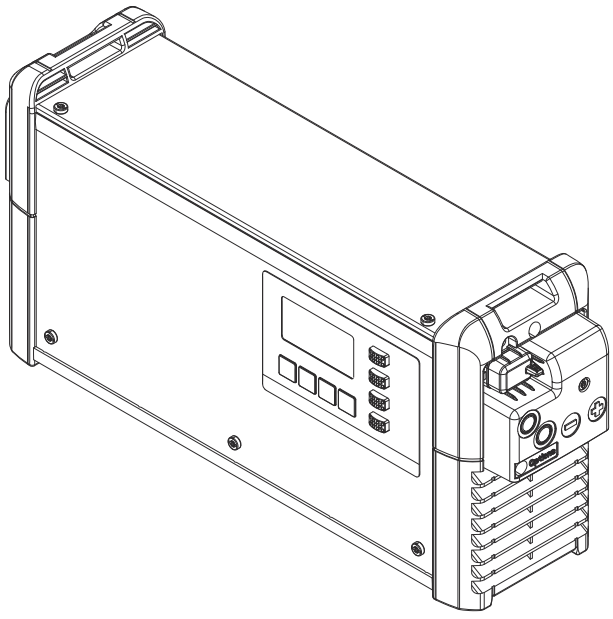
Operating Instructions

Selectiva

2040 2kW
2050 2kW
2060 2kW
2070 2kW
2080 3kW
2100 3kW
2120 3kW
4020 2kW
4035 2kW
4045 3kW
4060 3kW



EN | Operating Instructions

42,0426,0226,EN 013-19042023

Contents

Safety rules 5
- General 5
- Intended use 5
- Environmental conditions 5
- Mains connection 6
- Dangers due to grid and charging current 6
- Danger due to acid, gases and vapours 6
- General information on working with batteries 7
- Personal protection and protection of others 7
- Safety measures in normal operation 7
- EMC Device Classifications 7
- EMC measures 8
- Data protection 8
- Maintenance 8
- Obligations of the operator 8
- Safety inspection 8
- Markings on the device 8
- Disposal 9
- Copyright 9

General information 10
- Explanation of safety notices 10
- Device concept 10
- Proper use 10
- Mains connection 12
- Charging lead 12
- Correct installation of the mains/charging cables 12
- Warning notices on the device 13
- Warning notices inside the device 14
- Setup regulations 15
- Wall and floor bracket 16

Control elements and connections 20
- General 20
- Controls and connections 20
- Control panel 22

Charging the battery 24
- Charging 24
- Interrupting charging 26
- Stopping charging 27

Display 28
- Overview of display modes 28
- Standard mode 29
- Menu selection 29
- Statistics mode 30
- History mode 31
- Configuration mode 32
- Settings 36
- Additional functions 42
- General settings 45
- Reset settings 47
- USB mode 47
- Status codes 49

Options 52
- Safety 52
- Electrolyte circulation 3 kW (C1) 52
- External start/stop 54
- Temperature-controlled charging 54
- LED strip 54
- Air filter 54
- Wall and floor bracket 54
- "Mobile" kit 54

Option box 55
Mounting plate 56
Technical data 57
Selectiva 2 kW 57
Selectiva 3 kW 58

Safety rules

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 exact information on permitted environmental conditions, please refer to the "Technical data" section.

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.

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.

Obligations of the operator

The operator must only allow persons to work with the device who:
- are familiar with the fundamental instructions regarding safety at work and accident prevention and have been instructed in how to use the device
- have read and understood these operating instructions, especially the section "safety rules", and have confirmed as much with their signatures
- are trained to produce the required results.

Checks must be carried out at regular intervals to ensure that operators are working in a safety-conscious manner.

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.

Disposal

Waste electrical and electronic equipment must be collected separately and recycled in an environmentally responsible manner in accordance with the EU Directive and national law. Used equipment must be returned to the distributor or through a local, authorised collection and disposal system. Proper disposal of the old device promotes sustainable recycling of material resources. Ignoring this may lead to potential health/environmental impacts.

Packaging materials
Collected separately. Check your municipality's regulations. Reduce the volume of the box.

Copyright

General information

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.

Device concept

The single-phase battery charging systems for 24 V and 48 V batteries are fitted with intelligent charging technology. The successful Active Inverter Technology with the revolutionary Ri charging process adapts itself to the requirements of the battery and only charges the battery with the current that it actually needs.

The technology is embedded in a robust industry-standard housing. The exceptionally compact design complies with all safety standards, requires less installation space and protects the components to ensure a long service life.

Fitted with a graphical display, an integrated datalogger, new interfaces and additional options, the device is perfectly equipped for the future.

Proper use

⚠ WARNING!

Danger due to unsuitable batteries being connected to the charger.
This can result in serious injury and damage to property due to escaping gas, fire or explosion.

▶ Never connect a battery to the charger unless it is compatible in terms of its type, voltage and capacity and corresponds to the charger settings.

The battery charging system is only suitable for charging the following batteries:

Power category	Cell type	Minimum number of cells	Maximum number of cells	Minimum nominal capacity [Ah]	Maximum nominal capacity [Ah]
Selectiva 2040 2 kW	Pb-Wet/GEL	1	12	10	800
	NiCd	2	20	10	800
Selectiva 2050 2 kW	Pb-Wet/GEL	1	12	10	1000
	NiCd	2	20	10	1000
Selectiva 2060 2 kW	Pb-Wet/GEL	1	12	10	1200
	NiCd	2	20	10	1200
Selectiva 2070 2 kW	Pb-Wet/GEL	1	12	10	1400
	NiCd	2	20	10	1400
Selectiva 4020 2 kW	Pb-Wet/GEL	1	24	10	400
	NiCd	2	40	10	400
Selectiva 4035 2 kW	Pb-Wet/GEL	1	24	10	700
	NiCd	2	40	10	700
Selectiva 2080 3 kW	Pb-Wet/GEL	1	12	20	1600
	NiCd	2	20	20	1600
Selectiva 2100 3 kW	Pb-Wet/GEL	1	12	20	2000
	NiCd	2	20	20	2000
Selectiva 2120 3 kW	Pb-Wet/GEL	1	12	20	2000
	NiCd	2	20	20	2000
Selectiva 4045 3 kW	Pb-Wet/GEL	1	24	20	900
	NiCd	2	40	20	900
Selectiva 4060 3 kW	Pb-Wet/GEL	1	24	20	1000
	NiCd	2	40	20	1000

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

Mains connection

⚠ 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:
- ▶ All the Operating Instructions for the system components, especially the safety rules
- ▶ Battery and vehicle manufacturer's Operating Instructions and safety rules

⚠ WARNING!

Danger due to faulty or insufficient power supply.
This can result in severe personal injury and damage to property.
- ▶ The power supply requirements detailed in "Technical data" must be met.

Charging lead

⚠ WARNING!

Danger from flying sparks due to improper disconnection of the charging plug.
This can result in severe personal injury and damage to property. The resulting sparks can ignite the charging gases that form during charging and cause a fire or explosion
- ▶ End the charging process via the battery charger and, after the charging cables have cooled down, wind them up or, if available, place them on the cable holder.

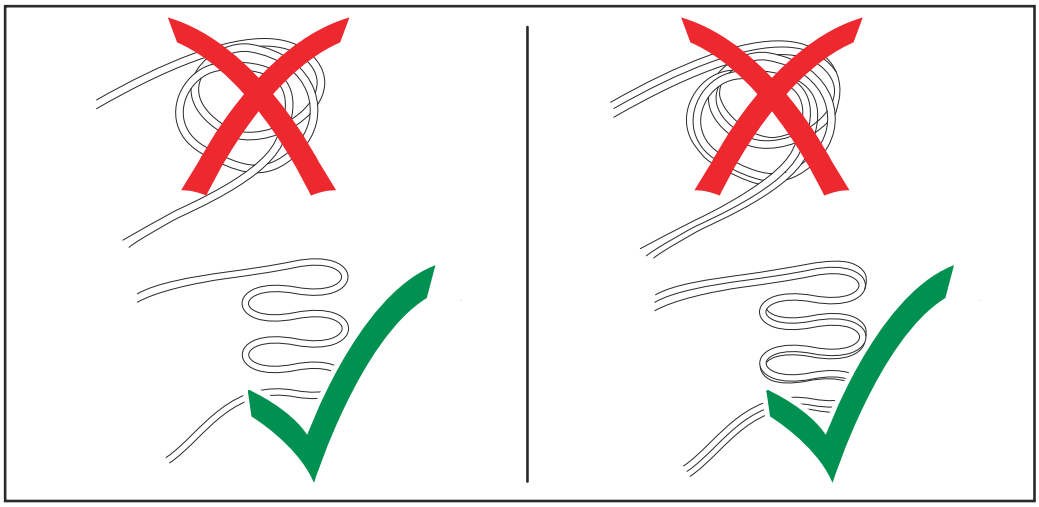
Correct installation of the mains/charging cables

⚠ WARNING!

Danger due to charging cables lying around.
This can result in severe personal injury and damage to property. Personnel can get caught or trip on unplugged, loose cables.
- ▶ Lay charging cables so that no one can trip over them or get caught on them.

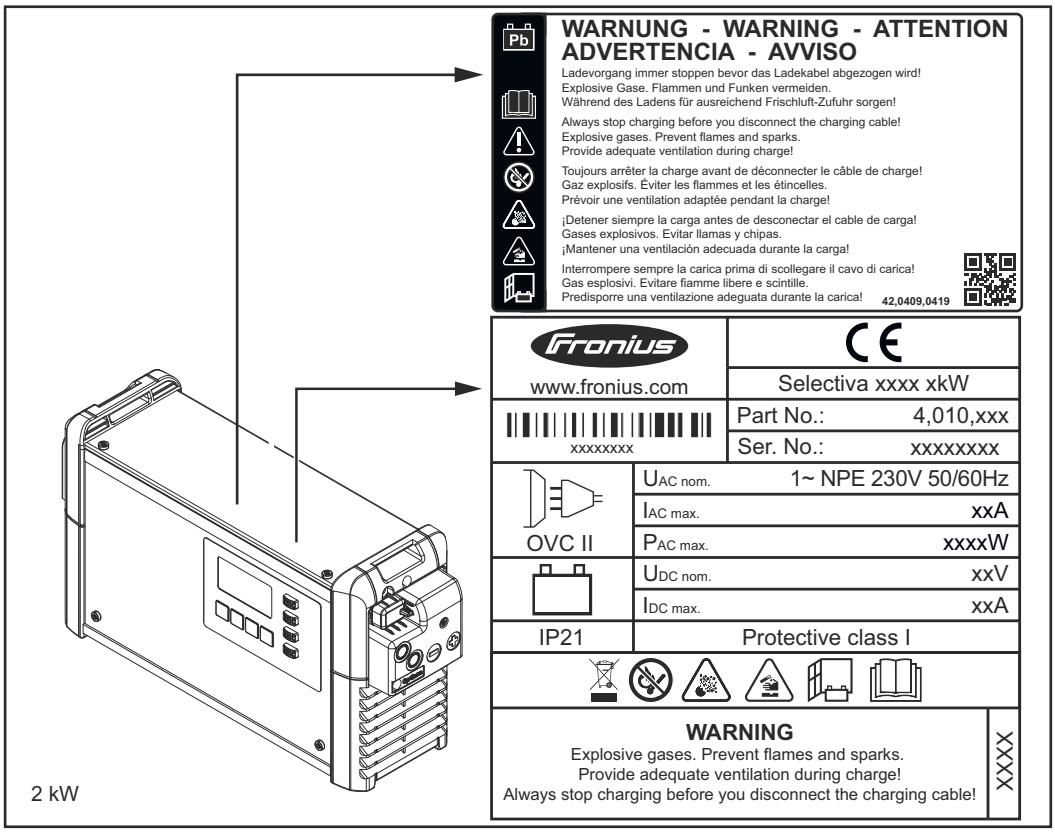
⚠ CAUTION!

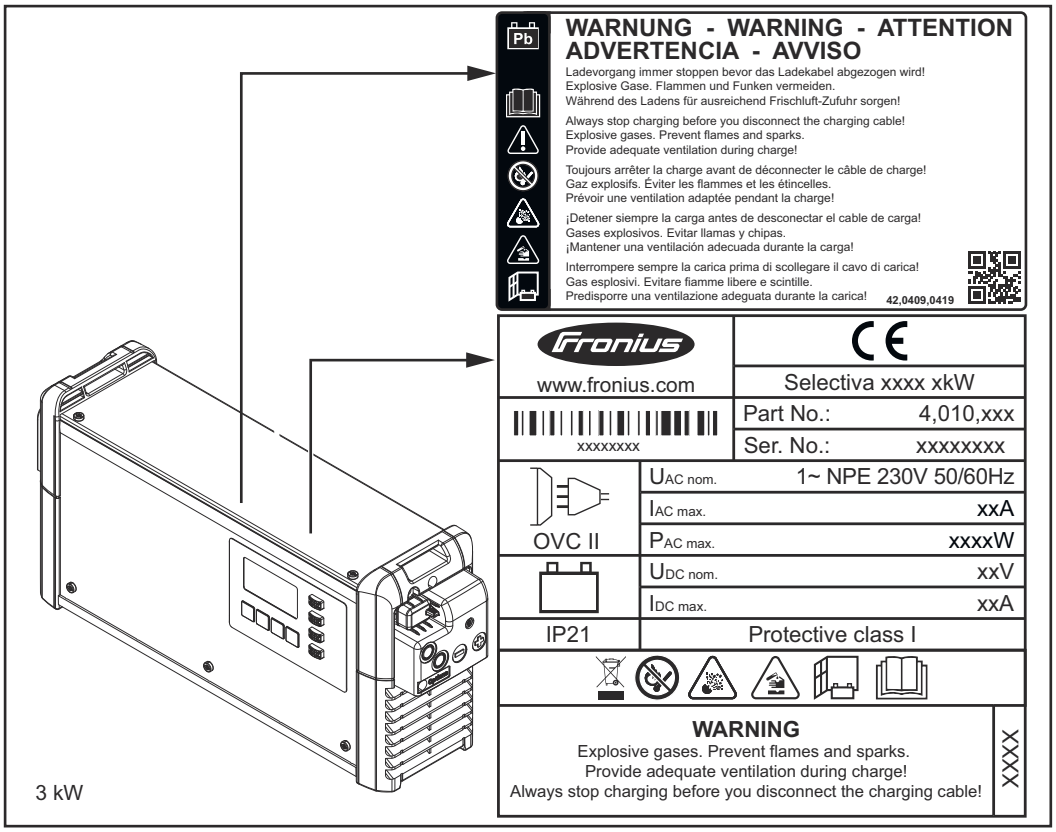
Danger due to overheating as a result of incorrectly laid mains/charging cables.
Risk of damage to the mains/charging cables.
- ▶ The mains/charging cable may only be replaced by a qualified electrician.
- ▶ Lay the mains/charging cable without a loop.
- ▶ Do not cover the mains/charging cable.
- ▶ Charging cables longer than 5 m (16 ft. 4.85 in.) must be laid individually (no bundling).
- ▶ Charging cables longer than 5 m (16 ft. 4.85 in.) can have an increased surface temperature (be aware of hot surfaces).
- ▶ In the following cases, pay special attention that the surface temperature of the charging cables does not exceed 80°C (176°F):
  - Ambient temperature is 30°C (86°F) or more
  - Cross-section of the charging cable is 95 mm^2 or more
  - Length of the charging cable is 5 m (16 ft. 4.85 in.) or more



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 dispose of used devices with domestic waste. Dispose of them according to the safety rules.

Possible sources of ignition, such as fire, sparks and naked flames, must be kept away from the battery.

Risk of explosion! Oxyhydrogen 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.

Do not use the functions until you have read all the Operating Instructions.

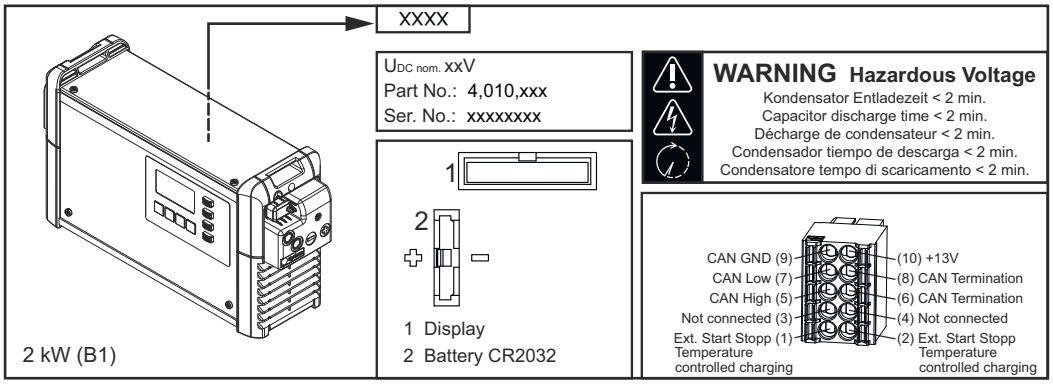
Warning notices inside the device

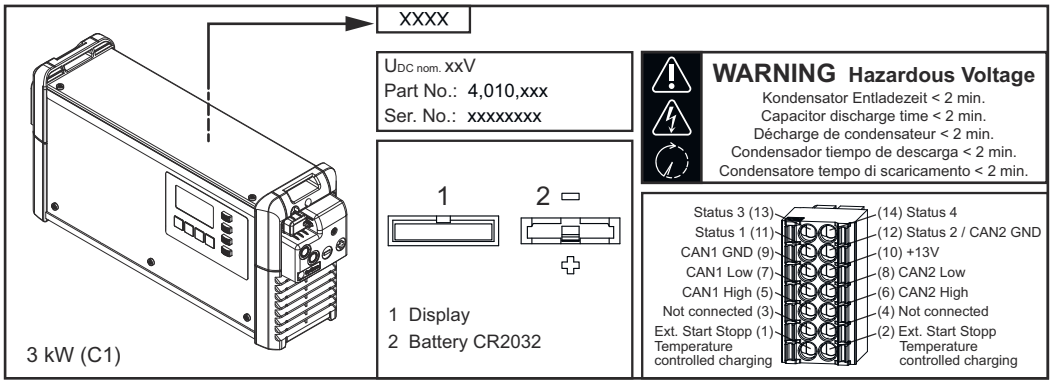
⚠ WARNING!

Danger from electric shocks.
This can result in serious injury or death.

- ▶ The housing must never be opened by anyone other than a service technician trained by the manufacturer.
- ▶ The device must be disconnected from the grid before starting any work with the housing open. A suitable measuring instrument must be used to ensure that electrically charged components (e.g. capacitors) are fully discharged.
- ▶ Use an easily legible and understandable warning sign to ensure that the device is not reconnected to the grid before all the work has been completed.

Inside the device:





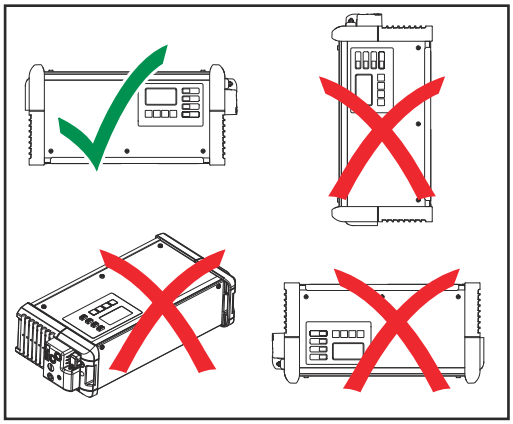
Setup regulations

⚠ WARNING!

Danger from devices falling or toppling over.
This can result in severe personal injury and damage to property.
- ▶ Set up all system components in a stable position.
- ▶ When using a floor bracket or wall bracket, always ensure that all fastening elements are firmly seated.

The device has been tested according to protection class 21. This means:
- Protection against the penetration of solid foreign bodies with a diameter of more than 12.5 mm (0.49 in.)
- Protection against dripping water falling vertically

The device can be set up and operated in dry, closed rooms in accordance with protection class 21. Avoid exposure to moisture.



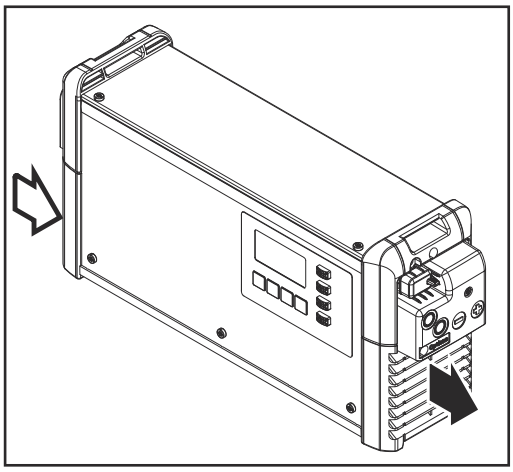
The permissible operating position of the device is horizontal.

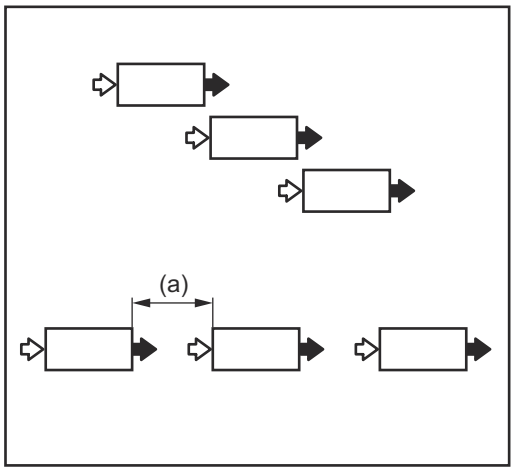
Cooling air
The device must be set up so that cooling air can flow through the housing openings provided unhindered. There must always be a minimum distance of 20 cm (7.87 in.) from the air inlet and outlet openings. The ambient air must be free from:
- Excessive dust exposure
- Electrically conductive particles (carbon black or metal chips)
- Heat sources
- Battery acid vapors

The cooling air flows in and out as indicated by the arrow symbols in the following illustrations.

⚠ CAUTION!

Danger due to partially or completely covered air intake and outlet openings.
This can result in damage to property.
▶ The setup of several devices one behind the other should be staggered.





If the devices are arranged in a line one behind the other without being staggered, the distance between the devices must be as follows:
a) Minimum distance 20 cm (7.87 in.)

Wall and floor bracket

⚠ WARNING!

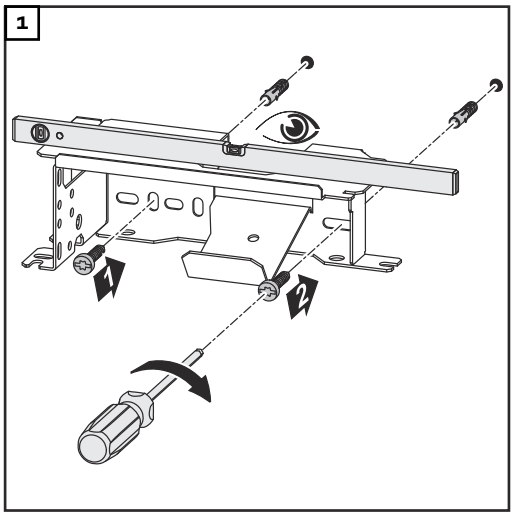
Danger from incorrectly performed work and falling equipment.
This can result in severe personal injury and damage to property.
▶ The mounting must only be carried out by trained and qualified personnel.

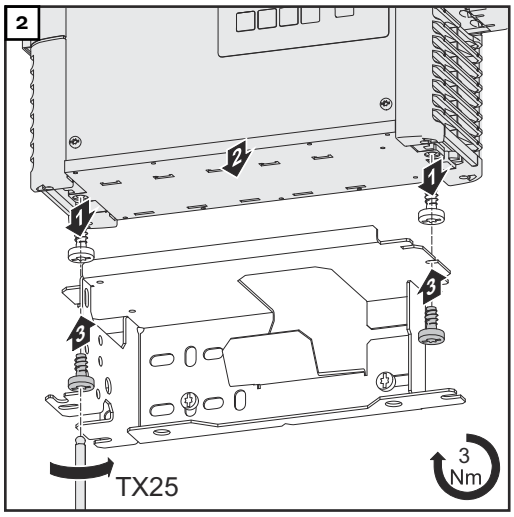
Depending on the substrate, different dowels and screws are required. Therefore, dowels and screws are not part of the scope of supply. The system installer is responsible for selecting the proper dowels and screws.

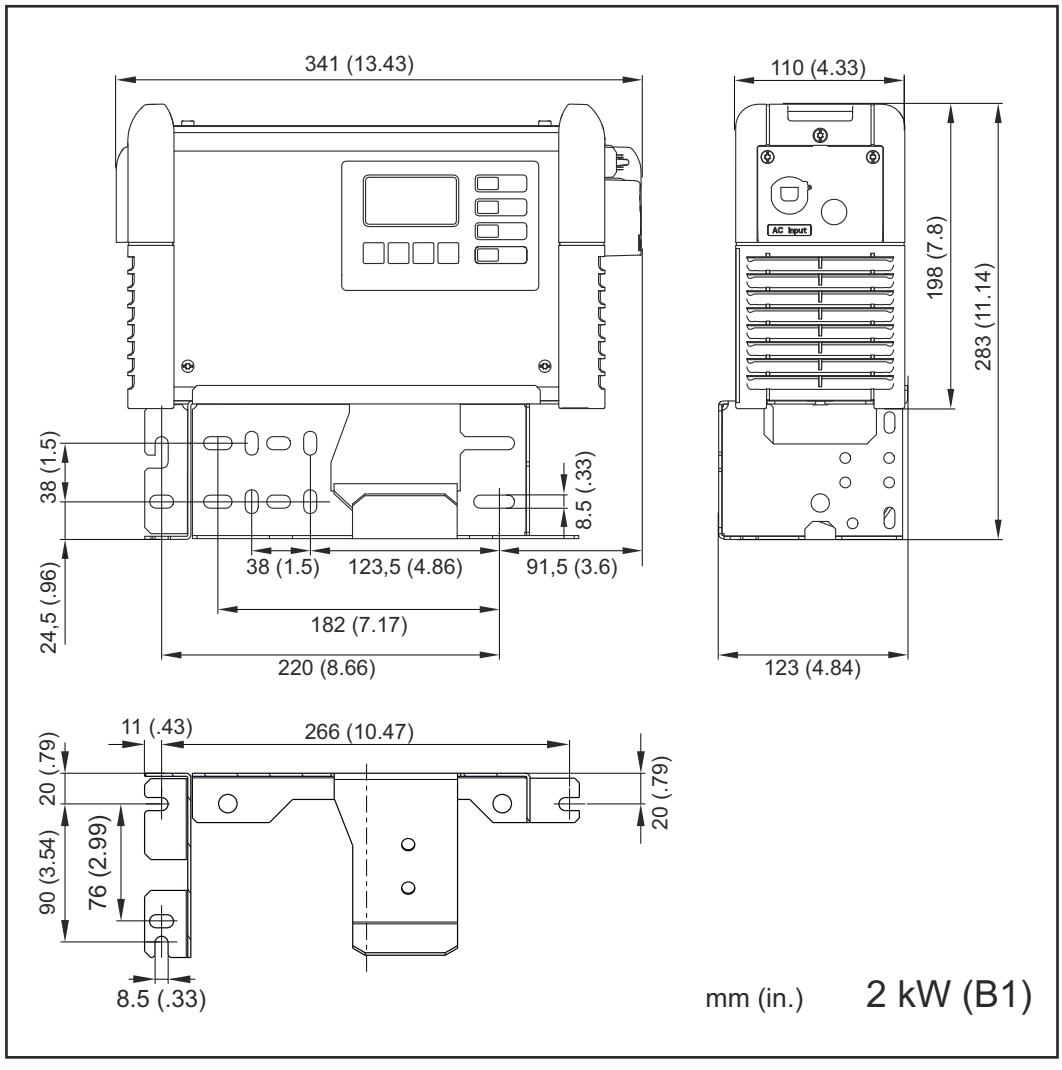
⚠ WARNING!

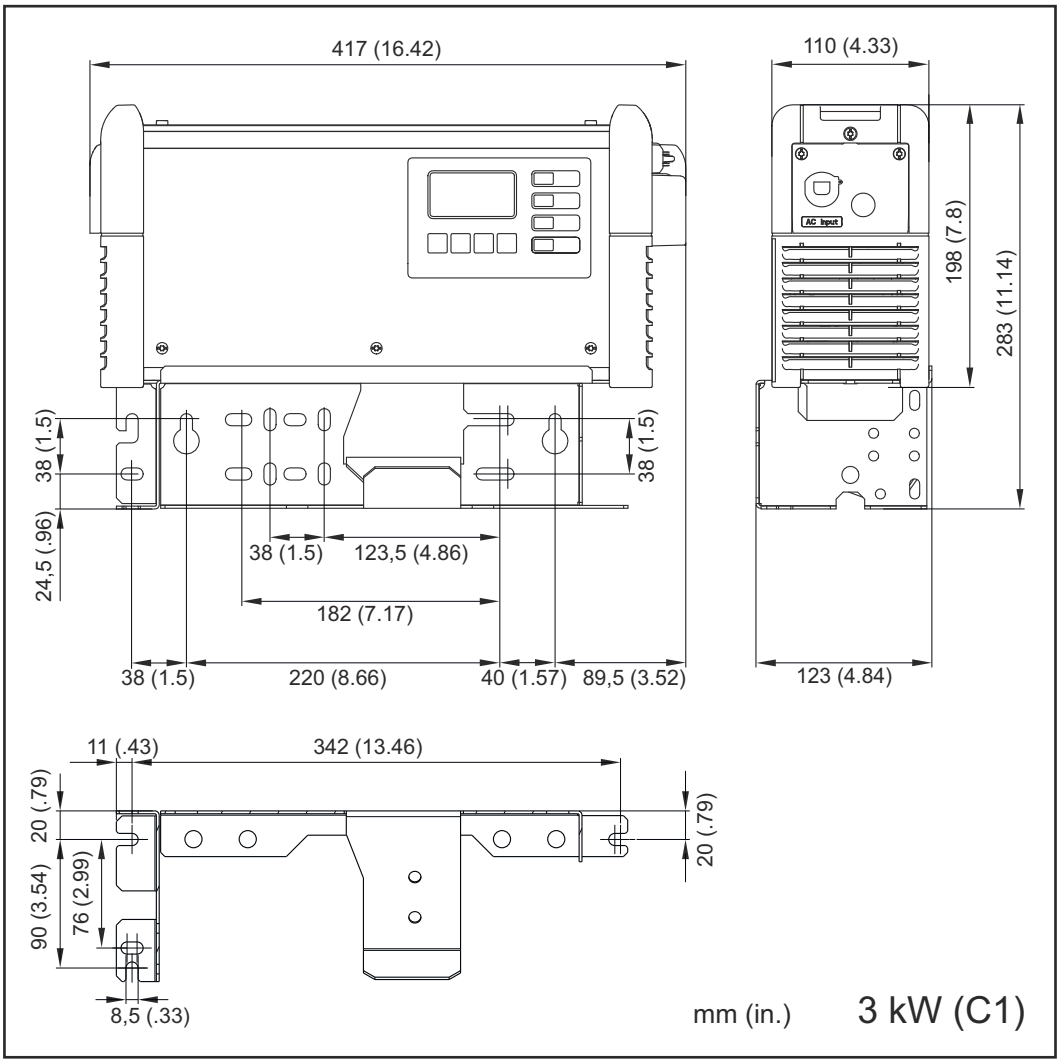
Danger from objects falling or toppling over.
This can result in severe personal injury and damage to property.
▶ Only use this wall bracket with the battery charger provided by the manufacturer.
▶ Mount the device horizontally.
▶ For wall mounting, the load bearing capacity of the wall must be sufficient.

Weight of wall bracket:	
2 kW (B1)	1.10 kg (2.43 lb)
3 kW (C1)	1.35 kg (2.98 lb)





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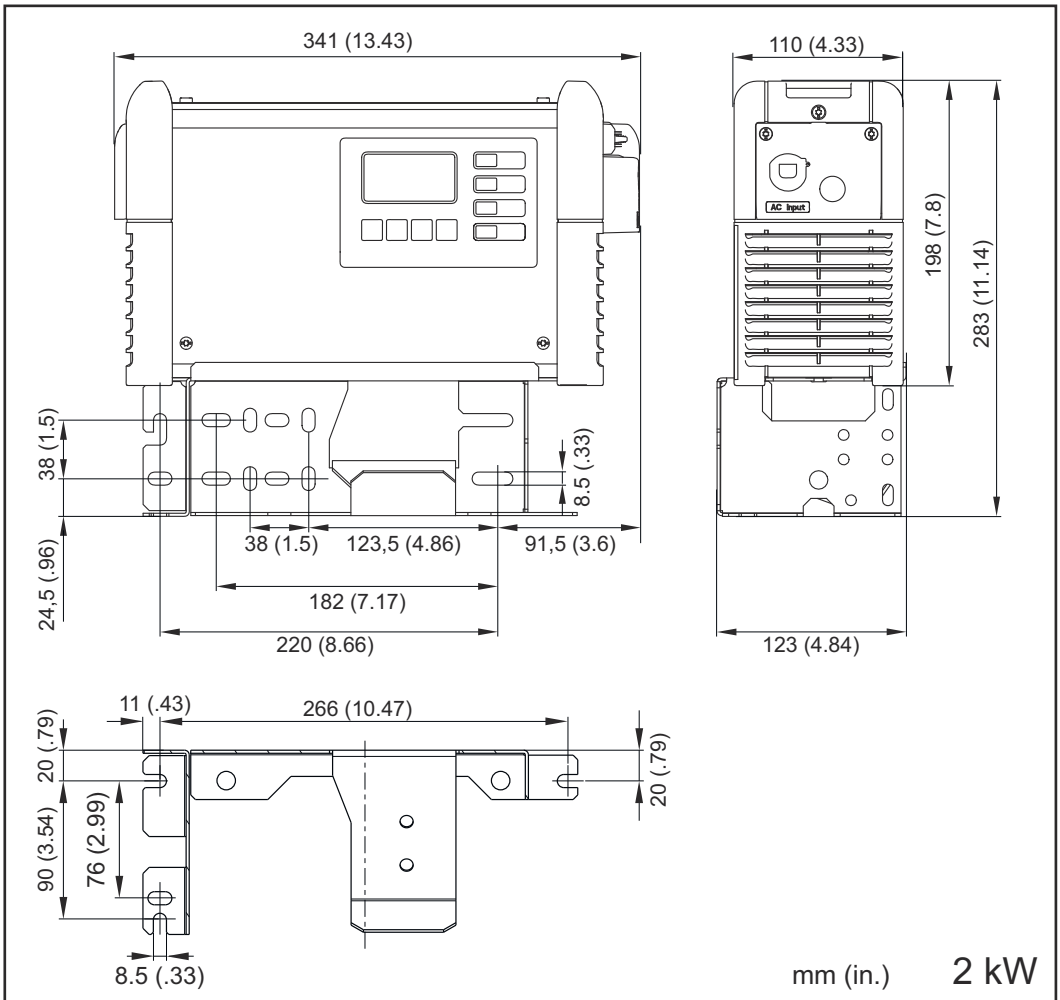
8,5 (.33)
mm (in.)
3 kW (C1)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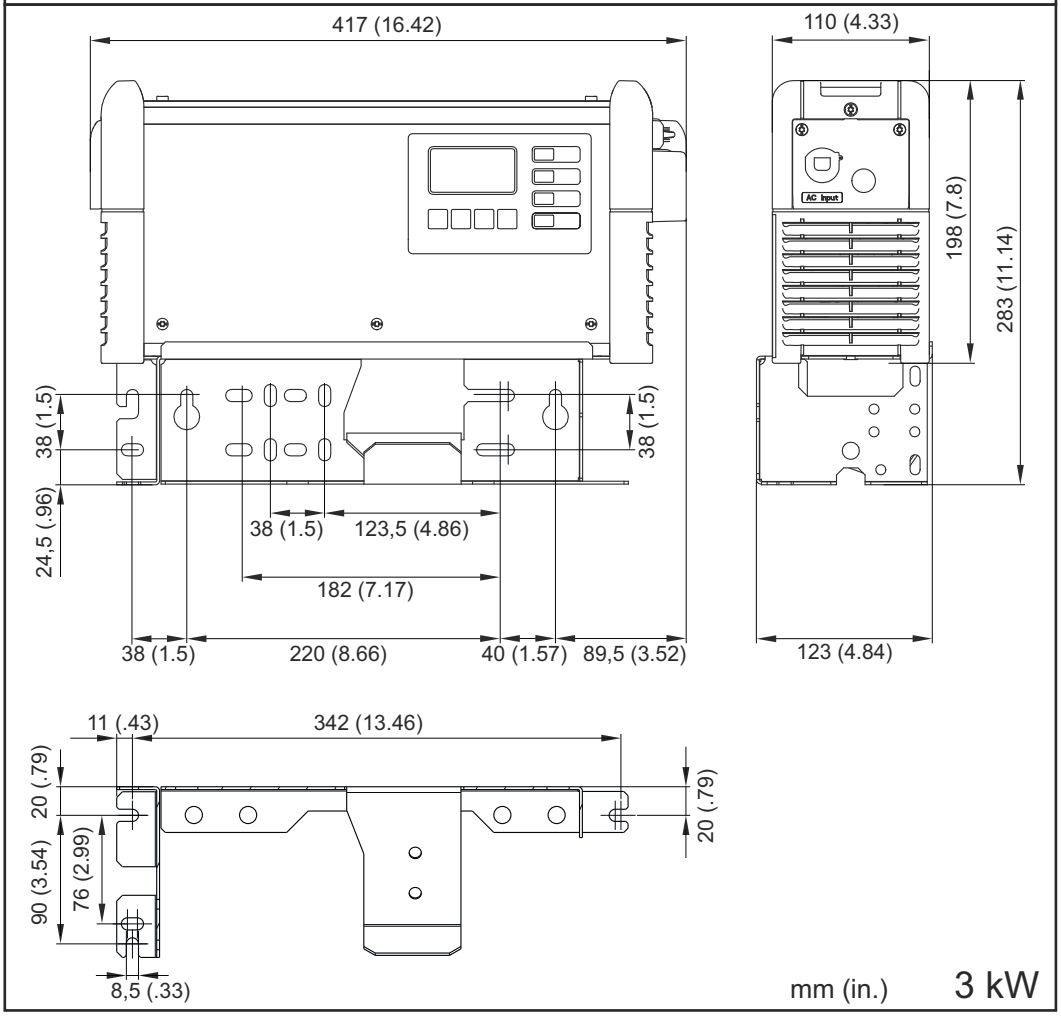
76 (2.99)
8.5 (.33)
mm (in.)
2 kW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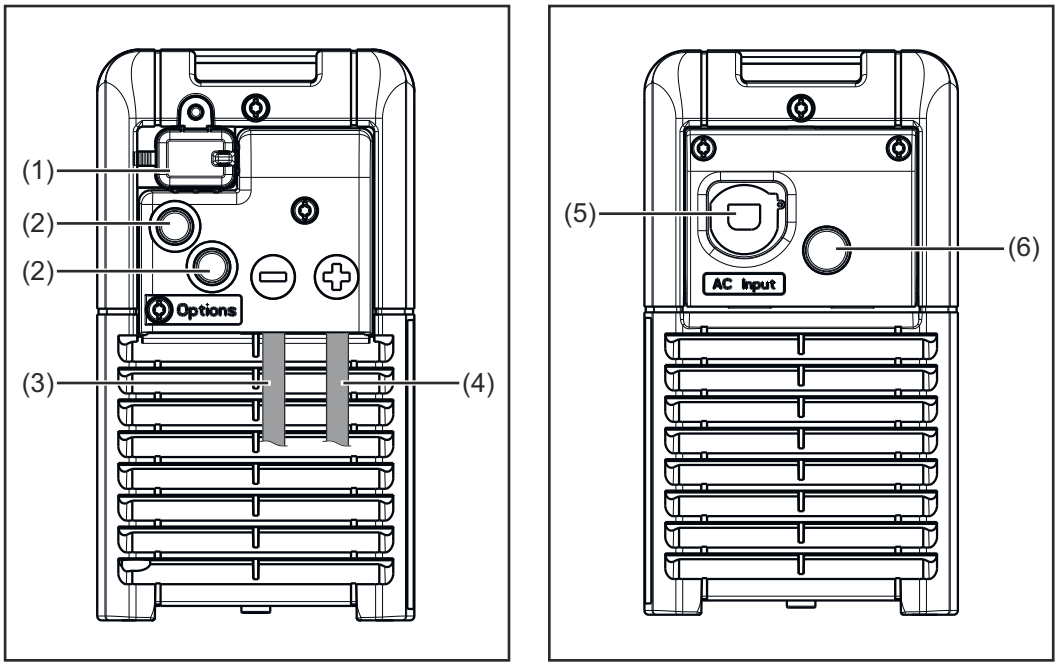
123 (4.84)
11 (.43)
342 (13.46)
20 (.79)
20 (.79)
90 (3.54)
76 (2.99)
8,5 (.33)
mm (in.)
3 kW

Control elements and connections

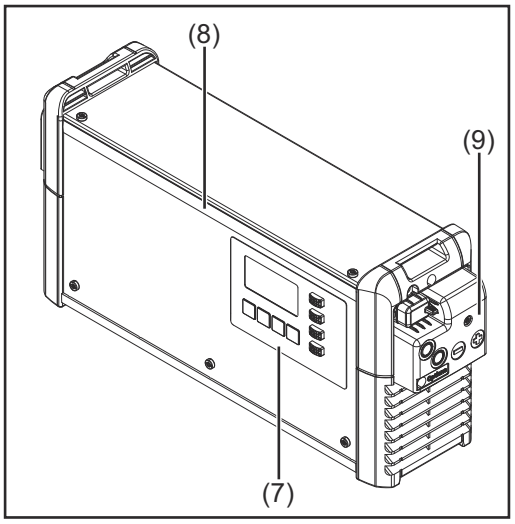
General

Please note:
as a result of firmware updates, you may find that there are functions available on your device that are not described in these Operating Instructions, or vice versa.
Certain illustrations may also differ slightly from the actual controls on your device, but these controls function in exactly the same way.

Controls and connections

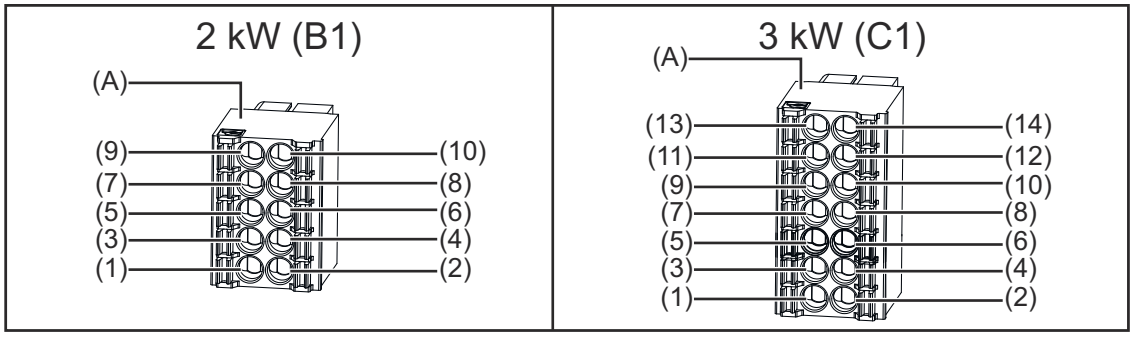


No.	Function
(1)	**USB port** The USB port allows a USB flash drive to be used to update the device and also to log the charging parameters while charging is in progress.
(2)	**Position for options** - External start/stop option - Temperature-controlled charging option
(3)	**(-) Charging cable**
(4)	**Cover for option plug and charging cables *** The option plug can only be accessed by removing the cover (4). The warning notices in the "Safety" section of the "Options" chapter must be obeyed.
(5)	**(+) Charging cable**
(6)	**Mains cable**
(7)	**Position for electrolyte circulation option**

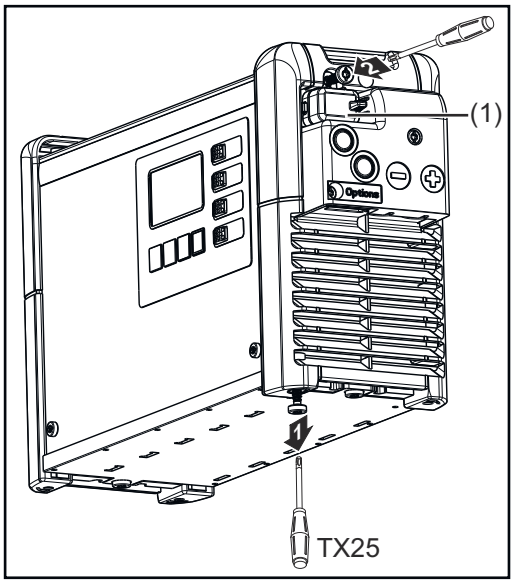


No.	Function
(8)	**Control panel**
(9)	**Optional LED strip** Lights up in different colours depending on the state of charge, as explained in the "Control panel" section

The option plug (A) is located behind the cover on the front of the device, upon which the charging cables can be found. For the CAN connection area, the warning notices in the "Safety" section of the "Options" chapter apply.

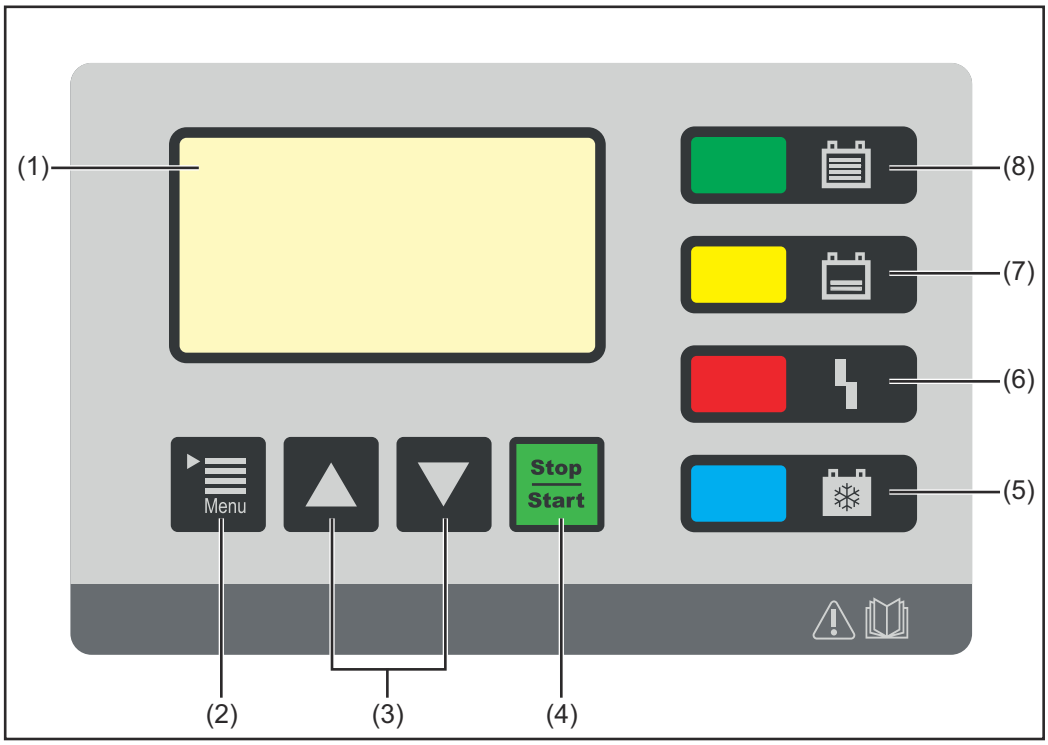


2 kW (B1)				3 kW (C1)			
				(13)	Status 3 / red	**(14)**	Status 4 / green
				(11)	Status 1 / blue	**(12)**	Status 2 / yellow CAN 2 GND
(9)	CAN GND	**(10)**	+ 13 V	**(9)**	CAN 1 GND	**(10)**	+ 13 V Air-Puls pressure switch
(7)	CAN Low	**(8)**	CAN termination	**(7)**	CAN 1 Low	**(8)**	CAN 2 Low Air-Puls pressure switch
(5)	CAN High	**(6)**	CAN termination	**(5)**	CAN 1 High	**(6)**	CAN 2 High
(3)	Not assigned	**(4)**	Not assigned	**(3)**	Not assigned	**(4)**	Not assigned
(1)	External start/stop or temperature-controlled charging	**(2)**	External start/stop or temperature-controlled charging	**(1)**	External start/stop or temperature-controlled charging	**(2)**	External start/stop or temperature-controlled charging



The cover (1) for the USB port can be secured with a screw.

Control panel



No.	Function
(1)	**Display** Displays the current charging parameters Displays settings
(2)	**"Menu" key** Selects the desired menu Selects the appropriate symbol to return to the previous display
(3)	**Up/down keys** Select the desired menu item Set the desired value

(4)	**Stop/Start key** For interrupting and resuming the charging process Confirms a menu item or setting
(5)	**"Battery cooled down" indicator (blue)** Indicates that a battery has cooled down and is ready for use **On steady:** After charging has finished, the set cooling time or optionally the battery temperature has been reached. **Flashes every second:** The water refill indicator has also tripped. More information can be found under "Additional functions" in the "Display" section.
(6)	**"Fault" indicator (red)** **On steady:** The charger outputs an error. The current conditions do not allow proper charge. While the red indicator is on, charging cannot take place (charging interrupted). The relevant status code appears in the display. **Flashes briefly every 3 seconds:** The charger outputs a warning. Charging is continued despite the adverse charging parameters. The relevant status code and the state of charge appear alternately on the display.
(7)	**"Charge" indicator (yellow)** **On:** During charging **Flashes:** If charging has been interrupted
(8)	**"Battery charged" indicator (green)** **On steady:** Charging ended. **Flashes every second:** Charging ended. The water refill indicator has also tripped.

Charging the battery

Charging

⚠ WARNING!

Danger due to escaping battery acid or explosion if faulty batteries are charged.
This may result in serious injury and damage to property.
▶ Before charging, ensure that the battery to be charged is fully functional.

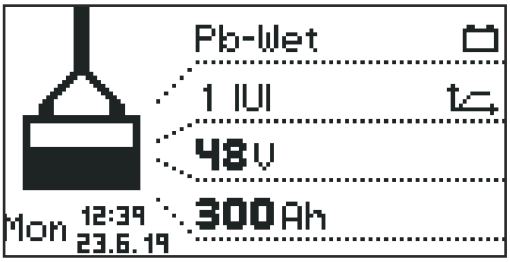
⚠ WARNING!

Danger due to faulty charging settings or a defective battery.
This may result in serious injury and damage to property.
▶ Before charging, ensure that the battery to be charged is fully functional.

NOTE!

Risk of property damage if the charging plug contacts are very dirty.
The resulting increase in contact resistance can lead to overheating and subsequent destruction of the charging plug.
▶ Keep the charging plug contacts free from impurities and clean them if necessary

1 Connect the charger mains plug to the electrical mains supply



The display appears in standard mode. The display shows the charger parameters:

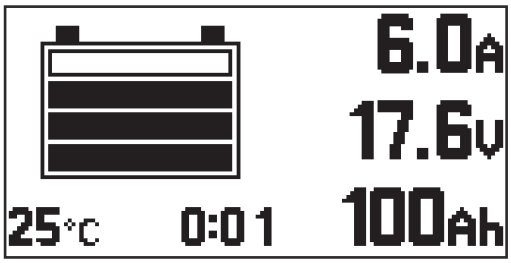
- Type of battery (e.g. wet)
- Charging characteristic (e.g. IUI)
- Nominal voltage (e.g. 48 V)
- Capacity (e.g. 300 Ah)
- Day of the week, date and time

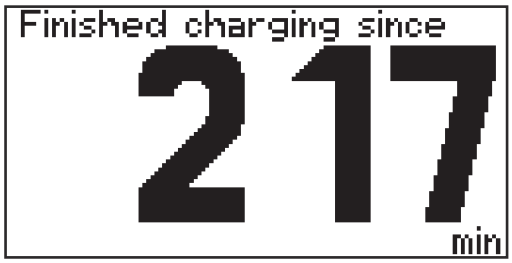
The charger parameters can be set individually. More information on the charger parameters can be found under "Configuration mode" in the "Display functions" chapter. Ensure that the battery to be charged matches the configuration of the battery charging system.

2 Connect the charging plug
or connect the
(+) charging lead to the positive pole of the battery and the
(-) charging lead to the negative pole of the battery

The charger detects that the battery is connected and starts charging. If start-up delay is activated, then charging will start at the end of the set delay time. For more information, see "Configuration mode" in the "Display" section.

During the charging process the display shows the following values:
- Current charging current (A)
- Current charging voltage (V)
- The charge already input (Ah)
- Battery temperature with the "temperature-controlled charging" option
- The time (hh:mm) since charging started

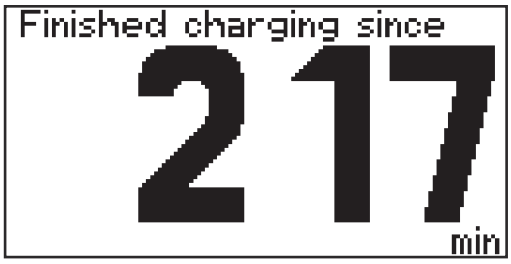


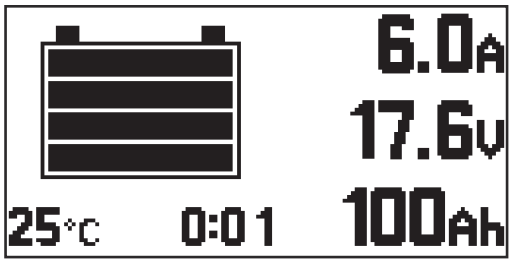


The battery symbol indicates the current state of charge. The greater the number of bars that are displayed, the further advanced the charging process is. As soon as the battery is fully charged, a minute counter will appear (see figure on right). This counts the minutes since the end of charging; when a number of chargers are being used, this makes it easier to decide which battery will have already cooled down most.

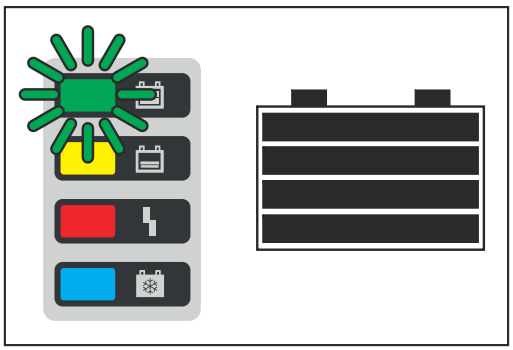
If, however, the standard display is still to be shown rather than the minute counter:

1 Use the "Up/Down" keys to toggle between the minute counter and standard display





When the battery is fully charged all 4 bars of the battery symbol appear black. As soon as the battery is fully charged, the charger begins conservation charging.



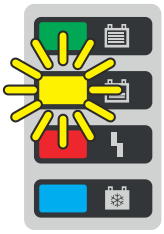
- All bars are displayed
- The green "Battery charged" indicator is on
- The battery is always ready to use
- The battery can remain connected to the charger for as long as required
- Conservation charging counteracts battery self discharge

Interrupting charging

To interrupt the charging process:

1 Press the "Stop/Start" key

While the charging progress is interrupted:



The "Charge" indicator (yellow) flashes

To resume the charging process:

2 Press the "Stop/Start" key again

As long as a battery is connected to the charger, only the charging process can be interrupted and resumed using the "Stop/Start" key. Display modes can be changed using the "Menu" key as described in the "Display" section, but this is only possible when there is no battery connected to the charger.

Stopping charging

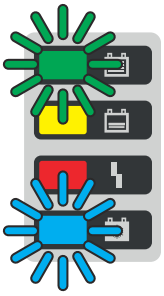
⚠ WARNING!

Danger due to ignition of oxyhydrogen caused by sparks generated when the charging cables are disconnected.
This can result in serious injury and damage to property.
▶ Before disconnecting or unplugging the charging plug, first stop the charging process by pressing the "Stop/Start" key

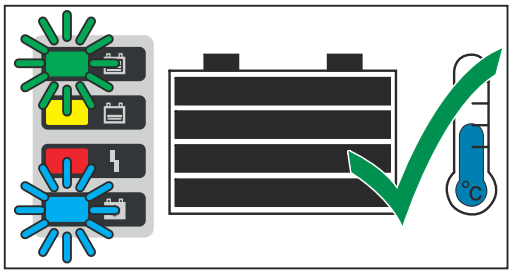
NOTE!

Risk of damage to the battery if it is disconnected from the battery charger before the charging process is complete.
This may result in damage to the battery.
▶ Only disconnect the battery from the charger when it is fully charged (green "Battery charged" indicator lights up)

As soon as the battery is fully charged and has cooled down, the following indicators light up:



- "Battery charged" indicator (green)
- "Battery cooled down" indicator (blue)



For an optimal battery life, only disconnect the battery from the battery charger when the blue "Battery cooled down" indicator is showing in addition to the green indicator, in accordance with the explanation below. If several battery chargers are in use, first disconnect the battery which has been fully charged for the longest (the coolest).

To stop the charging process:

1 Press the "Stop/Start" key

2 Unplug the charging plug
or disconnect the
(-) charging lead from the negative pole of the battery and the
(+) charging lead from the positive pole of the battery

When the charging contacts are open, the automatic open circuit voltage detection ensures that the charging contacts are de-energised.

Display

Overview of display modes

No.	Function
	Standard mode In standard mode the display shows the charging parameters.
	Statistics mode Visualises the frequency of the device operating modes and shows the total number of charging actions. Also shows an overview of the total and average Ah produced and energy consumed per charge.
	History mode Provides information about the parameters for all the stored charging processes.
	Configuration mode Configuration mode enables all the settings for the device and the charging process to be adjusted.
	USB mode USB mode enables a device to be updated, device configurations to be saved and loaded, and the charging parameters to be recorded during the charging process - all using a USB flash drive.

As long as a battery is connected to the battery charger, the charging process can only be interrupted and resumed by pressing the "Pause/Start" button. It is only possible to change the display modes with the "Menu" button after disconnecting the battery from the battery charger. A detailed description of the display modes is given in the following chapter.

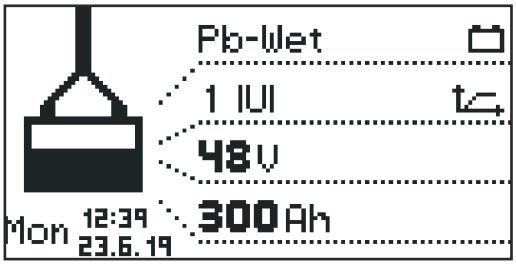
A limited menu selection is available while charging has been paused.

NOTE!

A limited menu selection is available while charging has been paused.

Standard mode

Once the mains plug has been connected to the electrical mains supply, the display will automatically operate in standard mode.

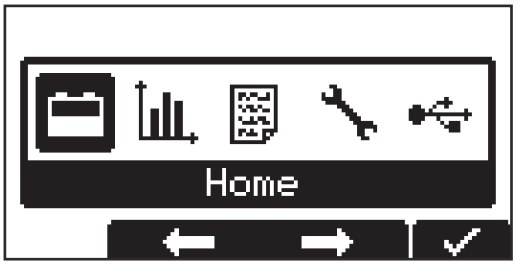


In standard mode, the display shows the following charger parameters:

- Type of battery (e.g. Pb-WET)
- Charging characteristic (e.g. IUI)
- Nominal voltage (e.g. 48 V)
- Capacity (e.g. 300 Ah)
- Day of the week, date and time

The charger parameters can be set individually. More information can be found in the "Configuration mode" section.

Menu selection



Change from standard mode to the menu selection as follows:

1 Press and hold the "Menu" key for approx. 5 seconds.

Change from all other modes to the menu selection as follows:

1 Briefly press the "Menu" key.

To select the desired mode:

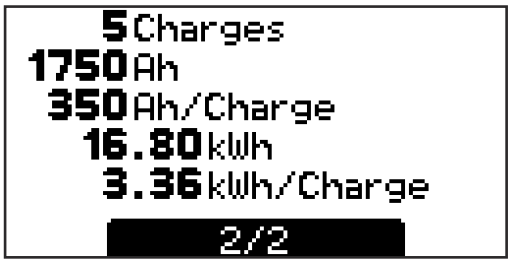
2 Use the "Up/Down" keys to select the symbol for the desired mode.
- e.g. the battery symbol for standard mode

3 Use the "Pause/Start" key to confirm the "Tick" symbol.

Statistics mode

In statistics mode, horizontal bars display the frequency of the following device operating statuses:
- Idle
- Charging
- Floatingcharge
- Cooldown
- Error

1 Use the "Up/Down" keys to toggle between page 1/2 and page 2/2.

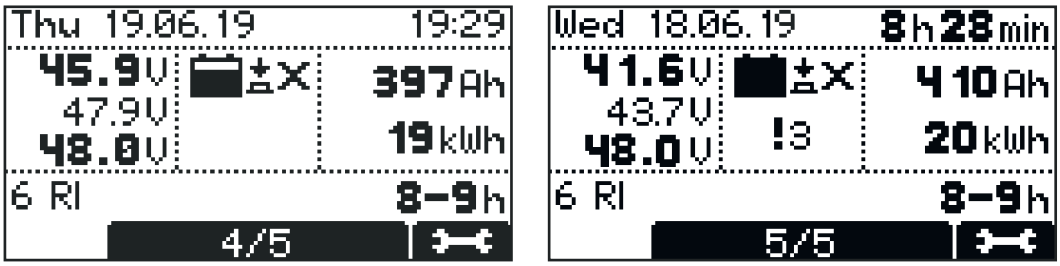


Page 2/2 shows the following values:
- Total number of charges.
- Total Ah output.
- Average Ah output per charge.
- Total energy consumed (kWh).
- Average energy consumed (kWh) per charge.

The consumed energy display is a standard value and can deviate from the actual amount of energy by up to 5% at nominal output. At lower power levels the deviation may be higher.

History mode

History mode provides information about the parameters for all the stored charging processes. In order to show changing or different displays, two versions of the display window are shown below:

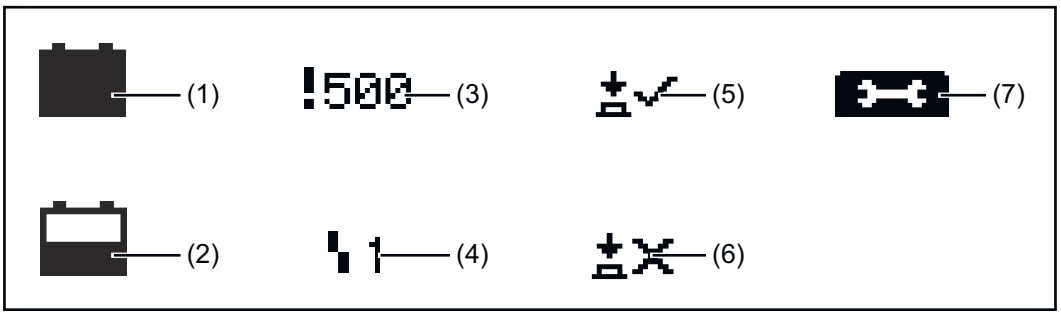


1 Use the "Up/Down" keys to switch between the pages for each stored charging process.

Contents of the display window

- Charge start date, e.g.: Thursday, 19/06/14.
- Charge start time, e.g.: 19:29 or charging time, e.g.: 8 h 28 min.
- Voltage at charge start, e.g.: 45.9 V.
- Voltage after 5 minutes, e.g.: 47.9 V.
- Voltage at charge end, e.g.: 48.0 V.
- Ah consumed, e.g.: 397 Ah.
- kWh consumed, e.g.: 19 kWh.
- Charging characteristic, e.g.: 6 RI.
- Set charging time, e.g.: 8 - 9 h or set Ah, e.g.: 400 Ah or set charge end time (not shown).

Symbols shown



No.	Function
(1)	**Full battery** Charging has been completed.
(2)	**Empty battery** Charging has not been completed.
(3)	**Exclamation mark with number** Warning issued, with code for the corresponding status code. Detailed information can be found in the **Status codes** section.
(4)	**Symbol with number** Error issued, with code for the corresponding status code. Detailed information can be found in the **Status codes** section.
(5)	**Key symbol with a tick** Charging was stopped properly using the "Pause/Start" key.

(6)	**Key symbol with a cross** Charging was stopped without using the "Pause/Start" key.
(7)	**Charging details** Displays certain battery data at the beginning and end of the charging process: Number of cells Ah Characteristic Type of battery

Configuration mode

Configuration mode provides the following setting options:

"Charging settings": settings for the battery
- Type of battery, e.g. "Wet".
- Charging characteristic, e.g. "IU".
- Capacity (Ah) or charging time (h) depending on the charging characteristic.
- Cells: voltage (V) and number of battery cells or automatic setting of the number of cells.

⚠ CAUTION!

Danger of damage to the battery.
This may result in damage to the battery.
- ▶ The number of cells should only be set automatically for batteries with the following nominal voltages: 12 V and 24 V for 24 V devices, 24 V and 48 V for 48 V devices.
- ▶ Do not set the number of cells automatically for deep discharged batteries.

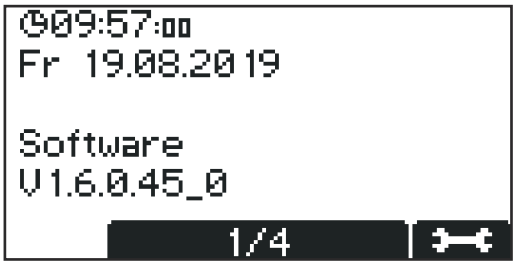
- Additional settings:
  for individual adaptation options for the charging characteristic.

"Additional functions": Additional functions
- Blue LED
- External start/stop
- Refill indicator
- Options area
- Start charging again after a grid failure

"General options": General settings
- Language
- Contrast
- Time (hh:mm:ss)
  Time zone
  Daylight saving time/normal time
- Date (dd:mm:yy)
- Length of charging cable (m)
- Charging cable cross section (mm^2)
- AC current limitation
- Unit for temperature values
- Code for accessing the configuration menu activated/deactivated.
- Time interval for the parameters recorded on the USB flash drive (s).
- Reset statistics
- Reset history

“Reset Settings”

- Includes a double-check prompt ("OK?") that requires the operator to reconfirm that this step is intended.

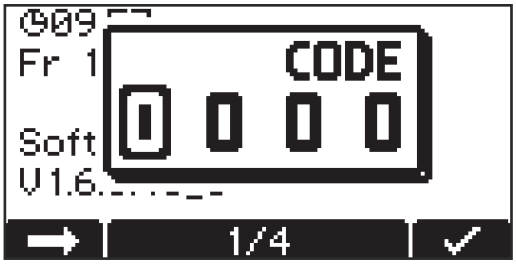


First the screen will appear in its initial format, showing the date, time and software version.

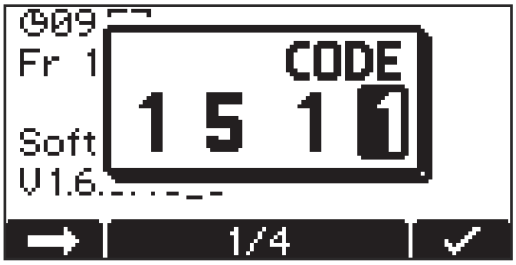
1 The "Up/Down" keys can be used to retrieve the following information:
- Serial number of the charger plus serial number and version of the configuration memory.
- PC board for controller/power electronics: hardware version and serial number.
- Software: main software, secondary software, primary software and characteristic block version.

The procedure for opening the configuration menu is as follows:

1 Press the "Pause/Start" key.



You will be prompted to enter a code.



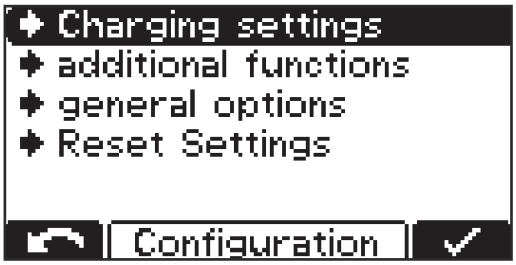
The code required is "1511" and is entered as follows:

1 Using the "Up/Down" keys, enter the first digit of the code.

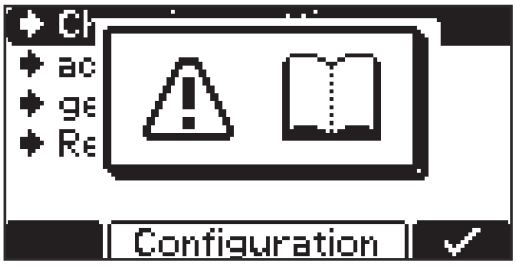
2 Press the "Menu" key to move to the next digit of the code.

3 Continue following the procedure described above until the complete code has been entered.

4 Use the "Pause/Start" key to confirm the code entered.



You will now be prompted to select one of the main menu items for the configuration mode.



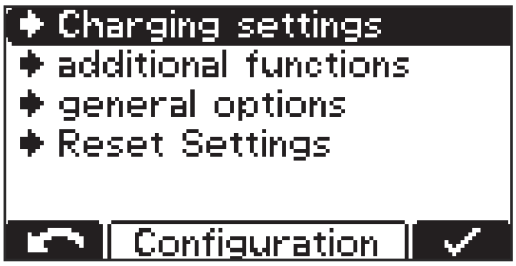
When you select a menu item you may be presented with a prompt to read the Operating Instructions. Confirm this prompt by pressing the "Pause/ Start" key again.

The procedure for navigating the configuration menu and its submenus is as follows:

1. Use the "Up/Down" keys to select the desired menu item.
2. Use the "Pause/Start" key to confirm the menu item, and reconfirm any double-check prompt (e.g. "OK?").
3. Use the "Up/Down" keys as necessary to choose an item, e.g. "Off/On" or enter a value.
4. Use the "Pause/Start" key to confirm what you have entered.
5. If the cursor moves to another setting or position after confirmation of the previous setting, repeat the procedure described in points (3) and (4).

To exit the current menu:

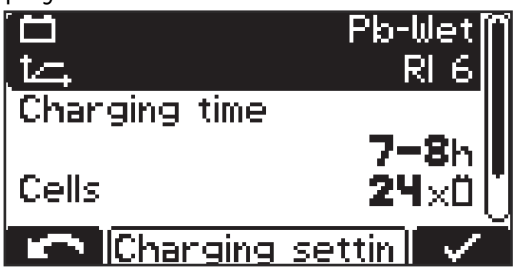
6. Press the "Menu" key to return to the higher-level menu.

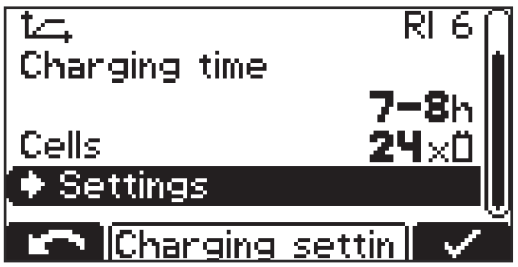


See the following explanation of how to set the charging settings by way of example:

1. Use the "Up/Down" keys to select the "Charging settings" menu item.
2. Use the "Pause/Start" key to confirm this menu item.

The choice of settings for the "Charging settings" menu item will now be displayed:





the display may vary depending on the selection made. If the "Pb-WET" type of battery has been selected in combination with the "RI" characteristic ("Curve") as in the example here, the "Ah" heading is replaced by the "Charging time" setting option.

Both the start and end time can be set for this charging time period. The starting time can be deselected as required; the charging time then bases itself exclusively on the specified charge end time following a manual charge start.

When applying the settings, the user will be guided through the menu in much the same way as a wizard function.

3 Use the "Up/Down" keys to select the desired parameter (e.g. "Cells").

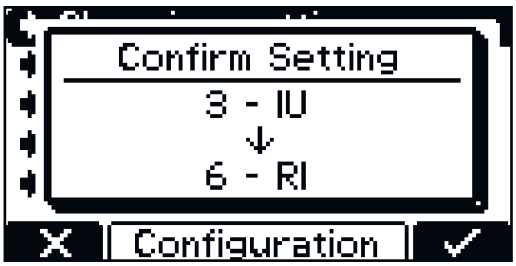
4 Use the "Pause/Start" key to confirm the parameter.

5 Use the "Up/Down" keys to set the desired value (e.g. "24" for the number of battery cells).

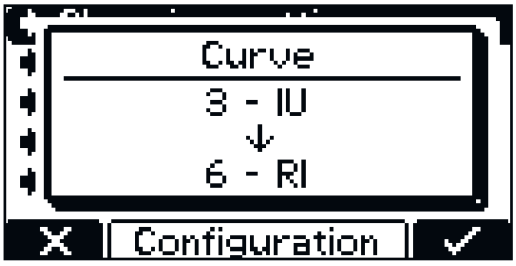
6 Use the "Pause/Start" key to confirm what you have entered.

If one or more relevant settings are changed for the charging process in configuration mode, you will once again be prompted to confirm acceptance of the changed settings when exiting configuration mode.

The following settings need to be confirmed when exiting configuration mode:
- Characteristic
- Battery capacity in Ah (excluding the RI characteristic)
- Number of cells
- Equalising charge ON/OFF
- CAN protocol



Example:
Changing the characteristic from 3 - UI (Pb-WET) to 6 - RI (Pb-WET).

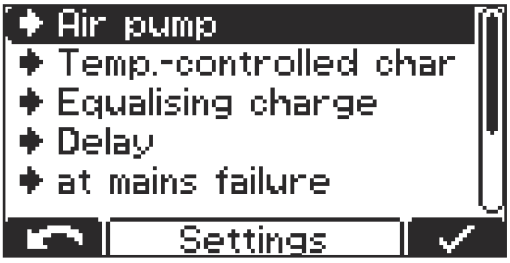


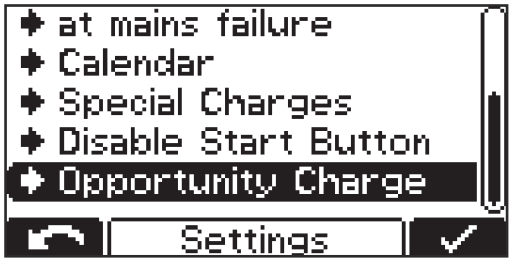
If the setting is not confirmed, the charger returns to configuration mode and the setting can be changed to the desired value.

Settings

Below is a detailed description of the "Settings" menu item for the "Charging settings" menu item discussed above. Navigation is performed as described in the "Configuration mode" section.

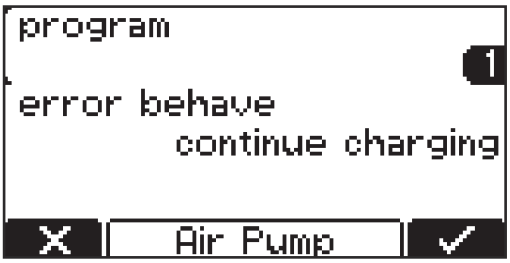
A list appears with the following selection options:





The individual selection options are explained in greater detail below:

Electrolyte circulation ("Air pump") - for 3 kW (C1) devices only:



More information on the electrolyte circulation can be found under "Electrolyte circulation 3 kW (C1)" in the "Options" chapter.

The electrolyte circulation cycle is controlled by the battery charger's control system. A number of selection options are available for this purpose.

The following settings are available for electrolyte circulation:
- Off:
  - Electrolyte circulation switched off
- Continuous operation ("continuous"):
  - Electrolyte circulation permanently on
- Program 1 to 5:
  - Default electrolyte circulation programs and their relevant parameters can be found in the table under "Settings" in the "Display" chapter.
- Automatic:
  - Automatic adjustment of electrolyte circulation flow rate based on the set battery parameters
- "User" - "On"/"Off":
  - Individual setting of the electrolyte circulation
  - The settings for "On" and "Off" determine the pulse/pause ratio of the air flow intervals

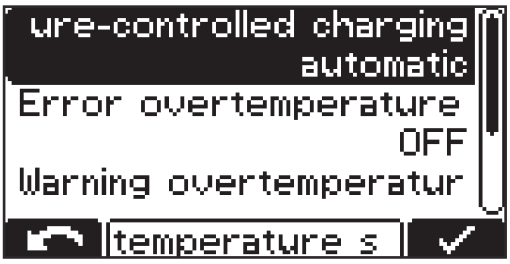
Default electrolyte circulation programs and their relevant parameters can be found in the table below:

Program	ON 1	OFF 1	Repeat	ON 2	OFF 2
1	30 min	25 min	1 x	5 min	25 min
2	3 min	10 min	4 x	3 min	20 min
3	3 min	12 min	1 x	3 min	12 min
4	5 min	10 min	3 x	5 min	20 min

5	2.5 min	7.5 min	1 x	2.5 min	7.5 min

In each of these programs, the solenoid valve opens for a time "ON 1" and closes for a time "OFF 1". This process is repeated for the number of times specified under "Repeat". After this number of repetitions has been completed, the process continues with the "ON 2" and "OFF 2" times until charging is completed.

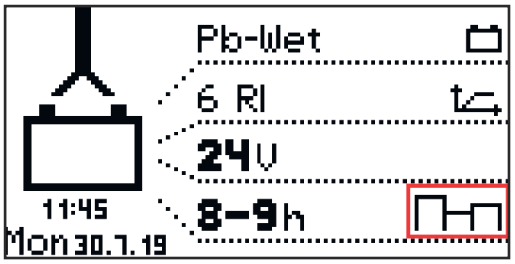
Temperature-controlled charging:



The following settings are available for temperature-controlled charging:
- automatic/OFF/required:
  - automatic ... Temperature-dependent adjustment of the charging characteristic
  - OFF ... The measured battery temperature is not taken into account
  - required ...
    Charging only starts when a temperature sensor is connected
- Error overtemperature ON/OFF:
  - ON ... Error message in the event of battery overtemperature
    Charging process stops and can only be continued once the battery has cooled down and been reconnected
  - OFF ... No error message in the event of battery overtemperature
- Warning overtemperature ON/OFF:
  - ON ... Warning in the event of battery overtemperature
  - OFF ... No battery overtemperature warning

Equalising charge:
- OFF:
  There is no equalising charge.
- Delay:
  If the battery remains connected to the battery charger for the duration of the equalising charge delay ("equalize charge delay"), then a special type of charging takes place. This prevents acid stratification.
  The parameters for the current (ampere / 100 ampere hours), voltage (volt / cell) and duration of the equalising charge can be changed.
- Weekday:
  Specify the weekday on which the equalising charge is to take place.
  The parameters for the current (ampere / 100 ampere hours), voltage (volt / cell) and duration of the equalising charge can be changed.
- Manual equalising charge ("Manual"):
  An equalising charge can be started manually by pressing the relevant key on the display. The equalising charge starts after a set delay time has been observed. The charge parameters that have been set are followed. The parameters for the current (ampere / 100 ampere hours), voltage (volt / cell) and duration of the equalising charge may all be changed. This function is only available for Pb-Wet characteristics.

If a setting for the equalising charge is enabled, a symbol on the home screen next to the set ampere hours or charging time shows whether an equalising charge is being carried out or can be started.



Delay:

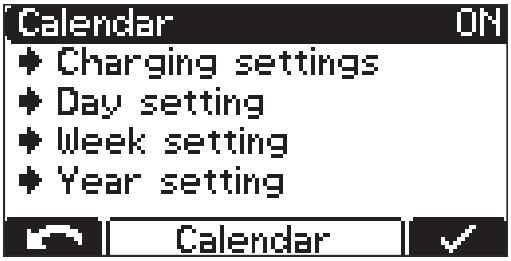
charge start delay:
Delay time (minutes) of actual start of charging relative to the moment when charge start was initiated

charge end delay:
Delay time (minutes) before charge end is signalled (e.g. green indicator) relative to the moment when charging actually stopped

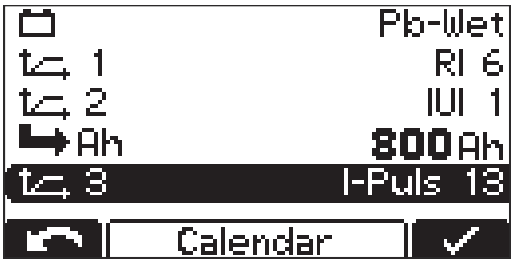
at mains failure restart charging:
If this option is selected, the charging process is restarted automatically as soon as the electrical grid becomes available again after a disruption to the electrical grid.

Calendar:

The calendar function allows charging to be started automatically according to the following criteria:
- Time window in which charging may not be started if a battery is connected
- Time window in which charging is to be started using a defined characteristic 1 if a battery is connected
- Time window in which charging is to be started using a defined characteristic 2 if a battery is connected

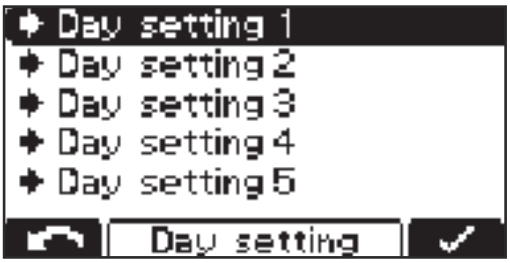


1 To activate the calendar function, select the "ON" setting and confirm

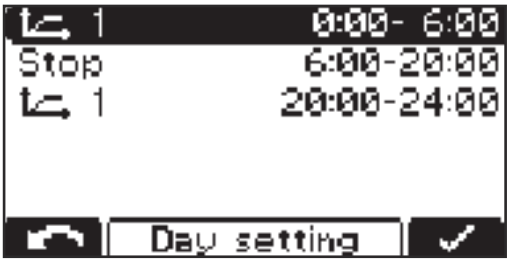


The first menu item "Charging settings" allows three characteristics to be defined:
- Type of battery for every characteristic:
  e.g. Pb-Wet
- Curve settings when selecting the relevant characteristic

Additional settings can be found under the "Calendar" function:



Day Setting 1-5:
The day settings allow up to five different charging start time profiles to be defined with the following settings:

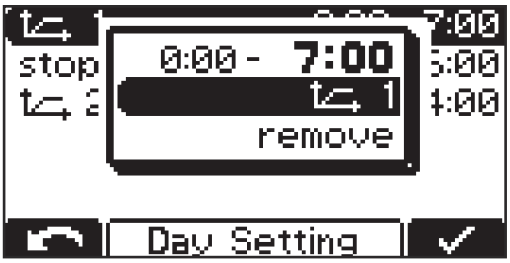


- Symbol for characteristic 1:
  Time window in which charging is to be started using characteristic 1 (e.g. 0:00-6:00)
- Stop:
  Time window in which charging must not take place (e.g. 6:00-20:00)
- Symbol for characteristic 2:
  Time window in which charging is to be started using characteristic 2 (e.g. 20:00-24:00)

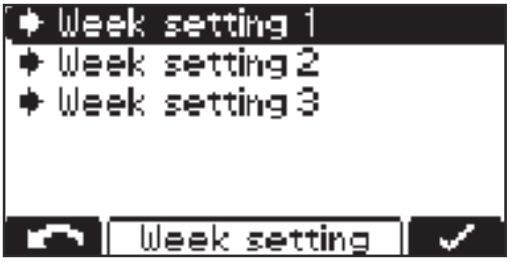
Please note:
Ongoing charging operations are not affected by the set time windows.
If in the example above a battery is connected at 5:45, the charge end time is governed by the requirements of the battery and is not interrupted by the end time specified for the set time window (6:00 in the example).

If the battery is connected during the "stop" time window, charging is started automatically during the next time window.

If charging is started manually during the "stop" time window, charging will always take place using characteristic 1.

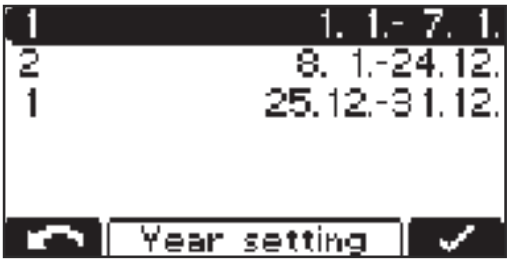


Additional settings:
- Change the allocated characteristic:
  characteristics symbol
- Remove the selected characteristic:
  "remove"



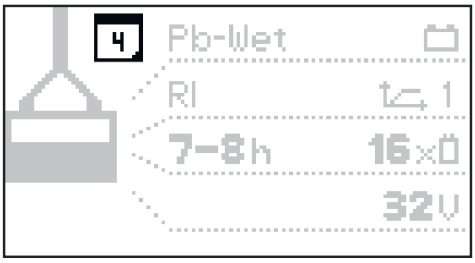
Week Setting:
- Three different week settings can be defined.

A previously created day setting can be assigned to any day of the week.



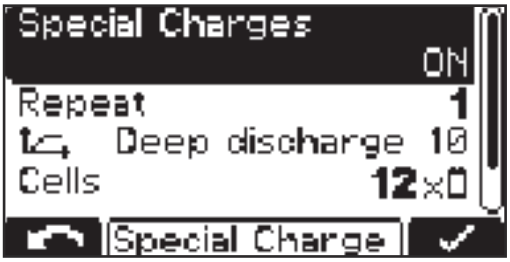
Year Setting:

- Multiple periods throughout the year may be defined, each containing a single week setting (e.g. 1/1 - 7/1).



When the calendar function is active, a calendar symbol appears with the current day (shown here with the number "4").

Special Charges:

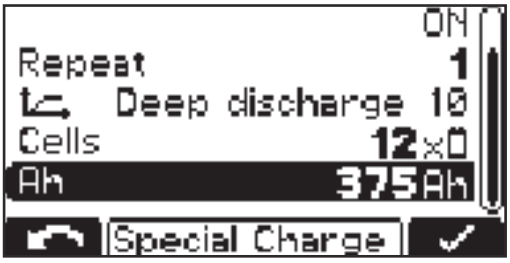


Selecting "Special Charges" allows one or more of the alternative charging types to be performed temporarily:

- ON: Function activated
- OFF: Function deactivated

The "repeat" setting defines how often the alternative charging mode should be performed until the device reverts to the original charging parameters again:

- Setting range: 1 to 99 repetitions



The following settings are also possible:

- Characteristic:
  e.g. "Deep discharge 10"
- Number of battery cells:
  "Cells" - e.g. 12x
- Battery capacity in Ah:
  e.g. 375 Ah

Disable Start Button:

- ON:
  The charging process cannot be started using the "Stop/Start" key; one reason for this is to prevent unauthorised intervention.
- OFF:
  The charging process can be started using the "Stop/Start" key.

"Opportunity Charge" special function:

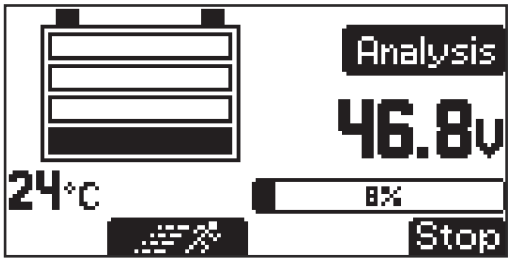
To extend the usage interval of a battery, it is possible to recharge it at a time when it will not be needed, e.g. during scheduled plant shutdowns.

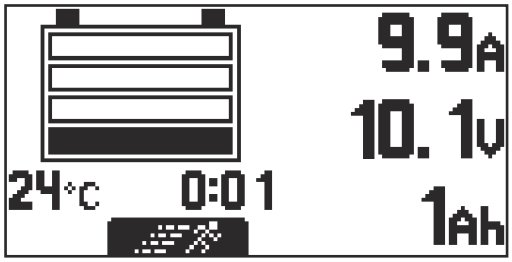
- ON: Function activated
- OFF: Function deactivated

The following curve settings are available:

- Curve - e.g. RI - Pb-Wet
- Charging time - e.g. 5-6 h

When opportunity charging is "ON" and a battery is connected, the following appears:

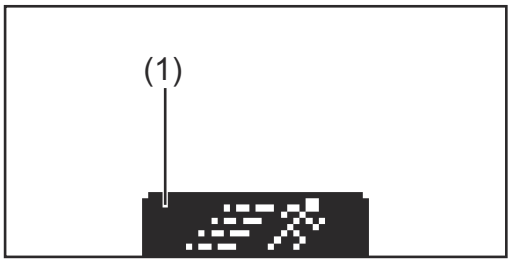




- Figure on left: Display when RI characteristic is selected
- Figure on right: Display for all other characteristics

To start opportunity charging:

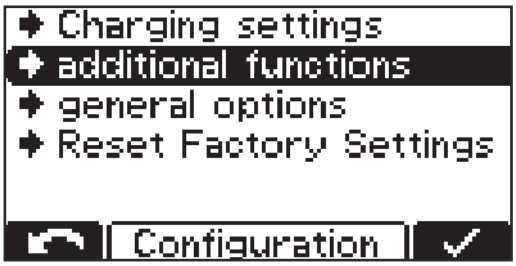
- Use the "Up" key to select the runner symbol (1)



- Figure on left: "Runner symbol" (1)
- Figure on right: Display when opportunity charging starts

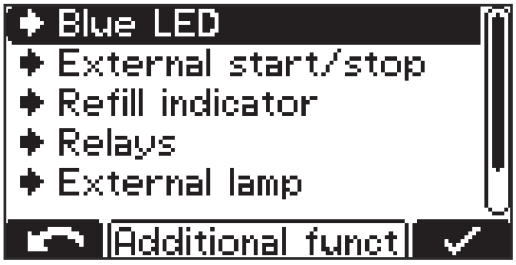
Additional functions

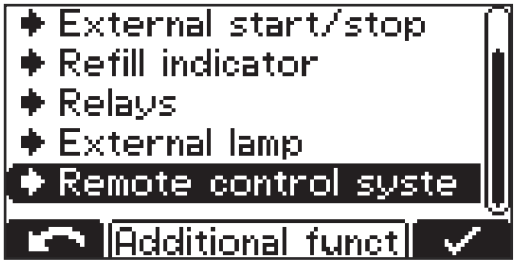
Detailed description of the "additional functions" menu item in configuration mode. Navigation is performed as described in the "Configuration mode" section.



1 Select the "additional functions" menu item.

A list appears with the following selection options:



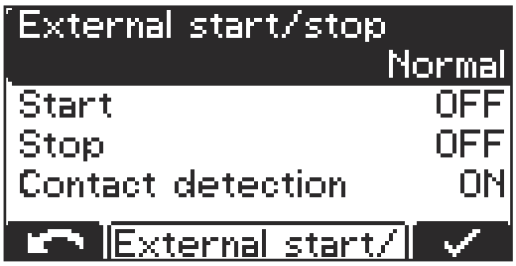


The individual selection options are explained in greater detail below:

Setting the "Blue LED" indicator
Time (minutes) that must be allowed to pass before the blue "battery cooled" indicator comes on to indicate that a battery has cooled down sufficiently. The time from the end of charging is used as the setting.

A temperature value can be set here in conjunction with the "Temperature-controlled charging" option. The blue "battery cooled" indicator will light up to signal a sufficiently-cooled battery once the temperature drops below this value.

External start/stop



The following settings are available when external start/stop is selected:

Button
- The function of the "OK/STOP" key can be simulated using an external button.

Normal
- **Start ON**
  Charging starts when an external switch is closed and a battery is detected, or when the charging plug is connected by closing the auxiliary contacts and a battery is detected.
- **Start OFF**
  Charging starts when a battery is connected.
- **Stop ON**
  Charging is interrupted when an external switch is opened, or when the charging plug is disconnected by opening the auxiliary contacts.
- **Stop OFF**
  Opening of an external switch or the auxiliary contacts is ignored.

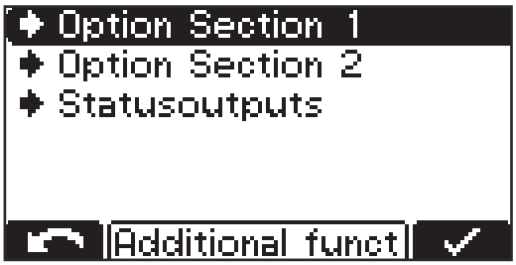
Contact detection
- **ON**
  When Start Normal is ON, a battery is connected and the external start/stop contact is not closed, error 16 is set.
  When Stop Normal is ON, charging has started, the external start/stop contact is open and the battery is not disconnected, error 16 is set.
- **OFF**
  Contact detection does not take place.

Refill Indicator
The refill indicator is a message that appears as soon as the battery needs topping up with distilled water. The time at which refilling is deemed necessary can be defined as follows:

Every nth week and weekday
- e.g. top up with water every fortnight on a Friday

If set to "OFF", the refilling request does not have to be confirmed.

Option Section



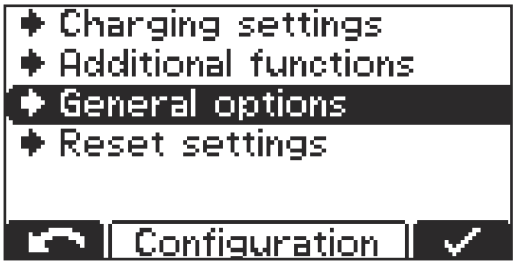
Option Section 1
- Setting options:
  CAN1 (option box)
  Cool Bat Guide Easy (Fronius variants only)

Option Section 2 (3 kW only)
- Setting options:
  CAN2 (option box)
  AirPuls (EUW)

Status outputs (3 kW only)
- Setting for external lamp (normal or RGB)

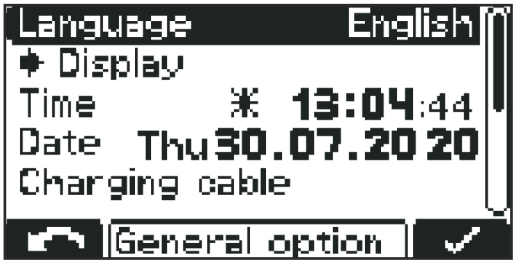
At mains failure restart charging
If this option is selected, the charging process is restarted automatically as soon as the mains supply becomes available again after a disruption to the electrical mains supply.

General settings Detailed explanation of the "general options" menu item in configuration mode.



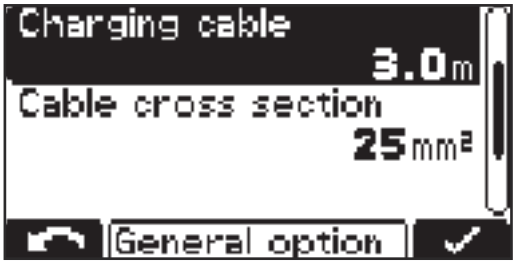
1 Select the "general options" menu item.

A list appears with the following selection options:



- Language
- Display settings
  - Contrast
  - LED brightness
  - Show Ah at charge end ON/OFF
- Time and Date
  - daylight saving time / normal time
  - Predefined time zones
  - User-defined time zones

Charging cable:

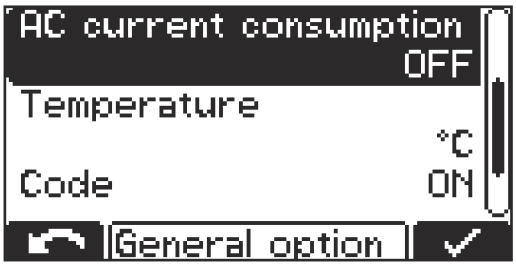


- Basic length of charging cable (m)

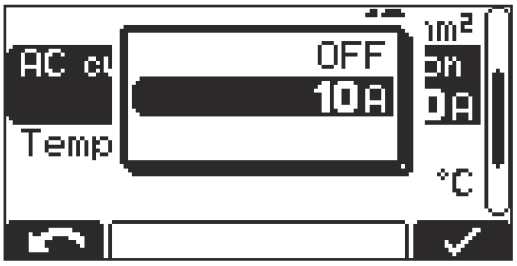
Cable cross section:

- Cross-section of the charging cable (mm^2)

AC current consumption:

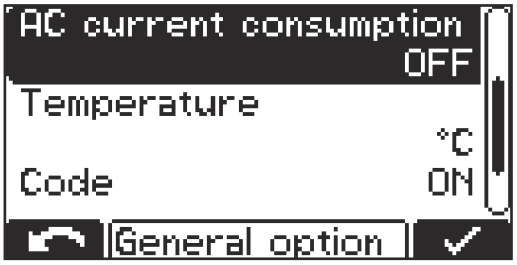


- Adapt the maximum consumed device current to the on-site electrical installation or the device connector fitted on the device.



- The minimum and maximum values differ depending on the different device classes. The minimum value is approx. 25% of the maximum nominal current of the charger.

Temperature:

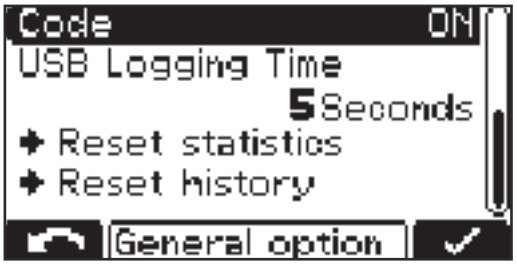


- Temperature in °C / °F

Code:

- Code entry required / not required to access configuration mode ("Code ON / OFF")

USB Logging Time:



- Time interval (s) for recording charging parameters on the USB flash drive (USB Logging Time)

Reset statistics

Reset history

For more detailed information on the statistics and history, please refer to the "Statistics mode" and "History mode" sections.

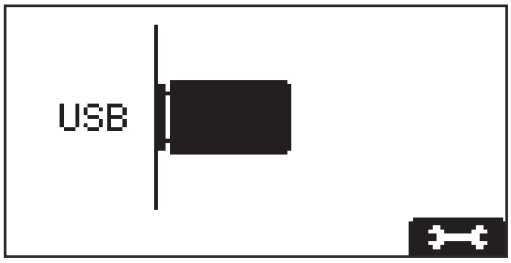
Reset settings

The menu item offers 2 possibilities to reset all settings made:

Reset Factory Settings:
- Resets to factory settings.

Reset Default Settings:
- Resets settings to the manufacturer's defaults.

USB mode



In USB mode, the display shows whether or not a USB flash drive is connected.

The USB flash drive must conform to the following specifications:
- Formatting: FAT32
- 32 Gigabyte maximum
- Non multi-partitioned

The I-SPoT VIEWER software supports the visualisation and evaluation of data on the USB flash drive.

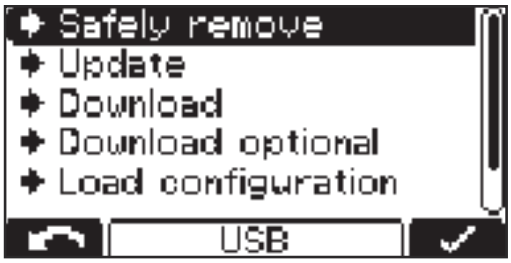
Only insert the USB flash drive when charging is not in progress of if the charging process has been interrupted.

If the charging process is only interrupted, not completed, it is only possible to read out data. A new update or configuration cannot be loaded.

1 Use the "Stop/Start" key to access the following settings.

2 Use the "Up/Down" keys to scroll between the settings.

3 Use the "Stop/Start" key to confirm the desired setting.

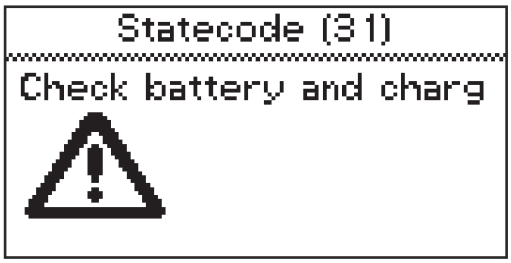


- **Safely remove**
  Safely remove the USB flash drive as soon as the desired action has been completed.
- **Update**
  A list of the suitable update files stored on the USB flash drive opens.
  Select and confirm the desired file in the same way as scrolling through the settings.
  Do not change the automatically assigned file names of the update file!
- **Download**
  The data relating to the logged charging parameters stored in the device's datalogger is saved to the USB flash drive for the I-SPoT VIEWER.
  Additionally, events - such as the device settings and user characteristics (configuration) - are saved.
  The following time ranges can be selected for the datalogger:
  - 1 month
  - 3 months
  - All
  - Since the last save
- **Download optional**
  The following options are available:
  - I-SPoT VIEWER
    The logged data is saved in the same way as for the "Download" function, but saving only the I-SPoT VIEWER data.
  - Save datalogger
    The logged data is saved in the same way as for the "Download" function, but is saved not in the I-SPoT VIEWER format, but as ".csv" files (Automatic folder structure for the ".csv" files: *
    Fronius\<device serial number>\Charges\<yyyymmdd>\<hhmmss.csv>
  - Save events
    Events are saved to the USB flash drive.
  - Save configuration
    The device settings are saved to the USB flash drive.

- **Load configuration**
  Loads onto the device one of the suitable device configurations stored on the USB flash drive, provided the configuration files are present.
- **Load dealer text**
  A text file can be loaded from the USB flash drive that is displayed as soon as the device enters an error state. The text file can, for example, contain the contact details of the dealer. The file must be saved on the USB flash drive as a ".txt" file in "unicode" format. The file name must be "dealer.txt". The number of characters is restricted to 99.

* If a USB flash drive is connected while charging is in progress, the ".csv" files are saved directly to the USB flash drive. The folder structure here is also created automatically and differs due to the presence of the "Datalog" folder instead of the "Charges" folder.

Status codes



If a fault occurs during operation, specific status codes may be displayed. Faults can result from the following:
- Battery is connected with reverse polarity
- The voltage of the connected battery is unsuitable
- The device has overheated
- There is a software or hardware fault

If an error message appears on the display and if you cannot resolve the error yourself:

1 Note the displayed status code: e.g. "Statecode (31)"

2 Note the configuration of the device

3 Contact After-Sales Service
Freely-defined text, which could for example include the contact details of the dealer, can be displayed if the device is in an error state. More information can be found in the "USB mode" section.

Status codes caused by external factors	
Number	**Cause**
(11)	Mains overvoltage or undervoltage
(13)	External temperature sensor faulty
(14)	Electrolyte circulation faulty (pressure switch not switching)
(16)	External start/stop is not closed
(17)	Open circuit voltage detection triggered more than once during charging (e.g. worn charging contacts)

Status codes in the event of a battery fault	
Number	**Cause**
(22)	Battery undervoltage
(23)	Battery overvoltage
(24)	Battery too hot (with external temperature sensor only)
(25)	Battery too cold (with external temperature sensor only)
(26)	Cell fault detected
(29)	Battery is connected with reverse polarity

Status codes in the event of a charging error	
Number	**Cause**
(31)	Timeout in I1 phase
(32)	Timeout in U1 phase
(33)	Battery overvoltage in the I2 phase

Status codes in the event of a charging error	
Number	**Cause**
(34)	Ah limit exceed
(35)	Timeout in I2 phase
(36)	Target voltage in I2 phase not reached (with format characteristic only)
(37)	Problem with RI charge
(38)	Set charging time cannot be reached

Status codes in the event of a fault in the primary circuit	
Number	**Cause**
(500)	Primary temperature sensor faulty
(503)	Primary overtemperature
(504)	Ventilator current outside the tolerance
(505)	Intermediate circuit overvoltage/undervoltage
(507)	Primary supply voltage outside the tolerance
(508)	Power failure
(510)	Primary EEPROM faulty
(527)	Phase shifter overcurrent
(530)	Communication error
(532)	Microcontroller error (e.g. Division by 0)
(533)	Reference voltage outside the tolerance
(534)	Start-up error
(535)	PFC overcurrent
(536)	Phase shifter or PFC faulty

Status codes in the event of a fault in the secondary circuit	
Number	**Cause**
(520)	Secondary temperature sensor faulty
(521)	Secondary overtemperature
(522)	Fuse fault
(524)	Reference voltage outside the tolerance
(525)	Current offset compensation error
(526)	Current offset outside the tolerance
(529)	Secondary communication not working
(531)	EEPROM faulty / access not working
(532)	Microcontroller error (e.g. Division by 0)
(537)	Voltage measurement faulty
(570)	Secondary relay cannot be switched
(571)	ADC/SPI error

Status codes in the event of a fault in the controller	
Number	**Cause**
(540)	CFM missing/faulty
(541)	No secondary communication
(542)	Secondary initialisation failed
(543)	Program/memory fault in characteristic control
(544)	Program/memory fault in characteristic control
(545)	Primary initialisation failed
(546)	Update failed
(547)	Load/save settings failed
(548)	Load/save characteristic settings failed
(549)	Charging process could not be continued after a power outage, due to a fault in the backup battery
(550)	Time not set
(551)	Hardware change detected
(552)	CFM invalid

Options

Safety

The housing has to be partially opened to connect the options.

⚠ WARNING!

Danger of electric shock.
This may result in serious injuries or death.
- ▶ The housing must never be opened by anyone other than a service technician trained by the manufacturer.
- ▶ Before working with the housing open, the device must be disconnected from the grid.
- ▶ A suitable measuring device must be used to ensure that electrically charged components (e.g., capacitors) are completely discharged.
- ▶ With the aid of a clearly legible, understandable warning sign, ensure that the device remains disconnected from the grid until all work has been completed.

⚠ WARNING!

Danger due to work that is not carried out properly.
This can result in severe personal injury and damage to property.
- ▶ All work involved with connecting optional components must only be carried out by service technicians trained by the manufacturer.
- ▶ If there are Installation Instructions or User Information for the optional component concerned, then all warning notices and instructions therein must be obeyed.
- ▶ For all options with electrical connections, a safety inspection must be carried out in accordance with the applicable national and international standards and guidelines after connection work has been carried out.
- ▶ You can obtain more information about the safety inspection from the authorized service body.
- ▶ The service body will provide the necessary documents upon request.

Electrolyte circulation 3 kW (C1)

NOTE!

Danger due to the ingress of electrolyte from the battery or due to operation without any back pressure.
This may result in damage to the air pump.
- ▶ Always set up the charger at least 0.5 m (1 ft. 7.69 in.) above the battery to be charged.
- ▶ Always use an undamaged connecting hose provided specifically for this purpose to connect the charger's compressed air outlet to the battery.

NOTE!

Danger due to non-observance of the permissible mains voltage tolerance.
This can cause malfunctions and damage.
- ▶ For the electrolyte circulation option, a restricted mains voltage tolerance vis-à-vis the charger of +/-10 V applies.

The electrolyte circulation option introduces air into the battery through capillary tubes that are provided specifically for this purpose. This allows intensive

mixing of the electrolyte to take place. The benefit is reduced heating of the battery, and consequently longer battery-life, plus reduced water loss during charging.

If a pump fault or leaks in the connection with the battery result in a fault being detected, then the status code "Statecode 14" will appear on the display. One way in which this fault can be indicated is by using an external indicator lamp to show a common error.

Weight of the electrolyte circulation set: Air-Puls + air hose kit	
3 kW (C1)	2.5 kg (5.51 lb)

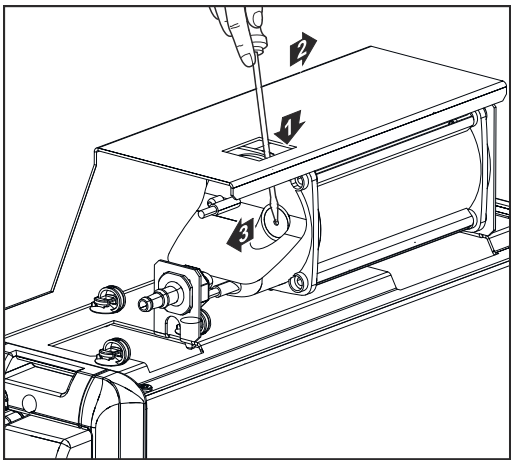
Electrolyte circulation air filter insert

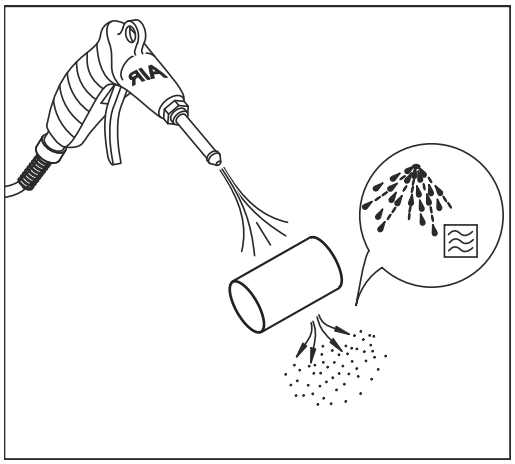
The air filter insert for the integrated air pump should be cleaned once a year. In dusty environments, the cleaning interval should be shortened accordingly. The air filter insert must be removed for cleaning. Remove the air filter by levering it out with a slotted screwdriver; then refit it as follows.

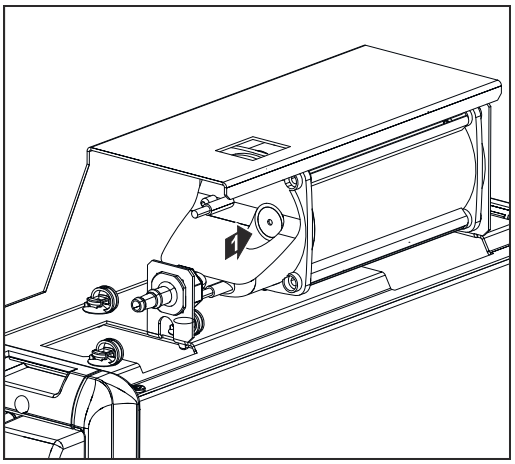
NOTE!

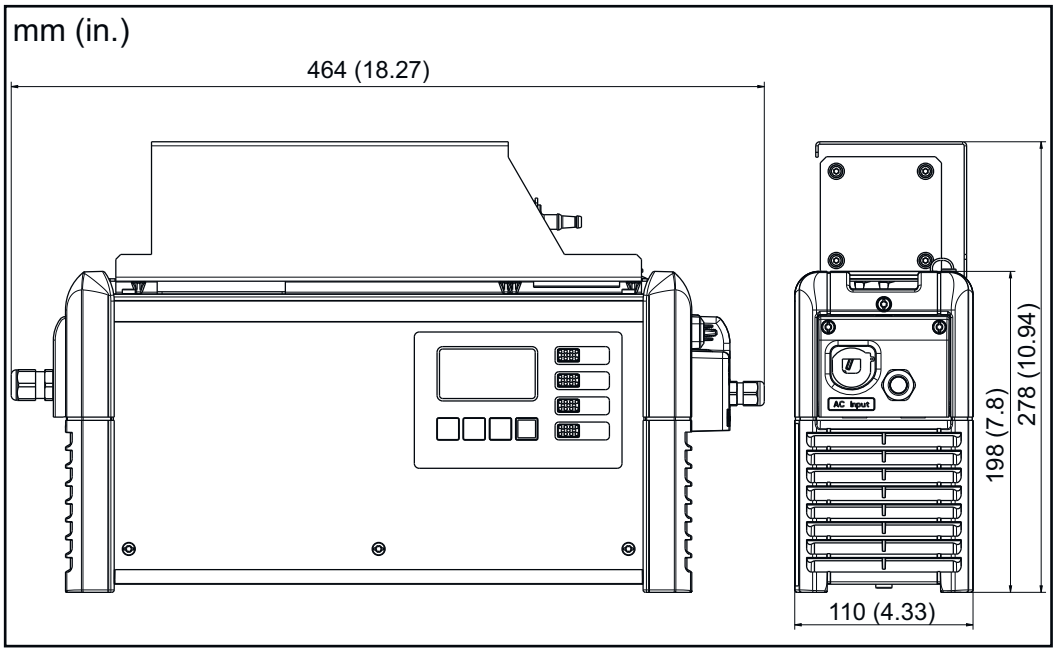
Danger from using the air filter with unsuitable chargers.
This can result in damage to property.

▶ Only use the air filter with the chargers provided by the manufacturer for this purpose.









External start/ stop

The external start/stop option prevents spark formation at the charging plug if it is disconnected during charging. Special contacts inside the charging plug register a disconnection. These contacts are leading in comparison to the main contacts. An immediate charging stop is triggered. There is therefore no wear on the main contacts and the level of safety against oxyhydrogen ignition is increased.

Temperature-controlled charging

The temperature-controlled charging option always adjusts the charging voltage according to the current temperature of the battery. This results in considerably longer battery-life, especially where batteries are used in cold stores.

LED strip

The LED strip acts as a status indicator and lights up in the same colours as the display elements on the control panel. An LED strip including a diffuser is installed in the gap between the front wall and upper part of the housing.

Air filter

In dusty environments, the air filter prevents the inside of the device from becoming dirty. This avoids a possible reduction in power and other problems. Detailed information can be found in the corresponding User Information.
Cleaning interval as required (manufacturer's recommendation: monthly)

Wall and floor bracket

The robust wall and floor bracket with integrated cable holder ensures safe installation at the place of use. Detailed information and diagrams can be found in under "Wall and floor bracket" in the "General information" chapter.

"Mobile" kit

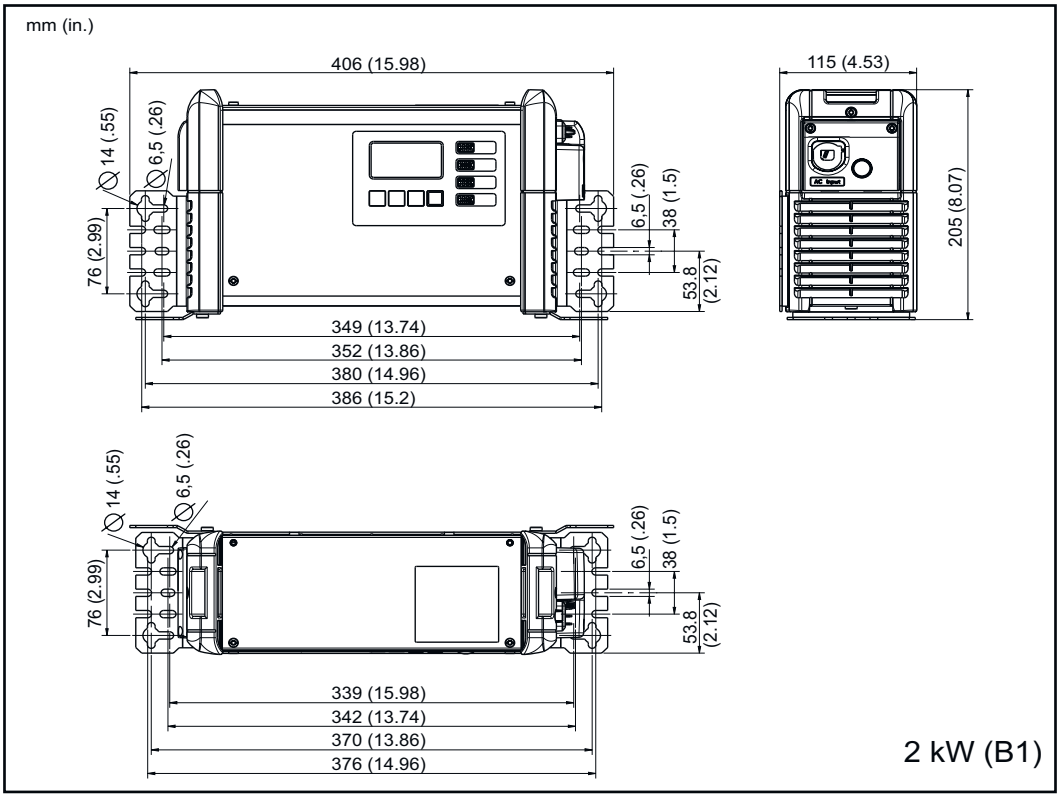
A carrying strap makes it easier to move the device.

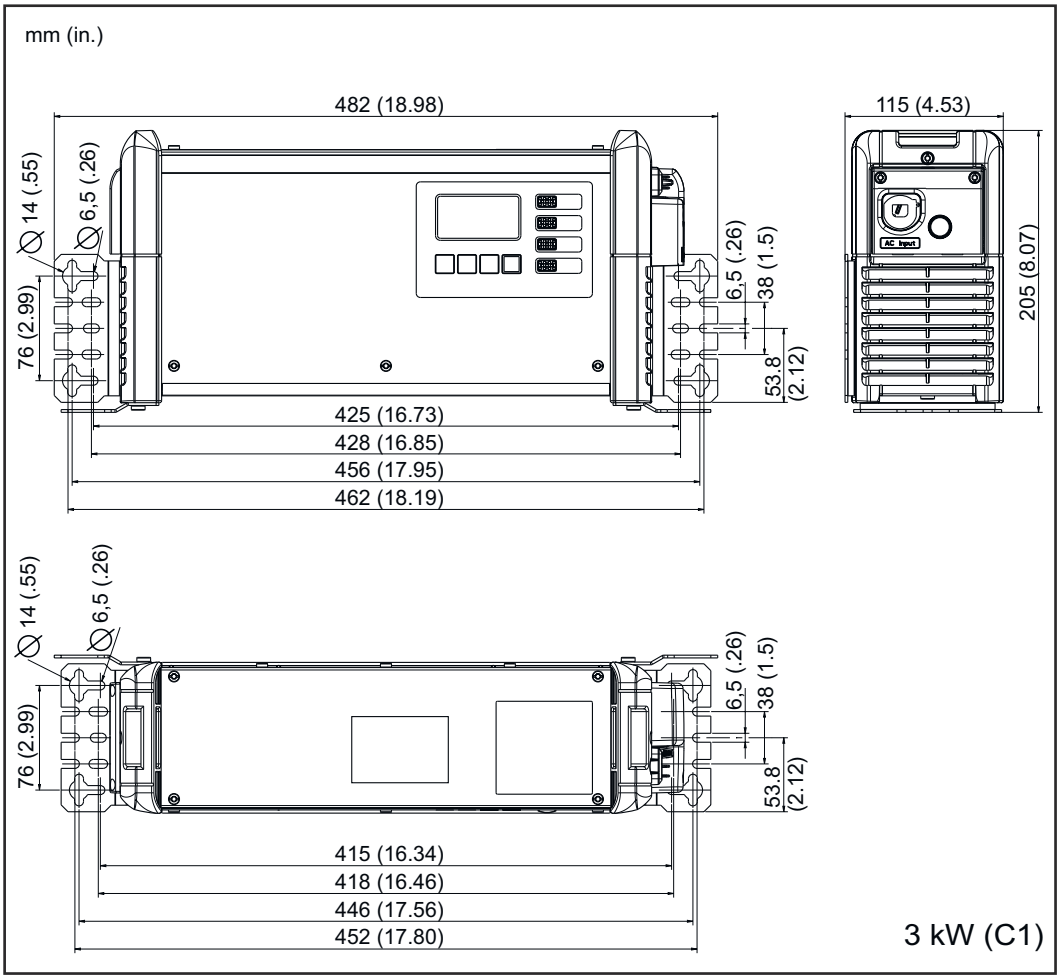
Option box

Using the option box, information on the state of charge of the connected battery can be obtained via an external circuit.
Error messages and additional features such as the Aquamatic control function, external air pump and refill indicator can also be displayed.

Mounting plate

The mounting plate may be used as a space-saving floor or wall bracket.





Technical data

Selectiva 2 kW

Mains voltage [1]	~ 230 V, ± 15%
Grid frequency	50/60 Hz
Mains fuse protection [2]	max. 16 A
Minimum mains lead cross section	1.5 mm² (0.002325 in.²)
Protection class	I (with ground conductor)
Max. permitted mains impedance Z_{max} on PCC[3]	None
Standby usage	4.9 W
EMC device class	B
Dimensions L x W x H	341 x 110 x 198 mm (13.43 x 4.33 x 7.8 in.)
Degree of contamination	3
Degree of protection [4]	IP21
Overvoltage category	II
Operating temperature [5]	-20°C to +40°C (-4°F to 104°F)
Storage temperature	-25°C to +80°C (-13°F to 176°F)
Relative humidity	maximum 85%
Maximum altitude above sea level	2000 m (6561 ft.)
Mark of conformity	according to rating plate
Product standard	EN62477-1

1) The device is approved for operation on neutral-earthed networks.

2) The thermal stress of the circuit breaker must not exceed 30,000 A^2s. The leakage current to earth is less than 3.5 mA.

3) Interface to a 230/400 V and 50 Hz public grid.

4) For indoor use only, do not expose to rain or snow.

5) A high ambient temperature may result in power degradation (derating).

Device-specific data	Max. AC current	Max. AC power	Nominal voltage	Max. charging current	Weight [6]
2040 2 kW	7.9 A	1540 W	24 V	40 A	5.8 kg (12.79 lb)
2050 2 kW	9.9 A	1930 W	24 V	50 A	6.1 kg (13.45 lb)
2060 2 kW	12.0 A	2330 W	24 V	60 A	6.1 kg (13.45 lb)

Device-specific data	Max. AC current	Max. AC power	Nominal voltage	Max. charging current	Weight [6]
2070 2 kW	12.1 A	2350 W	24 V	70 A	6.1 kg (13.45 lb)
4020 2 kW	7.9 A	1530 W	48 V	20 A	5.8 kg (12.79 lb)
4035 2 kW	11.9 A	2330 W	48 V	35 A	5.8 kg (12.79 lb)

6) With standard mains and charging leads

Selectiva 3 kW

Mains voltage [1]	~ 230 V, ± 15%
Grid frequency	50/60 Hz
Mains fuse protection [2]	max. 16 A
Minimum mains lead cross section	1.5 mm² (0.002325 in.²)
Protection class	I (with ground conductor)
Max. permitted mains impedance Z_{max} on PCC[3]	None
Standby consumption 24 V devices 48 V devices	 4.9 W 5.1 W
EMC device class	B
Dimensions L x W x H	417 x 110 x 198 mm (16.42 x 4.33 x 7.8 in.)
Degree of contamination	3
Degree of protection [4]	IP21
Overvoltage category	II
Operating temperature [5]	-20°C to +40°C (-4°F to 104°F)
Storage temperature	-25°C to +80°C (-13°F to 176°F)
Relative humidity	maximum 85%
Maximum altitude above sea level	2000 m (6561 ft.)
Mark of conformity	according to rating plate
Product standard	EN62477-1

1) The device is approved for operation on neutral-earthed networks.

2) The thermal stress of the circuit breaker must not exceed 30,000 A^2s. The leakage current to earth is less than 3.5 mA.

3) Interface to a 230/400 V and 50 Hz public grid.

4) For indoor use only, do not expose to rain or snow.

5) A high ambient temperature may result in power degradation (derating).

Device-specific data	Max. AC current	Max. AC power	Nominal voltage	Max. charging current	Weight [6]
2080 3 kW	15.1 A	3040 W	24 V	80 A	8.2 kg (18.08 lb)
2100 3 kW	15.3 A	3290 W	24 V	100 A	8.2 kg (18.08 lb)
2120 3 kW	15.5 A	3340 W	24 V	120 A	8.7 kg (19.18 lb)
4045 3 kW	15.0 A	3250 W	48 V	45 A	7.4 kg (16.31 lb)
4060 3 kW	15.2 A	3280 W	48 V	60 A	7.4 kg (16.31 lb)

6) With standard mains and charging leads

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