

Introduction to PowerCraft Inverters

The PowerCraft™ series of inverters, are members of the Vanner family of power products. The modified sinusoidal output waveform permits operation of many loads that would normally be run from the local utility supply. As with all Vanner products, the PowerCraft™ series is subject to a high degree of quality control, ensuring trouble free operation during the life of the equipment.

The PowerCraft™ series can be used in an extremely diverse range of applications including remote housing, recreation vehicles, marine applications etc.. The high quality output enables operation of sensitive equipment such as most televisions, video playback systems (VCR, DVD), personal computers, and other small appliances such as drills, sanders, grinders, blenders etc. .



To get the most out of your inverter, it must be installed properly. Please read this manual carefully and pay specific attention to Cautions / safety precautions, before installing the equipment.

Safety

Information for using the installation instructions



Warning! Safety warning: Failure to observe this warning may result

in injury to persons and damage to equipment.



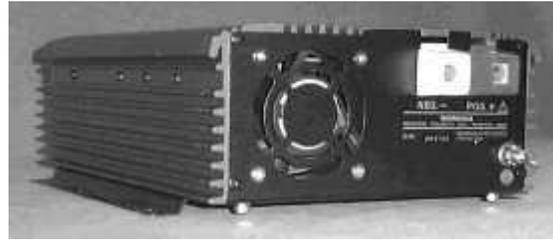
Caution! Safety warning: Failure to observe this warning may result in damage to equipment and improper functioning of the battery charger.

Cabling



- If cables have to be inserted through metal walls or other sharp-edged materials, use cable duct or cable bushes / glands.
- Do not lay cables loose or with sharp bends on electrically conductive materials (e.g. metal).
- Do not pull the cables.
- Do not lay mains cable and 12V DC cable together in the same cable duct.
- The specified minimum cable cross-section must be complied with.
- Secure cables properly.
- Lay cables in such a way that no one can trip over them.
- Lay cables in such a way that they are not exposed to the risk of damage.

Features



Front Oblique & Rear Views



1 On/Off switch

Caution: Leave the on / off switch in the 'off' position during installation.



2 Overload indicator

Caution ! The overload indicator illuminates when the inverter shuts down due to the load drawing excessive power. The correct procedure for resetting the inverter is as follows;

- 1) Switch 'off' the inverter.
- 2) Remove overload
- 3) Switch the inverter 'on'

3. AC Outlet. (available in North American, European & Australian / N.Z. formats).



4. Ventilation window

Caution ! Do not obstruct, allow at least 1" (24mm) for airflow.



5. DC terminals

Caution ! Reverse polarity connection will blow the internal fuse and may lead to permanent damage to the inverter. Damage due to incorrect polarity connection is not covered by Vanner terms of warranty.



6. Chassis ground/earth connection - Connect this terminal to ground / earth or to vehicle chassis, using cable of at least 8 AWG wire thickness.

Caution ! Operation of the inverter without correct grounding can result in an electrical safety hazard.

Installing Inverters

General installation considerations;

1. Unpack and inspect the inverter for physical signs of damage.
2. The PowerCraft™ inverter should be installed in a location that meets the following requirements.
 - a. Though the PowerCraft™ is designed for marine applications, you should always remember the rule that electricity and water together are a dangerous combination. Therefore locate the inverter where it is least likely to be subject to drips and splashes.
 - b. As with all electrical and electronic devices the location of the inverter should be out of direct sunlight and away from sources of thermal energy. A cool ambient environment is ideal (between 0 and 40 degrees Celsius),- the cooler the better.



Caution ! Ventilation, - allowance should be made for at least 1" (25mm) around the inverter.

- c The inverter has a lug on the rear panel assembly labeled 'chassis ground'. This is used to connect the chassis of the inverter to earth / ground.
 - d This terminal is also connected to the ground on the AC outlet. The chassis ground lug must be connected to an appropriate ground / earth

point.

e In a vehicle, connect this to the chassis of the vehicle. On marine applications connect to the boat's grounding system. On other fixed installation connect to a convenient and appropriate grounding point.

f The neutral conductor of the inverter AC output is also connected to ground. Therefore when the chassis ground is connected, the neutral will also be grounded. This conforms to most major national electrical codes.



Caution ! The negative DC input of the inverter is connected to the chassis. Do not install the power inverter in a positive ground DC system. A positive ground system has the negative terminal connected to the chassis of a vehicle, boat or fixed installation grounding point.

Caution ! Do not operate the inverter without connecting it to ground / earth. Electrical shock hazards may result.

Hooking up the Inverter

1. Ensure the power switch is in the 'off' position.
2. The inverter is suitable for negative ground applications only, connect the DC supply cables in the following order;
3. Connect the ground lug on the inverter using at least 8AWG insulated cable to ground.
4. Connect the inverter '-' terminal on the inverter to the supply 'negative' terminal with cable rated appropriately to comply with local regulations and to safely supply the surge requirements of the inverter, (cross refer to the 'specifications' section).
5. Ensure the positive supply is available through a suitable protective device.



Caution ! You may observe a spark when initially making this next connection. This is quite normal due to the input smoothing circuitry charges up. Do not make this connection in the presence of flammable or explosive materials. Fire or explosion could result if this Caution is not observed.

6. Connect the inverter '+' terminal on the inverter to the supply 'positive' terminal. Verify the cable is rated appropriately to comply with local regulations and to safely supply the surge requirements of the inverter, (x-refer to the 'specifications' section).



Caution ! Loosely tightened connectors result in excessive voltage drop and unnecessary heat, which can cause cabling to melt. Always ensure that connections are tight.

Caution ! Before proceeding further verify the connections and cabling carried out above are correct. Inspect the routing of the cables for inadvertent exposure to external heat sources and chafing.

7. Ensure the inverter power switch is in the 'off' position, the internal alarm may sound momentarily, this is normal.

8. Connect a test load to the inverter output, this can be a suitably rated light fixture with switch for example

9. Ensure the test load switch is in the 'off' position.

10. Switch the inverter power switch to the 'on' position.

11. Switch the test load on.

12. Using a suitable meter, verify the a.c. voltage is within specification.

Inverter Operation

General

1. To operate the power inverter, turn it on using the On/Off switch on the front panel.
2. The power inverter is ready to supply AC power to the load.
3. If operating several loads from the power inverter, turn them on separately after the inverter has been turned on. This ensures that the power inverter does not have to deliver high start-up surge currents simultaneously.

Controls and Indications

1. The On/Off switch applies power to the inverter's micro-controller. It does not disconnect the DC input from the inverter.
2. When the switch is in the 'Off' position, the inverter draws no current from the battery.
3. When the switch is in the 'On' position, but with no load, the inverter draws minimal current, (cross refer to the 'specifications' section in this manual).

Over-temperature Indication

1. The over-temperature indication, determines whether the inverter has shut down due to over heating.
2. The inverter can over heat due to operation at power levels above its designated rating. Alternatively, the inverter can overheat due to being located in a manner that does not permit sufficient airflow to cool the unit.
3. In an over-temperature condition, once the unit has cooled sufficiently to allow normal operation to resume, the inverter will restart automatically.

Overload Indication

1. The overload indication, determines whether the inverter has shut itself down due to the AC output either being in a short circuit

condition, or drastically overloaded.

2. In order to reset the unit, switch the 'On/Off' switch to the 'Off' position. Observing all necessary and appropriate safety precautions, correct the overload or short circuit condition. Switch the 'On/Off' switch to the 'On' position.

Operating Limits

1. Low Voltage Shutdown

a. The power inverter will operate within the DC voltage limits as detailed in the 'Specifications' section of this manual.

b. If the voltage drops below the lower limit specified, an audible alarm will sound indicating a low battery warning condition.

c. In the 'low battery warning condition', the inverter will shutdown if the DC input voltage drops below the lower limit. This protects the battery from being over discharged.

2. High Voltage Shutdown

a. The power inverter will operate within the DC voltage limits as detailed in the 'Specifications' section of this manual.

b. If the voltage increases above the high limit specified, the inverter will shutdown. This protects the inverter against excessive input voltages.

c. Although the inverter incorporates protection against over voltage, it may still remain susceptible to damage, if exposed to prolonged voltages in excess of 50% the nominal DC input voltage.

Inverter Troubleshooting

General

Your Vanner PowerCraft™ inverter should provide you with years of trouble-free operation. However, here are some guidelines that will

help you in dealing with some common problems with operation.

Television Interference

1. TV interference can be encountered on some channels when used in conjunction with the inverter.
2. Ensure the chassis ground/earth lug is solidly bonded to the ground system on your vehicle / boat / home etc. .
3. Do not operate high power loads with the inverter whilst watching TV.
4. Ensure the antenna / aerial feeding your television provides adequate 'snow-free' signal and that the signal cable is good quality.

Over Temperature Indication

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2. The inverter can over heat due to operation at power levels above its designated rating. Alternatively, the inverter can additionally over heat due to being located in a manner that does not permit sufficient airflow to cool the unit.



Caution ! In an over-temperature condition, once the unit has cooled sufficiently to allow normal operation to resume, the inverter will restart automatically.

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Other Problems

For other problems appertaining to the PowerCraft™ inverter series please consult your local Vanner PowerCraft™ dealer.

Introduction

Congratulations on your purchase of a Vanner PowerCraft Charger. The PowerCraft™ series of chargers, are members of the Vanner family of power products. The modified sinusoidal output waveform permits operation of many loads that would normally be run from the local utility supply. As with all Vanner products, the PowerCraft™ series is subject to a high degree of quality control, ensuring trouble

free operation during the life of the equipment.

The PowerCraft™ series can be used in an extremely diverse range of applications including remote housing, recreation vehicles, marine applications etc..

Caution points are highlighted through this manual in order to make users aware of safety aspects

General Safety and Installation Information



Warning! The following fundamental safety measures must be observed when using electrical equipment to avoid the danger of:

- *electric shocks
- *fire
- *injury



Warning! Protect and always operate the 110V connection for the battery charger with a fault current safety switch (GFCI/RCD) for 60mA fault current!

About the Unit



-The battery charger must only be used for the purpose specified by Vanner.

- When working on the battery charger, always disconnect it from the mains.
- Do not operate the battery charger if the housing or cables are damaged.
- The batter charger must be positioned and secured in such a way that it cannot fall over and is located for optimum stability.
- The metal housing is connected to the ground conductor of the utility plug. The connector cable from the battery charger must be plugged into the earthed outlets only.
- The battery charger must be kept in a safe place out of the reach of children.
- The battery charger must not be operated on in a damp or wet environment.
- Ensure good ventilation.
- Servicing and repair must only be carried out by a qualified person who is familiar with the risks involved and the relevant regulations.

Installation on Marine Craft



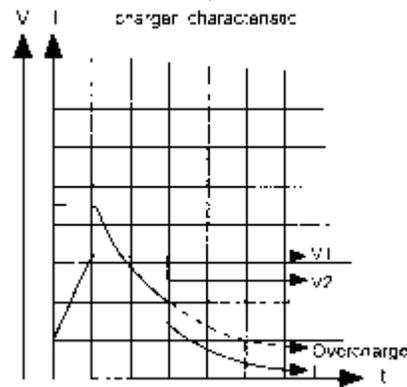
- Wrong installation of electrical units on boats can lead to corrosion of the boat. Therefore please ensure a qualified marine electrician carries out the installation of the charger.

Intended Use

The use of a high efficiency primary switching controller makes installation easy. The PowerCraft battery charger is very small, light

and powerful. Together with the mechanical strength, reverse polarity and short circuit protection ensure a high degree of operating safety.

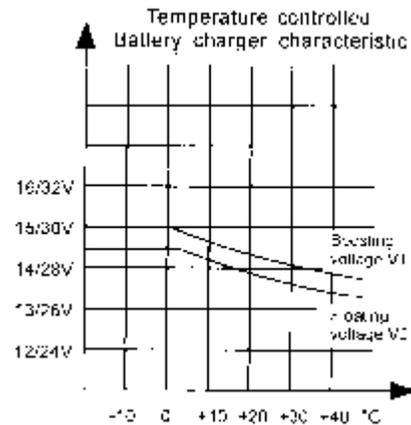
Because of these features, the units are ideal for mobile uses such as motor homes, motor vehicle, marine applications and emergency rescue vehicles with battery capacities of <150 Ah (PCCxx-1212), 300 Ah (PCCxx-1225) or 200 Ah (PCCxx-2414).



PowerCraft Charger Features

- Small, light and robust in design and manufacture
- Reverse polarity and short circuit protection
- Rectifier function. As mains unit, suitable for parallel operation of 12V equipment (PCCxx-1225)
- Easy installation by brackets on the housing.
- 2-stage charger characteristic for rapid and complete battery charging
- Cooling via thermostat-controlled fan (PCCxx-1225 and PCCxx-2414)

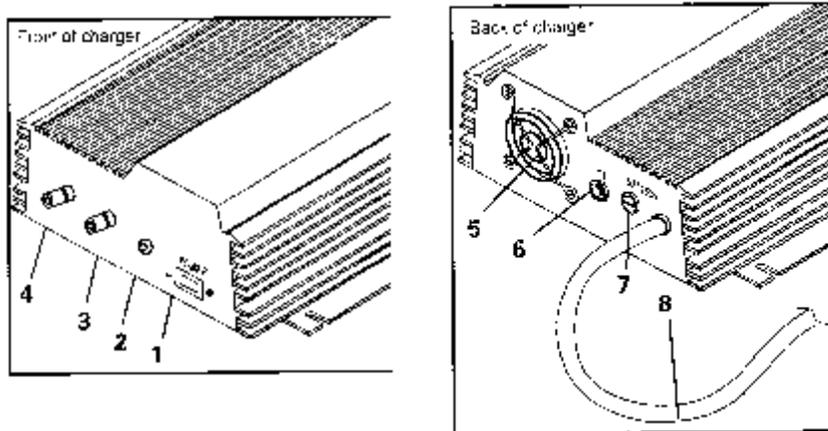
- LED display
- Optimum charge characteristics through temperature sensor



Installation and Commissioning



The PowerCraft battery charger must be installed in a location, which is protected from exposure to damp and moisture. Ensure that the location is well ventilated and that the surface on which it is mounted is level and sufficiently strong. The air intake on the base of the battery charger and the air outlet on the back must always be unobstructed.



Before connecting or disconnecting the DC cable, set the mains switch to "off" and unplug from the mains.

1. On/Off switch
2. Charging indicator
3. "+" (positive) terminal
4. "-" (negative) terminal
5. Fan with air outlet
6. Terminal for temperature sensor
7. Fuse

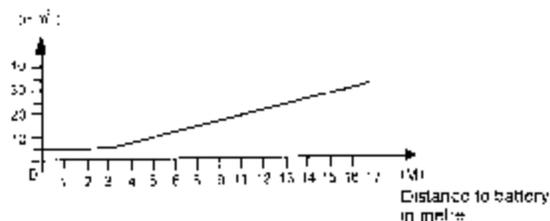
Battery charger type PCCxx-1212 Glass fuse 2AT 250V and glass fuse 15A 32V

Battery charger type PCCxx-2414 Glass fuse 4AT 250V

Battery charger type PCCxx-1225 Glass fuse 4AT 250V

8. Mains cable (110V)

Minimum wire cross sectional area in mm²



Connecting the Charger

When connecting the charger, only use cables with the specified wire cross-sectional area.

-This is shown in the diagram on the installation and commissioning page.

-Fit the ends of the cable to be connected to the battery charger with lugs (fork aperture: 6mm)

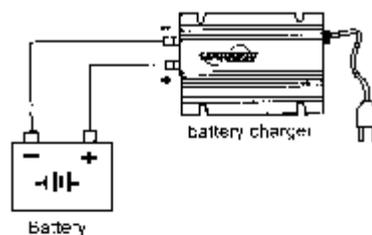
-Crimp the lugs onto the cable end with crimping pliers.

-Make sure that the lugs are securely fitted.

-Connect the cable to the unit via the two terminals on the front panel.

Despite the reverse polarity protection, always make sure that the cables are properly orientated.

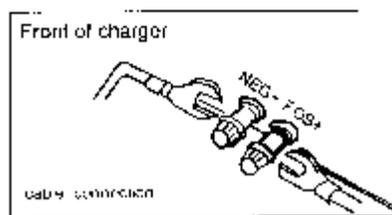
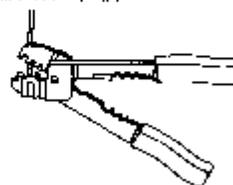
Connection diagram



Red: "-" pole of Battery charger - "+" pole of battery
 Black: "+" pole of Battery charger - "-" pole of battery
 (Use lug with fork aperture 6 mm and fit with crimping pliers)



Use lug with fork aperture 6 mm and fit with crimping pliers



Charger Operation

The battery chargers in 12V (PCCxx-1212 and PCCxx-1225), 24V (PCCxx-2408 and PCCxx-2414) and 48V (PCCxx-4808) formats. The maximum power rating of the charger must not exceed the maximum kilowatt rating of the utility supply to the charger. It is recommended always to connect the battery to the charger prior to utility mains hook-up. It is highly recommended that the charger should be connected directly to the utility supply and not via any branching configuration (This applies in particular to consumers with high peak currents (e.g. high start-up current in the case of Compressors).

In parallel operation, the maximum utility current should be more than the rated combined current of all the chargers otherwise the battery may discharge.

PCCxx-xx08 = max. 8 amperes

PCCxx-xx14 = max. 14 amperes

PCCxx-xx12 = max. 12 amperes

PCCxx-xx25 = max. 25 amperes

PCCxx-xx50 = max. 50 amperes

Charging

The temperature-controlled dual regime charger characteristic ensures rapid, complete and at the same time gentle charging of the battery.

In the first stage, the battery is charged with constant current until gassing voltage is reached.

When charging with compensated charge characteristic, the

temperature-dependent gassing voltage is taken into account, providing optimized full-charging and over-voltage protection. The green LED on the front of the charger remains lit up during charging until the charging end voltage is reached.

In the second phase, the battery is kept at constant voltage and the charging current gradually falls to a low value. The battery is practically at rest and only takes a trickle current necessary for maintaining capacity.

When the charger changes over to maintenance phase, the green LED goes off.



Enclosed batteries must not be charged, as there is a potential danger of explosion through the occurrence of gas in a non-ventilated area. Primary nickel-cadmium cells and non-chargeable batteries must not be charged with the charger. The casing of these types of batteries can explode if used with this type of charger.

Specification

Type Spec.	PCCxx-1212	PCCxx-1225	PCCxx-2408	PCCxx-2414	PCCxx-4808	PCCxx-1250 PCCxx-2425
Input Supply Voltage	110V +/- 10% 220V +/- 10%					

Charge End Voltage (V1)	14.4V	14.4V	28.8V	28.8V	54.4V	14.4V 28.8V
Maintenance Charge (V2)	13.41V	13.41V	27.2V	27.2V	51.2V	13.41V 27.2V
Max Charge Current	12A	25A	8A	14A	8A	50A 25A
Temperature Range	0-50 degC	0-50 degC	0-50 degC	0-50 degC	0-50 degC	0-50 degC
Input Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Net Weight	4.7 lbs	6 lbs	4.7 lbs	6 lbs	6 lbs	12.1 lbs
Dimensions (LxWxH)	9.4"x8.4"x3.4"	11.9"x8.4"x3.4"	9.4"x8.4"x3.4"	11.9"x8.4"x3.4"	11.9"x8.4"x3.4"	15.1"x9.8"

Inverter Charger Hybrid Introduction

The PowerCraft inverter charger unit charges its battery whenever connected to utility power. Should the AC utility power decrease below 18% of nominal, or increase 18% above nominal. A static transfer switch transfers the load to the inverter in 'no-break' mode. Should the AC utility voltage return to within nominal parameters, the output will revert to normal utility supply.

Front Panel

Overload indicator - LED color red - illuminates when the connected load exceeds the units capacity.

AC normal - LED color green - illuminates when the line voltage is normal.

Battery charge / line voltage - LED color yellow - displays battery charge current as a percentage of battery capacity.

Inverter use - LED color red - illuminates when the inverter is supplying the load from battery.

Type Spec.	PCHxx-xx5C0 500W	PCHxx-xx1K0 1000W	PCHxx-xx1K5 1500W	PCHxx-xx2K5 2500W
Output Waveform	Modified Sine	Modified Sine	Modified Sine	Modified Sine
Output Voltage	110V rms 230V rms	110V rms 230V rms	110V rms 230V rms	110V rms 230V rms
AC Input Voltage	110V 60Hz 220V 50Hz	110V 60Hz 220V 50Hz	110V 60Hz 220V 50Hz	110V 60Hz 220V 50Hz
DC Input Voltage	10-15V 20-30V	10-15V 20-30V	10-15V 20-30V	10-15V 20-30V
Transfer Time	<40mS	<40mS	<40mS	<40mS
Battery Protection	Auto self test + auto shutdown			

Low Battery Alarm	10.7V 21.5V	10.7V 21.5V	10.7V 21.5V	10.7V 21.5V
Overload Protection	Yes	Yes	Yes	Yes
Surge Capability	750W	1500W	2250W	3200W
Dimensions LxWxH	16"x9"x4"	20"x10"x4"	24"x9"x4"	33"x9"x4"
Weight	7lbs	13lbs	19lbs	23lbs