the engine is off, we recommend you turn OFF the device plugged into the inverter before starting the engine. To maintain battery power, start the engine regularly and let it run for approximately 15 to 20 minutes to recharge the battery. Although it is not necessary to disconnect the inverter when turning over the engine, it may briefly cease to operate as the battery voltage decreases. While the inverter draws very low amperage when not in use, it should be unplugged to avoid battery drain.

8. LED INDICATOR AND SHUTDOWN PROTECTION

The LED lights automatically when plugged into a 12 volt DC power source, but will not light under the following conditions:

1. When the power input from the vehicle’s battery drops to approximately 10.5 volts, low battery shutdown occurs and the inverter shuts off.
Solution: Recharge or Replace the battery.
2. When the power input from the vehicle’s battery exceeds 15 volts, high voltage overload protection occurs.
Solution: Reduce the voltage range to between 12 volts and 14 volts.
3. The continuous load demand from the equipment or device being operated exceeds the continuous load rating of the inverter being used.
Solution: Use a higher capacity inverter or lower rated device.
4. The case temperature becomes hot (exceeds 145°F).
Solution: Allow the inverter to cool. Do not block the cooling slots or air flow over and through the inverter. Reduce the load on the inverter to the continuous rated output.

RESET: To reset after shutdown occurs, press the On/Off button to turn the inverter OFF and press the reset button. Check the source of the problem and correct. Press the On/Off button to turn the inverter ON.

9. LED DISPLAY

The LED display identifies the current status of the inverter.

VOLTS IN: The voltage of the vehicle's battery, portable power jump starter or DC power source.

WATTS: The power or wattage supplied to the device plugged into the inverter.

NOTE: The tolerance of the display is $\pm 15\%$ when the output power is higher than 200 watts. An audio alarm will sound when any of the following codes display. To stop the alarm, press the On/Off switch:

QUP – The vehicle's battery voltage is between 15 and 16 volts. The inverter will automatically restart after the voltage drops below 15.0 volts.

QLP – The continuous load demand from the device exceeds the inverter's wattage output.

QCP – The inverter is overheated and automatically turns off for a period of 1 to 3 minutes to cool. Make sure the inverter is well ventilated. It will automatically restart after it cools.

LUP – Low Voltage Alarm. The vehicle's battery voltage is between 10.7 and 11.3 volts.

LUP – Low Voltage Shutdown. The vehicle's battery voltage is between 10.2 and 10.8 volts.

QPP – Short circuit, power surge or overload in the device.

10. IF THE INVERTER FUSE BLOWS

The power inverter is fitted with fuses, which should not have to be replaced under normal operating conditions. A blown fuse is usually caused by reverse polarity or a short circuit within the device or equipment being operated.

If the fuses blow:

The fuse is not user-replaceable; take the inverter to a qualified service person.

11. MAINTENANCE INSTRUCTIONS

- 11.1 After use and before performing maintenance, unplug the device and disconnect the inverter from the 12 volt power supply.
- 11.2 Use a dry cloth to wipe all battery corrosion and other dirt or oil from the battery terminals, cords, and the inverter case.
- 11.3 Ensure that all of the inverter components are in place and in good working condition.
- 11.4 Servicing does not require opening the unit, as there are no user-serviceable parts.
- 11.5 All other servicing should be performed by qualified service personnel.

12. TROUBLESHOOTING

PROBLEM	REASON	SOLUTION
Audible alarm is on, and/or inverter does not function.	Poor contact at terminals.	Check connections at power supply.
	Fuse blown.	See "IF THE INVERTER FUSE BLOWS" section.
	Inverter shutdown.	See "LED INDICATOR AND SHUTDOWN PROTECTION" section.

13. ACCESSORIES

Remote control..... 4999000247

14. SPECIFICATIONS

Maximum continuous power 2000 Watts
Surge capability (peak power) 4000 Watts
No load current draw..... <1A
Output wave form..... Modified Sine Wave
Input voltage range 10.5V - 15.5V DC
Output voltage Range 120V \pm 5% AC
Low battery alarm Audible, 11V \pm 0.3V DC
Low voltage shutdown 10.5V \pm 0.3V DC
High voltage shutdown..... 15.0V \pm 0.5V DC
Optimum efficiency 85%
AC outlet Three, NEMA 5-15 USA
USB port One, 5V DC 2.1 Amp
Fuse (not user-replaceable)..... Ten, 35 Amp
Ambient operating temperature range 14° to 104° F (-10° to 40° C)
Dimensions 11.5" L x 8.66" W x 4.17" H (292 x 220 x 106 mm)
Weight..... Approximately 6.39 lbs (2.9 kg)

15. LIMITED WARRANTY

WARRANTY NOT VALID IN MEXICO.

SCHUMACHER ELECTRIC CORPORATION, 801 BUSINESS CENTER DRIVE, MOUNT PROSPECT, IL 60056-2179, MAKES THIS LIMITED WARRANTY TO THE ORIGINAL RETAIL PURCHASER OF THIS PRODUCT. THIS LIMITED WARRANTY IS NOT TRANSFERABLE OR ASSIGNABLE.

Schumacher Electric Corporation (the "Manufacturer") warrants this inverter for one (1) year from the date of purchase at retail against defective material or workmanship that may occur under normal use and care. If your unit is not free from defective material or workmanship, Manufacturer's obligation under this warranty is solely to repair or replace your product with a new or reconditioned unit at the option of the Manufacturer. It is the obligation of the purchaser to forward the unit, along with proof of purchase and mailing charges prepaid to the Manufacturer or its authorized representatives in order for repair or replacement to occur.

Manufacturer does not provide any warranty for any accessories used with this product that are not manufactured by Schumacher Electric Corporation and approved for use with this product. This Limited Warranty is void if the product is misused, subjected to careless handling, repaired, or modified by anyone other than Manufacturer or if this unit is resold through an unauthorized retailer.

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