GENERAL SAFETY RULES

WARNING: Failure to read all instructions may result in serious personal injury.

- **Avoid wet environments.** Do not get the inverter wet.
- **Store the inverter in a safe place when not in use.** Keep out of reach of children.
- **Use the inverter for its intended purpose ONLY.** Do not overload the inverter. Trying to power an appliance that draws wattage larger than inverter's capability will result in damage to the inverter.
- **Disconnect appliances.** Disconnect the appliance from the inverter when not in use.
- **Proper cooling is essential when operating the inverter.** Do not place the unit near the vehicle's heat vent or in direct sunlight.
- **Use of accessories and attachments.** Do not use any accessories or attachments that are not recommended to use with your appliance. This could result in damage to the unit.

WARNING: Keep away from WATER, FIRE and SMOKE!

The inverter will shut off if overheated, overloaded, or short-circuited.

IMPORTANT SAFETY INFORMATION

For safe and optimum performance, the inverter must be installed and used properly. Carefully read and follow the guidelines in this guide and pay special attention to the Caution and Warning statements.

WARNING: Shock hazard! Keep away from children.

WARNING: The inverter produces the same potentially lethal 110V/AC power as a typical household outlet. It is suggested that you treat it as a normal 110V/AC outlet.

WARNING: The exterior of the unit may become very warm under high-power operation reaching 140°F. Be sure that there is at least 2″of unobstructed air space around the perimeter of the inverter at all times. During use, do not place materials that could be damaged by heat near the unit.

WARNING: Do not operate the unit near flammable fumes or gases such as the cabin of a gasoline power boat or near propane tanks.

WARNING: Do not operate the unit in an enclosed area that contains lead-acid batteries for automotive use. This type of battery emits explosive hydrogen gas which can be ignited by sparks.

WARNING: Always make all AC connections before making DC connections or the components built into the inverter can become energized producing an electrical shock hazard. Never work on the AC wiring without first physically disconnecting the DC connections.

CAUTION: Do not connect the unit to live AC power circuits or there could be damage to the inverter.

CAUTION: Do not use the unit on the following items:

- Small battery-operated appliances such as flashlights, razors, and nightlights that can be plugged directly into an AC outlet to recharge.
- Certain battery chargers for hand tool battery packs. These chargers will have warning labels indicating dangerous voltages.

CAUTION: Make sure to connect the inverter to a 12V battery. The inverter will work properly under 11V to 15V inputs.

ADDITIONAL SAFETY GUIDELINES

- Do not put anything on the unit outlets, vents, or fan openings.
- Do not connect the unit to any utility power distribution systems or branch circuits.
- Do not use the inverter in temperatures over 104°F or under 32°F.
- Failure to follow these safety guidelines may result in personal injury and/or damage to the unit. It may also void the warranty.

OPERATING TIPS

The inverter should only be operated in locations that are:

a. Dry: Do not allow water or other liquids to come into contact with the inverter.

b. Cool: Surrounding air temperature should ideally be 32°F to 104°F. Keep the inverter away from direct sunlight, when possible.

c. Well-Ventilated: Keep the area surrounding the inverter clear to ensure free air circulation around the unit. Do not place items on or over the inverter during operation. The unit will shut down if the internal temperature gets too hot. The inverter will auto-restart after it cools down.

d. Safe: Do not use the inverter near flammable materials or in any locations that may accumulate flammable fumes or gases. This is an electrical appliance that can briefly spark when electrical connections are made or broken.

Please find the continuous output power of your inverter below.

PWD30: Continuous output 30W

HELPFUL FORMULAS

To convert AMPS to WATTS: AMPS x VOLTS=WATTS
To convert WATTS to AMPS: WATTS ÷ VOLTS=AMPS

When you turn on an appliance or a tool that operates using a motor, 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 its continued running power requirements.

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

Your inverter can be used to operate personal electronics as below.

Below is a list of common items that may work with your new inverter. The wattages represented are an average and may not reflect your particular item. Please look at the item's owner's manual or contact the manufacturer for power consumption needs.

Cellular phone	3W
Tablet	15W
Glue Gun	20W
7″ DVD player	48W
Laptop	60W-100W
Video game console	60W-300W
Lamps (Up to 70 watts)	75W

Your inverter should be connected directly to your vehicle's 12V DC port or DC socket. We recommend that the equipment or appliance switch be in the **"OFF"** position while you plug into the AC receptacle of the inverter.

1. Place the inverter in the vehicle's 12V cigarette or power outlet socket
2. Plug in the AC product you want to operate
3. Disconnect the unit from the socket when not in use for safety

CAUTION: When short-circuit occurs, the inverter shuts off automatically to protect the inverter from damage.

OPERATING THE INVERTER

1. Plug the inverter into 12V DC port of your vehicle.
2. Check the connections.
3. The inverter's LED lights should be on.
4. Your inverter can power AC appliances now.

CAUTION: Connect AC appliances one at a time.

Through its AC outlet, the inverter is capable of powering most 110V products at its rated power. The unit will operate from input voltages ranging from 11V to 15V DC.

CAUTION: Most vehicle batteries are designed to provide a short period of very high current for starting the engine. They are not designed for a constant "deep discharge."

CAUTION: Constantly operating the unit from a vehicle battery until the low voltage shuts off will affect the life of the battery. If you are going to operate electrical products for long periods of time, you should consider connecting the unit to a separate deep discharge battery.

CAUTION: Although the inverter incorporates protection against over-voltage, it may still be damaged if the input voltage exceeds 16V.

The unit will shut down automatically if the inverter exceeds a safe operating temperature due to insufficient ventilation or a high-temperature environment.

THE SELF-PROTECTION OF YOUR INVERTER

Type	Possible cause	How do you know if the protection is activated?	Solution	Remarks
Current overload	If the output power exceeds the rated output power 10 to 15%	The inverter will automatically shut off.	Remove all appliances and unplug inverter. Use smaller power consumption appliances.	
Input low voltage	Input voltage lower than 10.5V		Remove all appliances and unplug inverter. Recharge the battery.	
Input high voltage	Input voltage higher than 15V		Remove all appliances and unplug inverter. Check the battery voltage, make sure it is within 11-15V.	Although the inverter has protection against over load, it may still damage the inverter if the input voltage exceeds 16V.
Overheat	The PCB temperature is around 230°F		Remove all appliances and unplug inverter. Cool down for 15 minutes before turning on again.	Please ensure there is ventilation in the surrounding environment.

BATTERY OPERATING TIME

Operating time will vary depending on the charge level of the battery, its capacity, and the power level drawn by the particular AC load. With a typical vehicle battery, an operating time of 4-5 hours or more can be expected.

When using a vehicle battery as a power source, it is strongly recommended to start the vehicle every hour or two to recharge the battery before its capacity drops too low. The inverter can operate while the engine is running, but the normal voltage drop that occurs during starting of the engine may trigger the inverter's low voltage shutdown feature.

Because the power inverter draws less than 0.45A when it's on with no AC product connected, it has minimal impact on battery operating times.

INTERFERENCE WITH ELECTRONIC EQUIPMENT

Generally, most AC products operate with the inverter just as they would with household AC power. Below is the information concerning two possible exceptions.

BUZZING IN AUDIO SYSTEMS AND RADIOS

Some stereo systems and AM-FM radios have inadequate internal power supply filtering and "buzz" slightly when powered by the inverter. Generally, the only solution is an audio product with a higher quality filter.

SPECIFICATIONS

Model	PWD30
Input	11-15V DC
Output	115V AC
Output Frequency	58-62Hz
Output Waveform	Modified Sine Wave (MSW)
Continuous Power	30W
Surge Power	60W
Efficiency	85% Max
No Load Draw	<0.2A
Low Battery Shutdown	10.5±0.3V DC
USB Output Port	2.4A
USB-C® Output Port	3.0A (15W)
AC Output Socket	1 Standard North American socket
Internal Fuse/ Replacement Fuse	1-8A fuse in the cigarette plug (replaceable)
Operating Temperature	Ideally 32F-104F
Battery Low Alarm	NA
Power Cable Length	36"
Dimensions	3.25" x 2.313" x 1"
Net Weight	0.32 lbs.

POWERDRIVE®

OWNER'S GUIDE
PWD30

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TROUBLESHOOTING

Problem	Cause	Solution
No power, no indicator.	Battery is defective.	Replace battery.
	Blown fuse.	Check and replace fuse.
	Loose connections.	Check connections, be sure the ports and plugs come into contact with each other.
The inverter will automatically shut off.	The actual output power is higher than rated power of inverter. Overload protection has occurred.	Reduce load to have the actual output lower than rated power of inverter.
	The actual output is less than rated power, but high starting surge has caused overload shutdown.	Use a product with starting surge power within the inverter's capability.
	The voltage input is too low.	Charge the battery.

Problem	Cause	Solution
The inverter will automatically shut off.	Inverter is overheated due to poor ventilation and has shut down.	Disconnect the inverter from battery or DC socket and allow to cool for 15 minutes. Please ensure to remove objects covering unit.
Inverter runs small loads but not large loads.	Low voltage battery.	Charge the battery.
Water entered.	Water entered the unit.	Disconnect the inverter and wipe immediately with a dry cloth, or permanent damage can occur from liquids.

Problem	Cause	Solution
Measured inverter output is too low.	Standard "average-reading" AC voltmeter used to measure output voltage, resulting in an apparent reading 5V to 15V too low.	Inverter's "modified sine wave" output requires "true RMS" voltmeter for accurate measurements.
	Battery voltage is too low.	Recharge battery.
Battery run time is less than expected.	AC product power consumption is higher than rated.	Use a larger battery to make up for increased power requirement.
	Battery is old or probably defective.	Replace battery.
	Battery is not being properly charged.	Some chargers are not able to fully recharge a battery. Make sure you use a powerful charger.