

Qoltec[®]



USER MANUAL

VOLTAGE CONVERTER WITH MODIFIED FOIL

**Model: 52680 52681 52682 52683 52684 52685
52686**

Introduction

Thank you for choosing a Qoltec voltage converter. Our devices have been designed with high reliability, safety and user comfort in mind.

Before use, please read this user manual carefully, as it contains all the necessary information regarding correct installation, operation and safety guidelines. We are confident that the device will meet your expectations and serve you reliably for a long time.

If you have any questions or require technical support, please contact our customer service department.

About the product

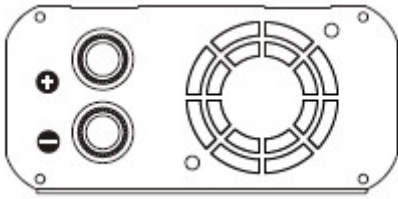
The modified sine wave voltage converter converts low-voltage direct current (DC) from a battery or other power source into 220V–240V alternating current (AC), i.e. the voltage found in domestic sockets.

They should not be used to power sensitive equipment, such as medical devices or computers. Some audio equipment may not function correctly if powered by modified sine wave current.

Device features

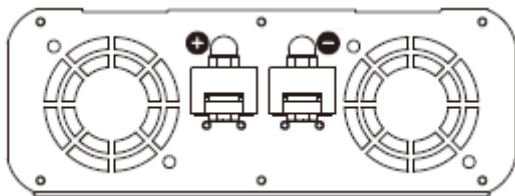
- Modified sine wave output
- USB port: 5V, 2.1A – enables fast charging of mobile devices such as smartphones, power banks and cameras
- High reliability and high efficiency – stable operation and optimal use of battery power
- High load capacity
- Temperature-controlled cooling fan – switches on automatically at elevated operating temperatures
- LEDs indicating operation and faults

Converter design



Front panel:

- The ON/OFF power switch is used to switch the converter on and off.
- Two LEDs:
 - a) Inverter – the LED is lit continuously when connected devices are receiving alternating current (AC) from the battery-powered inverter.
 - b) Fault – the LED lights up red when an error occurs; see the 'Troubleshooting' section for details.
- AC socket: Schuko
- USB port: 5V, 2.1A
- Ventilation outlet



Rear panel:

- The fans start automatically when the internal temperature of the converter exceeds 45°C. Always ensure free airflow — do not block the ventilation openings.
- DC battery terminals are used to connect the power cables from the battery. (DC terminals: negative (-) and positive (+) should be properly insulated to prevent accidental short-circuiting).
- Fuse (quantity depending on the inverter's power rating).

Important safety instructions

Warning: Incorrect installation or improper use of the inverter may pose a risk to the user or create hazardous operating conditions.

1. Do not connect any other power source, in particular an AC (alternating current) source.
2. Ensure that the ventilation openings and air inlets and outlets are not obstructed.
3. Do not pull on wires or cables. When disconnecting, always hold the plug, not the cable.
4. To avoid the risk of electric shock, always disconnect the converter from the external power source before inserting the AC plug into the socket.
5. The device is intended for indoor use only. Avoid exposure to external heat sources, direct and prolonged sunlight, dust, corrosive substances and moisture.
6. The converter heats up during operation — this is normal. Do not touch the device whilst it is in operation. Do not place the converter in areas exposed to high temperatures or near heat-sensitive materials.
7. Do not drop the device or subject it to impacts or shocks.
8. Do not place any objects on the converter housing.
9. Always use only the cables and connectors supplied with the device. The use of other cables, connectors or accessories is considered misuse and may result in injury or damage to the device.
10. Do not attempt to service, open or dismantle the device. The converter contains no user-serviceable parts. Attempting to repair it yourself poses a risk of electric shock, including a life-threatening hazard from contact with high voltage. In the event of any problems, stop using the device immediately and contact technical support.
11. Before cleaning the converter, switch it off and disconnect it from the mains supply. Clean only with a dry, soft cloth. Do not use damp materials or chemicals.

12. Before carrying out any work on circuits connected to the converter, disconnect all connections on the AC and DC sides. Setting the ON/OFF switch to the OFF position does not guarantee complete disconnection from dangerous voltage.

13. Store and use out of the reach of children.

Requirements for the converter installation site

Note: The installation site for the converter must meet the following environmental conditions:

1. Dry environment: The device must only be installed in a location protected from moisture. No water must be allowed to drip onto or splash onto the converter.
2. Suitable ambient temperature: The permissible operating temperature range is 0°C–40°C, with a recommended operating temperature of 15°C–25°C. The device must not be placed on or near heat sources generating temperatures higher than room temperature. It is recommended to avoid exposure to direct sunlight.
3. Proper ventilation: Ensure at least 2.5 cm (1 inch) of clearance on each side of the converter to allow for proper air circulation.
 - Do not place any objects on the unit's housing or cover the ventilation inlets and outlets during operation.
 - When operating at maximum load, it is recommended to provide additional forced air flow (e.g. using a fan).
4. Safety conditions: Do not install the converter in the same compartment as batteries. Do not install the unit in locations where flammable substances, liquids or vapours may be present, accumulate or form.
5. Dust protection: Do not install the converter in a highly dusty environment. When the cooling fan is operating, dust particles may be sucked into the device, which may reduce its service life and reliability.
6. Distance from the batteries: Avoid using excessively long power cables. Do not install the converter in the same compartment as the batteries.

Converter mounting position

Note: The converter can be mounted as follows:

- I. The unit may be mounted horizontally on the top surface of a horizontally oriented surface.
- II. The device may be mounted from the underside of a horizontal surface, also in a horizontal position.

Note: Vertical mounting is not permitted.

Connecting the converter

Note: To start operation, carry out the following steps:

1. Selecting the power source: The inverter must be powered by a battery/batteries or from a car cigarette lighter socket.
2. Connecting the converter to the power source: Set all switches to the OFF position (both on the converter and on the connected devices).

a) Power supply from battery/batteries:

Connect the DC cables to the battery terminals on the rear panel of the converter as follows:

red terminal – positive (+) terminal; connect the other end of the cable to the positive terminal of the battery.

black terminal – negative pole (-), connect the other end of the cable to the negative pole of the battery.

Warning: If the cables are connected to the wrong terminals, polarity reversal will occur, causing the fuse to blow.

b) Power supply from the car cigarette lighter socket:

Insert the cable plug into the car cigarette lighter socket.

3. Connecting the converter to devices

Note: Ensure that the power of the connected device does not exceed the converter's rated power, and that the inrush current does not exceed the peak power.

After connecting the converter to the power source and the load devices, switch on the converter, then switch on the connected devices.

When powering several loads simultaneously, switch them on one by one after the converter has started up. This prevents the need to supply a high inrush current to all devices at the same time.

Safety features

The converter is equipped with a range of safety features to ensure safe and reliable operation.

1. Input Low Voltage Protection

A. Low voltage warning:

When the battery voltage drops below: $11.0V \pm 0.5V$ (for a 12V converter), an audible alarm will sound, indicating a drop in DC source voltage and the need to recharge the battery.

B. AC output disconnection: If the input voltage drops below: $10.0V \pm 0.5V$ (12V), the AC output will be automatically switched off, an audible alarm will sound and the red WARNING LED will light up.

2. Input Over Voltage Protection

When the input voltage reaches: $16.0V \pm 0.5V$ (12V), the WARNING LED will light up red and the AC output will be automatically switched off.

3. Overload Protection

In the event of an overload:

the AC output will be switched off and the WARNING LED will light up red.

4. Reverse Polarity Protection

In the event of reverse battery polarity:

the fuse will blow, protecting the inverter and connected devices.

Damage resulting from reverse polarity is not covered by the warranty.

5. Over-temperature protection

When the heat sink temperature exceeds 45°C, the internal fan will start automatically.

When the internal temperature exceeds 75°C, the AC output will be automatically switched off, an audible alarm will sound and the red WARNING LED will light up.

Troubleshooting table

I. Audible Alarms (Buzzer)

An audible buzzing sound may occur when connecting audio devices.

This applies in particular to lower-quality devices, which may react to the modified sine wave output generated by the inverter.

II. TV interference

To minimise interference, an anti-interference filter can be used.

In some cases, where interference is particularly noticeable with a very weak TV signal, the following measures can be taken:

- Place the inverter further away from the TV and the TV antenna.
- Rearrange the TV signal cable and adjust the antenna's direction to minimise interference.
- Use a high-quality shielded antenna cable.

Problem: No output voltage

Cause	Solution
Battery voltage too low	Charge or replace the battery.
Inverter overload	Reduce the load on the inverter.
Thermal protection tripped	Cool the inverter and place it in a well-ventilated area; also reduce the load.
Failed attempt to start the inverter	Try starting the converter again.
Reverse polarity connection and blown fuse	Replace the fuse with a new one with the same rated current.

Problem: The converter is not responding

Cause	Solution
Poor or no contact between the	Reconnect the cables, ensuring that

Recommendations

For correct operation, the battery voltage should be within the range of $0.9 \times V_{nom}$ to $1.29 \times V_{nom}$, where V_{nom} is 12V, 24V or 48V – depending on the model.

The battery must be capable of supplying sufficient current to the inverter.

The table below shows the recommended components (DC battery cables, fuse, battery capacity) for specific inverter types:

Power	Input voltage	DC battery cable	Fuse	Battery Battery
150W	12V	2.5mm ² (1×Red / 1×Black)	35A ×1	≥25Ah
300W	12V	4mm ² (1×Red / 1×Black)	35A ×1	≥50Ah
500W	12V	6mm ² (1×Red / 1×Black)	35A ×4	≥100Ah
600W	12V	6mm ² (1×Red / 1×Black)	35A ×4	≥100Ah
1000W	12V	10mm ² (1×Red / 1×Black)	35A ×4	≥160Ah
1500W	12V	10mm ² (2×Red / 2×Black)	35A ×6	≥200Ah
2000W	12V	16mm ² (2×Red / 2×Black)	35A ×8	≥320Ah
2500W	12V	16mm ² (2×Red / 2×Black)	35A ×10	≥400Ah
3000W	12V	16mm ² (2×Red / 2×Black)	35A ×12	≥480Ah

Measures relating to maintenance, disposal and servicing

1. Before cleaning or maintenance, disconnect the inverter from the mains and the battery.
2. Use a dry cloth for cleaning — do not use solvents, detergents or corrosive agents.
3. If you notice a burning smell, smoke, unusual noises or deformation of the casing, immediately disconnect the power supply and stop using the device.
4. Repairs to the device may only be carried out by a qualified service centre.
5. Store in a dry place at a temperature between -20°C and $+45^{\circ}\text{C}$, protected from dust and moisture.
6. Do not dispose of used batteries in household waste — they must be taken to a disposal point compliant with the WEEE Directive.