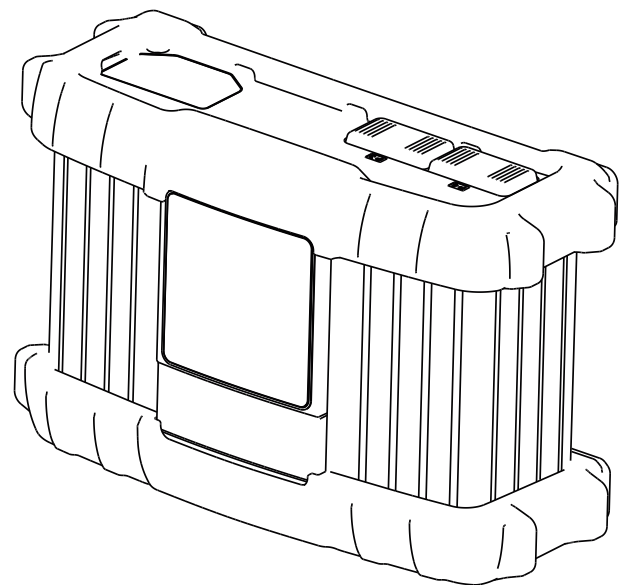


# Operating Instructions

**Selectiva 1020E / 1030E / 2010E / 2015E /  
2020E / 2032E / 2040E**



**EN** | Operating Instructions





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# Safety rules

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## 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 commissioning, operating, maintaining and servicing the device must:

- Be suitably qualified
  - Read and follow these Operating Instructions carefully
- 

The Operating Instructions must always be at hand wherever the device is being used. In addition to the Operating Instructions, attention must also be paid to any generally applicable and local regulations regarding accident prevention and environmental protection.

---

All safety and danger notices on the device:

- Must be kept in a legible state
  - Must not be damaged/marked
  - 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 your device. Before switching on the device, rectify any faults that could compromise safety.

**This is for your personal safety!**

---

## 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 device types in terms of:

- Connection restrictions, requirements regarding permitted mains impedance \*)
- Requirements with regard to the minimum short-circuit power requirement \*)

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

In this case, the operating company or the person using the device should check whether the device may be connected, possibly by discussing the matter with the energy company where appropriate.

**IMPORTANT!** Ensure that the grid connection is earthed properly!

## Dangers from mains current and charging current

Anyone working with battery chargers exposes themselves to numerous dangers, e.g.:

- Risk of electrocution from mains current and charging current.
- Hazardous electromagnetic fields, which can risk the lives of those using cardiac pacemakers.

An electric shock can be fatal. Every electric shock is potentially life threatening. To avoid electric shocks while using the charger:

- Do not touch any live parts inside or on the outside of the charger.
- Under no circumstances 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 inadequately dimensioned cables and leads must be immediately repaired by authorised personnel.

## Danger due to acid, gases and vapours

Batteries contain acid which is harmful to the eyes and skin. During charging, gases and vapours are released that may be harmful to health and are highly explosive in certain circumstances.

Only use the charger in well-ventilated areas to prevent the accumulation of explosive gases. Battery rooms are not deemed to be hazardous areas provided that a concentration of hydrogen of less than 4% can be guaranteed by the use of natural or forced ventilation.

Maintain a distance of at least 0.5 m (19.69 in.) between the battery and charger during the charging procedure. Possible sources of ignition such as fire and naked flames must be kept away from the battery.

The battery connection (e.g. charging terminals) must not be disconnected for any reason during charging.

Do not inhale any of the gases and vapours released under any circumstances - Make sure the area is well ventilated.

To prevent short circuits, do not place any tools or conductive metals on the battery.

Battery acid must not get into the eyes or onto the skin or clothes. Wear protective goggles and suitable protective clothing. Rinse any acid splashes thoroughly with clean water and seek medical advice if necessary.

---

**General information regarding the handling of batteries**

- Protect batteries from dirt and mechanical damage.
  - Store charged batteries in a cool place. Self discharge is kept to a minimum at approx. +2 °C (35.6 °F).
  - Carry out a visual inspection at least once a week or as often as specified by the battery manufacturer to ensure that the acid (electrolyte) level in the battery is at the max. mark.
  - If any of the following occur, do not start the device (or stop immediately if already in use) and have the battery checked by an authorised workshop:
    - uneven acid levels and/or high water consumption in individual cells caused by a possible fault.
    - overheating of the battery above 55 °C (131 °F).
- 

**Protecting yourself and others**

While the charger is in operation, keep all persons, especially children, out of the working area. If, however, there are people in the vicinity,

- warn them about all the dangers (hazardous acids and gases, danger from mains and charging current, etc.),
- provide suitable protective equipment.

Before leaving the work area, ensure that people or property cannot come to any harm in your absence.

---

**Safety measures in normal operation**

Chargers with a ground conductor must only be operated on a mains supply with a ground conductor and a socket with a ground conductor contact. If the charger is operated on a mains supply without a ground conductor or in a socket without a ground conductor contact, this will be deemed gross negligence. The manufacturer shall not be held liable for any damage arising from such usage.

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Only operate the charger in accordance with the degree of protection shown on the rating plate.

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Under no circumstances operate the charger if there is any evidence of damage.

---

Arrange for the mains cable to be checked regularly by a qualified electrician to ensure the ground conductor is functioning properly.

---

Any safety devices and parts that are not functioning properly or are in imperfect condition must be repaired by a qualified technician before switching on the charger.

---

Never bypass or disable protection devices.

---

After installation, an accessible mains plug is required.

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**EMC device classifications**

Devices with emission class A:

- Are only designed for use in an industrial setting.
- Can cause conducted and emitted interference in other areas.

---

Devices with emission class B:

- Satisfy the emissions criteria for residential and industrial areas. This also applies to residential areas in which power is supplied from the public low-voltage grid.

---

EMC device classification according to the rating plate or the 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.

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**Maintenance** Before switching on, always check the mains plug and cable as well as charger leads and charging terminals for any signs of damage.  
If the surface of the device housing is dirty, clean with a soft cloth and solvent-free cleaning agent only.

---

**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.

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

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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.

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

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**Markings on the device**

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

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

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**Disposal**

Waste electrical and electronic equipment must be collected separately and recycled in an environmentally-friendly way, in accordance with the European Directive and national legislation. Used equipment must be returned to the distributor or disposed of via an approved local collection and disposal facility. Correct disposal of used equipment promotes the sustainable recycling of material resources. Failing to dispose of used equipment correctly can lead to adverse health and/or environmental impacts.

**Packaging materials**

Separate collection according to material. Check your local authority regulations. Crush containers to reduce size.

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**Copyright**

Copyright of these Operating Instructions remains with the manufacturer.

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Text and illustrations were accurate at the time of printing. Fronius reserves 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 Operating Instructions, we will be most grateful for your comments.



# General information

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## 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 life and reduces the amount of maintenance required, while at the same time improving cost-effectiveness.

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. Add to this the fact that the active inverters can be used "on-board". In addition to its many existing features, the charger has a modular design that makes it easy to upgrade; it is therefore ideally equipped for future requirements. A wide range of options is available.

---

## 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.


  
  
  
  
  
  


**WARNUNG - WARNING - ATTENTION  
ADVERTENCIA - AVVISO**

Ladevorgang immer stoppen bevor das Ladekabel abgezogen wird!  
Explosive Gase. Flammen und Funken vermeiden.  
Während des Ladens für ausreichend Frischluft-Zufuhr sorgen!  
Always stop charging before you disconnect the charging cable!  
Explosive gases. Prevent flames and sparks.  
Provide adequate ventilation during charge!

Toujours arrêter la charge avant de déconnecter le câble de charge!  
Gaz explosifs. Éviter les flammes et les étincelles.  
Prévoir une ventilation adaptée pendant la charge!  
¡Detener siempre la carga antes de desconectar el cable de carga!  
Gases explosivos. Evitar llamas y chispas.  
¡Mantener una ventilación adecuada durante la carga!  
Interrompere sempre la carica prima di scollegare il cavo di carica!  
Gas esplosivi. Evitare fiamme libere e scintille.  
Predisporre una ventilazione adeguata durante la carica!









42,0409,0419 



A-4600 Wels  
www.fronius.com


**Active Inverter xxxxE**


Art. Nr.: 4,010,xxx  
SN: xxxxxxxx  
In: ~230V 50/60Hz;xxxW  
Out.: DC xxV/xxA

EMC Emission Class A

Always stop charging before you disconnect the charging cable!

  
 XXXXXXXX





Do not use the functions until you have read all the operating instructions.



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. 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.

# Before commissioning

## 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 required fuse protection for the mains lead can be found in the accompanying characteristic data sheet. If there is no mains cable or mains plug on your version of the appliance, fit one that conforms to national standards.

### **NOTE!**

#### **Danger due to insufficiently dimensioned electrical installations.**

This may result in serious injury and 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 strategy -  
standard protec-  
tion devices**

The new chargers are not just characterised by purely functional features. In terms of safety, the active inverters are also equipped to the highest standards. The following safety features come as standard:

- Reverse polarity protection prevents the battery or 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

### 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.

### **WARNING!**

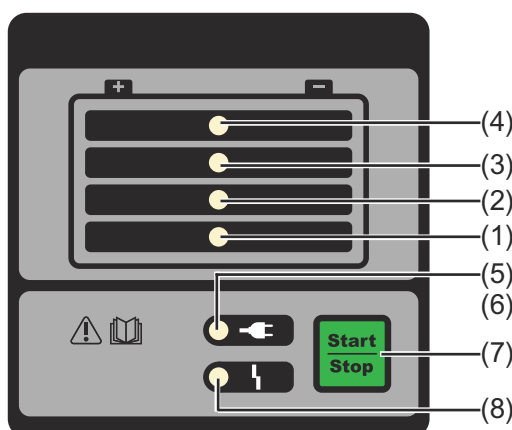
#### **Danger from incorrect operation.**

This can result in severe personal injury and damage to property.

- ▶ Do not use the functions described here until you have read and completely understood these operating instructions.
- ▶ Do not use the functions described here until you have fully read and understood all of the Operating Instructions for the system components, in particular the safety rules.

## Control panel

The control panel (LED version) is explained below.



- |     |   |
|-----|---|
| (1) | State of charge indicator 25%   |
| (2) | State of charge indicator 50%   |
| (3) | State of charge indicator 75%   |
| (4) | State of charge indicator 100%  |
| (5) | Ready indicator   |
| (6) | -   |
| (7) | Start/Stop and setup button <ul style="list-style-type: none"> <li>- for interrupting and restarting charging.</li> <li>- for selecting the characteristic type (press and hold for 10 s).</li> </ul> |
| (8) | Error indicator   |

## Plugging in options

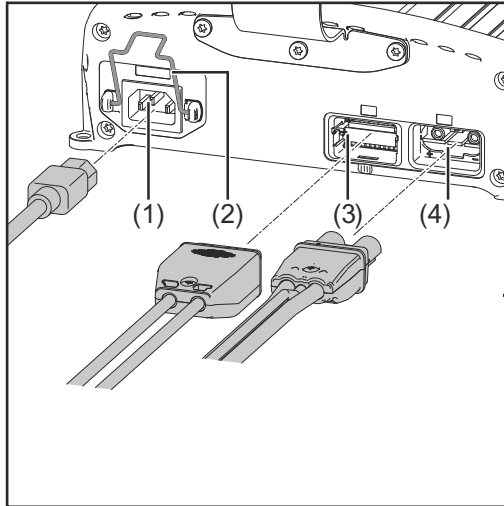
### **NOTE!**

#### **Danger from connecting options and accessories while the mains plug is plugged in.**

This can result in damage to the device and accessories.

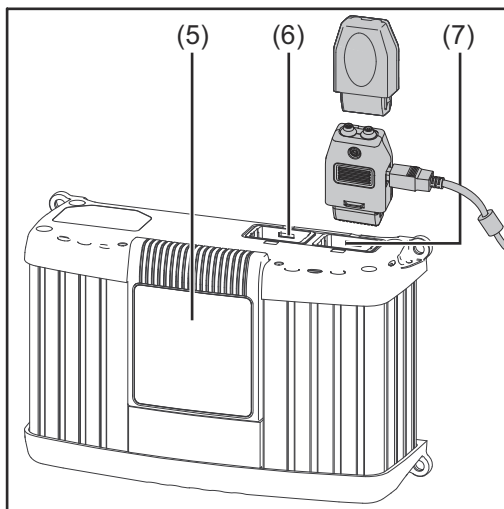
- ▶ Only connect options and system add-ons when the mains plug is unplugged and the charging leads are disconnected from the battery.

## Connections



Bottom of housing

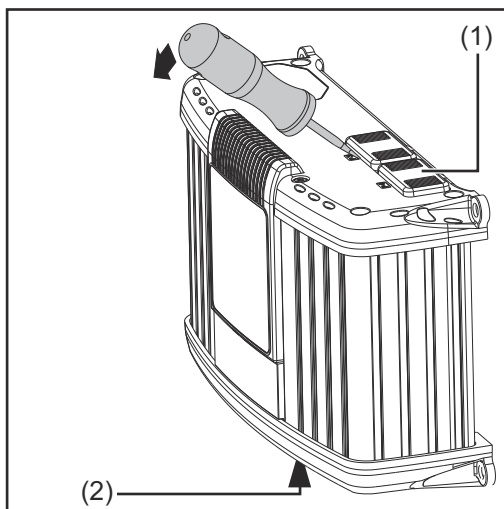
No.	Function
(1)	<b>AC input - mains socket</b>
(2)	<b>Mains cable safety bow</b> for fitting the mains cable.
(3)	<b>Connection P2 - I/O port</b> for options on the I/O port.
(4)	<b>Connection P1 - charger lead socket</b> also for external stop and temperature-controlled charging options.



Top of housing

No.	Function
(5)	<b>Removable display</b>
(6)	<b>Connection P3 - Visual Port</b> for connecting the internal display.
(7)	<b>Connection P4 - Multi Port</b> for connecting the following options: <ul style="list-style-type: none"> <li>- Status lamp.</li> <li>- Software update via USB port.</li> </ul>

## Removing covers for connections and options



If necessary, use a screwdriver to remove:

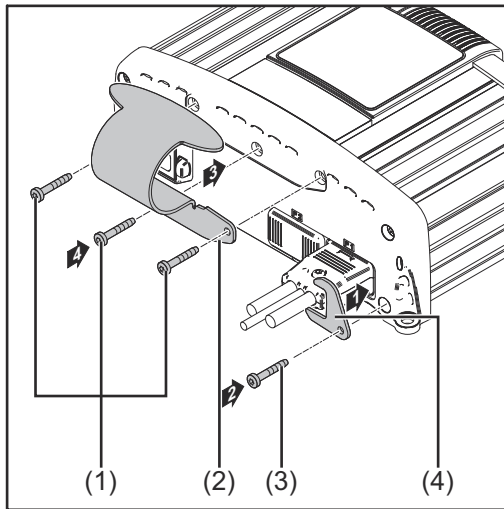
- Cover (1) for connection P4 - Multi Port.
- Cover (2) for connection P2 - I/O port.

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**

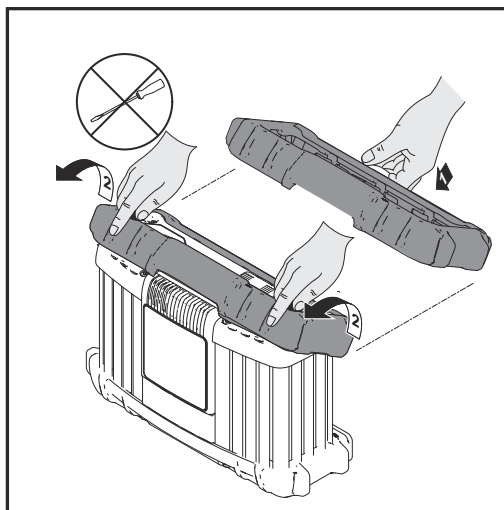


**Please note:**  
the torque for all screws is 2.5 Nm (1.84 ft. lb.).

- 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**

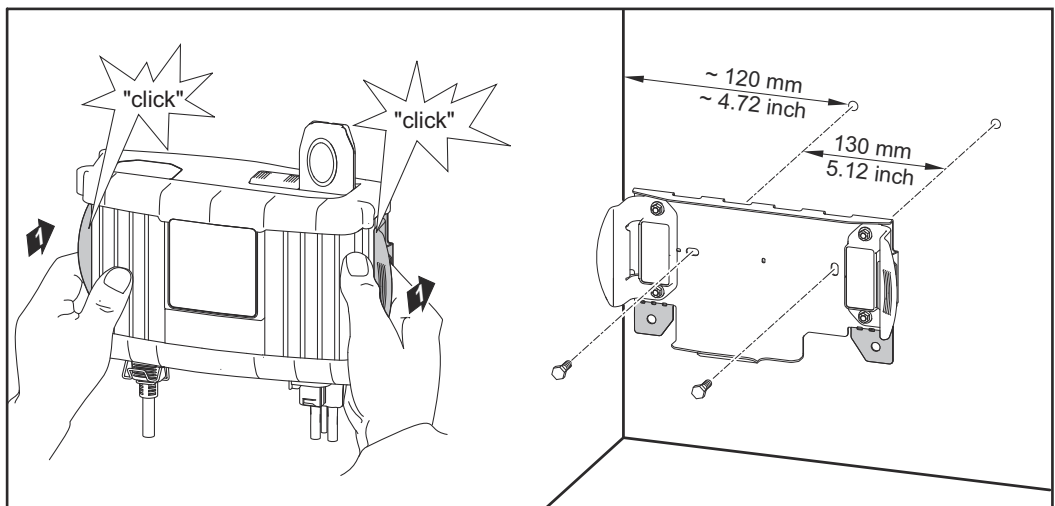


The edge guard removal process is the reverse of the fitting process.

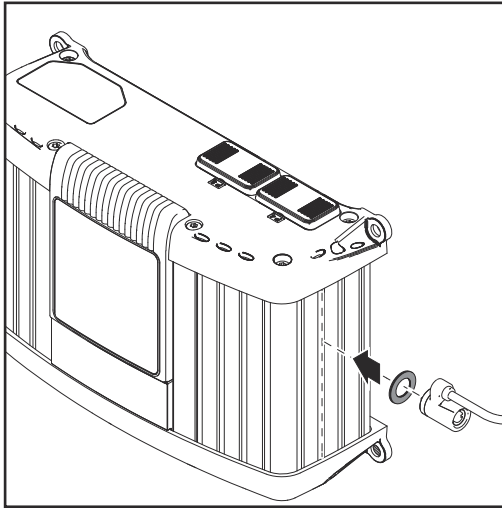
The bracket cannot be fitted if the edge guard is already in place.

**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.

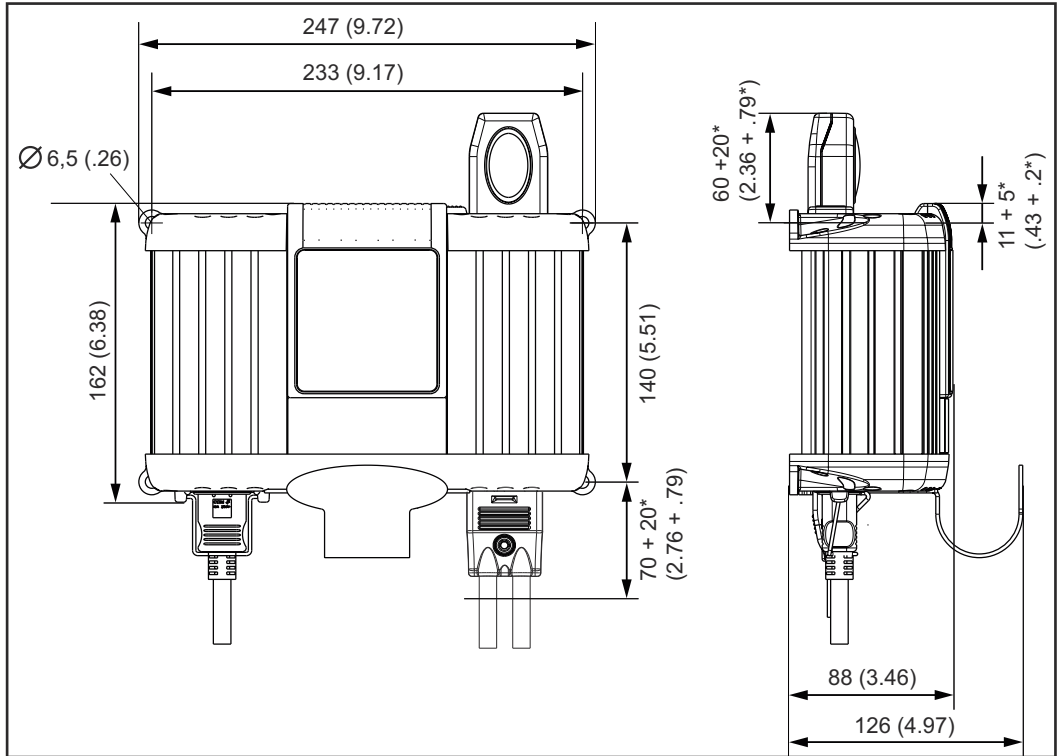


**Installation**

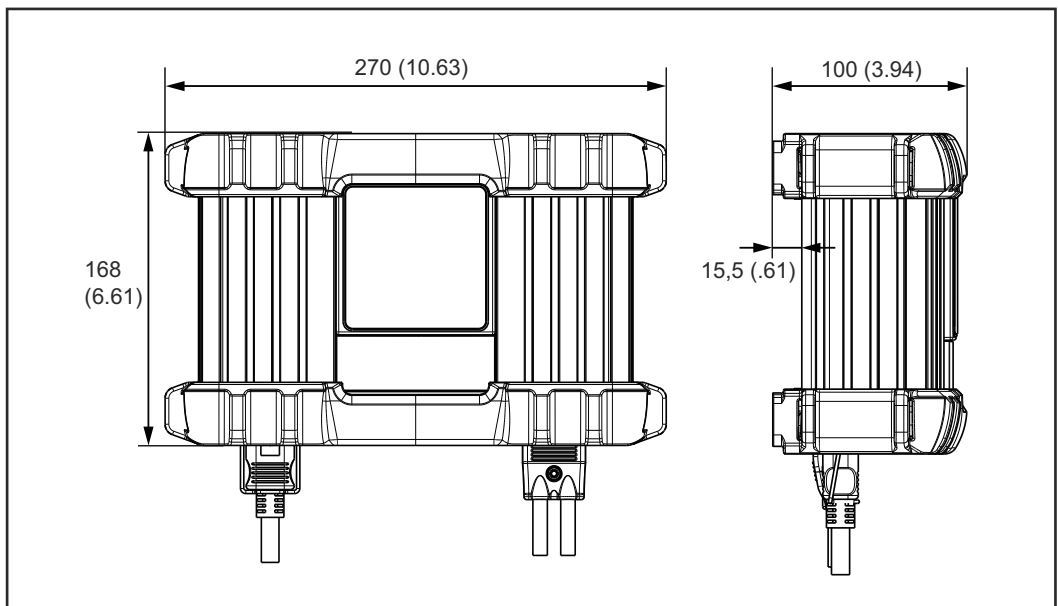
If installing the charger on a firm base, use the drilling template enclosed in the packaging.

If the charger is installed in a switch cabinet (or a similar sealed area), then forced-air ventilation must be provided to ensure adequate heat dissipation. There must be a clearance of 10 cm (3.94 in.) all around the charger.

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



\*Space for installation/removal



Space requirements with edge protector (\*Space for installation/removal)

# Charging the battery

## Starting charging

### CAUTION!

**Risk of damage if attempting to charge a faulty battery or using the incorrect charging voltage.**

This can result in damage to property.

- ▶ Before beginning charging, ensure that the battery to be charged is fully functional and the charging voltage of the device matches the battery voltage.

- 1 Connect the mains cable to the charger and plug into the mains.
- 2 Charger is on standby. Ready indicator lit.
- 3 Select characteristic type according to the battery to be charged.

### **Please note:**

Information on which characteristic type to select can be found in the "Setup menu" section or the enclosed characteristic data sheet.

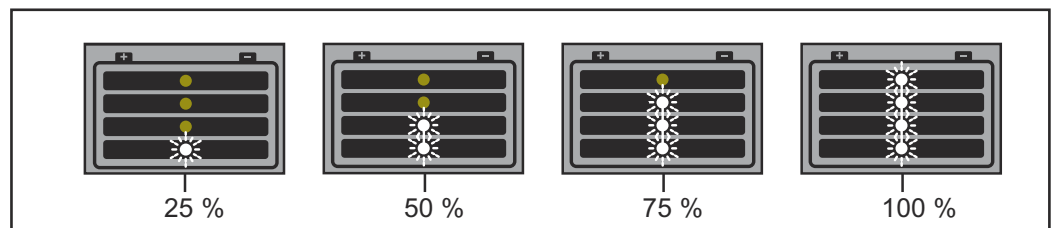
### WARNING!

**Danger due to incorrectly connected charging plugs.**

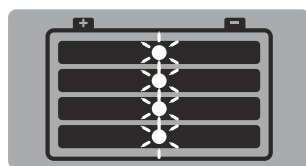
This may result in serious injury and damage to property.

- ▶ Connect charging leads to the correct poles and ensure proper electrical connection to the battery poles.

- 4 If using the vehicle power supply, switch off the ignition and all other devices consuming power.
- 5 Connect the charging lead (red) to the positive pole (+) on the battery.
- 6 Connect the charging lead (black) to the negative pole (-) on the battery.
- 7 Charging begins automatically after approx. 2 seconds.
- 8 A set of four LEDs shows the battery's state of charge.



- 9 Conservation charging: once the battery is fully charged, the charger automatically switches to conservation charging to prevent self discharge of the battery. The battery can remain connected to the charger for any length of time.



## Finishing charging

### **WARNING!**

#### **Danger due to ignition of oxyhydrogen caused by sparks generated when the charging plug is disconnected prematurely.**

This can result in serious injury and damage to property.

- ▶ Before disconnecting the charging plug, press the Stop/Start button to finish charging.

- 1 Press the Stop/Start button to complete charging.
- 2 Disconnect the charging lead (black) from the negative pole (-) on the battery.
- 3 Disconnect the charging lead (red) from the positive pole (+) on the battery.

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

## Interrupting charging

### **NOTE!**

#### **Danger from disconnecting or unplugging the charging lead during charging.**

This can result in damage to the connection sockets and connecting plug.

- ▶ Do not disconnect or unplug the charging lead while charging.

- 1 Press the Stop/Start button while charging.
  - The process is interrupted.
  - **Ready** indicator flashes.
- 2 Press the Stop/Start button again to continue charging.

# Setup menu

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**General remarks** Select the characteristic type in the Setup menu depending on either the battery to be charged or the requirement as specified in the accompanying characteristic data sheet.

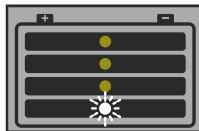
---

## Accessing the Setup menu

**Please note:**

Do not connect the charging lead to the battery.  
A characteristic type cannot be selected when the charging plug is connected.

- 1 Connect the mains cable to the charger and plug into the mains.
- 2 Charger is on standby - ready indicator is lit.
- 3 Press and hold the Start/Stop button for approx. 10 seconds to call up the Setup menu.
- 4 Ready indicator goes out. The charger is in Setup mode. The display also shows the selected characteristic type.



## Selecting the characteristic type

- 1 Press the Start/Stop button to select the characteristic type according to the enclosed characteristic data sheet.
- 2 If there is no further selection within 10 seconds, the selected characteristic type is saved.

**Please note:**

Do not connect a battery during these 10 seconds.  
Continue as described in the section "Charging the battery".



- 3 Ready indicator lights up. Once the new characteristic type has been selected, the charger is automatically ready for the next charging sequence.

## 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.

## Protection devices

### **Ready indicator flashing, error indicator flashing:**



Cause: Mains fault - mains voltage outside the tolerance range.

Remedy: Check mains conditions.

### **Ready indicator lit, error indicator flashing:**



Cause: Short circuit on the charging plug or charger lead. Short circuit detection active.

Remedy: Check charger leads, contacts and battery poles.

Cause: Battery overvoltage or undervoltage.

Remedy: Select correct charging characteristic/function, or set correct battery voltage.

### **Ready indicator lit, error indicator lit:**



Cause: Polarity reversal of charger leads. Reverse polarity protection has tripped.

Remedy: Connect battery poles correctly.

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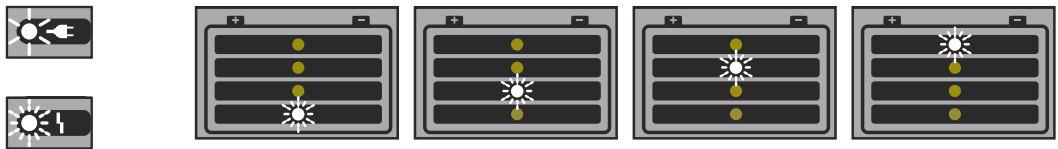
**Charger switches off during charging:**

Cause: Ambient temperature too high. Overtemperature protection active.

Remedy: Allow device to cool down. Charging will recommence automatically once the device has cooled sufficiently. If not, have it checked by a workshop.

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**Charging errors****Ready indicator lit, error indicator flashing, SOC indicator 1/2/3/4 flashing:**

Cause: Timeout in the corresponding charging phase or battery capacity too high.

Remedy: Select correct characteristic type according to the enclosed characteristic data sheet and charge again.

Cause: Battery faulty (cell short circuit, heavy sulphation).

Remedy: Check battery and replace if necessary.

Cause: Optional external temperature sensor has tripped due to over- or undertemperature.

Remedy: Allow battery to cool, or charge battery in a more suitable area.

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# Technical data

## Selectiva 1 kW

Mains voltage (+/- 15%)	~230 V AV
Mains frequency	50/60 Hz
Mains fuse	max. 16 A
Battery backfeed current	< 1 mA
Efficiency	max. 96 %
Standby consumption	max. 1.7 W
Safety class	I
Max. permitted grid impedance $Z_{max}$ on PCC	None
EMC emission class	A
Dimensions L x W x H	247 x 162 x 88 mm (9.72 x 6.38 x 3.46 in)
Weight (without cables)	
1020E   1030E   2010E   2015E	2.1 kg (4.63 lb.)
2020E   2032E   2040E	2.2 kg (4.85 lb.)
Cooling	
1020E   1030E   2010E   2015E	Convection
2020E   2032E   2040E	Convection and fan
Cooling	Convection
Operating temperature (>30 °C / >86 °F derating)	-20 °C to +40 °C (-4 °F to 104 °F)
Storage temperature	-40 °C to +85 °C (-40 °F to 185 °F)
Protection class	IP 40
Mark of conformity	According to rating plate
Housing	A1
Product standard	IEC 60068-2-27 (shock) IEC 60068-2-29 (bump) IEC 60068-2-64 (vibration) EN 60335-1 EN 60335-2-29 EN 61000-3-2 EN 61000-6-2 (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-11) EN 61000-6-4 (Class A)

Device-specific data					
Device	Grid current max.	Effective power max.	Nominal output voltage	Output voltage range	Output current
1020E	2.3 A	315 W	12 V DC / 6 cells	2 V to 16.8 V DC	20 A at 14.4 V DC

<b>Device-specific data</b>					
<b>Device</b>	<b>Grid current max.</b>	<b>Effective power max.</b>	<b>Nominal output voltage</b>	<b>Output voltage range</b>	<b>Output current</b>
1030E	2.9 A	420 W	12 V DC / 6 cells	2 V to 16.8 V DC	30 A at 13.5 V DC
2010E	2.3 A	340 W	24 V DC / 12 cells	2 V to 33.6 V DC	10 A at 28.8 V DC
2015E	2.7 A	410 W	24 V DC / 12 cells	2 V to 33.6 V DC	15 A at 24 V DC
2020E	4 A	650 W	24 V DC / 12 cells	2 V to 33.6 V DC	20 A at 28.8 V DC
2032E	7.6 A	1030 W	24 V DC / 12 cells	2 V to 33.6 V DC	32 A at 28.8 V DC
2040E	7.7 A	1120 W	24 V DC / 12 cells	2 V to 33.6 V DC	35 A at 28.8 V DC











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