VOLTCRAFT®

SPA-5 DIRECT VOLTAGE CONVERTER

GB OPERATING INSTRUCTIONS Page 13 – 23

Best.-Nr. / Item No. / N° de commande / Bestnr.:
51 16 70

CE

Version 07/09

GB INTRODUCTION

Dear Customer,

In purchasing this Voltcraft® product, you have made a very good decision for which we would like to thank you.

Voltcraft® - In the field of measuring, charging and network technology, this name stands for high-quality products which perform superbly and which are created by experts whose concern is continuous innovation.

From the ambitious hobby electronics enthusiast to the professional user, products from the Voltcraft® brand family provide the optimum solution even for the most demanding tasks. And the remarkable feature is: we offer you the mature technology and reliable quality of our Voltcraft® products at an almost unbeatable price-performance ratio. In this way, we aim to establish a long, fruitful and successful co-operation with our customers.

We wish you a great deal of enjoyment with your new Voltcraft® product!

TABLE OF CONTENTS

1. INTENDED USE

The device is used for connecting halogen lamps, radio devices and portable TVs with 12 V connections and other 12 V DC devices to a 24 V DC battery system/supply. To do this, the 24 V DC voltage has to be cut in half, i.e. reduced/converted to 12 V DC, using a compensated voltage stabilizer and parallel-switched series pass transistor.
The input of the DC/DC converter is protected against inverse polarity by a diode and a blowout fuse. The output is not short circuit-protected.

- The conversion of a 24 V DC (21 to 28.8 V) from a 24 V DC battery supply to 12 V DC in order to supply power to 12 V DC devices/consumers with a maximum ongoing current consumption of 6 A or brief consumption of 8 A (< 2 min.).
- Operating with alternating current is not permitted.
- Any use beyond that which is specified is not permitted.
- Operating the DC/DC converter outdoors or in damp rooms is not permitted.
- The SPA-5 voltage converter must not be modified or rebuilt.

This product fulfils European and national requirements related to electromagnetic compatibility (EMC). CE conformity has been verified and the relevant statements and documents have been deposited at the manufacturer.

Unauthorised conversion and/or modification of the device are inadmissible because of safety and approval reasons (CE). Any usage other than described above is not permitted and can damage the product and lead to associated risks such as short-circuit, fire, electric shock, etc. Please read the operating instructions thoroughly and keep them for further reference.

2. DELIVERY CONTENT

- SPA-5 DC voltage converter
- Operating instructions

3. SAFETY INSTRUCTIONS

We do not assume liability for resulting damages to property or personal injury if the product has been abused in any way or damaged by improper use or failure to observe these operating instructions. The warranty/ guarantee will then expire!
The icon with exclamation mark indicates important information in the operating instructions. Carefully read the whole operating instructions before operating the device, otherwise there is risk of danger.

Personal safety

- Keep DC voltage converters and accessories out of the reach of children!
- Wearing metallic, conductive jewellery such as necklaces, bracelets, rings and so forth is not permitted when operating DC voltage converters.
- When working with live/energized parts, use only tools that are explicitly approved for this purpose.

Product safety

- To operate the voltage converter in a/your vehicle, special vehicle or trailer, consult the respective maker of the vehicle or trailer. Modifications that are made to the vehicle must always be performed in such a way that they do not interfere with traffic safety or the constructional safety of the vehicle. In many vehicles, the operating permit is voided if even a sheet metal part is sawed out. The cables of the DC/DC voltage converter and the converter itself should not be installed near safety systems such as airbags, belt tensioners, ABS etc. If you are unsure, consult your vehicle dealer (or manufacturer) to ensure that the DC/DC voltage converter does not interfere with safety systems.

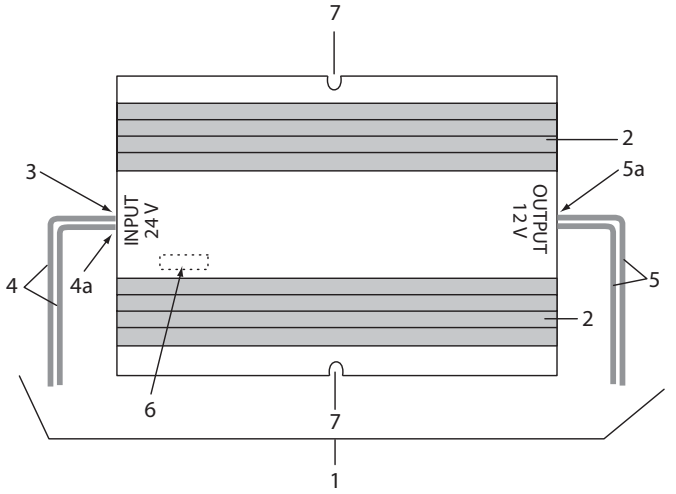
  Before drilling the anchoring points, make sure that you do not damage (drill into) any electrical cables, fuel lines, fuel tanks etc.
  When installing your DC/DC voltage converter, also make sure that there are no potential hazards that might result from devices that fly loose in the event of an accident. You should therefore securely mount the converter where it does not pose any hazard to passengers.
- In commercial facilities the accident-prevention regulations that are established by the employer's liability insurance association for electrical equipment and facilities must be observed.
- In schools, training centres, computer and self-serve workshops, the operation of DC voltage converters must be supervised by trained personnel, in a responsible manner.
- When you open covers or remove parts – unless you can do this by hand – live parts can be exposed. Connectors may also be live. If the appliance needs to be opened for calibration, servicing, repair or to replace parts, you must first disconnect the device from all voltage sources. After that, if calibration, servicing or repairs still have be performed while the device is opened, this may only be done by a specialist who is familiar with the associated risks and applicable regulations (VDE 0100 or 0701).

- Capacitors inside the device may still be charged, even if the device has been disconnected from all voltage sources.
- Never switch on your DC/DC SPA-5 voltage converter if it has just been moved from a cold to a warm room. Under unfavourable conditions, condensation water can form and destroy your device. Leave the device off/disconnected and wait until it has reached room temperature.
- The ventilation slits of the DC voltage converter must not be covered! The devices are to be placed on inflammable surfaces so that air can flow freely into the device. The device is cooled mainly by convection.
- During malfunction, voltages of > 35 V DC can be generated, which creates hazards. This can happen even if the specified input/output voltages of the device are less.
- Avoid operation under adverse ambient conditions. These can damage the sensitive electronics inside the device. Adverse conditions are:
  - excess air humidity (> 80 % rel., condensing)
  - dampness
  - dust and inflammable gases, vapours or solvents, petrol
  - excessive ambient temperatures (> approx. +50°)
  - strong electromagnetic (motors or transformers) or electrostatic (charges) fields
- Keep transmitters (mobile telephones, transmitter units for model building etc.) away from the DC/DC voltage converter to prevent transmitter emissions from interfering with the operation of or destroying the converter.
- Do not connect any 12 V DC batteries to the outlet of the device because the outlet is not short circuit-protected in case of incorrect polarity, which will destroy the device.
- The minimum input voltage must not be less than 21.0 V DC!
- The maximum input voltage must not exceed 28.8 V DC!
- When used in conjunction with other devices, observe the operating instructions and safety notices of connected devices.
- The product must not be subjected to heavy mechanical stress.
- The product must not be exposed it to extreme temperatures, direct sunlight, intense vibration, or dampness.
- If there is reason to believe that safe operation is no longer possible, put the device out of operation and secure it against unintended operation. Safe operation is no longer possible if:
  - the product shows visible damages,
  - the product no longer works and
  - the product was stored under unfavourable conditions for a long period of time,
  - the product was subject to considerable transport stress.

Miscellaneous

- Repair works must only be carried out by a specialist/ specialist workshop.
- If you have queries about handling the device, that are not answered in this operating instruction, our technical support is available under the following address and telephone number: Voltcraft®, 92242 Hirschau, Lindenweg 15, Germany, phone 0180 / 586 582 7.

4. OPERATING ELEMENTS



1. Complete converter
2. Cooling gills
3. Power transistors (Caution! Very hot during operation!)
4. Connector cable "+" = red and "-" = black for the 4a input of the DC/DC voltage converter
5. Connector cable "+" = red and "-" = black for the 5a output of the DC/DC voltage converter
6. 6 A fuse (fast-acting 250 V) inside the converter
7. Mounting holes

5. CONNECTING/STARTING UP, DISCHARGING/CHARGING

To connect the battery supply (24 V battery supply (at least two 12-volt batteries, at least 36 Ah) cables with a cross-section of at least 1.0 mm and maximum cable length of 0.5 m are to be used in order to prevent a voltage drop during operation. Each of the cable ends has to be tinned and provided with the cable shoes required for this cable cross-section. When connecting/using the batteries that are connected, observe the warnings of the battery maker. The operating lifetime basically depends on the charging state and age or how the battery/batteries is/are cared for (acid level for lead-acid batteries, upkeep of poles). Please also observe that at low ambient temperatures, “new” batteries will also exhibit a loss in capacity (approx. -25% at 0° C).
The converter itself must be placed on an inflammable surface. To ensure adequate air circulation (cooling), maintain a distance of at least 100 mm. In order to avoid heat build-up, never cover the ventilation slits/cooling gills.

When connecting a consumer, proceed as follows:

Before connecting a consumer/load, disconnect the DC/DC voltage converter from the battery system/ supply battery. We recommend installing a switch of corresponding capacity (at least 8 A switching capacity) between the supply battery and the DC/DC voltage converter.

Always connect any 12 V DC consumers only when they are powered off (danger of sparks!). Make sure that the cable cross-section is adequate. This must not be less than the cable cross-section of 1.0 qmm of the converter connector. If the connector cables on the input (power supply of the converter) or on the output (power supply of connected consumer) are too long, there is the risk that the power drop in the cables will be too great.

The converter only works with DC current; AC voltage at the input will inevitably result in damage to the device.
During operation, make sure that the converter is adequately ventilated because it can become very warm, especially when operated at its rated load.

Never cover the ventilation slits/cooling fins of the converter in order to prevent heat from building up, which can damage the converter.

6. FUSES

Make sure that only fuses of specified type and of the specified nominal current are used for replacement. Using repaired fuses or bridging the fuse bracket is not permitted.

1. To replace fuses, disconnect the converter from the battery circuit on the input and from the connected consumer.
2. Use a fitting Phillips head screw driver to carefully open the housing by hand (the stabilizer is mounted to the cover panel). Note the position of the cover plate. Now remove it carefully.
3. Remove the defective fuse(s) and replace with fuse(s) of the same type and rated current, i.e. 6 A fast-acting, 250 V, standard designation: F6 A/ 250 V (5 x 20 mm).
4. After you have finished replacing the fuse, close and carefully screw on the housing in reverse order.
5. Only operate the DC/DC converter if the housing is securely closed and screwed down.

7. MAINTENANCE

The converter is maintenance-free with the exception of a potential fuse replacement and occasional cleaning of the housing, ventilation openings/cooling fins and connector cables. For cleaning purposes use a dry, non-static, lint-free cloth.

Do not use detergents that contain carbon, benzine, alcohol or similar substances for cleaning purposes. This could cause corrosion to the surface of the converter. The vapours are also hazardous to one's health and explosive.

8. DISPOSAL

In order to preserve, protect and improve the quality of environment, protect human health and utilise natural resources prudently and rationally, the user should return unserviceable product to relevant facilities in accordance with statutory regulations.
The crossed-out wheeled bin indicates the product needs to be disposed separately and not as municipal waste.

9. TECHNICAL DATA

Input Voltage:	24 V/DC
Output voltage:	12 V/DC
Output current:	6 A
Output current (high):	8 A
Output	72 W
Output voltages dependent on load current (of the consumer), at exactly 24 V DC input voltage:	
Consumer (load)	Output voltage
0 A	max. 14.4 V DC
3 A	max. approx. 14.0 V DC
6 A	max. approx. 13.7 V DC
8 A	max. approx. 13.5 V DC
Connections:	Fixed cable
Fuse:	Blow-out fuse (5 x 20 mm) with specifications F6A/250V (F=fast-acting)
Type:	Linear
Weight:	550 g
Dimensions (W x H x D):	120 x 50 x 125 mm