GB
Automatic charger AL 600 compact

Before using the device, please consider the instructions in this manual.
It is required by law that we give you important instructions for your own safety and make you aware of how you can avoid damage to people, the device and other facilities.
If this manual is not taken into consideration, the manufacturer is not liable for any damage that results from negligence or deliberate disregard of the manual.

Danger during charger operation

The charger is produced according to the state of the art and approved safety-related regulations. However, in case of maloperation or misuse, there is the threat to
-physical condition and life of the user or third parties,
-the charger and equipment of the operator.
Every person who deals with the set-up, operation, maintenance and Servicing of the charger, must be either accordingly qualified, acquire or have knowledge in handling chargers and consider this manual in detail.

Errors affecting safety must be avoided and if necessary fixed immediately.

To ensure safe operation, the operator must consider the safety instructions and warnings included in the manual.

Intended use

The device is designed for automatic charge and buffering of lead batteries with 2, 6 or 12V terminal tension. A sliding switch carries out the set-up of the battery voltage.
Possible battery types are lead-gel, lead-fleece or lead-acid-batteries.

Primary batteries (zinc-carbon, alkaline, etc.) or other battery types must not be plugged in or charged.
Another mode of operation other than the one specified is not allowed and results in the damage of the product.
In addition, this is linked with dangers, such as short-circuit, firing, electric shock etc.

Specifications

The I-U-charging concept charges the lead-battery with constant current of 600 mA (0,6A) until the end of charge voltage is reached for the respective battery.
The charger recognises this and switches to constant current in order to adjust the charging current down (Maintenance charger). The battery charger is therefore maintained at an ideal level.
As a result, the battery can be plugged into the charger for a longer period of time. This is the reason why this device is suitable for “over wintering”. The luminous display on the charger always gives information on the current operating status.
The plug charger is protected against overcharge and short-term short-circuit (<1min.). The polarity on the charging output must be taken into consideration. A protective circuit avoids charging in case of incorrect poling that could destroy the battery as well as the charger. Incorrect poling will be indicated by a red light. The connection is carried out by marked battery terminal clamps. By means of safety switching the charging clamps conduct no electric charge as long as they are not connected to a battery. It is therefore not possible to measure the current on the open charging clamps.

Note!

As for safety, this device has left the factory in a faultless condition.
In order to maintain this condition and ensure a safe operation, the user must consider the safety instructions and warnings included in this manual.

Operating conditions

The charger may only be connected and used in well-ventilated, dry interiors as well as only in a small alternate current voltage of 230V/50 Hz.

The position of operation is optional.
The permissible ambient temperature must not exceed 50°C during operation.

Ventilation slots or vents avoid the increase of operating temperature and must not be blocked or covered. Especially easily inflammable materials as well as inflammable matter, cleaning cloths or paper, must therefore be kept away from the device.

The device should be kept in dry and clean spaces. If condensation water is formed, a period of acclimatisation of 2 hours maximum must be accounted for.
Never use the device outdoors or in humid spaces.
The device must be protected from humidity, splash water and impact of heat.
The device may only be charged with 2-6-12 voltage lead-accumulators.

• Never charge frozen batteries, allow for heating to room temperature.

• Never charge batteries in a boat or watercraft.

• Take the battery out of the boat or watercraft before charging.

In case of misuse (e.g. incorrect battery type or too long polarity reversal.) the battery can be overcharged or damaged. In the worst case, the battery can explode and can cause considerable damage.

Keep the transmitters (mobile phones, transmitters for modelling etc.) away from the charger since the incoming sender radiation can result in the failure of the charging device or destruction of the charger and therefore the batteries. Never connect your charger with the mains voltage if it is taken from a cold into a warm space. The condensation that is brought about may destroy or cause an electric shock under unfavourable conditions. Let the device adjust down to room temperature.
Never store the lead batteries next to the heat source or the open fire.

The device must not be used in connection with easily inflammable and combustible fluids.
Chargers and accessories must be kept away from children. This is no toy.
In commercial spaces the precaution measures for accidents of the assembly of the government safety organisation for electric equipment and operating resources must be considered.
In schools, formation facilities, hobby and self-help shop the use of chargers and accessories must be supervised by trained personnel in a responsible way.
Never use the components in an environment that contain or may contain inflammable gases, smoke or dust. If the device needs repair, only original accessories may be used.
The use of different accessories can cause damage to person and property.
A repair of the device may only be carried out by a tradesman.
The device must be separated from the supply voltage.

Detach the battery first and only then interrupt the operating voltage.
When using products that get in touch with electric charge, the valid VDE-regulations, especially VDE 0100, VDE 0550/0551, VDE 0700, VDE 0711 and VDE 0860 must be complied with.

Before opening the device, pull out or secure the mains plug first so the device is dead.
If the existing manual does not clarify electric properties for the non-commercial end consumer, a tradesman must be asked for advice.

Ask a qualified person for advice if you are in doubt about the mode of operation or the safety of the product.
. Generally, check if this product is basically appropriate for the intended use, before using the device. If in doubt, take the user manual into consideration of the respective product (e.g. the product/ vehicle to be charged or the specifications of the battery manufacturer).
Please consider that operation and connection faults are beyond our sphere of influence. Understandably, we cannot assume liability for defects resulting from this.

Safety instructions

For reasons of safety and approval (CE) arbitrary rebuilding and/ or modification of the product is not allowed.

• The device must not be exposed to extreme temperatures, strong vibrations or strong mechanic demands. This will damage the product.

• Handle the product carefully, thrusts, blows and dropping from even little height will cause damage. A faulty device must no longer be used and must therefore be disposed of.

• Use the device only for designated lead batteries.

• Do not leave packaging lying around; It can become a dangerous toy for children. Danger of suffocation!

• This product is not meant for playing, it must be kept away from children. Children are not able to estimate the danger when dealing with electric devices.
Before initial operation:

Before each initial operation, check the charger as well as its leads for damages.
Do not start using the device under any circumstances if the protecting insulation of the mains or charger leads is damaged (squashed, ripped down or ripped off).
Never work with the charger in spaces or unfavourable environment conditions that contain or may contain inflammable gases, smoke or dust.
Never cover ventilation slots or containers. Do not place the device near hot air sources such as radiators or similar. Do not expose the device to sunlight, strong dust formation, mechanic vibrations or thrusts. Do not use the device near or on easily inflammable materials. If necessary, use an appropriate non-inflammable basis (e.g. a big, thick wall tile or flagstone).
Do not place or guide the mains or charger leads near inflammable materials.
Ensure that no inflammable objects (wood, cloths, cleaning rags or similar) are placed near the device. The mains or charger leads must not be modified, extended or shortened. In addition, the leads must neither be bent, squashed nor be guided through square-edged parts.

Current conducting cables or leads that are connected with the device, must be checked for insulation faults such as points of rupture, squashing or bending before and after using the device.

In case of fault detection (damage) of the cable, the device must be disposed of immediately. Only start using the device outside of the vehicle. Ensure that a secure and stable connection is established when connecting the battery charging clamps.
Operating note

The device heats up when operating. Ensure enough ventilation. The case must not be covered. Never charge lead batteries in a closed container. When charging sufficient ventilation must be ensured and open fire must be avoided. When charging there may be the danger of explosive gas formation. Keep away from children.

Before charging batteries with liquid acid, open the closing plug of the individual cells. Air the battery case for 2 minutes so inflammable gases can volatilise. Check the liquid level when charging and, if necessary, refill it. In addition, check the liquid regularly in case of longer charging time (hibernation). Use safety goggles.

Do not spill lead-acid-batteries. Avoid any kind of contact with the battery liquid since it can cause serious burns. In case of contact, wash off the contact spot (skin, clothes etc.) immediately with plenty of water to dissolve the battery acid. Always see a doctor in case of skin contact. Keep recharging lead-acid-batteries from time to time, at least every 3 months, if stored for a longer period of time to prevent deep discharge. Never bypass the battery contacts. When connecting the batteries, it is necessary to consider the polarity and the charging instructions of the respective battery manufacturer.

Charging

First of all, set up the cell voltage at the back of the device (2V/6V or 12V).

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• Place the charger in a mains socket (230 V~). The green LED “net” lights up if there is a mains voltage.
• Connect the battery with the correct polarity. Red polarity clamp on positive pole, black polarity clamp on negative pole. The charging process starts automatically. The yellow charging display “charge” is lit up as long as a charge current flows.

• If the red display „reverse polarity“ lights up, check the polarity of the battery terminal clamps immediately and change them.

Attention! Stop the charging process in case of defective battery.

Signs of a defective battery:

- Smell of gas in the room
-Different temperatures of individual cells when touching the battery
-Mechanic and thermal deformation of the battery case or charger.
-Different liquid level in the cells or liquid leakage.
Disconnection of charging process

The charger is provided with an automatic switch-off control that ends the charging process automatically once the charging end voltage is reached and switches automatically to the conservation-charging mode. The yellow charging display switches off in the conservation-charging mode or if the charge current falls under 80mA.

The device is characterised by the following properties:

• short-circuit and reverse-polarity protection
• Constant charging end voltage
• No charging if battery is connected with reverse-polarity

• Charging is only carried out if the battery is connected correctly
• Visual display, for net, charging and reverse-polarity

This article was verified according to the EG-regulation (89/336/EWG (EMVG as of 09/11/1992, electromagnetic compatibility) and complies with the legal regulations. Any modification of connection or use of other accessories other than the ones specified, terminates the approval.

As opposed to common chargers, the charge current of this automatic charger does not represent a precise value and depends on various factors. This includes e.g. the charge condition of the battery, the battery age, the battery type or capacity. In addition, it is important how much the battery was discharged before. If the battery was extracted a lot of current, a high initial charge current will take place at the beginning (max. 0,6 A) that will diminish after a short time. This means with increasing voltage of the battery, the charge current decreases.

The following graph demonstrates this behaviour.

Charging curve AL 600 time

The charging time, until the charging end voltage is reached, depends on several parameters, e.g.

• the capacity (Ah, the bigger the longer the charging time)
• the battery type
• the charging condition of the battery (full, partly charged, flat),
• the ambience temperature
• the general condition (age) of the battery.
The charging time is based on the above parameters and can roughly be calculated according to the following formula (for a rough time estimation):

Capacity of the battery in Ah
Charging time (in hours [h]) = ------- x 1,4
Charge current 0,6A

Example: Lead-gel-battery 12 Ah, flat

12 Ah --------x 1,4, the charging time amounts 0,6 A to approx. 28 h

Towards the end of the charging process (battery is full), the yellow LED “loading” usually switches off. Older or high-capacity batteries may show an extremely high self-discharge (approx. 1% of the battery capacity) and the plug connector may not recognize this elevated conservation charge current as a completed charging cycle (yellow LED-display is not switched off). In this case the plug connector works as a buffer to compensate the self-discharge of the battery.
Generally, as for more recent batteries, the LED switches off once the battery if fully charged. Batteries of different capacities can be charged, bigger batteries have a longer charging time whereas smaller batteries have a shorter one. As far as the charging process is concerned, it does not make any difference whether the battery is partly or fully discharged.
The batteries may also remain connected to the charger, the ambience temperature should not

exceed approx. 50 °C. If by accident the battery is poled incorrectly then being connected to the charger, this will be signaled by a red LED “reverse poled” and the charge current will be switched off automatically.

Note

• When charging batteries it is necessary to ensure that the connection of the batteries are correctly poled.

• Never deep charge the batteries to avoid damage of the batteries.
• During the charging process ensure that the room is sufficiently ventilated.
• Open the cell plug of the lead-acid batteries (if available).
• Check the acid level of the lead-acid battery before charging.

• Check the acid level from time to time when charging for a longer period of time.

• Avoid open fire, open light and sparks near the charging batteries (danger of explosion through oxyhydrogen gas).

• It is necessary to consider .the charging instructions of the respective battery manufacturers (mostly printed on the battery).

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Specifications

Charging end voltage: 2,3 Volt/6,9 Volt/13,8 Volt
Max. charge current: 0,6 Ampere
Operating voltage: 230 Volt / 50 Hz
Measurements: 90 x 56 x 60 mm

If it is to be assumed that an operation free of risks is no longer possible, the evice must be switched off immediately and it must be ensured that it cannot be switched on accidentally.
This applies:

• if the device shows visible damages
• if the device is no longer operational
• if components of the device are loose or disconnected.

• if the connecting cables show visible damages.
If the device needs repair,
If the device needs repair, only original accessories may be used.
The use of different accessories can cause damage to person and property.
A repair of the device may only be carried out by a tradesman.

We issue a 2-years guarantee. The guarantee includes free defect elimination that can be linked to defective material or fabrication defects, further claims are excluded.

We do not assume neither warranty nor liability for damages or secondary damage in relation to this

product. We reserve the right to repair, touching up, supply of components or reimbursement of the purchase price. If the following criteria are complied with a repair will be carried out or the warranty claim expires.

Warranty claim:

The retailer/ manufacturer where the device was acquired, offers a warranty of 2 years since handover for material and manufacturing of the product.
In case of defect, the purchaser has only the right to supplementary performance.
The supplementary performance includes either rectification or the supply of a replacement product. Exchanged devices or components become property of the retailer/ manufacturer.

The purchaser must immediately notify the retailer of the defects. The evidence of the warranty claim must be provided with a proper proof purchase (bill or invoice).

Defects caused by misuse, incorrect connection, use of components from different manufacturers, normal wastage, use of force, own repair attempts or modifications to the device, leads or clamps, modification to the connection, defects caused by disregard of the manual or outside influences, when connecting to an incorrect voltage or type of current, mal-operation or defects through negligent use, all of this is not covered by the warranty or the warranty claim expires.

Environmental protection notes:

This product must not be disposed of through normal household waste at the end of its durability, but handed in at a collecting point for recycling of electrical and electronic devices. This is shown by the picture on the product, the manual or the packaging. The materials are recyclable according to its labeling.
By means of its reuse, the material recycling or other types of recycling of old devices, they make an important contribution to the environmental protection.

Disposal of used batteries/chargers!

As an end consumer you are obliged by law (battery regulation) to return all used batteries and chargers, a disposal through household waste is not permitted.
Toxic batteries/chargers are characterized with appropriate symbols pointing out the interdiction of the disposal through household waste. The designations for the decisive heavy metal are: Cd = Cadmium, Hg =mercury, Pb =lead. All of your used batteries/chargers can be handed in free of charge at the collecting points of your local authorities or anywhere where batteries/chargers are sold. You comply with the legal obligations and contribute to the environmental protection.

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