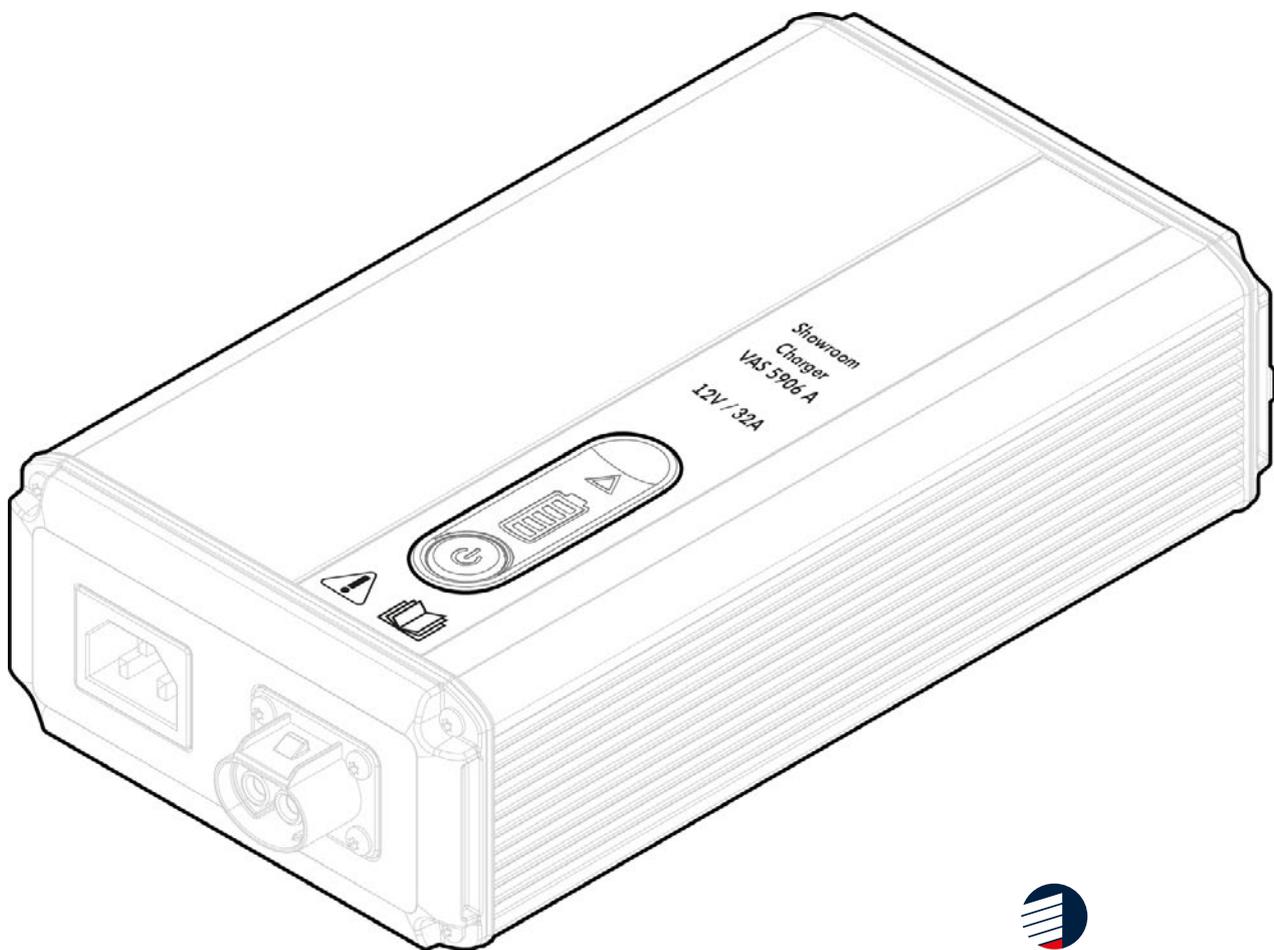


VAS 5906A

EN

Operating Manual
Battery Charger




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Safety informations

DANGER!



"DANGER!" Identifies an immediately-threatening hazard. If it is not avoided, death or serious injuries will result.

WARNING!



"WARNING!" Indicates a possibly dangerous situation. If it is not avoided, death or serious injury may result.

CAUTION!



"CAUTION!" Indicates a situation where damage or injury could occur. If it is not avoided, minor injury and/or damage to property may result.

NOTE!



"NOTE!" Indicates a risk of flawed results and possible damage to the equipment.

IMPORTANT!

IMPORTANT! Indicates tips for correct operation and other particularly useful information. It does not indicate a potentially damaging or dangerous situation.

If you see one of the symbols shown in the "Safety regulations" chapter, you should pay particular attention.

General remarks



The charger is manufactured in line with the latest state of the art and according to recognised safety standards. If used incorrectly or misused, however, it can cause

- injury or death to the user or a third party,
- damage to the charger and other material assets belonging to the operator,
- inefficient operation of the charger.

All persons involved in commissioning, operating, maintaining and servicing the charger must

- be suitably qualified,
- have knowledge of and experience in dealing with chargers and batteries and
- read and follow these operating instructions carefully.

The operating instructions must always be at hand wherever the charger is being used. In addition to the operating instructions, attention must also be paid to any generally applicable and local regulations regarding accident prevention and environmental protection.

**General
remarks
(continuation)**



- All safety and danger notices on the charger
- must be kept in a legible state.
 - must not be damaged/marked.
 - must not be removed.
 - must not be covered, pasted or painted over.

For the location of the safety and danger notices on the charger, refer to „General remarks“ in the charger operating instructions. Before switching on the charger, remove any faults that could compromise safety.

Your personal safety is at stake!

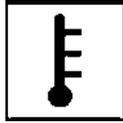
**Utilisation in
accordance
with
"intended
purpose"**



The charger is to be used exclusively for its intended purpose. Utilisation for any other purpose, or in any other manner, shall be deemed to be "not in accordance with the intended purpose". The manufacturer is not liable for any damage, inadequate or incorrect results arising out of such misuse.

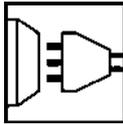
Utilisation in accordance with the "intended purpose" also comprises

- carefully reading and obeying all operating instructions and safety and danger notices.
- performing all stipulated inspection and servicing work.
- following all instructions from the battery and vehicle manufacturers.

Environmental conditions

Operation and/or storage of the charger outside the stipulated area will be deemed as "not in accordance with the intended purpose". The manufacturer shall not be liable for any damage resulting from such improper use.

For exact information on permitted environmental conditions, please refer to the "Technical data" in the operating instructions.

Mains connection

High-performance devices can affect the quality of the mains power due to their current-input.

This may affect a number of types of device in terms of:

- connection restrictions.
- criteria with regard to maximum permissible mains impedance. *)
- criteria with regard to minimum short-circuit power requirement. *)

*) At the interface with the public mains network.

See Technical Data

In this case, the plant operator or the person using the device should check whether or not the device is allowed to be connected, where appropriate through discussion with the power supply company.

Risks from mains current and charging current

Anyone working with chargers exposes themselves to numerous risks e.g.:

- risk of death by electrocution from mains current and charging current.
- hazardous electromagnetic fields, which can risk the lives of those using cardiac pacemakers.



An electric shock can be fatal. Every electric shock is potentially life threatening. To avoid electric shocks while using the charger:

- do not touch any live parts inside or on the outside of the charger.
- under no circumstances touch the battery poles.
- do not short-circuit the charger lead or charging terminals.

All cables and leads must be complete, undamaged, insulated and adequately dimensioned. Loose connections, scorched, damaged or inadequately dimensioned cables and leads must be immediately repaired by authorised personnel.

Risks from acid, gases and vapours



Batteries contain acid which is harmful to the eyes and skin. During charging, gases and vapours are released that can harm health and are highly explosive in certain circumstances.

- Only use the chargers in well ventilated areas to prevent the accumulation of explosive gases. Battery compartments are not deemed to be hazardous areas provided that a concentration of hydrogen of less than 4 % can be guaranteed by the use of natural or forced ventilation.
- Maintain a distance of at least 0.5 m between battery and charger during the charging procedure. Possible sources of ignition, such as fire and naked lights, must be kept away from the battery.
- The battery connection (e.g. charging terminals) must not be disconnected for any reason during charging.



- On no account inhale any of the gases and vapours released
- Make sure the area is well ventilated.
- To prevent short circuits, do not place any tools or conductive metals on the battery.



- Battery acid must not get into the eyes, onto the skin or clothes. Wear protective goggles and suitable protective clothing. Rinse any acid splashes thoroughly with clean water, seek medical advice if necessary.



General informations regarding the handling of batteries



- Protect batteries from dirt and mechanical damage.
- Store charged batteries in a cool place. Self-discharge is kept to a minimum at approx. + 2 °C (35.6 °F).
- Every week, perform a visual check to ensure that the acid (electrolyte) level in the battery is at the max. mark.
- If any of the following occurs, do not start the machine (or stop immediately if already in use) and have the battery checked by an authorised workshop:
 - uneven acid levels and/or high water consumption in individual cells caused by a possible fault.
 - overheating of the battery (over 55 °C/131 °F).

Protecting yourself and others

While the charger is in operation, keep all persons, especially children, out of the working area. If, however, there are people in the vicinity,

- warn them about all the dangers (hazardous acids and gases, danger from mains and charging current, etc),
- provide suitable protective equipment.

Before leaving the work area, ensure that no-one or nothing can come to any harm in your absence.

Safety measures in normal mode

- Chargers with PE conductors must only be operated on a mains supply with a PE conductor and a socket with an earth contact. If the charger is operated on a mains without a PE conductor or in a socket without an earth contact, this will be deemed to be gross negligence. The manufacturer shall not be liable for any damage resulting from such improper use.
- Only operate the charger in accordance with the degree of protection shown on the rating plate.
- Under no circumstances operate the charger if there is any evidence of damage.
- Ensure that the cooling air can enter and exit unhindered through the air ducts on the charger.
- Have the mains and charger supply checked regularly by a qualified electrician to ensure the PE conductors are functioning properly.
- Any safety devices and components that are not functioning properly or are in an imperfect condition must be repaired by an qualified technician before switching on the charger.
- Never bypass or disable protection devices.
- After installation, a freely accessible mains plug will be required.

EMC device classifications



Devices with emission class A:
– are only designed for use in an industrial setting.
– can cause conducted and emitted interference in other areas.

Devices with emission class B:
– satisfy the emissions criteria for residential and industrial areas. This also applies to residential areas in which power is supplied from the public low-voltage grid.

EMC device classification as per the rating plate or technical specifications.

EMC measures



In certain cases, even though a device complies with the standard limit values for emissions, it may affect the application area for which it was designed (e.g. when there is sensitive equipment at the same location, or if the site where the device is installed is close to either radio or television receivers). If this is the case, then the operator is obliged to take appropriate action to rectify the situation

Data protection



The user is responsible for the safekeeping of any changes made to the factory settings. The manufacturer accepts no liability for any deleted personal settings.

Maintenance and repair



Under normal operating conditions the charger requires only a minimum of care and maintenance. However, it is vital to observe some important points to ensure it remains in a usable condition for many years.

- Before switching on, always check the mains plug and cable, and charger leads/charging terminals for any signs of damage.
- If the surface of the charger housing is dirty, clean with a soft cloth and solvent-free cleaning agent only.

Maintenance and repair work must only be carried out by authorised personnel. Use only original replacement and wearing parts (also applies to standard parts). It is impossible to guarantee that bought-in parts are designed and manufactured to meet the demands made on them, or that they satisfy safety requirements.

Do not carry out any modifications, alterations, etc. without the manufacturer's consent.

Dispose of in accordance with the applicable national and local regulations.

Guarantee and liability



The warranty period for the charger is 2 years from the date of invoice. However, the manufacturer will not accept any liability if the damage was caused by one or more of the following:

- Use of the charger "not in accordance with the intended purpose".
- Improper installation and operation.
- Operating the charger with faulty protection devices.
- Non-compliance with the operating instructions.
- Unauthorised modifications to the charger.
- Catastrophes caused by the activities of third parties and force majeure.

Safety inspection



The operator is obliged to arrange a safety inspection of the device at least once every 12 months.

The manufacturer recommends that the power source is calibrated during the same 12 month period.

A safety inspection must be carried out by a qualified electrician

- after any changes are made.
- after any additional parts are installed and after any conversions.
- after repair, care and maintenance.
- at least every twelve months.

For safety inspections, follow the appropriate national and international standards and directives.

Further information on safety inspections and calibration is available from your service centre, who will be happy to provide you with the required documentation.

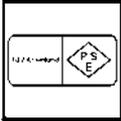
Safety marking



Chargers with the EC marking satisfy the fundamental requirements of the low-voltage and electromagnetic compatibility directive.



Devices with the TÜV test mark satisfy the requirements of the relevant standards in Canada and USA.



Devices with the TÜV test mark satisfy the requirements of the relevant standards in Japan.



Devices displaying this TÜV test mark and the mark on the rating plate satisfy the requirements of the relevant standards in Australia.

Disposal



Do not dispose of this device with normal domestic waste! To comply with the European Directive 2002/96/EC on Waste Electrical and Electronic Equipment and its implementation as national law, electrical equipment that has reached the end of its life must be collected separately and returned to an approved recycling facility. Any device that you no longer require must be returned to your agent, or find out about the approved collection and recycling facilities in your area. Ignoring this European Directive may have potentially adverse affects on the environment and your health!

Copyright



Copyright of these operating instructions remains with the manufacturer.

Text and illustrations were accurate at the time of printing. Subject to change without notice. The content of the operating instructions does not justify any claims that may be made by the purchaser. We are grateful for any suggestions for improvement and for drawing our attention to any errors in these instructions.

General informations

Principle The main feature of the new technology is efficient and "intelligent charging". This means that the charging behaviour adapts itself automatically to the age and charge level of the battery. This innovation extends the battery's service life and reduces the amount of maintenance required, while at the same time improving efficiency.

The VAS 5906A charger is based on a high-frequency technology. This charger represents the latest technology. It is well suited to charge lead/acid, AGM, EFB, GEL and lithium-ion batteries up to approx. 250 Ah for a unlimited time. The charger can be connected in parallel connected loads during the charging process, e.g. in the on-board vehicle network, with up to 32 A.

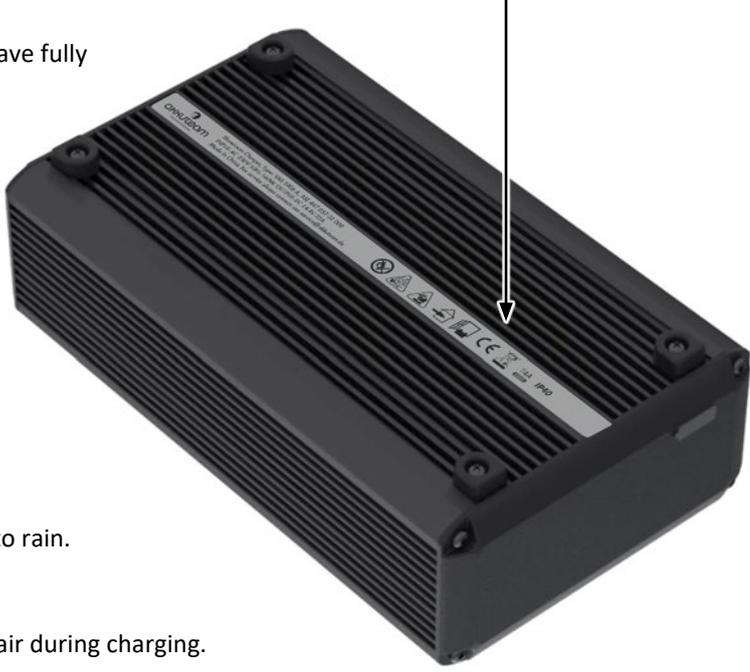


Device concept The compact and simple design reduces space requirements and makes portable use considerably easier. For the use in the showroom, the design of the device housing is perfect fitted for the high demands of modern presentation surfaces. Through the possibility of a firmware update via USB cable, each user can adapt the charger to future changed characteristic requirements and is equipped for all future challenges. The assembly with few assemblies simplifies the repair in case of damage.

Warning notices affixed to the device A number of safety symbols can be seen on the charger's rating plate. The safety symbols must NOT be removed or painted over



-  Do not use the functions until you have fully read all the operating instructions.
-  Possible sources of ignition, such as fire, sparks and naked lights, must be kept away from the battery.
-  Risk of explosion! Detonating gas is generated in the battery during charging.
-  Battery acid is corrosive and MUST be kept away from eyes, skin and clothes.
-  For indoor use only. Do not expose to rain.
-  Ensure an adequate supply of fresh air during charging.
-  Do not dispose of used chargers with domestic waste. Dispose of them according to safety rules.



Before commissioning

Safety



WARNING! Operating the equipment incorrectly can cause serious injury and damage. Do not use the functions described until you have thoroughly read and understood the following documents:

- Operating instructions
- All the operating instructions for the system components, especially the safety rules
- Battery and vehicle manufacturers' operating instructions and safety rules

Utilisation in accordance with "intended purpose"

Read the user guide carefully. If there are any uncertainties, please contact akkuteam or a qualified person. Connect red clamp to (+) and black clamp to (-). The charger is intended for use with lead/acid, AGM, EFB, GEL and Lithium-Ion batteries. The battery manufacturer's recommendation shall always be taken into consideration. NB: To make sure the correct charging voltages are applied to the battery the charging cables must not be shortened or made longer.

The charger is only to be used for charging batteries as described in the "Technical data" section and is intended exclusively for supporting the electrical systems of cars in showrooms. Any other form of usage is deemed "not in accordance with the intended purpose". The manufacturer shall not be liable for any damage resulting from such improper use. Utilisation in accordance with the "intended purpose" also includes

- following all the instructions in these operating instructions
- regular checking of mains and charging cables



WARNING! Charging dry batteries (primary cells) and non-rechargeable batteries can cause serious injury or damage, and is therefore prohibited.

Mains connection

The rating plate, which is located on the housing, contains information about the permitted mains voltage. The charger is designed for this mains voltage only. The fuse protection required for the mains lead can be found in the "Technical data" section. If there is no mains cable or mains plug on your machine, fit one that conforms to national standards.



NOTE! Inadequately dimensioned electrical installations can lead to serious damage. The incoming mains lead and its fuse must be dimensioned to suit the local power supply. The technical data shown on the rating plate applies.

**Safety strategy –
standard protective
features**

The new chargers do not just boast functional features. In terms of safety, the chargers are also equipped to the highest standards. The following safety features come as standard:

- Voltage-free and spark-free terminals protect against explosions.
- Reverse polarity protection prevents the battery or charger from being damaged or destroyed.
- Short-circuit protection provides effective protection for the charger. The fuse does not need to be replaced in the event of a short circuit.
- A charging time monitor provides effective protection against over-charging and destruction of the battery.
- Thanks to the high degree of protection, there is a lower rate of contamination in adverse conditions. This adds to the charger's reliability.
- Overtemperature protection through derating (charging current reduced if the temperature rises above the permitted level).

Control elements and connections

General



NOTE! As a result of firmware updates, you may find that there are functions available on your device that are not described in these operating instructions or vice versa. Certain illustrations may also differ slightly from the actual control elements on your device. However, these control elements function in exactly the same way.

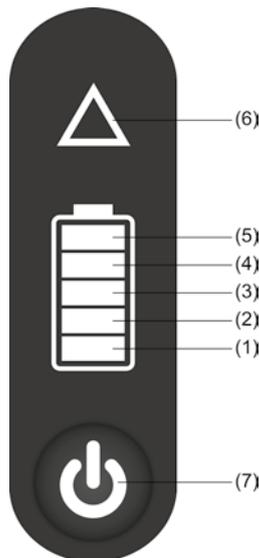


WARNING! Operating the equipment incorrectly can cause serious injury and damage. Do not use the functions described until you have thoroughly read and understood the following documents:

- these operating instructions,
- all the operating instructions for the system components, especially the safety rules.

Control panel

Important! The control panel (LED version) is explained below.



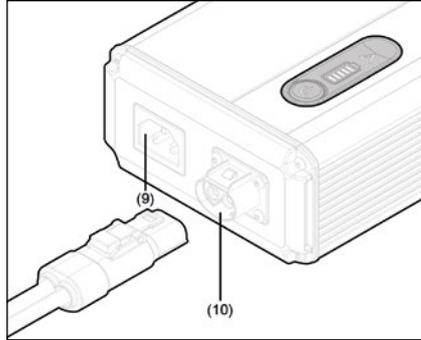
No.:	Function
(1)	Charge level indicator 0 – 20 %
(2)	Charge level indicator 40 %
(3)	Charge level indicator 60 %
(4)	Charge level indicator 80 %
(5)	Charge level indicator 100 %
(6)	Error indicator
(7)	Power button to switch the charger on/off and to interrupt the charging process.

Plugging in options



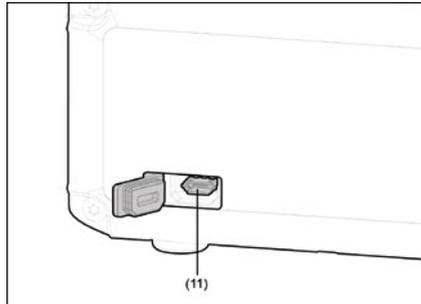
NOTE! Risk of damage to charger and accessories. Only plug in options and system add-ons when the mains plug is unplugged and the charging cables are disconnected from the battery.

Connections housing bottom



No.:	Function
(9)	AC Input – mains socket
(10)	Mains cable socket

Connections housing top



No.:	Function
(11)	Mirco-USB Port

Assembling edge protection

Attention! Take care about the position of the detents. Push the edge protection on the charger til you notice that the detents on the side snap in the charger.



Assembly

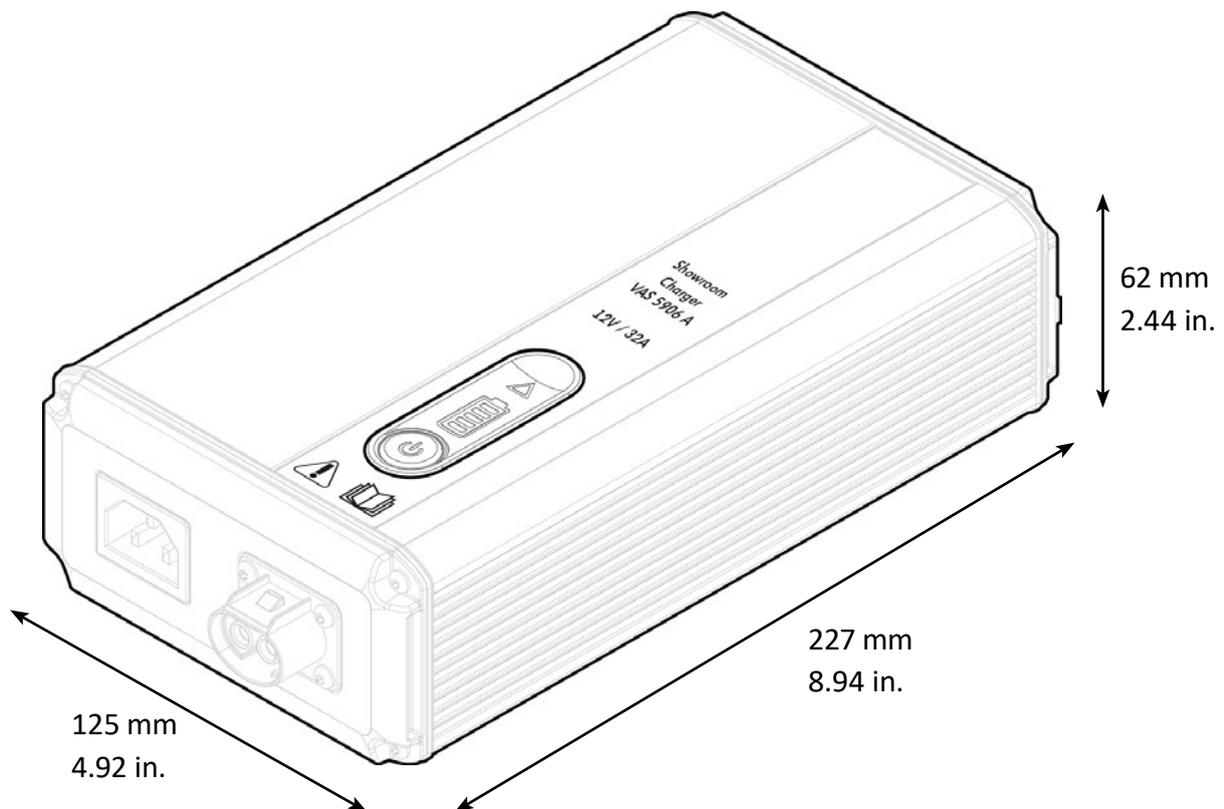


NOTE! Protection IP44 is only guaranteed for the upright position.

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If the charger is installed in a switch cabinet (or a similar sealed area), then forced-air ventilation must be provided to ensure adequate heat dissipation. There should be a clearance of 10 cm (3.94 in.) all around the charger.

The space requirement measurements in mm (inches) illustrated below are given to ensure that there is easy access to the plug connections:



Charging the battery

Start charging



CAUTION! Risk of damage when attempting to charge a faulty battery, or if using the incorrect charging voltage. Before beginning charging, ensure that the battery to be charged is fully functional and the charging voltage of the charger matches the battery voltage.

The charger starts charging the battery with constant current up to 14.4 V (at 25 °C). The charge voltage is then held constant at 14.4 V and the charging current is reduced until it is below a defined level. The charge voltage then drops to 13.8 V, when the long-term charging phase starts. During charging, battery charge is shown by the number of LEDs illuminated. The blinking segment above these LEDs indicates active charging. During the charge retention process, all 5 LED segments remain illuminated and pulse at a slow rate. If the measured battery voltage is below 2.0 V, the charger will enter error mode, and the warning triangle above the battery indication will start to flash.

1. Connect mains cable to charger and plug into mains.
2. Charger in open circuit – Triangle lights up and the red triangle flashes, because no connected battery is detected.

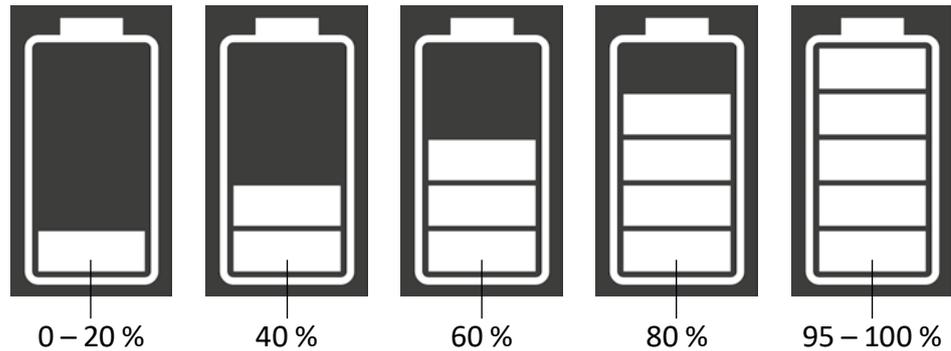


WARNING! Risk of serious injury and damage from incorrectly connected charging terminals. Connect charging terminals to correct poles and ensure proper electrical connection to battery terminals.

3. If using the vehicle power supply, switch off ignition and all other devices consuming power.
4. Connect charging cable (red) to positive pole (+) on battery.
5. Connect charging cable (black) to negative pole (-) on battery.

Charging

6. Charging begins automatically after approx. 2 seconds.
7. A set of five LEDs show the battery's charge level.



8. After the battery is fully charged, the charger delivers 13.8 V with a maximum of 32 A. This is indicated by slow pulsing of all LEDs. Conservation charging: Once the battery is fully charged, the charger automatically switches to conservation charging to prevent the battery from self-discharging. The battery can remain connected to the charger for any length of time.

Finishing charging



CAUTION! Risk of sparks if the charging terminals are disconnected too soon. Press Start/Stop button to finish charging.

9. Press the Stop/Start button to complete charging.



10. Disconnect charging cable (black) from negative pole (-) on battery.
11. Disconnect charging cable (red) from positive pole (+) on battery.

Interrupting charging

Stopping charging



NOTE! Risk of damage to connection sockets and plugs. Do not disconnect or unplug the charging cable while charging.

1. Press the Stop/Start button to stop charging.



2. Charging stopped – operating indicator flashes.

Restarting charging

3. Press the Stop/Start button to continue charging.



Troubleshooting

The charger analyses the battery again after the charging phase. Post analysis can detect batteries with a short circuit in individual cells. This cannot be detected in the pre analysis. If the battery voltage drops below 12 V within 2 min, the charger will go into error mode and the red warning triangle will start to flash. The charging sequence will be stopped.

Safety



WARNING! An electric shock can be fatal. Before opening the device

- Unplug the device from the mains,
- Disconnect battery connection,
- Put up an easy-to-understand warning sign to stop anybody inadvertently switching it back on again,
- Using a suitable measuring instrument, check to make sure that electrically charged components (e.g. capacitors) have discharged.



CAUTION! Inadequate PE conductor connections can cause serious injury and damage. The housing screws provide a suitable PE conductor connection for earthing (grounding) the housing and must NOT be replaced by any other screws that do not provide a reliable PE conductor connection.

Protective devices tripping

Red warning triangle is flashing:



Cause: No battery voltage identified. Clamps decrease identification is activated.

Remedy: Check charging cables, contacts and battery poles.

Cause: Short circuit on the charging terminals or charging cable. Short circuit detection on.

Remedy: Check charger leads, contacts and battery poles.

Cause: Battery overvoltage or undervoltage.

Remedy: Check the battery voltage and, if necessary, recharge or replace the battery.

Cause: Battery fault.

Remedy: Check the battery on a suitable analyzer (e.g. VAS 6161) for damage and condition.

Characteristics

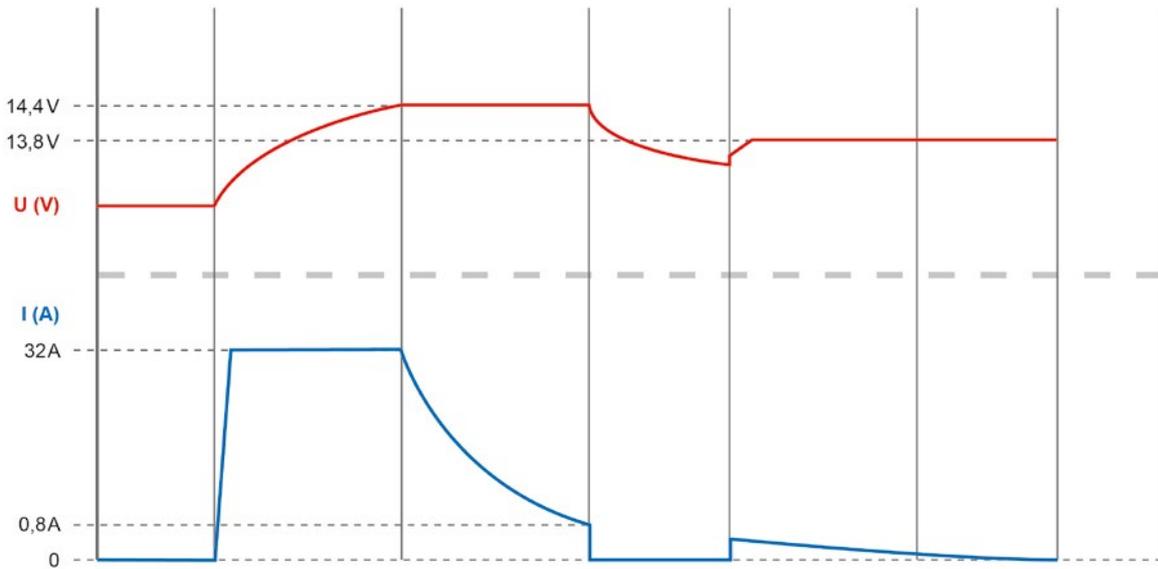
Safety



WARNING! Operating the equipment incorrectly can cause serious injury and damage. Follow the battery manufacturer's instructions. The battery must not be connected to the charger while setting parameters.

Characteristics

No.	Characteristic	Battery	Capacity _[Ah]	I ₁ [A]	U ₁ [V/Cell]	I ₂ [A]	U ₂ [V/Cell]
1	IU ₀ U	12 V / Block Batteries	–	32	2.40	–	2.26



Technical data

Electrical data input	Mains voltage	~ 230 V AC
	Mains frequency	50 / 60 Hz
	Mains current	max. 2.9 A eff.
	Mains fuse protection	max. 4 A
	Efficiency	max. 95 %
	Effective power	max. 560 W
	Power consumption (standby)	max. 1.7 W
	Protection class	I
	Maximum permitted mains impedance at the interface (PCC) to the public grid	none
	EMV emission class	A
Electrical data output	Nominal output voltage	12 V DC / 6 cells
	Output voltage range	2 V – 14.4 V DC
	Output current	32 A at 14.4 V DC
	Battery return current	< 1 mA
Mechanical data	Cooling	Convection
	Dimensions L x W x H	227 x 125 x 62 mm
	Weight (without cable)	1.7 kg
Environmental conditions	Operating temperature	-20 °C – +40 °C
	Storage temperature	-40 °C – +85 °C
	Climate class	B
	Degree of protection, horizontal position	IP40
	Degree of protection, vertical position	IP44

Standards	EN 60335-1	EN 60335-2-29
	EN 61000-6-2	(EN 61000-4-2, EN 61000-4-3, EN 61000-4-4) (EN 61000-4-5, EN 61000-4-6, EN 61000-4-11)
	EN 61000-6-4	(Class A)

Equipment

1 x	Battery charger VAS 5906A	Art.-Nr: A004911
1 x	Power cable 5,0 m	Art.-Nr: A000410
1 x	Charging cable 5,0 m including solid screwed charging clamps	Art.-Nr: A004912
1 x	Operating manual	

Service

The battery charger is mostly maintenance-free and does not require regular calibration. If the surface of the charger housing is dirty, clean with a soft cloth and solvent-free cleaning agent only. Recurrent security inspections shall be carried out in accordance with valid national and international regulations.

If future needs require a software update of the charger, it can be done through the micro-USB port at the side panel of the charger. Necessary information will be given along with the software.

In case of a device defect the maintenance are offered by akkuteam Energietechnik GmbH. Please contact us by indicating the device type and serial number: **vas-service@akkuteam.de**

Shipping address: akkuteam Energietechnik GmbH
Theodor-Heuss-Straße 4
D-37412 Herzberg am Harz

You can also order spare parts in our online shop. **www.shop.akkuteam.de/VAS-Zubehoer**

Warranty

The battery charger from akkuteam comes with a product warranty of 24 months against materials or manufacturing defects.

The product warranty begins on the shipping date as confirmed on the invoice or the shipping ticket.

The product warranty is valid for the user/buyer, provided the battery charger was purchased from an authorized dealer and that it was used as intended. The customer must deliver the product back to the place of purchase together with the receipt.

The product warranty is null and void if the battery charger was used for other purposes that are in violation of the intended uses or if the charger opened or repaired by someone other than akkuteam Energietechnik or an authorized representative of akkuteam Energietechnik GmbH.

The warranty expires when the battery charger was not used in accordance with the operating manual.

In case of a defect, akkuteam will at its own discretion repair or replace only the defective components.

Service and shipping address: akkuteam Energietechnik GmbH
Theodor-Heuss-Straße 4
D-37412 Herzberg am Harz
vas-service@akkuteam.de



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