GRANIT
QUALITY PARTS

Operating instructions

# Automatic battery charger

5850010121

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## 1 Important safety instructions

Please read this manual and follow the instructions carefully before using the charger.

**WARNUNG:**

- We recommend that you always check the specifications of the battery manufacturer before using this charger.
- Explosive gases may be emitted from the battery during the charging process. Provide suitable ventilation, and avoid flames and sparks
- For indoor use.
- Do not expose the charger to rain, snow or liquids.
- ONLY for charging lead-acid batteries (GEL, wet, EFB, AGM).
- The battery size & voltage are shown in the specification table**.**
- Battery acid is corrosive. On contact with skin or eyes rinse with water immediately.
- Never charge a frozen battery.
- Do not charge damaged batteries
- Do not charge non-rechargeable batteries.
- During charging never place the charger on top of the battery.
- Do not expose the cable to hot surfaces or sharp edges.
- Never use a charger which has a damaged cable.
- Avoid metallic tools falling on top of the battery. The battery could cause sparking, create a short-circuit, or an explosion in another electrical component.
- When working with the battery remove personal metallic items such as rings, armbands, necklaces, watches and so on.
- Never smoke in proximity to the battery or motor. Avoid sparks or flames.
- To reduce the risk of electric shock, remove the power plug of the charger from the mains before each maintenance or cleaning operation. Switch off the controls to reduce the risk.
- The charger should not be used by children or by people who are not able to understand the manual.

## 2 Main features

Intelligent charger with charge retention and desulphation function.

- Charger with new switch mode, high efficiency and low weight.
- The 12V charger is designed to charge 12V lead-acid batteries (GEL, WET, EFB, AGM) with **6Ah to 120Ah**. The charger however is able to preserve the charge of batteries up to **200Ah.**
- Extra-low power consumption for standby mode.
- Simple to operate, clear state of charge display.
- Fully microprocessor-controlled.
- Diagnostic of the initial battery condition.
- A low starting battery voltage can be caused by deep discharge or severe sulphating.
- Battery voltage analysis, where possible automatic repair (desulphating).

- 7 Charging levels
    - Battery analysis
    1. Desulphating
    2. Soft Start charging
    3. Bulk charge (maximum current)
    4. Absorption charging
    5. Reconditioning
    6. Float + Pulse
    7. Charge retention charging

- Protection against short-circuiting due to incorrect polarity:
- Heavy duty cable
- Corrosion-resistant output plug connector.
- The charger can be attached to the wall using four screws.

## 3 Protection functions

The charger contains 4 protection devices:

- **INTERNAL OVERHEATING PROTECTION:**
  The charger is equipped with an electronic circuit which provides protection against overheating and over-charging. If the charger overheats, it reduces the charging current. Once the temperature has dropped, the charger works normally again
- **TIMER PROTECTION:**
  The charger provides the maximum charge time control for every charging level. The charger switches off when it attempts to charge batteries with excessive capacity or batteries which are defective. To protect the battery it is no longer charged, and the RED LED flashes slowly. If this situation occurs, please check the battery using a battery tester.
- **INCORRECT POLARITY PROTECTION:**
  The charger has protection against incorrect polarities. If the poles are transposed, the red LED lights up. Change over the connections to the correct sequence. To do this you do not need to remove the charger from the power supply.
- **SHORT-CIRCUIT PROTECTION:**
  The charger has an initial short-circuit protection. If the charger detects a short circuit in the output cables, the red LED lights up. Disconnect the charger from the mains and create the correct connection. As soon as the charger detects an initial short-circuit or transposed poles, the charging program ends, to avoid danger.

## 4 Battery capacities & types

- Suitable for 12V lead-acid batteries. (GEL, WET, EFB, AGM)
- Battery capacity: The following maximum Ah details should be taken as guidelines.

| Charging current | 2 A | 5 A |
|---|---|---|
| Battery capacity: Charging | 6-50 Ah | 51-120Ah |
| Battery capacity: Waiting | 6-70 Ah | 71-200 Ah |

- Battery type: The following voltage values should be taken as general information.

| Temperature mode for wet or EFB | | Absorption voltage | Float voltage |
|---|---|---|---|
| Normal | Charging at T > 10 °C | 14.4 V | 13.7 V |
| Winter | Charging at T < 10 °C | 14.7 V | 13.8 V |

## 5 Technical data

| Model | 5850010121 |
|---|---|
| Type | Automatic |
| Input voltage & frequency | 220 - 240 V,<br>50 - 60 Hz |
| Output voltage | 12 V |
| Output current | 2 A / 5 A |
| Output voltage at zero load | < 0.5V |
| Min. voltage at start of charging | > 2.0V |
| Size (L*W*H) | 205*90*52 (mm) |
| Gross weight | 850 g |
| Insulation class | IP 65 |

## 6 Scope of delivery

- Mains power cable: 1750 mm flat cable 2 x 0.75mm² with VDE plug.
- Output cable: 1800 mm 2 x 0.823 mm² with SAE connector
- Extension cable: with battery terminal and ring-eye

## 7 Environmental values

- Operating temperature range: -10 to 40° C
- Storage temperature range: -10 to 80°C
- Moisture range: max. 90% rel. air humidity

## 8 ECO mode

- If AC power is connected and the battery is not connected, the charger automatically changes to ECO mode.
- If AC power is displayed and the battery is disconnected, the input power is less than 1.5W, equating to a daily power consumption of 0.04 kWh.
- Once the battery is fully charged, and during the charge retention phase, the complete power consumption is around 0.05 kWh per day.

## 9 Charging instructions

**STEP 1 - Check before charging & electrolyte level check**

- Check the battery electrolyte level and if req. top up with distilled water. (This only applies for maintenance-free wet batteries.)
- Check on the battery label whether it is a 12V battery. Otherwise this charger is not suitable.

**STEP 2 - Connecting the battery charger to your battery**

- If the battery is **outside the vehicle**:
  1. Connect the red cable from charger to the positive terminal (+) of the battery.
  2. Connect the black cable from the charger to the negative terminal (-) of the battery.

- If the battery is located **in the vehicle**, check whether the vehicle is positively or negatively earthed.
  If negatively earthed (most frequent):

  1. First connect the red (+) cable to the positive battery terminal (+).
  2. Then connect the black cable (-) to the negative battery terminal (-) or to earth on the bodywork.

     (Note: Keep away from the fuel line!)

  If positively earthed:
  1. First connect the black (-) cable to the negative battery terminal (-).
  2. Then connect the red cable (+) to the positive battery terminal (+) or to earth on the bodywork.

     (Note: Keep away from the fuel line)

**STEP 3 - Connect the battery charger to the power supply (220-240V)**

- Connect the battery charger to the mains power socket.
- The charger starts automatically.

(Note: If the LED of the fault display lights up red, please check your connections, since it is likely that the positive and negative contacts are transposed. Further information can be found on the fault-finding page).

**CHARGING PROCESS:**

- **Check of the battery starting condition (battery analysis)**
  Once the battery is connected and the AC power is switched on, the charger automatically analyses the condition of the battery and checks whether Soft Start, desulphating, or Bulk Charging should be activated.

- **Intelligent charging mode**

The charger automatically carries out the following steps:

1. **Desulphating**
   - The 20% charge LED lights up.
   - the device detects sulphated batteries and dissolves the sulphate crystals through pulsing voltage and current.
   - the device ensures that the electrolyte liquid enters a well-distributed condition. This allows the battery capacity to be restored if req.
   - The battery voltage slowly increases.

2. **Soft Start**
   - The 20% charge LED is on.
   - The battery voltage slowly increases.

3. **Bulk charge (maximum current)**
   - The 80% charge LED is on.
   - The battery can be charged up to approx. 80%.
   - The charger provides an almost constant current, until the battery voltage reaches the set value.

4. **Absorption mode**
   - The 80% charge LED is on.
   - The battery can be charged up to approx. 95%.
   - The charging current drops and the charge voltage remains constant at the set value.

**Battery analysis**

- Charging is interrupted briefly while the battery voltage is measured.
- If the battery voltage drops too quickly, the battery is likely to be faulty.
- The full LED flashes .

**5. Reconditioning**

- The charger increases the voltage, in order to create an acid mix through controlled gas formation, which will charge the battery evenly to full level.
- The full LED flashes .

**6. Float mode**

- The full LED lights up.
- The battery is charged at a constant voltage until it is full.
- As soon as the voltage drops, the device provides another charging pulse.

**7. Charge retention charging**

- The full LED lights up.
- The programme activates a special charging waveform and monitors the battery voltage fluctuation.
- If the battery voltage drops, the special pulses keep the battery in optimal condition.
- If the battery voltage drops further still, the battery charger switches over to bulk charging.

In charge retention mode the battery can remain connected to the battery during the off-season period. If possible, check the electrolyte liquid level in the battery.

**STEP 4 - disconnecting the charger from the battery**

- If the battery is **outside the vehicle**:
  1. Disconnect the mains plug.
  2. First remove the black (-) cable and then the red (+) cable.
  3. Only with batteries which are not maintenance-free: Check the electrolyte level and if req. top up with distilled water.

- If the battery is **inside the vehicle**:
  1. Disconnect the mains plug.
  2. Remove terminals (see 2a or 2b).

  2a. If negatively earthed (most frequent):

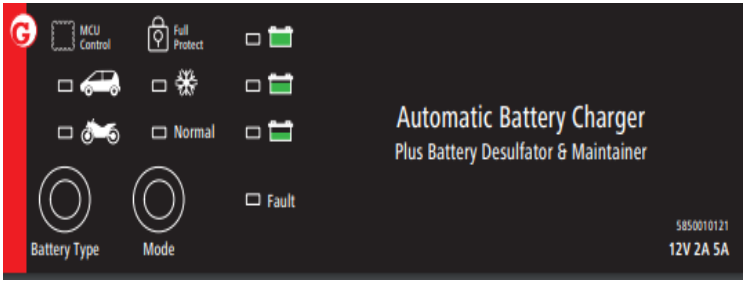
  1. Remove the black (-) cable from the bodywork earth or the negative battery terminal (-).
  2. Remove the red (+) cable from the positive battery terminal (+).

  2b. If positively earthed:

  1. Remove the red (+) cable from the bodywork earth or the positive battery terminal (+).
  2. Remove the black (-) cable from the negative battery terminal (-).

  3. Only with batteries which are not maintenance-free: Check the electrolyte level and if req. top up with distilled water.

## 10 LED status display table




| LED | Status | Description |
|---|---|---|
| | Green | Charging the battery ≦ 10 ℃ |
| Normal | Green | Charging the battery > 10 ℃ |
| | | |
| | Green | 20% charge capacity. |
| | Green | 80% charge capacity. |
| | Flashing | Battery analysis or reconditioning |
| | Green | Fully charged, charge retention |
| Fault | ON | Short-circuit or poles transposed. |
| Fault | Flashing | Timer protection triggered, battery is fault or too large. |
| | Green | Both LEDs light up at the same time. Battery over-voltage. |

## 11 Troubleshooting

| Possible problems | Indication | Possible causes | Recommended solution |
|---|---|---|---|
| **Charger not working?** | No control lights on | No AC power | check the mains power supply and make sure that the power is switched on. |

| | | | |
|---|---|---|---|
| **charger has no DC output?** | Fault: RED LED is ON. | Short-circuit or Poles transposed | - check the DC power connection between charger and battery, and make sure that no short-circuit occurs.<br>- Ensure that the terminals are connected with the correct polarity. |
| **No charging current?** | FULL LED & Fault LED flashes | Battery voltage is higher than the charge voltage indicated | - check the condition of the battery. Battery may need to be replaced.☐<br>- check the setting of the charging voltage 6V / 12V. |
| **Long charging time, full LED not lighting up?** | red Fault LED flashes | Battery capacity too large or battery faulty | - Check whether the specification of the charger covers the battery capacity.<br>- check the condition of the battery. Battery may need to be replaced. |

## 12 Maintenance

The charger is maintenance-free. If the power cable is damaged, the charger must be repaired by a qualified electrical specialist. the housing should be cleaned occasionally. During cleaning, the charger should remain disconnected from the power supply.

## 13 Disposal

The separate, environmentally friendly disposal of materials encourages recycling of materials. Therefore, after expiry of the normal service life, the device itself and all related components, including the packaging, should be disposed of at a recyclables collection point.

Packaging, equipment and accessories are made of recyclable materials and should be disposed of accordingly. If the unit is no longer serviceable, make sure it is unusable before disposal.

**ACHTUNG:** If you do not have the necessary expertise, engage a specialist for dismantling and disposal.

***!!! Always observe local disposal regulations!!!***

## 14 EU Declaration of Conformity

The manufacturer,

**Wilhelm Fricke SE**
**Zum Kreuzkamp 7**
**DE-27404 Heeslingen**

hereby declares under its sole responsibility that the automatic battery charger with the type or series ID number: **5850010121** complies with the requirements of the

| | |
|---|---|
| **2011/65/EU** | **Directive on the restriction of the Use of Certain Hazardous Substances in Electronic and Electrical Equipment (RoHS)** |
| **2014/35/EU** | **Low voltage directive** |
| **2014/30/EU** | **Electromagnetic Compatibility (EMC) Directive** |

The product has been developed in accordance with the following standards:
**IEC62321-3-1:2013; IEC62321-4:2017; IEC62321-5:2013; IEC62321-7-1:2015; IEC62321-7-2:2017; IEC62321-6:2015; IEC62321-8:2017**
**EN 60335-1:2012+A11:2014+A13:2017+A1:2019+A14:2019+A2:2019**
**EN 60335-2-29:2004+A2:2010+A11:2018; EN 62233:2008;**
**EN 55014-1:2017; EN 55014-2:2015; EN 61000-3-2:2014; EN 61000-3-3:2013**

The technical documentation is managed by:
Mr Eike Viebrock
Wilhelm Fricke SE
Zum Kreuzkamp 7
DE-27404 Heeslingen

The serial number and model year are indicated on the nameplate of the equipment.

Heeslingen, 04.03.2021

Holger Wachholtz, Board

Translation of the original Conformity Declaration

## 15 Warranty

The warranty terms of Wilhelm Fricke SE, as can be found in the sales documents and the current version of the Terms and Conditions, apply. In case of questions, please contact the company's customer service line.

## 16 Addresses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|---|---|
| Sales/customer service/<br>Spare parts sales: | Tel.: +49 (4281) 712 712<br>Fax: +49 (4281) 712 700 |
| Postal and shipping address: | Wilhelm Fricke SE<br>Zum Kreuzkamp 7<br>DE-27404 Heeslingen |


## 17 Legal notice

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|---|
| Translation of the original operating instructions for automatic battery charger |
| Manufacturer: Wilhelm Fricke SE - D-27404 Heeslingen |
| 1st edition February 2021 |
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| Printed on paper made from chlorine and acid-free bleached pulp. |