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**Power that really moves**

## **Users Manual of 400W Power Transformer**

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Made in China

Please read this manual carefully before using this product.

## 1. Read this manual carefully before using your transformer.

Safety is the first concern.

Improper installation or use may result in danger or accidental injury. Before using it, please read this instruction carefully. Special attention should be paid to the contents of **WARNING** and **ATTENTION** parts. Attention indicates that under certain conditions or by some kind of operations, you may cause damages to the transformer or other equipment. Warning means the cases that might cause physical injury to human.

### **Warning: Danger of electric shock! Keep it out of children's reach!**

The AC input outlets are as risky as the general household electrical outlets, and they can be fatal.

The outlets, fan and ventilation window should not be blocked.

The transformer should be avoided from soaking, raining, etc.

In no case can the common AC electric wires be connected directly to the transformer.

### **Warning: surface heating**

The surface temperature will rise to 60° C after being used continuously. When using it, make sure that the air ventilates well within at least 5cm above both terminal sides. Don't put the objects nearby which are easily influenced by heat.

### **Warning: Danger of explosion**

Usage under the following circumstances is forbidden: nearby there are explosives or flammable objects; at the bottom of the ship compartment which was powered by gas; near places where the epoxy propane reservation tank, vehicle tyres, and lead acid battery are stored. The battery may be easily ignited by static sparkles in the case of hydrogen leakage. Make sure that aid can be achieved nearby in case of accidents.

### **Attention:**

Plugging the powered DC power supply line directly into the transformer is not allowed. Don't connect the grounded DC load to the transformer.

Using it in the environment above 60° C is not allowed.

**2. Explanation**

Thank you for purchasing 400W power transformer. This style of transformer is light and small and rationally designed, representing the trend of hi-frequency transformer. No matter whether it is connected to vehicles, ships or a special 12V power storage battery, it can supply safe and reliable AC power to all the household electric appliances, such as TV sets, video-recorders, electricity motivated tools and soon. The self-protection function designed enables your transformer and battery to achieve effective protection against overload, and it is handy to be used.

**Please read this manual carefully before any installation and operation.**

**Keep the instruction book for later reference.**

**I). Safety features:**

- 1) overload protection, power shuts off.
- 2) Built-in fuse offers safety protection when restarting it.

- 3) Low-voltage warning, power shuts off automatically.
- 4) Over-voltage protection, power shuts off automatically.
- 5) Over-heating protection, power shuts off automatically.
- 6) Shortcircuit protection.

**II). Installation guidance**

In consideration of safety and performance, the installation environment should be:

- 1) Dry: soaking or raining is not allowed.
- 2) Cool: suitable to be used within the ambient temperature of 0°C~40°C.
- 3) Ventilated: make sure there is no other objects 5 cm above the outer shell and the other terminal sides are well-ventilated.
- 4) Safe: can't not be connected to the electric appliances powered by battery, and in the installation environment there should be no flammable liquid like gasoline or volatile and explosive gas.
- 5) Clean and dust-free: this kind of working environment is crucial to the 400W transformer.

**Wiring: Please use the lead with cigar head.**

As the general 12V sockets are limited in vehicles or ships, the 400W transformer is only used to supply AC power to the electric appliances of 320W (about 1.4A) or less power. If more than 320W (but smaller than 400W) power, or a higher peak value is needed, please use a lead with cigar head.

- 1) connect the round terminal of the red wire to the positive electrode bolt DC (+), and connect the round terminal of the black wire to the DC negative electrode DC (-) bolt.
- 2) Wrong electrodes connection will result in burning damage of the fuse, or even the damage of the transformer.
- 3) Turn tight the screws of the connection bolts, but not too tight.
- 4) Plug the cigar head into the 12V socket, turn the switch to ON position. If it does not work normally, refer to Part 3.
- 5) When the transformer is not in use, please pull the cigar head out of the 12V socket to avoid slight discharge of the storage battery.

**Use the lead with clips**

Use the clips of the lead to connect the 12V storage battery, and you can run an electric appliance with a continuous power of 320W.

- 1) Step 1 and Step two here are just the same as the above Step 1 and Step 2.
- 2) Connect the clip of the black PVC wire to the negative electrode of the storage battery.
- 3) Connect the clip of the red PVC wire to the positive electrode of the battery.
- 4) Turn the switch to "ON" position. In case it does not work normally, refer to Part 3.
- 5) When the transformer is not in any use, don't connect the clips to the storage battery.

**III) Use method.**

The 400W transformer is suitable to be used to the 220V electric appliances with a continuous power of or no more than 320W. The AC output wavetype is "refixed sine wave", meaning the power supply applied is similar to sine wave in terms of function. Power or the volume of Watts means the nominal power of the product.

At the moment when the product is started, the consumption of electricity is greater than in the normal working time. When TV sets, monitor, electric motors are started, the electricity volume reaches the peak value. Even though the 400W transformer can endure the power consumption of 800W, sometimes the peak value of an electric appliance lower than 400W can still be greater than the peak power value the transformer can endure, and it can cause overload protection to turn off the power. It occurs possibly if multiple electric appliances are motivated at the same time. If it is necessary to use multiple electric appliances at the same time, please shut off the switches of the electric appliances, then turn on the switch of each electric appliance. The electric appliance with highest peak value should be turned on first.

#### **IV) Display and control the system**

1) On one side of the transformer there are 2 AC output outlets, and can be connected at the same time to two 220V electric appliances whose power add up to no more than 320W.

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- 2) when the switch of the transformer is turned on, there exists AC output of power supply.
- 3) The green indicator (power indicator) works, indicating there is outgoing power at both of the outlets and the transformer functions normally.
- 4) The red indicator (protection indicator) is on, indicating the transformer has shut off due to reasons of over-voltage, under-voltage, overload or overheat.

#### **V) Operation**

- 1) If the 12V output or the storage battery are connected correctly, the green indicator will be on, indicating there is AC power output.
- 2) Connect the electric appliance to the transformer, each time plug one electric appliance.
- 3) When being used, the voltage of the storage battery starts decreasing. When the voltage at the input terminal of the transformer drops to 10.4-11V, it alarms. Then the electric appliance should be turned off in time.
- 4) If the alarm is neglected, the transformer will turn off automatically when the current drops to 9.7-10.3V, avoiding the battery from leaking. When power is shut

off, the red protection indicator lights.

5) When the output power of the transformer is greater than 100W, the fan starts.

6) Once the power of the electric appliances exceeds 320W, the transformer shuts off and the red protection indicator lights.

7) Once the temperature exceeds the safe working temperature or any mal-ventilation cause the ambient temperature to rise, the transformer will turn off automatically.

8) If the charging system does not work well and has caused the voltage in the storage battery rise too high, the transformer will shut off automatically.

9) When overload, underload or overheat occurs, the transformer will shut off automatically.

#### **VI) Important advice:**

Generally the vehicle used storage battery has a powerful output power, but it lasts short. In order to start the vehicle in time, the battery should not discharge excessively for a long time, for doing so will shorten the life-span of the storage battery. If you need to use different electric appliances in the vehicle for a long time, we suggest

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you to connect the transformer to another storage battery which can discharge power for a longer time.

**Attention:** Even though the transformer is designed with a function of over-voltage protection, the transformer still can be damaged if the input voltage exceeds 15.5V.

#### **VII) The working time length of the battery**

The working time length of a storage battery relies on its discharge extend, its capacity and the power consumption of the electric appliances. A common vehicle used storage battery, running a 100W electric appliance (for example, running a small TV set), can last for 2-3 hours or longer. If the vehicle battery is used as power supply, you'd better start your engine every 1 or 2 hours to recharge the battery and avoid power volume exhaustion. The transformer and the engine can work at the same time. When starting, the power current drops sharply, and the transformer can probably shut off as a result of under-voltage. When the transformer is free of any load, the consumption current is smaller than 0.25AMPS, being a minimum influence to the battery.

**VIII) Electromagnetism Interference.**

Generally there is no difference between using a transformer to supply power to the household electric appliances and using a household power supply. However, the following two cases can be the exceptions:

a) There is interference noise in the radio or audio system.

The cheap audio equipment and AM-FM radio receivers, due to its poor internal power supply compatibility, may give out interference noise when connected to a transformer. The only solution is to use a better filter.

b) TV interference

Even though the transformer exerts a extremely small interference to TV set, when the TV signal is relatively weaker, there might be horizontal lines rolling in the TV screen. Using the following methods, you can reduce or eradicate this problem.

- 1) enlarge the distance between the TV set and the transformer, as well as the distance between antenna and electric wires.
- 2) Adjust the angles of the TV set, antenna and electric wires.
- 3) Use a high quality antenna or antenna with protection function.
- 4) Change a TV set which is better in quality and with a better anti-interference performance.

**3. Problems and solutions**

<b>Problems</b>	<b>Causes</b>	<b>Suggested solutions</b>
The electric appliance does not work, and the indicator does not work.	Improper storage battery	Check the storage battery, change it depending on situation.
	Wrong connection at positive poles and negative poles	Check the battery connection. The transformer may be damaged. Change a transformer (not guaranteed)
	The wires are not tight enough	Check the cables and the connections, turn fast the wiring terminals.
The electric appliance does not work, and the transformer's red indicator is on.	The nominal power of the electric appliance exceeds 320W leading to overload shutoff.	Use the electric appliances with a power smaller than 320W.
	The power of the electric appliance is smaller than 320W, and the peak power is too high, causing overload shutoff.	The peak value of the electric appliance is greater than that of the transformer. Use the electric appliance with the same peak value as the transformer.
	The battery exhausts power and it alarms.	Change the battery.
	Mal-ventilation, causing over-temperature shutoff.	Turn off the transformer, cool it down for 15 minutes, clear up the objects around the fan and the transformer, move the transformer to a cool place, reduce the load according to requirement, and restart it.

Problems	Causes	Suggested solutions
	The input power is too strong	Check the working condition of the recharging system, the output current of the storage battery should be 12V
The output current of the transformer is checked too week.	The reading degrees of the generally used power test meters are too limited.	To test the output of the square-wave transformer, one should use " True effective value multimeter " so as to achieve accurate data.
	The current of the storage battery is too low.	Recharge the storage battery
The transformer alarms	Under-voltage or over-temperature protection	Shorten the lead or use a thicker cable, recharge the storage battery, let the transformer cool down, improve the ventilation around the transformer, put the transformer to a cool place, reduce the load according to requirement.
The transformer can only motivate a small power load.	Current attenuates when passing the lead.	Reduce the length of the lead, use a bigger lead.
The working hours of the transformer is too short.	The power consumption is bigger than the transformer's nominal load.	Use a more powerful storage battery.
	Battery mal-condition or damage	Replace the battery
	The battery is not recharged enough	The recharger cannot fully recharge the battery, replace it with a better intelligent recharger.

Problems	Causes	Suggested solutions
	Current attenuates when passing the lead.	Reduce the length of the lead, use a bigger lead.

#### 4. Technical Parameters

Output voltage: 220V

Working voltage: 10-15V

Lasting output power: 320W

30 minutes lasting power: 400W

Peak power value: 800W

Output frequency: 50 ±2HZ

Output wave type: modify sine wave

Maximum power: 90%

12V output, the power consumption of the transformer in load-free state: <0.25A

Ambient temperature: 0 °C ~ 40 °C

Under-voltage alarm: 10.4~11V

Low-voltage shutoff: 9.7~10.3V

Over-voltage shutoff: 14.5~15.5V

Volume: (L×W×H) : 158×90×49mm

Weight: 800 gram