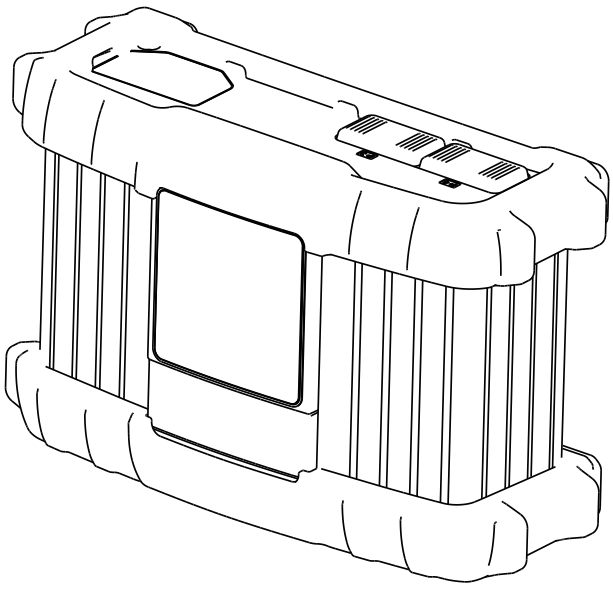
Operating Instructions

Acctiva Professional 35 A
EU / CH / UK / CN 充 器



EN | Operating Instructions

42,0426,0093,EN 029-25072024

Contents

Safety rules

Explanation of safety notices

⚠ DANGER!

Indicates immediate danger.

▶ If not avoided, death or serious injury will result.

⚠ WARNING!

Indicates a potentially hazardous situation.

▶ If not avoided, death or serious injury may result.

⚠ CAUTION!

Indicates a situation where damage or injury could occur.

▶ If not avoided, minor injury and/or damage to property may result.

NOTE!

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

General

The device has been manufactured in line with the state of the art and according to recognized safety standards. If used incorrectly or misused, however, it can cause:

- Serious or fatal injury to the operator or third parties
- Damage to the device and other material assets belonging to the operating company
- Inefficient operation of the device

All persons involved in the commissioning, operation, maintenance, and servicing of the device must:

- Be suitably qualified
- Have fully read and precisely followed these Operating Instructions

The Operating Instructions must always be kept to hand wherever the device is being used. In addition to the Operating Instructions, all applicable local rules and regulations regarding accident prevention and environmental protection must also be followed.

All safety and danger notices on the device:

- Must be kept in a legible state
- Must not be damaged
- Must not be removed
- Must not be covered, pasted, or painted over

For the location of the safety and danger notices on the device, refer to the section headed "General information" in the Operating Instructions for the device. Before switching on the device, eliminate any faults that could compromise safety.

Your personal safety is at stake!

Intended use

The device is to be used exclusively for its intended purpose. Any use above and beyond this purpose is deemed improper. The manufacturer is not liable for any damage, or unexpected or incorrect results arising out of such misuse.

Proper use also includes:
- Carefully reading and following all Operating Instructions, safety and danger notices
- Performing all stipulated inspection and servicing work
- Following all instructions from the battery and vehicle manufacturers

Proper handling of the device is essential for it to function correctly. Never pull on the cable when handling the device.

Environmental conditions

Operation or storage of the device outside the stipulated area will be deemed as not in accordance with the intended purpose. The manufacturer shall not be held liable for any damage arising from such usage.

For detailed information on the permitted environmental conditions, please refer to the "Technical data".

Mains connection

Devices with a higher rating may affect the energy quality of the mains due to their current consumption.

This may affect a number device types in terms of:
- Connection restrictions
- Criteria with regard to the maximum permissible mains impedance *)
- Criteria with regard to the minimum short-circuit power requirement *)

*) at the interface with the public grid
see "Technical data"

In this case, the plant operator or the person using the device should check whether the device may be connected, where appropriate by discussing the matter with the power supply company.

IMPORTANT! Ensure that the mains connection is earthed properly

Dangers due to grid and charging current

Working with battery chargers poses a number of dangers, such as:
- Electrical hazard due to grid and charging current
- Hazardous electromagnetic fields that may pose a risk of death for individuals with pacemakers.

An electric shock can be fatal. Every electric shock poses a risk of death. To prevent electric shock during operation:
- Do not touch any voltage-carrying parts inside or outside of the device.
- Never touch the battery poles.
- Do not short-circuit the charging cable or charging terminals.

All cables and leads must be secured, undamaged, insulated, and adequately dimensioned. Loose connections, scorched, damaged, or under-dimensioned cables and leads must be repaired immediately by an authorized specialist.

Danger due to acid, gases and vapours

Batteries contain acids which pose a risk to the eyes and skin. Furthermore, charging batteries produces gases and vapors that may be hazardous to your health and are highly explosive under certain circumstances.

Only use battery chargers in well ventilated rooms in order to prevent the accumulation of explosive gases. Battery charging rooms are not considered at risk of explosion if a hydrogen concentration of less than 4 % is guaranteed by natural or artificial ventilation.

During charging, observe a minimum distance of 0.5 m (19.69 in.) between the battery and battery charger. Keep potential sources of ignition such as fire and open flames away from the battery.

Never disconnect the battery (e.g., charging terminals) during charging.

Never breathe in the gases and vapors produced by the battery – ensure there is a sufficient supply of fresh air.

Do not place any tools or electrically conductive metals on the battery, in order to prevent short circuits.

Never allow battery acid to come into contact with your eyes, skin, or clothing. Wear eye protection and appropriate protective clothing. Rinse away any splashed acid immediately and thoroughly with clean water, and consult a physician if necessary.

General information on working with batteries

- Protect batteries from dirt and mechanical damage.
- Store charged batteries in cool rooms. The lowest self discharge occurs at approx. +2°C (35.6°F).
- Refer to the specifications of the battery manufacturer or conduct weekly visual inspections to ensure that the battery is filled with acid (electrolyte) up to the maximum marking.
- Do not start operating the device, or immediately stop operation, and have the battery inspected by an authorized specialist if:
  - The acid level is uneven or there is high water consumption in individual cells caused by a possible defect
  - The battery heats up to an impermissible level, above 55°C (131°F)

Personal protection and protection of others

Keep persons, especially children, away from the device and working area during operation. However, if persons are in the vicinity:

- Inform them of any dangers (hazardous acids and gases, risk due to grid and charging current, etc.),
- Provide suitable protective equipment.

Before leaving the working area, ensure that no personal injury or property damage can occur in your absence.

Operation by children and persons with limitations

This device can be used by children aged 8 years and over, as well as individuals with reduced physical, sensory or mental capabilities, or a lack of experience and knowledge, if such persons are under supervision or have received instruction concerning use of the device in a safe way and if they understand the risks involved. Children must not play with the device. Children must not perform cleaning or user maintenance unless supervised.

Safety measures in normal operation

Operate devices with ground conductors only on a grid with a ground conductor and a socket with a ground conductor contact. Operating the device on a grid without a ground conductor or on a socket without a ground conductor contact is considered gross negligence. The manufacturer accepts no liability for any damage resulting from improper use.

Only operate the device in accordance with the protection class shown on the rating plate.

Never commission the device if it is damaged.

Have the grid and device supply lead regularly inspected by an electrician to ensure that the ground conductor is functioning properly.

Safety devices that are not fully functional and components with defects must be repaired by an authorized specialist before the device is turned on.

Never bypass or disable protection devices.

A freely accessible mains plug is required after installation.

EMC Device Classifications

Devices in emission class A:
- Are only designed for use in industrial settings
- Can cause line-bound and radiated interference in other areas

Devices in emission class B:
- Satisfy the emissions criteria for residential and industrial areas. This is also true for residential areas in which the energy is supplied from the public low-voltage mains.

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

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 operating company 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

Before each start-up, check the mains plug and mains cable and charging cables and charging terminals for damage.
If dirt accumulates on the device, clean the surface of the device housing with a soft cloth and only with solvent-free cleaning agents.

Maintenance and repair

Maintenance and repair work must only be carried out by authorised personnel. Use only original spare 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.

Modifications, installations or conversions are only permitted with the approval of the manufacturer.

Warranty 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 manufacturer recommends that a safety inspection of the device is performed at least once every 12 months.

The safety inspection may only be performed by an appropriately qualified electrician

- After any changes have been made
- After any additional parts are installed, or after any conversions
- After repair, care and maintenance are carried out
- At least every twelve months

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

Further details on safety inspections can be obtained from your service centre. They will provide you on request with any documents you may require.

Markings on the device

Devices with the CE marking satisfy the essential requirements of the applicable guidelines.

Devices displaying the EAC mark of conformity satisfy the requirements of the relevant standards in Russia, Belarus, Kazakhstan, Armenia and Kyrgyzstan.

Devices displaying the CP mark of conformity satisfy the requirements of the relevant standards in Morocco.

Disposal

Do not dispose of this device with normal domestic waste! To comply with the European Directive 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 either be returned to your dealer or given to one of 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.

The text and illustrations are all technically correct at the time of printing. We reserve the right to make changes. The contents of the operating instructions shall not provide the basis for any claims whatsoever on the part of the purchaser. If you have any suggestions for improvement, or can point out any mistakes that you have found in the instructions, we will be most grateful for your comments.

Safety rules - required for USA, Canada and Australia

General and electrical risks

1. KEEP THESE INSTRUCTIONS CAREFULLY - This guide contains important safety and operating instructions for these charger types (for model, see first page of this document).
2. Do not expose the charger to rain or snow.
3. The use of accessories not sold or recommended by the charger manufacturer can lead to fire, electric shock or personal injury.

Minimum AWG size of an extension cable			
25 ft (7.6 m)	50 ft (15.2 m)	100 ft (30.5 m)	150 ft (45.6 m)
AWG 16	AWG 12	AWG 10	AWG 8

4. To reduce the risk of damage to plugs and cables, always unplug the charger by pulling at the plug rather than the cable.
5. Use of an adapter is not allowed in Canada. If a grounding type receptacle is not available, do not use this appliance until the proper outlet is installed by a qualified electrician.
6. Only use an extension cable if it is absolutely necessary. The use of an incorrect extension cable can lead to fire and electric shock. If an extension cable must be used, make sure that
   - the pins of the extension cable plug are of the same number, size and shape as those of the charger plug
   - the extension cable is correctly wired and in good electrical condition
   - the cable size is large enough for the AC amperage of the charger, as indicated above
7. Do not use the charger with a damaged cable or plug - replace the cable or plug immediately.
8. Do not use the charger if it has been subjected to heavy impact, dropped or otherwise damaged; hand it over to a qualified service technician.
9. Do not dismantle the charger; hand it over to a qualified service technician if maintenance or repair is required. Incorrect reassembly can result in fire and electric shock.
10. To reduce the risk of an electric shock, unplug the charger from the socket before carrying out any maintenance or cleaning. This risk cannot be reduced by setting controls to the "Off" position.

Warning - Risk of Explosive Gases

Working in the vicinity of a lead-acid battery is dangerous. Batteries generate explosive gases during normal battery operation. For this reason, it is of the utmost importance that each time before using your charger, you read and follow the instructions provided exactly.

1. To reduce risk of battery explosion, follow these instructions and those marked on the battery.
2. To reduce the risk of battery explosion, follow these instructions, the battery manufacturer's instructions and those of the manufacturers of any accessories that you plan to use in the vicinity of the battery. Observe warning signs on these products and on the engine.

Personal safety precautions

There must be another person within hearing range of you or close enough to come to your assistance when you are working in the vicinity of a lead acid battery.

1. Make sure there is sufficient fresh water and soap nearby in case battery acid comes into contact with the skin, clothing or eyes.
2. Complete eye protection and protective clothing must be worn. Do not touch your eyes when working in the vicinity of a lead acid battery.
3. If skin or clothing comes into contact with battery acid, wash away the acid immediately with soap and water. If acid gets into the eye, rinse the eye immediately with running cold water for at least 10 minutes and seek immediate medical assistance.
4. NEVER smoke or allow an open spark or flame in the vicinity of the battery or engine.
5. Be especially careful to avoid the risk of a metal tool falling onto the battery. This might create sparks or short-circuit the battery or other electrical components, thereby causing an explosion.
6. Remove personal metal objects such as rings, bracelets, necklaces and watches before working with a lead acid battery. A lead acid battery can cause a short-circuit current high enough to melt a ring or similar, thereby leading to a fire.
7. Use Charger for charging a LEAD-ACID battery only. It is not intended to supply power to an extra-low-voltage electrical system or to charge dry-cell batteries. Charging dry-cell batteries may cause them to burst and cause injury to persons and damage to property.
8. Use the charger only to charge a LEAD ACID battery. It is not suitable for transferring power to an electrical low-voltage system other than a starter motor application. Do not use the charger to charge dry cell batteries, which are used mainly for home appliances. Such batteries can burst, causing injury to people and damage to property.
9. NEVER charge a frozen battery.

Preparing for charging

1. If it is necessary to remove battery from vehicle to charge it, always remove grounded terminal from battery first. Make sure all accessories in the vehicle are off in order to prevent an arc.
2. Ensure that the area around the battery is well-ventilated while the battery is being charged. The released gas can be effectively dispersed using a piece of cardboard or other non-metallic object such as a fan.
3. Clean the battery terminals. Be careful to ensure that corrosion residues do not come into contact with the eyes.
4. Top up each cell with distilled water until the battery acid reaches the level specified by the manufacturer. This helps to purge surplus gas out of the cells. Do not overfill. In the case of a battery without cell caps, follow the manufacturer's charging instructions carefully.
5. Study all battery manufacturer’s specific precautions such as removing or not removing cell caps while charging and recommended rates of charge.
6. With the help of the vehicle manual, determine the battery voltage and ensure that it matches the output of the charger.
7. For a charger having an output voltage selector switch, refer to the car owner’s manual in order to determine the voltage of the battery and to make sure the output voltage is set at the correct voltage. If an output voltage selector switch is not provided, do not use the battery charger unless the battery voltage matches the output voltage rating of the charger.

Charger set-up location

1. Never place the charger directly above or below the battery being charged. Gases or fluids from the battery will corrode and damage the charger. Locate the charger as far away from the battery as DC cables permit.
2. When measuring acid density or topping up the battery, never allow battery acid to drip onto the charger.
3. Do not operate charger in a closed-in area or restrict ventilation in any way.
4. Do not place the battery on the charger.

Precautions for DC connection

1. Connect and disconnect DC output clips only after setting any charger switches to the off position and removing AC cord from the electric outlet. Never allow clips to touch each other.
2. Attach the terminals to the battery and chassis as indicated in points 5 and 6 of the next section and points 2 and 4 of the section after that.
3. Attach the terminals to the battery poles and turn them to and fro several times to ensure a good connection. This will prevent the terminals from slipping off the battery poles and reduces the risk of sparks.

Steps to follow with battery installed in vehicle

Follow these steps when battery is installed in vehicle. A spark near battery may cause a battery explosion. To reduce risk of a spark near battery:

1. Position AC and DC cords to reduce risk of damage by hood, door, or moving engine parts.
2. Stay clear of fan blades, belts, pulleys, and other parts that can cause injury to persons.
3. Check polarity of battery posts. A positive (pos, p, +) battery post usually has a larger diameter than a negative (neg, n, -) post.
4. Determine which post of battery is grounded (connected) to the chassis. If negative post is grounded to chassis (as in most vehicles), see item (5). If positive post is grounded to the chassis, see item (6).
5. For a negative-grounded vehicle, connect the positive (red) clip from battery charger to positive (pos, p, +) ungrounded post of battery. Connect the negative (black) clip to vehicle chassis or engine block away from battery. Do not connect clip to carburetor, fuel lines, or sheet-metal body parts. Connect to a heavy gauge metal part of the frame or engine block.
6. For a positive-grounded vehicle, connect the negative (black) clip from battery charger to negative (neg, n, -) ungrounded post of battery. Connect the positive (red) clip to vehicle chassis or engine block away from battery. Do not connect clip to carburetor, fuel lines, or sheet-metal body parts. Connect to a heavy gauge metal part of the frame or engine block.
7. Connect charger AC supply cord to electric outlet.
8. When disconnecting charger, turn switches to off, disconnect AC cord, remove clip from vehicle chassis, and then remove clip from battery terminal.
9. For information about the required charging period, refer to the operating instructions.

Steps to follow with battery outside the vehicle

Follow these steps when battery is outside vehicle. A spark near the battery may cause a battery explosion. To reduce risk of a spark near battery:

1. Check polarity of battery posts. A positive (pos, p, +) battery post usually has a larger diameter than a negative (neg, n, -) post.

2 Attach at least a 60 cm (23.62 in.) 6-gauge (AWG) insulated battery cable to a negative (neg, n, -) battery post.

3 Connect the positive (red) charger clip to the positive (pos, p, +) post of battery.

4 Position yourself and the free end of cable as far away from battery as possible, then connect the negative (black) charger clip to free end of cable.

5 Do not face battery when making final connection.

6 Connect charger AC supply cord to electrical outlet.

7 When disconnecting charger, always do so in reverse sequence of connecting procedure and break first connection while standing as far away from battery as practical.

8 A (marine) boat battery must be taken out and charged on dry land. Charging the battery on board requires special equipment designed for use at sea.

Instructions for connecting the mains cable including earthing

The charger must be earthed to reduce the risk of electric shock. The charger has a mains cable with integrated earth conductor and an earthed plug.

1 Connect the plug to a socket that has been installed and earthed in accordance with all local rules and regulations

DANGER - Never change the supplied mains cable or its plug - if it does not fit the socket, have a proper socket installed by a qualified electrician. An improper connection may create the risk of electric shock.

This device is designed for more than 15 amperes and must be operated on a circuit with a nominal voltage of 120 volts. The device is equipped in the factory with a specific mains cable and mains plug to allow connection to a suitable circuit.

1 Ensure that the charger is connected to a socket having the same configuration as the plug. Never use the charger with an adapter

The device is not intended to be used by children or infirm people, unless they are supervised by a responsible person to ensure safe use of the device.

Children must be supervised to ensure that they do not play with the device.

30A + 50A battery chargers in USA

This equipment has been tested and found to comply with the limit values for a Class A device, pursuant to Part 15 of the FCC Rules.
These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.
This equipment generates, uses and can radiate high frequency energy. If it is not installed and used in accordance with the operating instructions, it may cause harmful interference to radio communications.
Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

General information

Principle

The main feature of the new Active Inverter Technology is intelligent charging. This means that the charging behaviour adapts itself automatically to the age and state of charge 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.

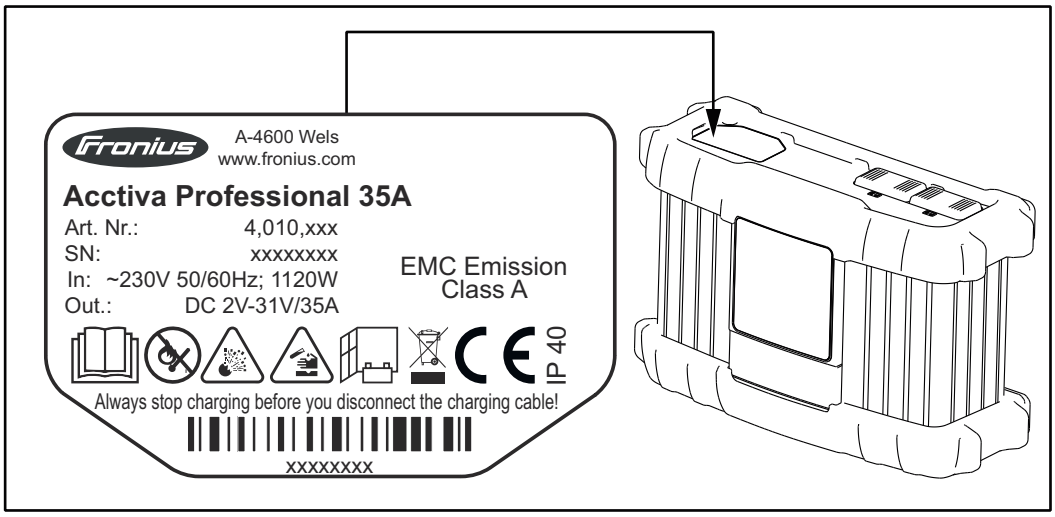
Active Inverter Technology is based on an inverter with active rectification and an intelligent safety cut-out. The charging current and voltage are held constant by a digital control that is not affected by any fluctuations in the mains voltage.

Device concept

The compact design reduces space requirements and makes portable use considerably easier. In addition to its many existing features, the charger is also of modular design, making it perfectly capable of accommodating future requirements. A wide range of options is available. A 14.4 V voltage limit provides optimum protection for the vehicle electronics.

Warning notices on 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.

Ensure an adequate supply of fresh air during charging. Maintain a distance of at least 0.5 m (19.69 in.) between battery and charger during the charging procedure.

Do not dispose of used chargers with domestic waste. Dispose of them according to safety rules.

For indoor use only.

Start-up

Safety

⚠ WARNING!

Danger from incorrect operation.
This can result in severe personal injury and damage to property.

- ▶ Do not use the functions described here until you have fully read and understood the following documents:
- ▶ Operating Instructions,
- ▶ all the Operating Instructions for the system components, especially the safety rules,
- ▶ Battery and vehicle manufacturer's Operating Instructions and safety rules.

Proper use

The charger is designed to charge the batteries listed below. Any use above and beyond this purpose is deemed improper. The manufacturer shall not be liable for any damage resulting from such use. Proper use also includes

- following all the instructions contained in the Operating Instructions,
- regular checking of the mains and charging leads.

⚠ WARNING!

Danger from charging dry batteries (primary cells) and non-rechargeable batteries.
This may result in serious injury and damage to property.

- ▶ Only charge the battery types listed below.

The following battery types may be charged:

- Wet batteries:
  Sealed batteries with a liquid electrolyte (recognisable by the vent plugs) and low-maintenance/maintenance-free wet batteries (MF).
- Absorbent Glass Mat (AGM) batteries:
  Sealed batteries (VRLA) with immobilised electrolyte (sealant).
- Gel batteries:
  Sealed batteries (VRLA) with immobilised electrolyte (gel).

Mains connection

The rating plate, which is located on the housing, contains information about the permitted mains voltage. The device 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 version of the appliance, fit one that conforms to national standards.

NOTE!

Danger from insufficiently dimensioned electrical installation.
This can result in serious damage to property.

- ▶ The mains lead and its fuse must be dimensioned to suit the local power supply. The technical data shown on the rating plate applies.

Safety features - standard protection devices

The following safety features are provided as standard with the Active Inverter:

- Voltage-free and spark-free terminals protect against explosions
- Reverse polarity protection prevents the 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 overcharging and destruction of the battery
- Overtemperature protection through derating (charging current reduced if the temperature rises above the permitted level)

Control elements and connections

General remarks

NOTE!

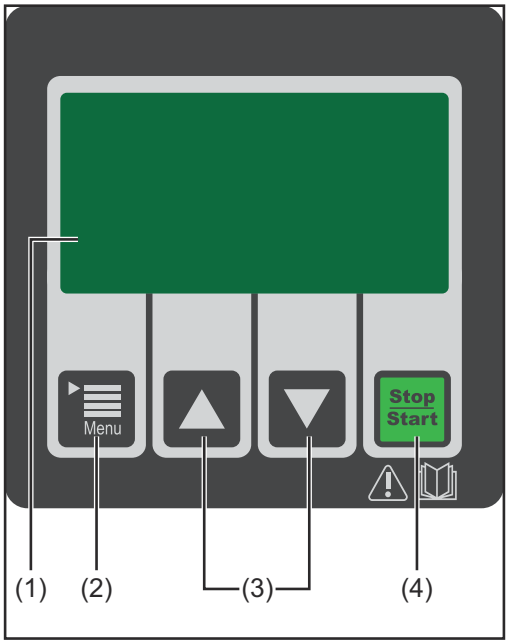
As a result of firmware updates, you may find that there are functions available on your unit that are not described in these operating instructions or vice versa. Certain illustrations may also differ slightly from the actual control elements on your device. However, these controls function in exactly 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 these operating instructions
- ▶ Do not use the functions described until you have thoroughly read and understood all the operating instructions for the system components, especially the safety rules

Control panel



No.	Function
(1)	**Graphic display**
(2)	**Menu key** - Select the desired setting, e.g. Ah
(3)	**Up/Down keys** - Select the desired operating mode, e.g. 'Charging' or 'Battery changing' - Alter the setting that has been selected by the Menu key (2) - After connecting to a new battery: ability to manually select the charging voltage from 6, 12 or 24 V
(4)	**Stop/Start key** - For interrupting and resuming charging - Confirming selections, e.g. after the charging voltage has been selected from 6, 12 or 24 V using the Up/Down keys

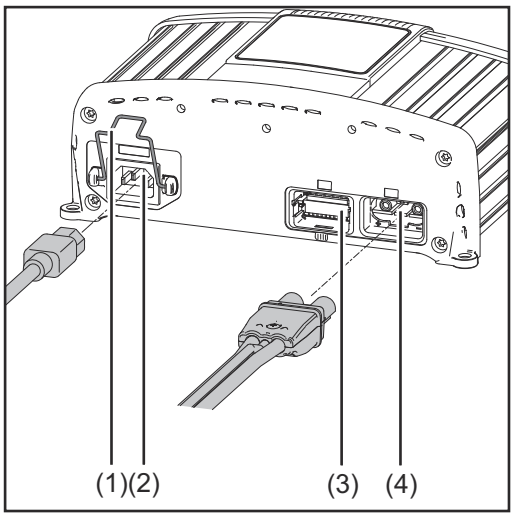
Plugging in options

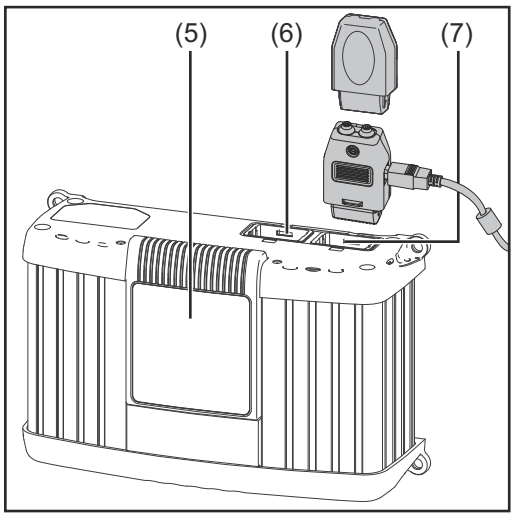
NOTE!

Danger from connecting options and accessories while the mains plug is plugged in.
This can result in damage to the device and accessories.

▶ Only connect options and system add-ons when the mains plug is unplugged and the charging leads are disconnected from the battery.

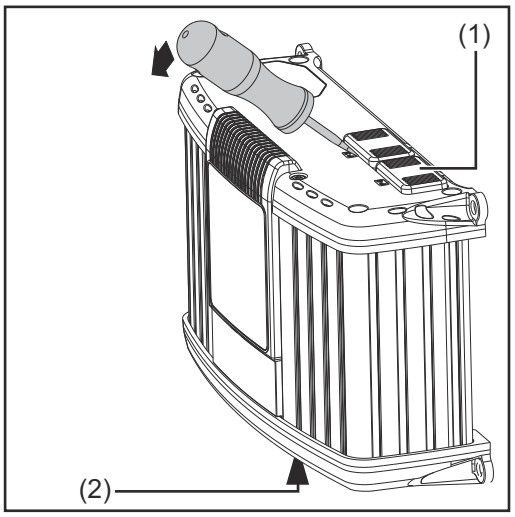
Connections





No.	Function
(1)	**Mains cable safety bow**
(2)	**AC input - mains socket**
(3)	**Connection P2 - I/O port - no function, can be retrofitted however** for connecting the following options: - Immobiliser device - Common error - Immobiliser device and common error
(4)	**Connection P1 - charging lead socket** used to connect the charging lead also for connecting the temperature-controlled charging or external start/stop options
(5)	**Removable display**
(6)	**Connection P3 - Visual Port** for connecting the internal display
(7)	**Connection P4 - Multi Port** for connecting the following options: - Status lamp - Software update via USB port

Removing covers for connections and options



If necessary, use a screwdriver to remove:

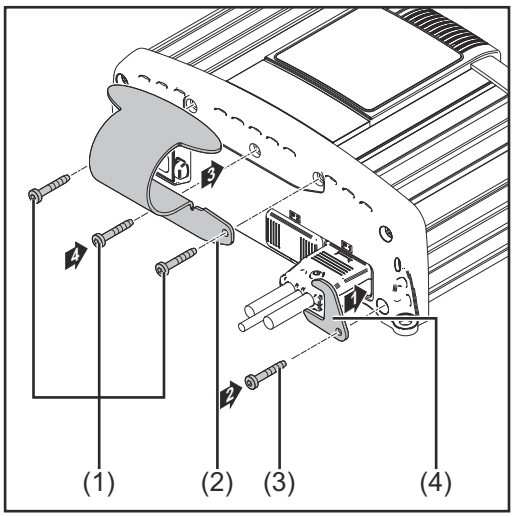
- Cover (1) for connection P4 - Multi Port.
- Cover (2) for connection P2 - I/O port.

Leave covers (1) and (2) in place on unused P2 and P4 connections.

USB update option

The USB update option allows the charger to be updated directly via the USB interface.

Fitting the optional bracket and strain-relief device for the charging lead



Please note:
the torque for all screws is 2.5 Nm (1.84 ft. lb.).

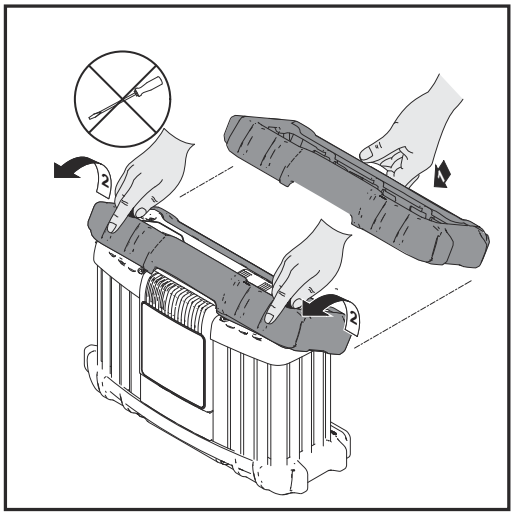
To fit the bracket:

- Undo the screws (1).
- Fit bracket (2) using the previously removed screws.

To fit the strain-relief device:

- Undo screw (3).
- Fit charging lead strain-relief device (4) using the previously undone screw.

Edge guard option

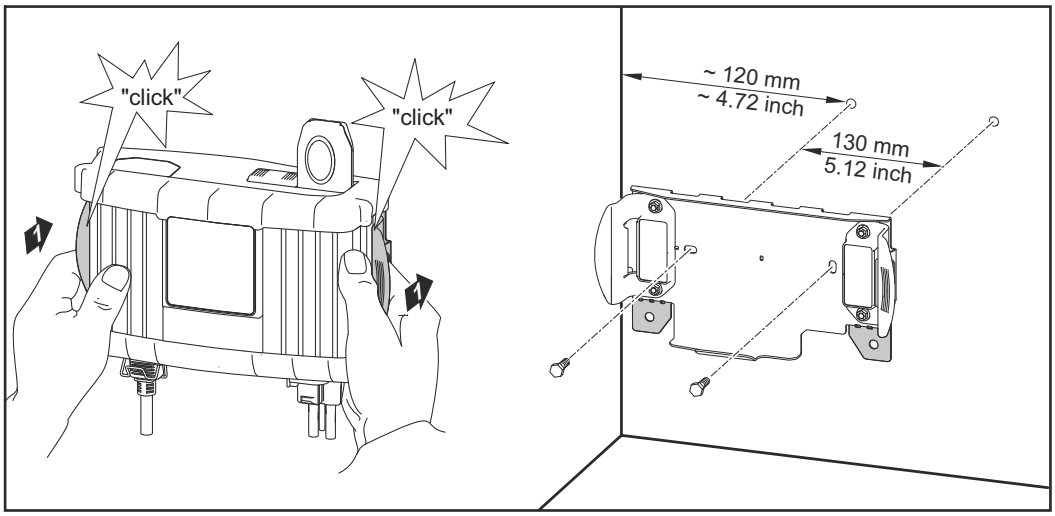


The edge guard removal process is the reverse of the fitting process.

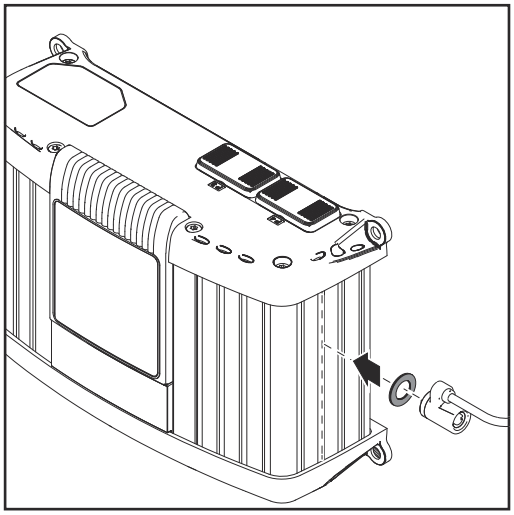
The bracket cannot be fitted if the edge guard is already in place.

Wall bracket option

Different wall plugs and screws will be required depending on the supporting surface. Wall plugs and screws are therefore not included in the scope of supply. The installer is responsible for selecting the right wall plugs and screws.



Preparations for security lock



The security lock is not contained in the scope of supply.

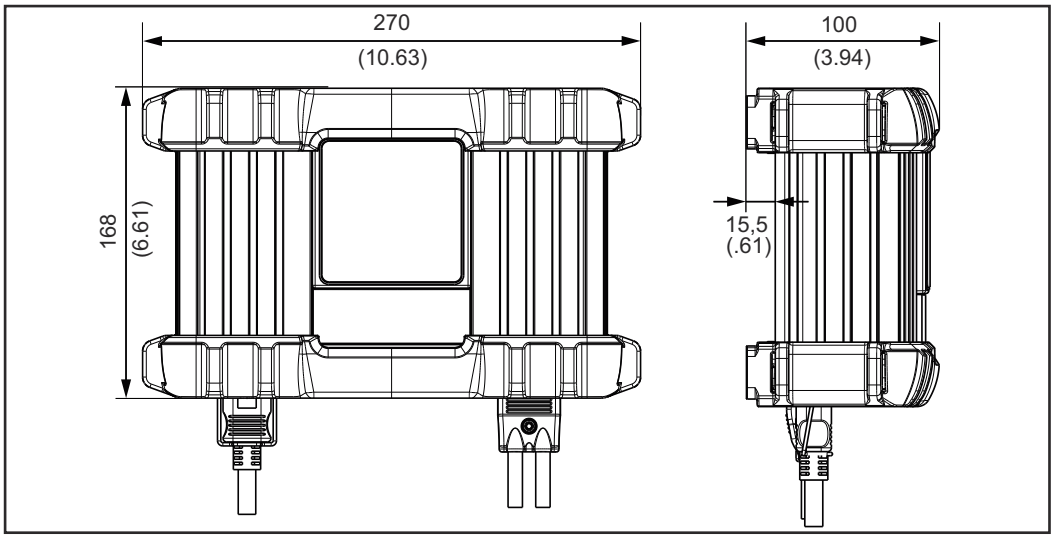
A security lock can only be attached
- to the groove on the housing as shown.
- to the groove on the housing that is exactly opposite.
- using spacer M8 DIN 125 or DIN 134, located as shown.

Mounting

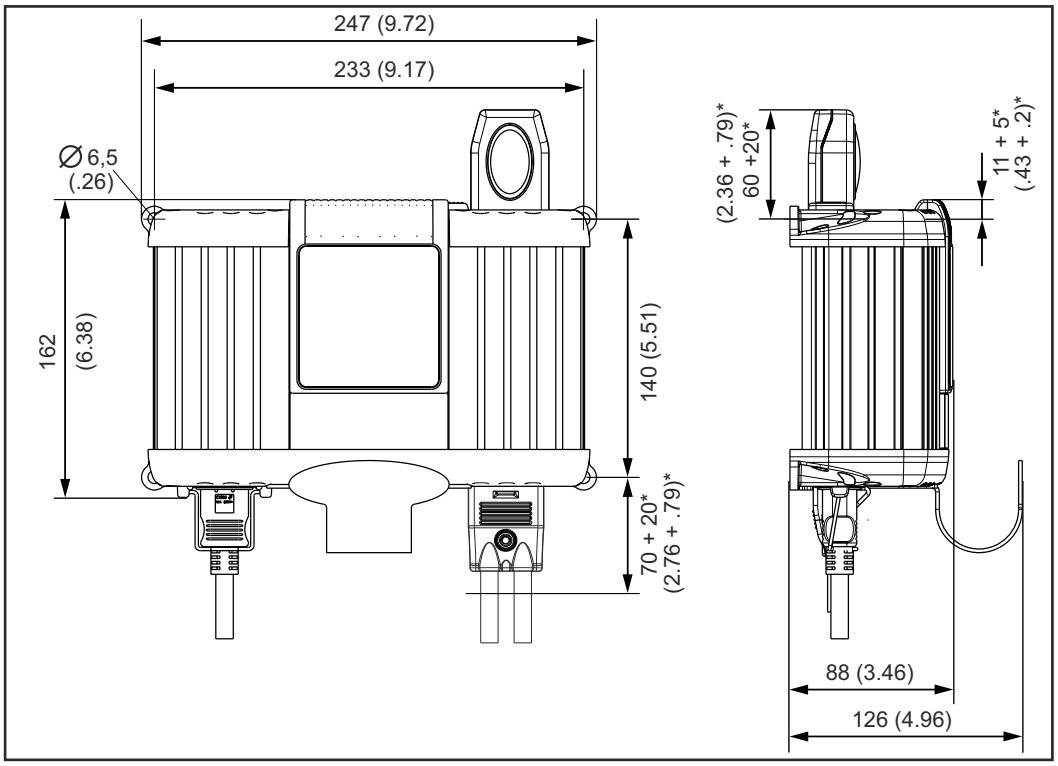
NOTE!

Danger due to improper installation of the charger in a switch cabinet (or in a similar enclosed space).
This can result in damage to property.
- ▶ Ensure sufficient heat dissipation using forced-air ventilation.
- ▶ There should be a clearance of 10 cm (3.94 in.) all around the device.

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



Space requirements with edge protector



Space requirements without edge protector, and space requirements with signal lamp and bracket options (space for mounting/removal)*

Operating modes

General information

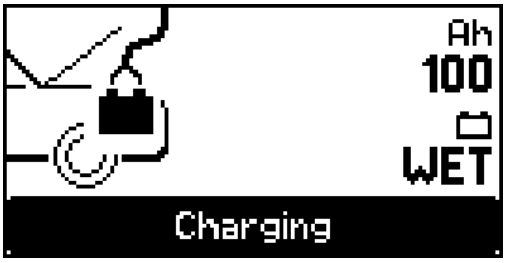
The charger is suitable for all 6/12/24 V lead acid batteries (wet, MF, AGM and GEL).

Available operating modes

The following operating modes are available:
- Charging
- Buffering (Trickle) mode during vehicle diagnosis or software updates
- Refresh
- Power supply mode
- Battery changing
- Device options

Selecting the operating mode

1 Connect mains cable to charger and plug into mains



The charger is on standby - 'Charging' mode is displayed.

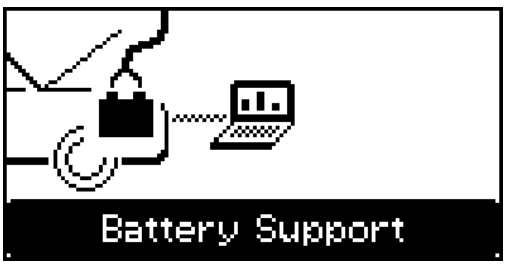
2 Select other operating modes using the Up/Down keys

Charging mode

Charging mode is used for:
- Charging or conservation charging with the battery either fitted or removed
- Charging while vehicle consumers are switched on

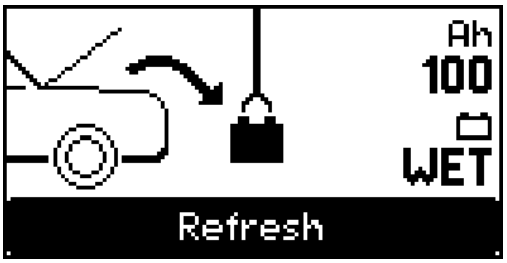
Charging mode is automatically started after the charger is connected to the mains.

Buffering (Trickle) mode



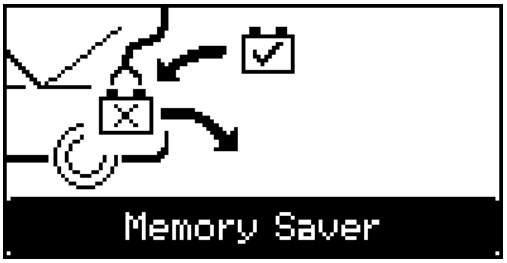
Buffering (Trickle) mode relieves the vehicle battery while vehicle diagnosis or a software update is being performed.

Refresh mode



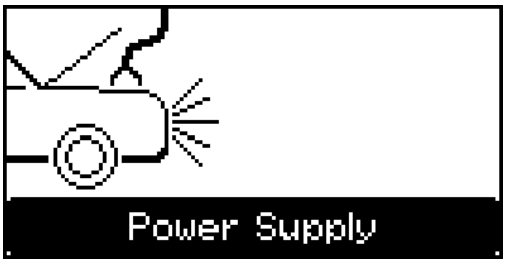
Refresh mode reactivates deeply discharged or sulphated batteries. Refresh charging of batteries must be carried out either in the open or in a well-ventilated area.

Battery changing mode



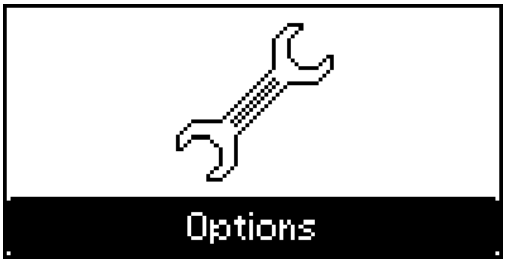
Battery changing mode provides a continuous power supply to the vehicle electronics while the battery is being changed.

Power Supply mode



Power supply mode provides the vehicle with power while repairs are being carried out with the battery removed.

Device options



The charger can be configured in a number of ways using the device options, as follows:

- Language
- Graphic display contrast
- Configure an individual standard
- Restore factory settings
- Activate/deactivate Expert mode
- Information on the hardware and software version

Charging mode

General information

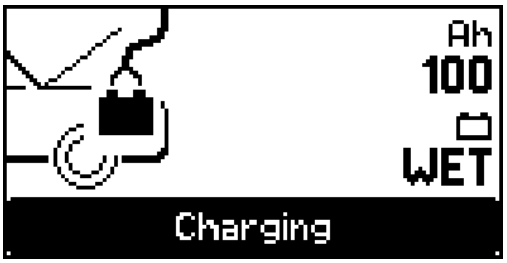
Charging mode is used for:
- Charging or conservation charging with the battery either fitted or removed
- Charging while vehicle consumers are switched on

Charging the battery

NOTE!

Danger due to a faulty battery.
This can result in damage to property.
▶ Before charging, ensure that the battery to be charged is fully functional.

1 Plug in charger mains plug

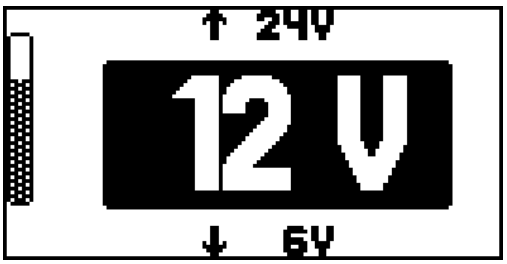


Charging mode is automatically started after the charger is connected to the mains.

2 Use the Menu key to select the "Ah" or "Battery type" setting.

3 Use the Up/Down keys to enter the required value (e.g. 100 Ah or "Wet" battery type).

4 Connect the battery, observing the correct polarity. Because the charging terminals are de-energised, there is no risk of sparks when connecting to the battery, even if the charger is already connected to the mains supply.
- Connect the red charging lead to the positive pole (+) of the battery
- Connect the black charging lead to the negative pole (-) of the battery



The charger automatically identifies the battery, e.g. 12 V, and starts the charging process after 5 seconds.

If the battery voltage is not correctly identified (e.g. in the event of a deeply discharged battery), you have 5 seconds to enter the correct battery voltage, as follows:

NOTE!

Danger if the wrong battery voltage is set.
This can result in damage to property.
▶ Always ensure that the correct battery voltage is set.

5 Set the correct battery voltage using the Up/Down keys (6V / 12V / 24V).

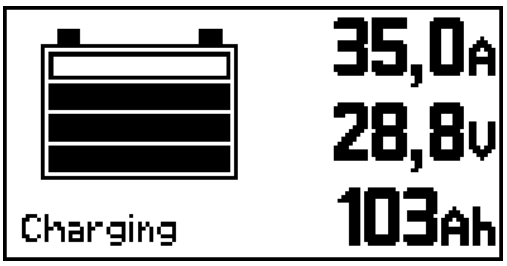
6 Confirm the selection using the Stop/Start key

If the battery voltage selection window does not open, then the battery is in a state of extreme deep-discharge (less than 2 V). In this case, it is advisable to use Refresh mode to reactivate the deep-discharged battery. For more information, see the "Refresh mode" section.

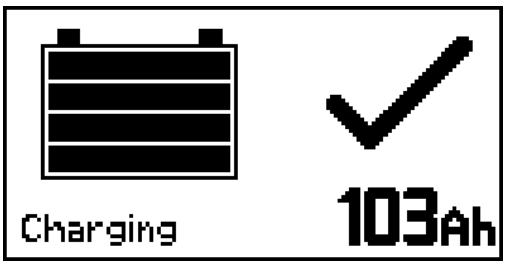
- A corresponding warning appears

If Charging mode is still required despite the battery being in a state of extreme deep-discharge

- Acknowledge the warning via the OK button using the Stop/Start key.
- Use the Up/Down keys to select the correct battery voltage in the subsequent selection window.
- Confirm the selection using the Stop/Start key



- A set of four bars shows the state of charge of the battery (e.g. three bars represent a state of charge of 80%).



- All four bars are continuously displayed.
- The state of charge is 100%.
- The battery is ready to use.
- The battery may remain connected to the charger under certain conditions*).
- Conservation charging counteracts battery self discharge.

⚠ WARNING!

*) **Danger if battery is not monitored during conservation charging.**
Serious injury and material damage can result, in particular due to short circuits, arcs and oxyhydrogen explosions.

▶ Visually inspect the battery at a regular interval as specified by the manufacturer (but at least once per week) to ensure the battery is filled to the max. marking with acid.

▶ In the event of the following, do not start the device or switch it off immediately and have the battery checked by an authorised workshop:
Uneven acid levels or high water consumption in individual cells
Impermissible warming of the battery to above 55 °C (131 °F).

⚠ WARNING!

Danger following ignition of oxyhydrogen caused by sparks resulting from the charging leads being disconnected too soon.
This can result in serious injury and damage to property.
▶ Before disconnecting the charging leads, press the Stop/Start key to finish charging.

7 To end the charging process:
- Press the Stop/Start key

8 Disconnect the charger
- Disconnect the black charging lead from the negative pole (-) of the battery
- Disconnect the red charging lead from the positive pole (+) on the battery

Interrupting the charging process

NOTE!

Danger from disconnecting or unplugging the charging lead during charging.
This can result in damage to connection sockets and connecting plugs.
▶ Do not disconnect or unplug charging leads while charging.

1 Press the Stop/Start key while charging
- The charging process is interrupted

Restarting charging

2 Press the Stop/Start button to continue charging

Buffering (Trickle) mode

General information

Buffering (Trickle) mode is intended exclusively for relieving the battery during a vehicle diagnosis or software update. The power used over an extended period of time must be less than the charger's maximum output current (35 A), otherwise the battery will be drained. Buffering (Trickle) mode is not suitable for fully charging the battery.

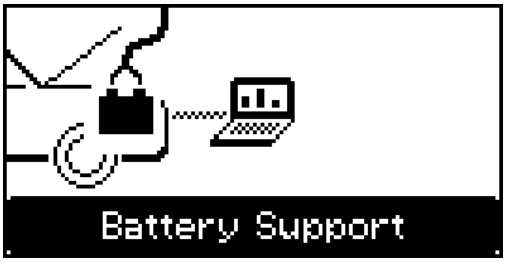
Buffering the battery

NOTE!

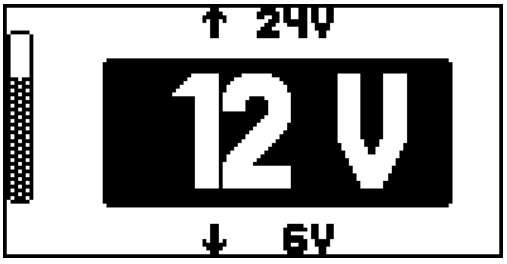
Danger due to a faulty battery.
This can result in damage to property.
▶ Before buffering, ensure that the battery is fully functional.

1 Plug in charger mains plug

2 Select Buffering mode using the up/down keys.



3 Connect the battery - the de-energised charging leads mean there are no sparks when connecting to the battery, even if the charger is already connected to the mains supply.
- Connect the red charging lead to the positive pole (+) of the battery
- Connect the black charging lead to the negative pole (-) of the battery



The charger automatically identifies the battery, e.g. 12 V, and starts the buffering process after 5 seconds.

If the battery voltage is not correctly identified (e.g. in the event of a deeply discharged battery), you have 5 seconds to enter the correct battery voltage, as follows:

NOTE!

Danger if the wrong battery voltage is set.
This can result in damage to property.
▶ Always ensure that the correct battery voltage is set.

4 Set the correct battery voltage using the Up/Down keys (6V / 12V / 24V).

5 Confirm the selection using the Stop/Start key

If the battery voltage selection window does not open, then the battery is in a state of extreme deep-discharge (less than 2 V). In this case, buffering is not permitted. We recommend that the battery is replaced.

⚠ WARNING!

Danger following ignition of oxyhydrogen caused by sparks resulting from the charging leads being disconnected too soon.
This can result in serious injury and damage to property.
▶ Before disconnecting the charging leads, press the Stop/Start button to finish buffering.

6 To cancel Buffering mode:
- Press the Stop/Start key

7 Disconnect the charger
- Disconnect the black charging lead from the negative pole (-) of the battery
- Disconnect the red charging lead from the positive pole (+) on the battery

Interrupting Buffering mode

NOTE!

Danger from disconnecting or unplugging the charging leads during buffering.
This can result in damage to connection sockets and connecting plugs.
▶ Do not disconnect or unplug charging leads while buffering.

1 Press the Stop/Start key during buffering
- The charging process is interrupted

Resuming buffering

2 Press the Stop/Start key
- Buffering is resumed

Refresh mode

General information

Refresh mode is used to charge the battery if it is suspected that the battery has been in a state of deep-discharge over a long period (e.g. battery sulphated)
- Battery is charged to maximum acid density
- Plates are reactivated (degradation of sulphate layer)

⚠ WARNING!

Risk of injury and damage from overheated batteries.
Only charge the battery under supervision! Monitor the battery temperature and interrupt the charging process if necessary. Do not charge the battery to be reactivated in an ambient temperature exceeding 30°C. "Refresh" mode can cause the battery temperature to rise to up to 45°C. Immediately disconnect the charger if the battery temperature exceeds 45°C.

⚠ CAUTION!

Refresh charging may damage the vehicle electronics.
Disconnect and remove the battery from the vehicle before carrying out a refresh charge.

The success of refresh charging depends on the degree of sulphation of the battery.

NOTE!

Use Refresh mode with caution, as refresh charging can cause fluid loss or drying-out.
Also ensure that
- ▶ the battery is at room temperature (20 - 25°C)
- ▶ the battery capacity has been correctly set
- ▶ the battery has been disconnected from the vehicle electrical system
- ▶ refresh charging is carried out on batteries removed from the vehicle, either in the open (without being exposed to direct sunlight) or in well-ventilated areas

⚠ CAUTION!

Risk of injury.
Wear eye protection and suitable protective clothing when handling battery acid. Rinse any acid splashes thoroughly with clean water, and seek medical advice if necessary. On no account inhale any of the gases and vapours released.

Refresh mode may be used on the following batteries:
- Wet batteries:
  sealed batteries with a liquid electrolyte (identifiable on the vent plugs)
  After reactivating, check the acid level and top up with distilled water if necessary.
- AGM batteries:
  sealed batteries (VRLA) with immobilised electrolyte (sealant) and maintenance-free wet batteries (MF)
- Gel batteries:
  sealed batteries (VRLA) with immobilised electrolyte (gel)

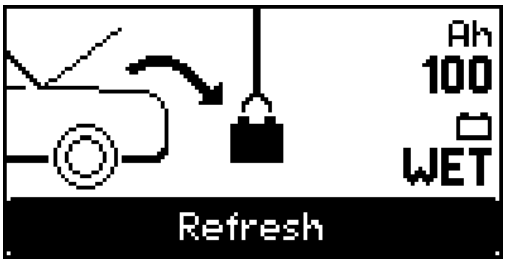
Reactivating batteries

⚠ CAUTION!

Deeply discharged batteries are liable to freeze at temperatures of 0°C and below.
Risk of damage when battery is frozen. Before starting refresh charging, ensure that the acid in the battery to be refreshed is not frozen.

1 Plug in charger mains plug

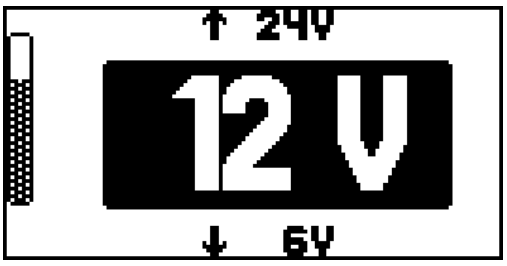
2 Select Refresh mode using the up/down keys.



3 Use the Menu key to select the 'Ah' or 'Battery type' setting.

4 Use the Up/Down keys to enter the required value (e.g. 100 Ah or 'Wet' battery type).

5 Connect battery - the de-energised charger leads mean there are no sparks when connecting to the battery, even if the charger is already connected to the mains supply.
- Connect the red charger lead to the positive pole (+) of the battery
- Connect the black charger lead to the negative pole (-) of the battery



The charger automatically identifies the battery, e.g. 12 V, and starts the charging process after 5 seconds.

If the battery voltage is not correctly identified (e.g. usually the case if a battery is deeply discharged), you have 5 seconds to enter the correct battery voltage as follows:

⚠ CAUTION!

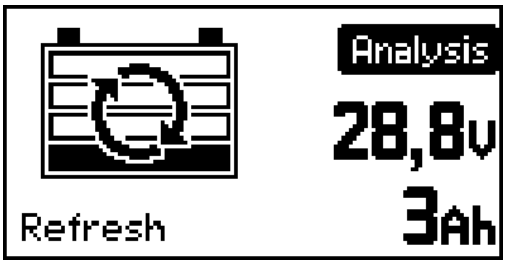
Risk of damage if the wrong voltage is set.
Always ensure that the correct battery voltage is set.

6 Set the correct battery voltage using the Up/Down keys (6V / 12V / 24V).

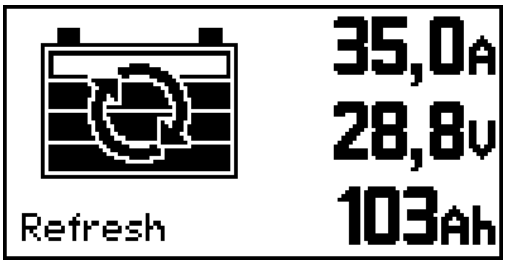
7 Confirm the selection using the Stop/Start key.

If the battery voltage selection window does not open, then the battery is in a state of extreme deep-discharge (less than 2 V).
- A corresponding warning appears

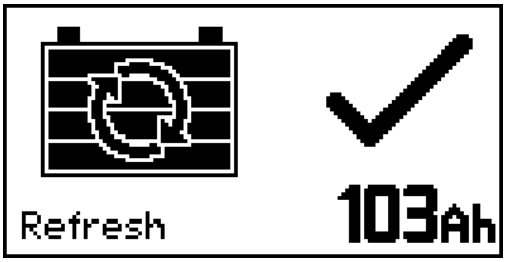
If Refresh mode is still required despite the battery being in a state of extreme deep-discharge
- Acknowledge the warning via the OK button using the Stop/Start key.
- Use the Up/Down keys to select the correct battery voltage in the subsequent selection window.
- Confirm the selection using the Stop/Start key



During the analysis phase, the charger monitors the battery voltage and the result is used in the subsequent charging process.



- A set of four bars shows the state of charge of the battery (e.g. the third bar represents a state of charge of 80%).



- All four bars are continuously displayed.
- The state of charge is 100%.
- The battery is ready to use.
- The battery may remain connected to the charger for any length of time.
- Conservation charging counteracts battery self-discharge.

⚠ CAUTION!

Risk of sparks if the charger leads are disconnected too soon.
Before disconnecting the charger leads, press the Stop/Start key to finish charging.

8 To terminate Refresh charging:
- Press the Stop/Start key

9 Disconnect the charger
- Disconnect the black charger lead from the negative pole (-) on the battery
- Disconnect the red charger lead from the positive pole (+) on the battery

Interrupting "Refresh" charging

NOTE!

Danger due to disconnecting or unplugging the connection sockets and connecting plugs during reactivation.
This can result in damage to the connection sockets and connecting plugs.
▶ Do not disconnect or unplug charging leads while reactivating.

1 Press the Stop/Start key while reactivating
- "Refresh" charging is interrupted

Resuming refresh charging

1 Press the Stop/Start key
- Refresh charging is resumed

Battery changing mode

General information

Battery changing mode supplies the vehicle electronics with power while the battery is replaced. Before disconnecting the old battery from the vehicle electronics, the charger leads must be connected to the vehicle battery leads. This connection must remain in place until the new battery is connected.

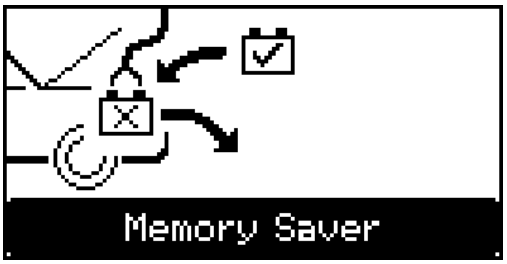
Changing the battery

NOTE!

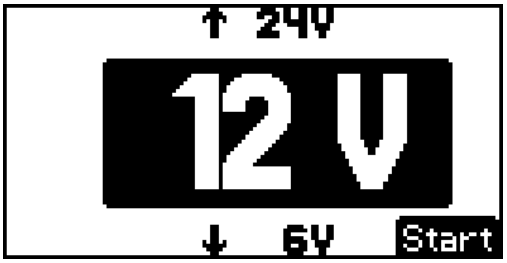
Danger of incorrect voltage setting.
This can result in severe damage to the vehicle electronics.
▶ Always set the correct voltage after connecting the charger to the vehicle battery leads.

1 Plug in charger mains plug

2 Select Battery changing mode using the up/down keys.



3 Connect the charging leads to the vehicle battery leads as described below - the de-energised charging leads mean there are no sparks when connecting the battery, even if the charger is already connected to the mains supply.
- Connect the red charging lead to the positive (+) vehicle battery lead
- Connect the black charging lead to the negative (-) vehicle battery lead



The charger automatically identifies the battery, e.g. 12 V, and starts powering the vehicle electronics after 5 seconds.

If the battery voltage is not correctly identified (e.g. usually the case if a battery is deeply discharged), you have 5 seconds to enter the correct battery voltage as follows:

NOTE!

Danger if the wrong battery voltage is set.
This can result in damage to property.
▶ Always ensure that the correct battery voltage is set.

4 Set the correct battery voltage using the Up/Down keys (6V / 12V / 24V).

5 Confirm the selection using the Stop/Start key.

If the battery is in a state of extreme deep-discharge (under 2 V), a warning appears instructing the user to disconnect the battery.

Batteries in a state of extreme deep-discharge must be replaced without using Battery changing mode.

6 Install and connect a new battery

⚠ WARNING!

Danger following ignition of oxyhydrogen caused by sparks resulting from the charging leads being disconnected too soon.
This can result in serious injury and damage to property.

▶ Before disconnecting the charging leads, press the Stop/Start button to finish buffering.

7 To cancel Battery changing mode:
- Press the Stop/Start key

8 Disconnect the charger
- Disconnect the black charging lead from the negative (-) vehicle charging lead
- Disconnect the red charging lead from the positive (+) vehicle charging lead

Remember:

9 Start charging mode to charge the (as yet not fully charged) battery.

Power supply mode

Requirements

In Power supply mode, the charger leads are connected directly to the battery leads or the vehicle jump start points. It ensures that the vehicle electronics are supplied with power while the battery is removed during repair work. As only the vehicle battery leads are connected to the charger, the battery voltage recognition function is not available.

Power Supply mode

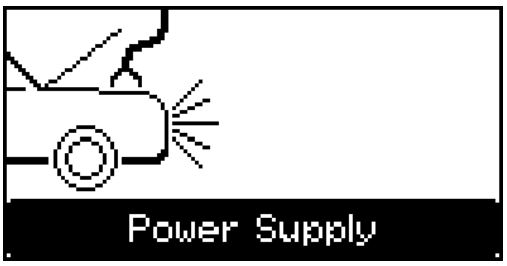
NOTE!

Danger of an incorrect vehicle-specific voltage setting.
This can result in severe damage to the vehicle electronics.

▶ Before connecting the charger to the vehicle battery leads, ensure that the correct voltage has been set.

1 Plug in charger mains plug

2 Select Power Supply mode using the up/down keys



3 Use the Menu key to select the vehicle power supply voltage (6 V / 12 V / 24 V).

4 Connect the charging leads to the vehicle battery leads as described below - the de-energised charging leads mean there are no sparks when connecting the battery, even if the charger is already connected to the mains supply.
- Connect the red charging lead to the positive (+) vehicle battery lead
- Connect the black charging lead to the negative (-) vehicle battery lead

- A safety message appears on the display asking whether the charging leads are connected correctly.

5 Use the Stop/Start key to confirm the safety message and start supplying the vehicle electronics with power.

NOTE!

Danger if the charging leads are disconnected before pressing the Stop/Start key.

Data stored in the vehicle may be lost as a result.

▶ Before disconnecting the charging leads, press the Stop/Start key to cancel Power Supply mode.

6 Finish Power Supply mode:
- Press the Stop/Start key

7 Disconnect the charger
- Disconnect the black charging lead from the negative (-) vehicle battery lead
- Disconnect the red charging lead from the positive (+) vehicle battery lead

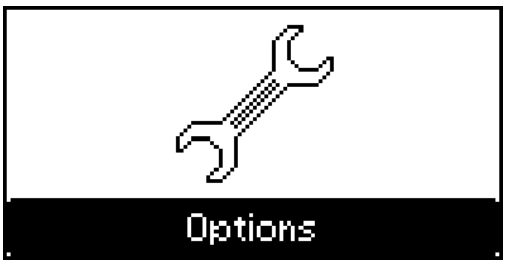
Device options

General information

The device options allow the following to be configured:
- Language
  Selection of language for user guide
- Graphic display contrast
- Configuration
  an individual standard may be set
- Factory default
  to restore all device options to the factory settings
- Activate/deactivate Expert mode
- Info
  provides information on the
  hardware and software version
  total Ah charged
  total operating time

Selecting device options

1 Use the up/down keys to select the device options



Configuration

⚠ CAUTION!

Risk of damage when selecting and using individual charger lead lengths.
The user accepts full responsibility for shortening the charger leads supplied and making the appropriate settings to reflect the individual charger lead lengths. The manufacturer shall not be held liable for any damage arising from such actions.

The following parameters can be configured to create an individual standard:

Charger lead length:
- 1 m - 10 m, adjustable in 0.5 m stages
- The following lengths may be requested in the scope of supply: 2,5 m / 5 m

Initial values:
- Start mode (charging/buffering mode)
- Battery capacity (3 – 350 Ah)
- Type of battery (WET, GEL and AGM)
- Voltage selection
  automatic
  optionally set permanently to 6 V, 12 V or 24 V

Charging parameters:

- Boost (on/off), factory setting: on
  Boost on: shorter charging time resulting in the battery being fully charged sooner. The full 35 A of power available from the device is applied if parallel consumers are detected (car radio, etc.).
  Boost off means that a conventional workshop charging process is followed (fixed charging current of 20 A per 100 Ah of specified battery capacity). Parallel consumers (car radio, etc.) are not detected in this case.
- Expert (on/off)
  Enter the following to activate Expert mode (Expert on):

  Code number 1511
  Expert mode (Expert on) allows a user application to be specified for WET, GEL and AGM batteries when the device is in charging mode. The following may be configured:
  Final charging voltage
  Conservation charge voltage
- Buffering mode
  Constant voltage may be adjusted
- Refresh
  Enter the following to alter the Refresh setting:

  Code number 1511
  Final charging voltage and duration may be adjusted
- Power Supply mode
  Constant voltage may be adjusted

Synergic lines

Safety

⚠ WARNING!

Danger from incorrect operation.
This can result in severe personal injury and damage to property.
- ▶ Follow the battery manufacturer's instructions.
- ▶ The battery must not be connected to the charger when setting parameters.

Available characteristics

Operating mode	Battery	Characteristic	I_1	U_1 [6/12/24V]	I_2	U_2 [6/12/24V]	Exp. 3)
Charging	WET	IUoU	35 1)	7.2/14.4/28.8	-	6.75/13.5/27	Yes
	AGM			7.35/14.7/29.4		6.84/13.68/27.36	
	GEL			7.05/14.1/28.2			
	USER 3)			2-30		1.9-29.9	
Buffering mode	ALL	IU	35	6.75/13.5/27	-	-	Yes
Refresh	WET	IUIoU	35 1)	7.2/14.4/28.8	4	6.75/13.5/27	No
	AGM			7.35/14.7/29.4	2	6.84/13.68/27.36	
	GEL			7.05/14.1/28.2			
	USER 3)	IUa	35 2)	2-34	-	-	Yes
Power Supply mode	NONE	IU	35	6.75/13.5/27	-	-	Yes
Changing the battery	ALL	IU	35	6.75/13.5/27	-	-	No

I_1 Main charging current [A]
Maximum device current: 35 A

I_2 Recharging current [A per 100 Ah of specified battery capacity]

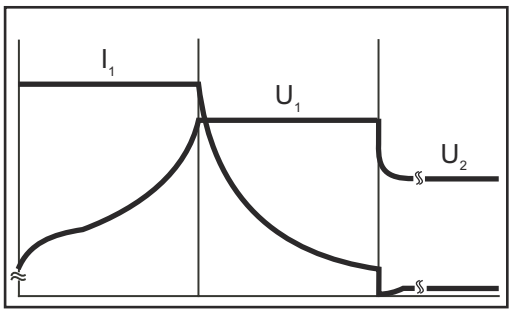
U_1 Final charging voltage [V]

U_2 Floating charge voltage [V]
Automatic switchover to pulse charge conservation after 12 hours, apart from user application in Expert mode

1) 20 A per 100 Ah of specified battery capacity

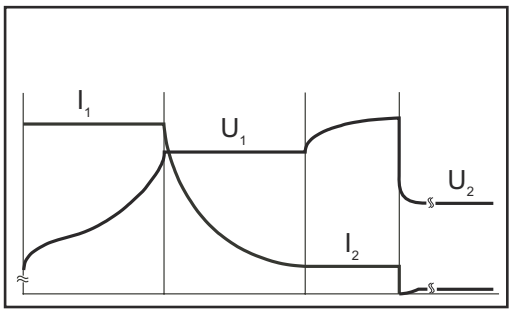
2) 10 A per 100 Ah of specified battery capacity

3) Adjustable final charging voltage and conservation charge voltage in Expert mode; for trained professionals only



Charging characteristic IUoU:

I_1 = Main charging current
U_1 = Final charging voltage
U_2 = Conservation charging voltage



Refresh characteristic IUIoU:

I_1 = Main charging current
U_1 = Final charging voltage
I_2 = Recharging current
U_2 = Conservation charging voltage

Troubleshooting

Safety

⚠ WARNING!

Risk of electric shock.
This can result in serious injuries or death.

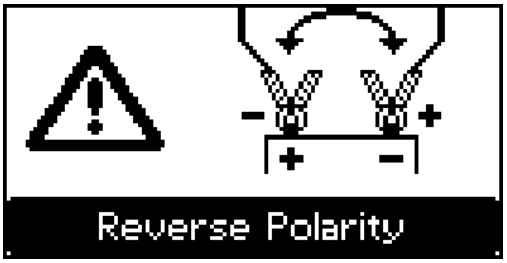
- ▶ Before opening the device:
- ▶ Unplug the device from the mains.
- ▶ Disconnect battery.
- ▶ Put up an easy-to-understand warning sign to stop anybody inadvertently switching it back on again.
- ▶ Using a suitable measuring instrument, ensure that electrically charged components (e.g. capacitors)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

⚠ WARNING!

Danger from an inadequate ground conductor connection.
This can result in severe personal injury or damage to property.

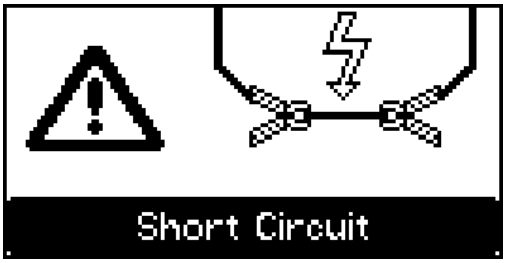
- ▶ The housing screws provide a suitable PE conductor connection for earthing the housing and must NOT be replaced by any other screws that do not provide a reliable PE conductor connection.

Protective equipment



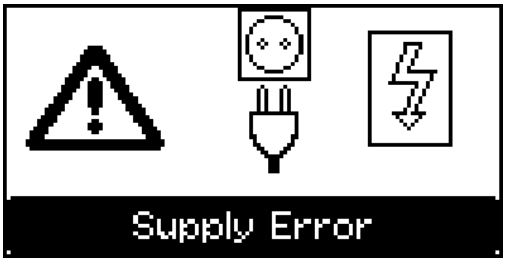
Charger leads connected to wrong poles, reverse polarity protection has tripped

Remedy:
- Connect battery poles correctly



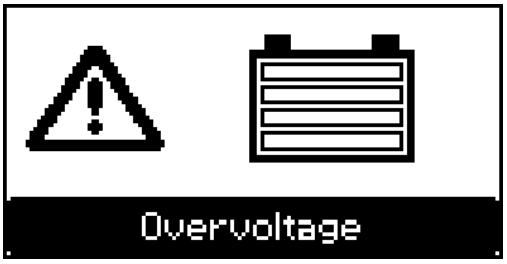
Short circuit in the charging terminals or charger lead, short-circuit detection active

Remedy:
- Check charger leads, contacts and battery poles



Mains fault - mains voltage outside the tolerance range

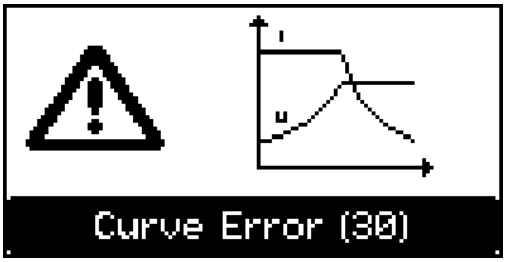
Remedy:
- Check mains conditions



Battery overvoltage

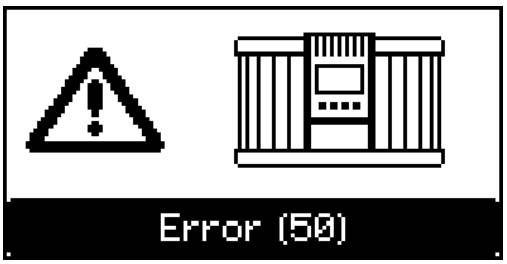
Remedy:
- Set the correct operating mode and voltage

Charging error



Status codes caused by external factors:	
30	Cause: Timeout in the corresponding charging phase
	Remedy: - Set Ah to correct value - Check for parallel consumers (car radio, etc.) - Battery temperature too high
31	Cause: Too many Ah charged, too few Ah set
	Remedy: - Set Ah to correct value - Check for parallel consumers (car radio, etc.) - Replace battery if it is faulty
32	Cause: Optional external temperature sensor has tripped due to under-temperature
	Remedy: - Charge the battery in an area with a more suitable temperature
33	Cause: Optional external temperature sensor has tripped due to over-temperature protection
	Remedy: - Allow battery to cool or charge it in an area with a more suitable temperature
34	Cause: Battery voltage set too high
	Remedy: - Set the correct battery voltage
35	Cause: Voltage below target voltage after 2 h - "Refresh" mode in analysis phase
	Remedy: - Check for parallel consumers (car radio, etc.) - Replace battery if it is faulty
36	Cause: Cell short circuit
	Remedy: - Check for parallel consumers (car radio, etc.) - Replace battery if it is faulty

37	Cause: Conservation charge current too high
	Remedy: - Check for parallel consumers (car radio, etc.)



Status codes in the event of device fault:

50	Cause: Device output fuse faulty
	Remedy: - Contact your authorised service centre
51	Cause: Secondary temperature is outside permissible range
	Remedy: - Contact your authorised service centre
52	Cause: Current regulator faulty
	Remedy: - Contact your authorised service centre
53	Cause: External temperature sensor faulty
	Remedy: - Replace external temperature sensor
60	Cause: Invalid characteristic number
	Remedy: - Contact your authorised service centre
61	Cause: Characteristic block invalid
	Remedy: - Contact your authorised service centre
62	Cause: Incorrect checksum of calibration values
	Remedy: - Contact your authorised service centre
63	Cause: Incorrect device type
	Remedy: - Contact your authorised service centre

Technical data

Electrical data input 230V

Mains voltage	~ 230 V AC, +/- 15 %
Mains frequency	50 / 60 Hz
Mains current	max. 9 A eff.
Mains fuse protection	max. 16 A
Efficiency	max. 96 %
Effective power	max. 1120 W
Power consumption (standby)	max. 2.4 W
Protection class	I (with PE conductor)
Maximum permitted mains impedance at the interface (PCC) to the public grid	None
EMC emission class	A
Marks of conformity	CE

Standards 230V

IEC 60068-2-6	Sine oscillations (10 - 150 Hz; 1.5 h / axis)
IEC 60068-2-29	Repetitive shock (25 g / 6 ms / 1000 shocks)
EN 60335-1	EN 60335-2-29
EN 61000-6-2	
EN 61000-6-4	(Class A)
EN 62233	EMF Standard

Electrical data input 120 V

Mains voltage	~ 120 V AC ±15%
Mains frequency	50/60 Hz
Mains current	max. 16 A eff.
Mains fuse	max. 20 A
Efficiency	max. 94.5%
Effective power	max. 1120 W
No-load power consumption	max. 7.8 W
Protection class (with ground conductor)	I
Maximum permitted mains impedance at the interface (PCC) to the public grid	none
Mark of conformity	cTÜVus
EMC device class	A

Standards 120V

UL1236	
C22.2 No 107.1-01	
FCC CFR 47 Part 15	(Class A)
IEC 60068-2-6	Sinusoidal vibration (sine 10-55 Hz; 20 cycles / axis; acceleration 5 g)
IEC 60068-2-29	Repetitive shock (25 g / 6 ms / 1000 shocks)

Electrical data output

Nominal output voltage	6 V / 12 V / 24 V DC
Output voltage range	2 V - 34 V
Output current	35 A at 28.8 V DC 35 A at 14.4 V DC 35 A at 7.2 V DC
Battery return current	< 1 mA

Battery data

6 V / 12 V / 24 V DC	3 - 350 Ah

Technical data

Cooling	Convection and fan
Dimensions l x w x h	270 x 168 x 100 mm
Weight (without cable)	2 kg

Environmental conditions

Operating temperature	-20 °C - +40 °C (>30 °C derating)
Storage temperature	-40 °C - +85 °C
Climate class	B
Degree of protection	IP40

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