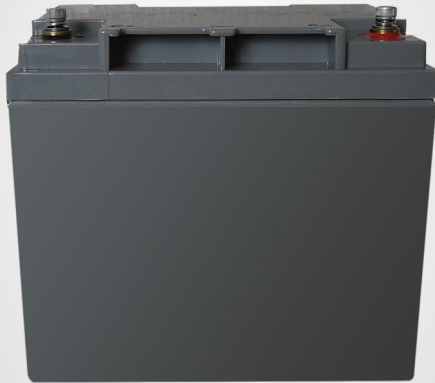


Bedienungsanleitung
Instruction manual
Manual de instrucciones

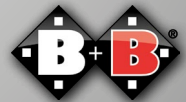
Lead-Acid Batteries

Important notes for the operation

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Enjoy mobility.





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1. Preliminary remark

Dear user,

You have decided in favour of a high-quality electric mobility scooter or an electric wheelchair from Bischoff & Bischoff. We thank you for your trust.

This instruction manual contains all the necessary information for handling lead-acid batteries.

Please take the time to read this guide completely so that you are as satisfied and safe as possible with your electric scooter or electric wheelchair in terms of range and battery life.

For users with visual impairments, this document is accessible as a PDF file from our website www.bischoff-bischoff.com.

Hint!

Despite careful research and editing, incorrect information may have crept into our guides. We reserve the right to make technical changes. Illustrations may contain accessories. The latest version of the operating instructions can be found in the download area on our website:

www.bischoff-bischoff.com

1.1. Signs and Symbols



Important! Designates especially useful information in the respective context.



Attention! Indicates particularly safety-relevant information. Observe operating instructions!

2. Important Safety instructions



The accumulators must be protected from sunlight to avoid damage.

2.1. Safety in handling accumulators

When handling accumulators, it is essential to follow the instructions in the charger's operating manual during the charging process.

The safety instructions on the accumulators must also be followed.

Do not place any objects on the accumulators, as this may cause short circuits and injuries.

2.2. Purpose

This guide is for the handling of lead-acid batteries only.

2.3. Responsibility

We shall only provide a warranty if

- the product is used under the specified conditions and for the intended purpose,
- modifications, extensions, repairs and maintenance work are only carried out by persons who have been authorised by us to do so, and
- the electric scooter or electric wheelchair is used in compliance with all instructions for use.

3. Product and Delivery overview

3.1. Checking the delivery

All Bischoff & Bischoff GmbH products are subjected to a proper final inspection.

The lead accumulator is delivered in a special cardboard box. After unpacking, keep the cardboard box if possible. It is used for possible later storage or return of the product.

Delivery and instruction are usually carried out by qualified medical supply retailers.

In the case of shipment by rail or forwarding agent, the goods must be checked immediately for transport damage in the presence of the deliverer.

Check the contents for completeness and integrity. In case of irregularities or damage, contact our customer service. You will find the contact details on the back of these operating instructions.

4. Battery Types

There are three types of accumulators. We recommend sealed accumulators

4.1. Not tightly closed batteries

Refillable liquid starter batteries are a poor choice for electric scooters or electric wheelchairs. (They do not have high cycle numbers, must be regularly checked, possibly removed and refilled, and must not be operated in an inclined position, otherwise there is a risk of acid leaking out).

4.2. Sealed / valved batteries

VRLA batteries (may be operated in inclined position):

Lead-GEL batteries

Have high cycles (can often be recharged), but do not deliver high currents and are usually more expensive than AGM lead batteries.

AGM lead batteries

(Absorbent-Glass-Mat / glass-fibre fleece batteries) do not have quite as many cycles as lead-GEL batteries, but they also deliver high peak currents and are cheaper than Lead-GEL batteries.

5. Battery-cycles

Theoretically, one cycle means 100 % energy extraction.

However, since batteries are deep discharged or „dead“ when they are 100 % empty or 0 % (voltage), in practice there should never be complete cycles. The recommended depth of discharge (DOD) is approx. 50 to 75 %.

4 times 25 % removal means 1 cycle.

2 times 50 % withdrawal means 1 cycle.

6. Useful life

Batteries last approx. 2 - 4 years maximum approx. 5 years depending on use and care. Please also read the following topics.

7. Charging the batteries

7.1. Battery-Voltage

Good care of lead batteries means, among other things, that the battery voltage does not drop below certain voltage values.

It is therefore important to charge once a month, even when not in use, and to charge immediately after every journey.

When the clearly visible red bar appears while driving, the voltage has dropped below a certain value set in the controller; you should then recharge promptly. With LCD displays (without colour), the „red zone“ begins when only three bars are displayed.

7.2. Battery charge status and display screen

The actual state of charge of lead batteries can only be accurately displayed when charging and discharging with profile chargers.

In electric scooters / electric wheelchairs, the display on the control panel informs about the charge level of the batteries. With lead batteries, only approximate values are measured and displayed and whenever you take a break and turn the ignition key off and on again, the control unit has „virtually forgotten“ what the exact state of charge was before switching off.

E.G.: If the batteries have already run down to the red bar, a short pause and switching off and on the display can cause two green bars to be shown again. Appearances (the display) shortly after switching on are deceptive.

When switching on, the control unit measures the voltage of the batteries without load. If you then continue driving, the batteries are loaded again and the control unit then measures the voltage values under load and corrects the display relatively quickly. The display is corrected more quickly when the load is greater (e.g. on inclines).

The red bar on the display

Compared to normal cars, it is best to imagine that the red bar means that the „reserve fuel indicator“ is lit. This means that approx. 50 to 75% of the energy has been taken out. If two red LEDs flash, the batteries are completely empty. The scooter should be connected to the charger immediately. In the case of LCD displays (without colour), the „red zone“ begins when only three bars are displayed.

However, you can continue the journey at your own risk if you know your „fuel gauge“ and have your own empirical values for known routes and the same conditions.

There is an „energy reserve“ in the battery after the red bar appears. The utilisation of this reserve means that the voltage further decreases and the batteries have a critical voltage after journeys that must be corrected immediately by charging.

7.3. Battery deep discharge

When the „reserve“ is completely exhausted or deep discharges are to be avoided, up to approx. 90% to 95% of the retrievable energy is drawn.

The control unit (the controller) logs a deep discharge and the scooter / electric wheelchair emits warning tones (beeps) via the loudspeaker. These sounds are similar to the sounds when reversing.



If the battery is heavily discharged, warning tones (beeps) are emitted via the loudspeaker.

Apart from acoustic warning signals, deep discharges can also be perceived when the buzzing of the electric motor gradually sounds lower and the speed also noticeably decreases, especially on inclines. Do not continue to operate the electric scooter or the electric wheelchair when it is deeply discharged, because on the one hand, you will damage the batteries permanently and, more importantly, they will suddenly stop running. If you still drive on traffic routes, you endanger your own safety and that of other road users.



Never drive with deeply discharged batteries. There is a risk of sudden stopping and endangering the safety of you and other road users.

The constant use of the energy reserve up to deep discharge is not recommended under any circumstances, as this damages the batteries and also puts you in the position of having to leave the vehicle somewhere. The deeper the discharge, the fewer the number of charging cycles until the end of the service life.

When using the reserve, immediate charging is an absolute must, otherwise the batteries will, without the necessary voltage, most certainly be damaged.

8. Charging recommendation

The batteries only reach their maximum charging capacity after three complete charging cycles. Before charging the batteries for the first time, first empty the batteries (the red bar lights up) and then charge them for at least 12 hours (all green bars light up) or, in the case of LCD displays (without colour), all the bars are displayed. Repeat this procedure at least three times. Please also note the display on the charger. Only use chargers approved by the manufacturer. Always charge to 100% if time permits, so that you have as much range as possible.

Discharged batteries must be charged as soon as possible and must not be in a discharged state. This also applies to partially discharged batteries. Otherwise, a reduction in the service life of the battery is to be expected.

During the charging process, the charger charges the batteries with different methods. Initially by high currents and later by reduced currents and later they are reduced while the voltage remains the same. This means that the first 80% are charged quicker than the last 20%. The last charging phase is important- it serves to balance the cells within the battery.

In general, it is advisable to recharge the batteries only after a discharge of at least 30%. Intermediate charges are possible.

However, a full charge should be carried out every four partial loads in order to avoid a loss of power within the batteries.

If you are permanently planning to travel further and e.g. visit friends with a power socket for an extended coffee break, you are welcome to use the time to recharge the batteries there, of course with the consent of your friends. This extends the range and shortens the overnight charge later on, so that your electric vehicle is ready for use again more quickly.

When connecting the charger, first insert the plug into the scooter and then the power plug into the socket. When unplugging the charger, first pull the power plug out of the socket and as soon as the light on the charger has gone out, then disconnect the plug from the scooter.

Do not expose the chargers to direct sunlight, as the chargers themselves become very warm when charging. Avoid additional heat from outside.

Please be sure to follow the instructions in the respective operating instructions.

9. People and battery winter operation

Depending on the battery manufacturer's specifications, batteries can also be recharged at approx. -10°C can be charged and operated. However, batteries and people perform similarly poorly when travelling between -10°C and $+10^{\circ}\text{C}$.

If you drive in colder temperatures, e.g. $0 - 10^{\circ}\text{C}$, then you should dress warmly and not plan trips that last longer than half an hour. Ski clothing in a very warm design may be a good solution. However, unlike skiing, you do not generate heat through movement and you cool down faster.



If possible, do not drive in cold temperatures as there is a risk of hypothermia.

Batteries work best between 20°C and 35°C . (Optimal at 25° Celsius / 77° Fahrenheit).

The amount of energy that can be charged into the batteries is also greater in this range than at colder temperatures ($0 - 20^{\circ}\text{C}$), for example. If you still want to drive in winter (not in snow or ice!), charge

your batteries in an environment that is as warm as possible. (E.g. better in the garage than outdoors, whereby the batteries will certainly need 1 - 3 hours to fully adopt the outside temperature inside as well. So, since longer trips in low temperatures are not advisable for people, as you quickly get hypothermia, snowy and icy roads are not suitable for driving, and batteries also lose significant power, you should ask yourself what options you choose to get your vehicle through the winter. Some dealers offer a storage service. So, if you do not have a suitable place in a garage or the like where you can also recharge these batteries on a monthly basis (given the manufacturer's temperature specifications for your batteries), you should find out about storage options from your dealer, friends or neighbours.

10. Recommended Accumulators

A good battery for long ranges:

Gel and AGM batteries from Eternity Technologies.

Battery C values:

C-values are used to compare the nominal (theoretical, calculated, achievable after approx. 20 charging cycles) performance of batteries. The C-values are hourly values in which a nominal amount of energy in Ah can be taken.

85 Ah in C20 means nominally (theoretically): 85 Ah with an energy withdrawal in a period of 20 hours. If, however, all the energy is drawn from an 85 Ah in C20 battery in only one hour, the 85 Ah is reduced to e.g. 48 Ah, depending on the battery, because the C1 value then applies.

In conclusion, we can extend ranges if we give the batteries more time to release their energy.

This means, for example, if we travel at slower speeds, we need more time to travel, but we can also retrieve more nominal energy.

Breaks also give the battery more time to build up some energy again and thus be able to call up more energy.

11. Chargers

As the batteries are connected in series, you need chargers with a voltage of 24 V for 2 x 12 V batteries.



Attention! Only use the chargers approved by the manufacturer.

12. Ranges of electric mobile and electric wheelchairs

The range of electric mobility scooters / electric wheelchairs is determined by a whole host of physical values. e.g.:

- Stored energy (Ah values, state of charge, age of the batteries)
- Motor power consumption
- Uphill or downhill (at 15 km/h straight ahead approx. 30 - 50 A, at 10° incline 130 - 180 A)
- Temperature during battery charging and operation (the closer to 25°C, the better)
- Rolling resistances (the flatter the better)
- Speed (the slower, the less power consumption (A) and further range via time factor (see C values)).
- Payload (the lower, the greater the range)
- Headwind or tailwind

In terms of the required range, electric mobility scooters / electric wheelchairs are perfectly designed as a means of transport for the local area. This means that you can usually run your errands within a radius of 3 - 6 km. The range can easily be covered daily in summer and winter. If you want to drive further distances, you will notice from about 15 - 20 km per day that the required charging times increase. And after each journey, the electric vehicle or the batteries should be recharged.

At a depth of discharge of 75%, it takes approx. 10 - 12 hours before you have sufficient energy charged again. So if you start charging in the evening around 9 p.m., you can drive again in the morning at 7 a.m. (after 10 hours), but depending on how much energy you used the day before, you may not be able to drive with fully charged batteries.

13. Transport

13.1. Transport of lead, gel and AGM accumulators

Following consultation with the DANGEROUS GOODS OFFICE of CIVIL AVIATION AUTHORITY¹, gel and AGM accumulators meet the requirements of Special Provision A-67 and Packing Instruction No. 872. Therefore, these batteries are not subject to IATA air cargo dangerous goods regulations.



Not restricted by air under Special Provision A67.

Dangerous goods marking for maritime transport (IMDG)², amendment 34-08, applicable in the currently valid version. The batteries comply with the requirements of Special Provision No. 238, items A and B, and are tested as:

„NO DANGEROUS GOODS, LEAK-PROOF BATTERY“.

The CATEGORY for this battery type is

- UN2800 BATTERIES
- Accumulators
- OUTLOOK
- Electricity storage.

European Agreement concerning the International Carriage of Dangerous Goods by Land (ADR). Regulation concerning the International Carriage

of Dangerous Goods by Rail (RID). Regulation on the Transport of Dangerous Goods in the currently valid version.

The conditions of special provision No. 238 A & B are fulfilled. Therefore, these batteries are not subject to the provisions of ADR and RID.

To transport the battery, also make sure that the terminals are covered. No objects may come into contact with the pole connections. It is best to use the original packaging for transport.

13.2. Carriage in motor vehicles

When transported in motor vehicles, the battery must be secured against slipping with safety straps. The securing straps must not come into contact with the connection terminals. Use the original packaging for transporting the battery in motor vehicles.



When transporting in motor vehicles, the battery must be secured against slipping, as otherwise this can lead to injuries in the event of heavy braking or cornering.

14. Check before installation

The installation of the battery should be carried out by your specialist dealer.

In any case, make sure that the battery terminals are undamaged.

15. Checking the battery

It is not possible to check the battery without using special equipment.

16. Maintenance instructions

We recommend that you hand over your electric scooter / electric wheelchair to your specialist dealer for inspection at least once a year.

In case of malfunctions or defects, hand over the wheelchair immediately to your specialist dealer for repair.

The necessary information and documents for repair and maintenance will be made available to the specialist dealer on request.

17. Passing on the battery

When passing on the battery, please remember to give this guide and the address of your specialist dealer to the new user.

18. Storage

If accumulators are taken out of service for a longer period of time, they must be stored fully charged in a dry, frost-free room.

To ensure that the batteries are ready for use, the following charging treatments can be selected:

- Quarterly full charge
- With connected consumers, e.g. measuring or control devices, full charging may already be required every 14 days.
- The storage time must be taken into account in the service life.

19. Disposal

If your battery is no longer in use and should be disposed of, contact your dealer.



If you want to dispose of the waste yourself, ask local recycling companies about the regulations in your area.

20. Warranty

1. For products supplied by Bischoff & Bischoff, the period of warranty is 24 months from purchase date. The products are delivered free from production and material defects. In case of evidence of material or manufacturing defect, defective parts will be replaced free of charge.

2. This warranty excludes claims, if a repair or replacement of a product or a part is required for the following reasons:

- a) normal wear and tear, which include but is not limited to the following parts where fitted; Batteries, motor brushes, handles, armrests, upholstery, tyres, brakes, caps, etc.
- b) overloading the product such as, for example, by exceeding the maximum user weight or load.
- c) the product or part has not been maintained or serviced in accordance with the Instruction manual, the care and hygiene instructions or the manufacturer's recommendations as shown in the maintenance instructions.
- d) Accessories have been used which are not original accessories.
- e) The product or part has been damaged through negligence, accident or incorrect use.
- f) changes/modifications have been made to the product or parts, which deviate from the manufacturer's specifications.
- g) Repairs have been carried out, before our customer service has been informed of the circumstances.

3. To enforce the warranty, please contact your dealer with the exact details of the nature of the difficulty. The product must be repaired by a dealer authorised by Bischoff & Bischoff.

4. For parts, which have been repaired or exchanged within the scope of the warranty, the warranty will be extended to the remaining warranty

period for the product in accordance with point 1).

5. For original spare parts which have been fitted at the customer's expense, these will have a 12 months guarantee, following the fitting.

6. If the repair fails after a reasonable time, the customer can, at his discretion, request a reduction, compensation or the termination of the purchase contract.

7. The guarantee is subject to the law of the country in which the product was purchased from Bischoff & Bischoff & Bischoff.

Please also observe the Bischoff & Bischoff care, warranty, hygiene and maintenance instructions. Your dealer will be happy to provide these to you.

For replacement devices and repairs, the warranty period is one year.

Observe the Bischoff & Bischoff care, warranty, hygiene and maintenance instructions. Your dealer will provide these to you.

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Non-observance of the operating instructions as well as improperly performed maintenance work and, in particular, technical modifications and additions (attachments) without the consent of Bischoff & Bischoff GmbH will invalidate both the warranty and product liability in general.

Notes

Notes



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