INSTRUCTION MANUAL

VARTA family/home

VARTA Storage GmbH

Congratulations!

You have chosen a storage system from VARTA Storage GmbH! We are pleased that in doing so, you chose a durable system for which we considered quality paramount. Please read through these instructions carefully. They describe how to operate and use the battery.

Have fun storing power!

Guidance for the qualified electrician

The first part of this manual contains general information on how to use the VARTA family/home System. Further information can be found in the “Installation”, “Operation in the password-protected area” and “Maintenance” sections.

Legal notice

Translation of the original instruction manual VARTA family/home

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Contents

About this manual

Read this manual carefully to ensure the VARTA family and VARTA home battery storage systems (VARTA family/home) operate correctly. Installation and maintenance activities must be performed by a qualified electrician certified by VARTA Storage GmbH. The instruction manual should be kept in close proximity to the VARTA family/home and must be permanently available to all individuals involved in working on the storage battery.

Scope

This instruction manual applies for VARTA family/home products from VARTA Storage GmbH.

Disclaimer

VARTA Storage GmbH accepts no liability whatsoever for personal injury, property damage, damage sustained by the product, or consequential damage that occurs or has occurred on the product due to failure to comply with these instructions, improper use of the product, or by repairs, opening of the storage cabinet and any other actions carried out by unqualified electricians not certified by VARTA Storage GmbH. This disclaimer also applies for the use of non-approved spare parts and failure to comply with the specified maintenance intervals.

The product must not be rebuilt or technically modified without authorisation.

General

1 Information about this manual

1.1 Explanation of symbols

This instruction manual uses the following types of safety instructions and tips:

 **DANGER!**	Indicates an instruction which, if not followed, will immediately lead to death or serious injuries.
 **WARNING!**	Indicates an instruction which, if not followed, can lead to death or serious injuries.
 **CAUTION!**	Indicates an instruction which, if not followed, can lead to minor or slight injuries.
 **NOTICE!**	Indicates an instruction which, if not followed, can lead to property damage.
	Indicates useful hints for handling VARTA family/home.

Table 1: Explanation of symbols

1.2 Pictograms

	Warning about general hazards!
	Warning about electrical voltage!
	Warning about electric shock!
	Warning about flammable substances!
	Warning about battery hazard!
	Warning about failure to observe discharge time: 3 min!

Table 2: Pictograms

2 Safety

2.1 General information on safety

WARNING!

Potential mortal danger through failure to observe the safety instructions!

Improper use can cause fatal injury.

Therefore: Make sure that all safety devices are in working order before use!

The information contained in this manual is to be observed by all individuals during operation, installation and maintenance. These instructions are unable to describe every conceivable situation. Therefore, the applicable standards and the relevant regulations for occupational health and safety shall govern.

Moreover, installation and maintenance work involves residual risks under the following circumstances:

- Installation and maintenance work is not performed correctly.
- Installation and maintenance work is performed by personnel who have not been trained and not been instructed.
- The safety instructions given in these instructions are not observed.

All persons assigned to work on the system must have read and understood these instructions, in particular the chapter on Safety.

All safety instructions must be strictly obeyed, compliance therewith ensures your safety. The device must not be modified.

2.2 Proper use

WARNING!

Potential mortal danger through improper use!

The device accommodates parts carrying hazardous voltages. Contact with these parts can be fatal.

Using the battery storage system or the individual components thereof for any use other than that intended can lead to life-threatening situations.

VARTA family/home and its components are built using state-of-the-art technology and to product-specific standards and is to be used for storing electricity from generation plants of renewable energy, such as photovoltaic systems or other energy sources such as CHP. Alternative uses must be agreed in consultation with the manufacturer and the local energy supplier.

Essentially, VARTA family/home must not be used:

- for mobile use on land, water or in the air
- for using medical equipment
- as an uninterrupted power supply unit

2.3 Requirements regarding qualified electricians

WARNING!

Potential mortal danger if the electrician lacks the proper training!

Make sure that all activities on the VARTA family/home system (e.g. installation, service and maintenance work) are carried out by qualified electricians certified by VARTA Storage GmbH!

The “Installation”, “Operation in the password-protected area” and “Maintenance” sections contain further information for qualified electricians.

2.4 General hazards

WARNING!

Property damage due to incorrect handling!

Failure to obey the following instructions on handling the device can cause damage to the device for which VARTA Storage GmbH accepts no liability.

- Do not place any objects on or in front of the cabinet!
- Avoid direct heat impact from other devices!
- Avoid air humidity of over 80 %!
- Do not store corrosive substances at the installation location!
- In order to protect the cells from deep discharge, the device must be switched off only for maintenance and service purposes!
- Never clean the device wet or using chemical agents!
- Use only accessories and spare parts recommended by the manufacturer!
- Bear in mind that work on electrical systems and operating equipment must be carried out by qualified electricians certified by VARTA Storage GmbH in compliance with the electrical regulations.
- Work on electrical systems and operating equipment must be carried out in the de-energised state!
- Watch out for damage to electrical equipment! Rectify defects without delay!
- Always keep the cabinet locked! Access by authorised personnel only!
- Respect the waiting times!

2.5 Safety equipment

WARNING!

Faulty safety equipment can cause accidents!

The safety equipment must not be damaged, modified, removed or shut down.

On completion of installation and commissioning, the safety devices must be tested by qualified electricians certified by VARTA Storage GmbH to confirm faultless function.

The VARTA family/home system features multiple safety devices. Included are a NA-protected activation point in accordance with VDE AR N 4105, a door lock with key (VATA family), closed electrical operating area and over temperature cut-out . We also recommend installing a smoke detector in the VARTA family/home system installation room.

3 Function, scope of supply and technical parameters

3.1 Function

The VARTA family/home battery storage system is a modular storage system for operation in a 3-phase domestic supply and with the ability to connect a separate grid-connected photovoltaic system. This must be a power-generating unit that is supplied according to surplus rather than to full feed. There is also provision for storing renewable energy, for example from small wind turbines or other CHP system energy sources.

The VARTA family/home system increases the own consumption rate and the economy of the photovoltaic system. Any power produced by the photovoltaic system that is not required for immediate use can be buffered in the battery storage system. The storage system feeds the power back to the building system as soon as consumption once again exceeds the amount of power generated by the photovoltaic system.

The VARTA family/home system is connected to the building system as an alternating, 3-phase current, and operates independently of the photovoltaic system. A current sensor controls the charge and discharge processes of the battery storage system. This current sensor is mounted in the fuse box immediately behind the consumption/feed meter and measures all incoming and outgoing currents.

If this current sensor measures outgoing currents when the battery storage system has free charge capacity, the system will be charged. During this process, the battery inverter located in the VARTA family/home system converts the alternating current into direct current, and charges the battery modules. Once the maximum charge capacity is reached or when the solar-

generated current exceeds the maximum charge current, the surplus solar current is fed into the public grid.

If the photovoltaic system is unable to cover the power requirement inside the building, the current sensor measures the incoming currents. The battery storage system then discharges capacity into the building system in order to minimize external power consumption and the associated costs.

The VARTA family/home system has two different battery modes: Normal energy storage mode (own consumption optimisation) and emergency power mode. In emergency power mode, separate consumers entitled to the emergency power supply are supplied with battery current even if the mains power supply fails. Before the VARTA family/home battery storage system is installed, it is necessary to clarify with the energy supplier whether or not the system has to be registered.

3.2 Scope of supply

The VARTA family/home system includes:

- Storage cabinet with control element and LED bar for indicating the fill level
- Battery module (a battery module comprises cells and a battery management system BMS.)
- Battery inverter with fan
- Energy management system
- 50-A current sensor with sensor board and sensor cable (= RJ12 cable)
- Design front (optional, VARTA family only)

- Battery module compartment covers
  (VARTA family: 0-22, VARTA home: 9x)
- Removal tool
- Mounting bracket (2 x VARTA family only)
- Warning label
- Instruction manual
- Service book
- Warranty card
- Commissioning report

Supply scope of the battery modules

VARTA family:
The basic equipment includes eight battery modules.

VARTA home:
The basic equipment includes six battery modules.

Battery modules can also be reordered and supplied as separate items.

Figure 1: VARTA family

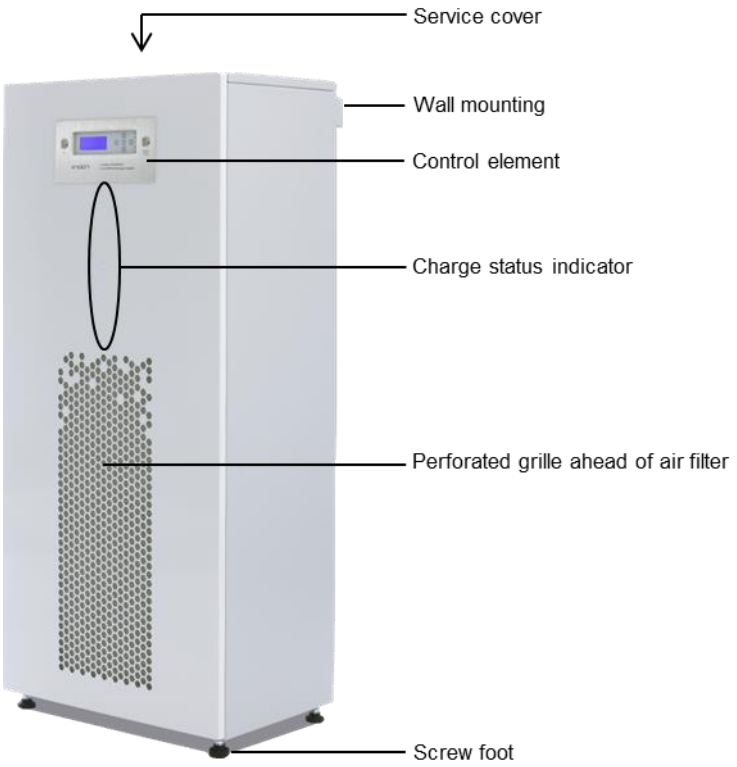


Figure 2: VARTA home

3.3 System overview

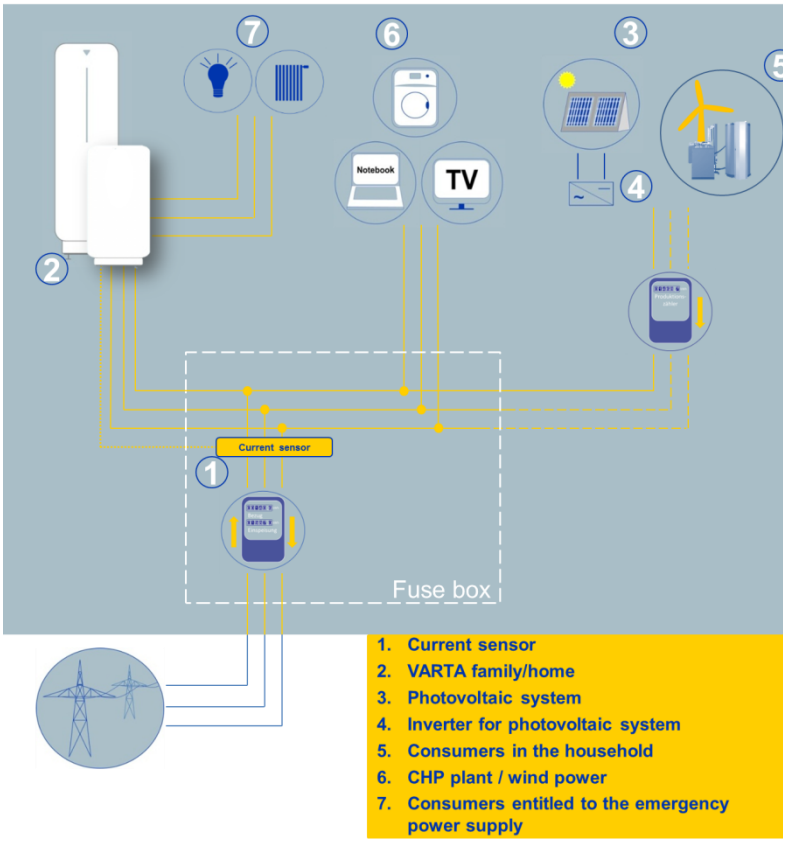


Figure 3: System overview

3.4 Type plates

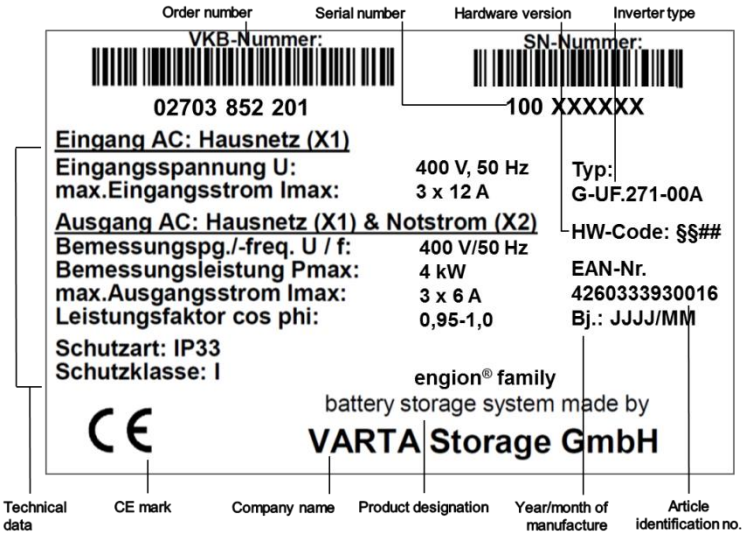


Figure 4: Type plate VARTA family

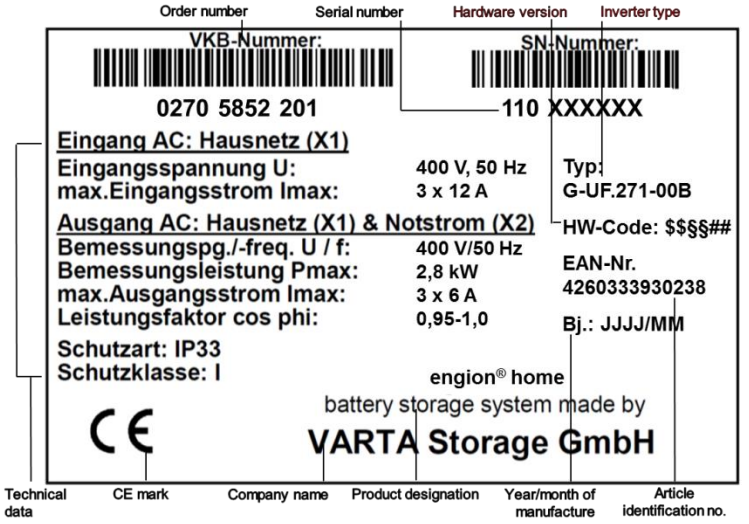


Figure 5: Type plate VARTA home

3.5 Technical parameters

SYSTEM: VARTA FAMILY	
Nominal capacity	3.7–13.8 kWh
Battery inverter capacity (in composite operation)	4.0 kW (depending on the number of battery modules)
Battery inverter layout	without isolation transformer
Dimensions (W x H x D)	600 mm x 1,850 mm x 400 mm
Weight (empty)	110 kg
Installation location	inside the building
Temperature range	+5 °C to +30 °C
Max. air humidity	80 % (no condensation)
Paintwork front	RAL 9003
Paintwork side	RAL 7035
Special paint	on request
System connection	400 V AC, 3-phase, 50 Hz
Inrush	< max. operating current for input and output
Maximum output fault current	max. 6 A for 100 µs
Own consumption optimisation	3-phase, regulated
Power measurement	3-phase via current sensor
Emergency power capability	3-phase
System charge/discharge time	depending on the number of battery modules
System transport	vertical on a Euro pallet
Packaging (W x H x D)	800 mm x 2,120 mm x 1200 mm
Isolated system fusing	6 A (B-character)
Grid fusing	16 A (B-character)
FI isolated system	Type B (0.03 A)

Table 3 : Technical parameters – VARTA family

SYSTEM:VARTA HOME

Nominal capacity	2.8–6.9 kWh
Battery inverter capacity (in composite operation)	2.4 kW (depending on the number of battery modules)
Battery inverter layout	without isolation transformer
Dimensions (W x H x D)	600 mm x 1,320 mm x 400 mm
Weight (empty)	90 kg
Installation location	inside the building
Temperature range	+5 °C to +30 °C
Max. air humidity	80 % (no condensation)
Paintwork front	RAL 9003
Paintwork side	RAL 7047
Special paint	on request
System connection	400 V AC, 3-phase, 50 Hz
Inrush	< max. operating current for input and output
Maximum output fault current	max. 6 A for 100 µs
Own consumption optimisation	3-phase, regulated
Power measurement	3-phase via current sensor
Emergency power capability	3-phase
System charge/discharge time	depending on the number of battery modules
System transport	vertical on a Euro pallet
Packaging (W x H x D)	715 mm x 1,570 mm x 580 mm
Isolated system fusing	6 A (B-character)
Grid fusing	16 A (B-character)
FI isolated system	Type B (0.03 A)

Table 4: Technical parameters – VARTA home

BATTERY MODULE

Electrochemical cell	Lithium-iron phosphate
System configuration	14,000 cycles at room temperature*
Nominal module capacity	461 Wh
Discharge depth	90 %
Usable module capacity	415 Wh
Module output	162 W
Connection	touch safe
Cell monitoring	integrated
Dimensions (W x H x D)	165 mm x 130 mm x 320 mm
Weight	6 kg
Charge/discharge time	~3 h (to max. charge state)
Module packaging (W x H x D)	240 mm x 240 mm x 400 mm

Table 5: Technical parameters - Battery module (*60 % residual capacity)

ENVIRONMENTAL CALCULATION DATA

Environment category	Climate-controlled in interior rooms*
Classification of wet rooms	Wet rooms not permitted
Contamination level	2
Penetration protection	IP33
Ambient temperature	+5 °C to +30 °C
Relative humidity	80 %
Max. altitude	2000 m above sea level
Overvoltage category	III
Protection class	1

*The battery storage system is completely enclosed by a building or enclosure. This protects the battery storage system against sun, dust, fungus, radiation from the cold night sky and other environmental influences. The building or enclosure is also climate-controlled in terms of temperature, humidity and air filtering.

Table 6: Environmental calculation data

3.6 Warranty

For the warranty, see Chapter 8.2 in the installation section.

Operation

4 Displays and control element

WARNING!

Mortal danger from electric shock on opening the cabinet door!

The device accommodates parts carrying hazardous voltages. Contact with these parts can be fatal.

Never open the cabinet door without authorisation!

4.1 LED displays

4.1.1 Indicator lamps in the control element

The indicator lamps in the control element (see Figure 21) signal the states and incidents occurring during operation of the battery storage system.

Figure 6: Control element

Indicator lamp	Indication
 Error lamp	• Flashes red/illuminates permanently red: malfunction. → Service must be contacted.
 Air filter lamp	• Flashes every 5 s blue: Voltage is being supplied to the control. • Flashes blue rapidly: The password-protected area is accessible. • Illuminates permanently blue: The air filter insert has to be replaced. → Service must be contacted.
°C Temperature lamp	• Flashes yellow: A key is pressed on the control element. • Illuminates permanently yellow: The system has overheated. → Room temperature has to be verified, ventilation needed.
 Operation lamp	• Illuminates permanently green: The system is ready. • Flashes every 3 s green: The system is in standby mode.

Table 7: Indicator lamps in the control element

4.1.2 Charge state indicator at the cabinet door

The blue LEDs in the charge state indicator (LED strip) below the control element (see Figure 1 and Figure 2) signal the charge state of the battery storage system. The charge state indicator relates to the maximum available capacity: For VARTA family, the number of illuminated LEDs shows from bottom to top 10 %, 20 %, 30 % etc. up to 100 % of the available capacity. For VARTA home, the graduation is 20 %, 40 %, 60 %, 80 % and 100 %.In standby mode, only one LED illuminates. From bottom to top, the position of the illuminated LED corresponds to the available capacity in percent.

Indicator	Information
One part of the LED strip illuminates.	The number of illuminated LEDs corresponds to the current capacity of the battery storage system in %.
Only one LED illuminates.	The system is in standby mode. The position of the LEDs corresponds to the current capacity of the battery storage system in %.
The LEDs illuminate briefly, one after the other, in repeated cycles from top to bottom.	The battery modules are discharging.
The LEDs illuminate briefly, one after the other, in repeated cycles from bottom to top.	The battery modules are charging.

Table 8: Charge state indicator (LED strip)

4.2 Switching on and off

Switch on the VARTA family/home storage system using the *On/Off* key on the control element. The button engages and the display and the charge state indicator switch on.

Switch off using the *On/Off* key on the control element. The button engages andthe control element and the charge state indicator switch off. In this mode the VARTA family/home neither charges nor discharges.

	Control key	**Function**
	Arrow key to top (= *Up* key)	Select menu option Increment values
	Arrow key to right (= *Right* key)	Next view Next value entry
	Arrow key to bottom (= *Down* key)	Select menu option Decrement values
	Arrow key to left (= *Left* key)	Previous view Previous value entry
	*OK* key (= Confirm)	Confirm selection

Table 9: Control keys on the control element

4.3 Main menu

- Tap any control key on the control element.
- The display backlight switches on. (When the system is in standby mode, a second tap is required.)
- The main menu is now displayed.
- Press the *Up/down* keys to display additional information.
- The following information is displayed:

16.06.2014 14:06:20 Ready P Inverter 2 kW P Grid 0 kW	• **Date** and **time** • **Operating state** of the storage cabinet, e.g. *Ready* • **P Inverter:** Power currently measured at battery inverter in kW. Positive values indicate charge, negative values indicate discharge.
16.06.2014 14:06:20 P Inverter 2 kW P Grid 0 kW Online state 1 16.06.2014 14:06:20 P Grid 0 kW Online state 1 Active BM 8	• **P Grid**: Power currently measured at the current sensor in kW. Positive values indicate supply, negative values indicate consumption. • **Online state:** 1 = online, 0 = offline • **Active BM**: Number of battery modules detected by the system.

4.4 Selection menu

- You are in the main menu.
- Press the *OK* key.
- The selection menu appears.
- Press the *Up/down* keys to display additional information.
- You have access to the following menus:

Selection **>** System Energy balance NA Protection	• **System:** The *Inverter* and *Battery module* sub-menus can be selected. • **Energy balance:** You see information on the energy balance, the energy consumption from the public grid and the energy supply into the system. These values are for assessment purposes only; they do not form the basis of the electricity bill. • **NA Protection:** The settings and potential errors messages of the system and device protection are displayed.
Selection **>** Air filter Emergency Service	• **Air filter:** The time until the next filter replacement is displayed. • **Emergency:** The emergency power function can be enabled / disabled.

Selection **>** Emergency Service Version	• **Service:** Entering the password gives you access to the service menu. • **Version:** The current connection data (e.g. IP) and software versions are displayed.

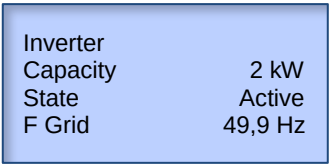
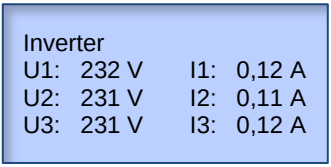
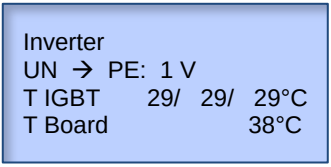
4.4.1 System

- You are in the selection menu.
- Use the *Up/down* keys to select *System*.
- Press *OK* to confirm your selection.
- You have access to the following menus:

System **>** Inverter Battery module	• **Inverter:** The operating values of the battery inverter can be read off. • **Battery module:** The operating values of the battery modules can be read off.

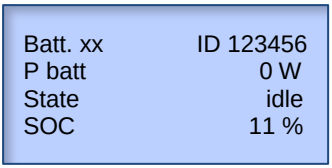
Inverter

- From the *System* menu, use the *Up/down* keys to select the *Inverter* sub-menu.
- Press *OK* to confirm.
- The following parameters can be read off:

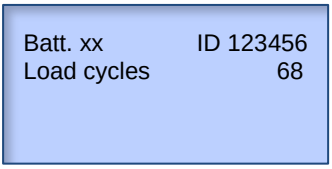
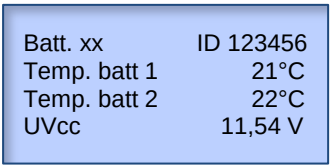
 	• **Capacity:** Power of the battery inverter in kW • **State:** Operating state of the battery inverter, e.g. *Active* • **F Grid:** System frequency in Hz • **U1 and I1** (U2 and I2 / U3 and I3): Voltage in V and current strength in A in the three phases
	• **UN → PE:** Voltage gradient between neutral conductor and protective conductor in V • **T IGBT:** Temperature of the transistors in the power part of the battery inverter • **T Board:** Electronic temperature in the battery inverter

Battery module

- From the *System* menu, use the *Up/down* keys to select the *Battery module* sub-menu.
- Press *OK* to confirm.
- The parameters for a battery module (no. *xx*) can be read off.
- Press the *Up/down* keys to switch between the battery modules.

	• **P batt xx:** Power of the selected battery module in W • **State:** Of the selected battery module, e.g. *charging, no load* • **SOC:** State of charge of the selected battery module

- Press *OK* to display further parameters for the selected battery module.

	• **Load cycles:** Number of load cycles for the selected battery module
	• **Temp. batt 1:** Temperature of cell string 1 • **Temp. batt 2:** Temperature of cell string 1 • **UVcc:** Voltage supply to the selected battery module

4.4.2 Energy balance

- From the Selection menu, use the *Up/down* keys to select the *Energy balance* menu.
- Press *OK* to confirm.

- The parameters for the energy balance can be read off. The measured values displayed by the energy counter of the energy supplier are binding for settlement.

Energie balance E Grid → Home 123 kWh E Grid ← Home 456 kWh E Inv → Batt 789 kWh Energie balance E Inv → Batt 789 kWh SOC 80%	• **E Grid → Home:** Energy supplied from the public grid to the building • **E Grid ← Home:** Energy supplied from the building to the public grid • **E Inv → Batt:** Energy supplied from the inverter of the storage system to the battery modules • **SOC:** State of charge of the overall system

4.4.3 NA Protection

- From the Selection menu, use the *Up/down* keys to select the *NA Protection* menu and press *OK* to confirm.
- The parameters for system and device protection can be read off.

NA Protection **>** NA Settings NA Errors	• **NA Settings:** The settings for system and device protection are displayed. • **NA Errors:** The last five grid and plant protection system errors are displayed.

4.4.4 Air filter

- From the Selection menu, use the *Up/down* keys to select the *Air filter* menu and press *OK* to confirm.
- The time until air filter replacement can be read off and/or reset.

Air filter Time to renew: 6000 hours	The air filter must be replaced after 6000 hours. • **Time to renew:** The number of hours remaining until the air filter replacement is displayed.

4.4.5 Emergency power function

- Use the *Up/Down* keys to select the *Emergency power function* menu option in the drop down menu and press *OK* to confirm.

Emergency power (enabled) **>** disable? Emergency power (disabled) **>** enable?	• The emergency power function can be enabled / disabled. • The *Enable emergency power function*? or *Disable emergency power function?* window will appear. • Press *OK* to confirm. • If you do not want to enable/disable the emergency power function, press the *Left* key.

! At power failure ! automatically ! voltage at the ! emergency circuit > OK?	• When the emergency power function is enabled, a hazard warning will appear. • Press *OK* to confirm.

4.4.6 Service

This area is reserved exclusively for qualified electricians certified by VARTA Storage GmbH.

4.4.7 Version sub-menu

- In the Selection menu, use the Up/down keys to select the Version sub-menu.
- Press *OK* to confirm.
- The versions are displayed:

ID: G008285 00-11-22-4a-cd-6f IP 192.168.10.228 FW V2.0.1 00-11-22-4a-cd-6f IP 192.168.10.228 FW V2.0.1 NA V1.0.1	• **ID:** Identifier (= serial number) for unique identification of the cabinet • **IP:** Network address • **FW:** Firmware version • **NA:** Software version of the NA Protection

4.5 Emergency power mode

4.5.1 Switching on emergency power mode in the event of a power failure

Automatic (default)

The VARTA family/home storage battery automatically switches to emergency power mode in the event of a power failure.
Note: emergency power mode presupposes that the storage battery is not flat.

Manual activation

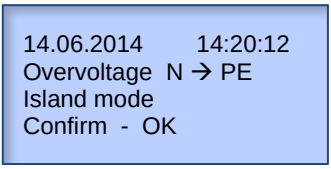
Manual activation of emergency power mode is required if the storage battery is to be switched on for the first time without a grid being available or if the storage system has switched off e.g. following an overload.

Manual activation of the storage battery requires the following steps:

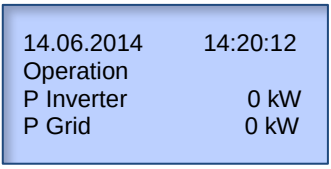
- Activate storage system using *On/Off* button on the control element (*button engaged*).
- Briefly press the Manual/Backup mode button.

4.5.2 Error messages in emergency power mode

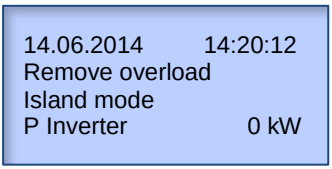
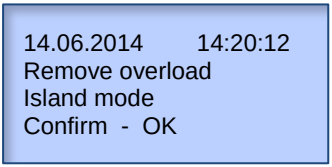
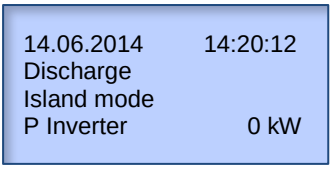
Voltage between neutral conductor and protective conductor too high

	• **Overvoltage N → PE:** voltage between neutral conductor and protective conductor is too high. The inverter switches off after this message and the fault is displayed for 30 s. • Press *OK* to acknowledge. • The storage battery restarts in emergency power mode.

Once the power failure is over, the following message appears on the display:

	• The main menu is displayed.

Overload

	• The inverter is switched off. • The storage battery tries to start up again.
	• Remove the overload and press *OK* to acknowledge. This display remains visible for 30 s.
	• The display indicates normal stand-alone operation.

If you do not press *OK* to confirm, the storage battery will switch off. Once the power failure is over, the storage battery switches back on.

	• The main menu is displayed.

4.6 Web interface

The web interface offers the option of configuring settings, and monitoring and controlling the energy storage system functions.

4.6.1 Access to the web interface

To access the web interface, you will need the serial number of the energy storage system. The serial number can be found on the rating plate on the outside of the cabinet. See also Figure 4 and Figure 5.

Connect your storage cabinet to the router of your home network by means of the network cable. The port (RJ45 socket) is located at the rear of the cabinet (see Figure 15).

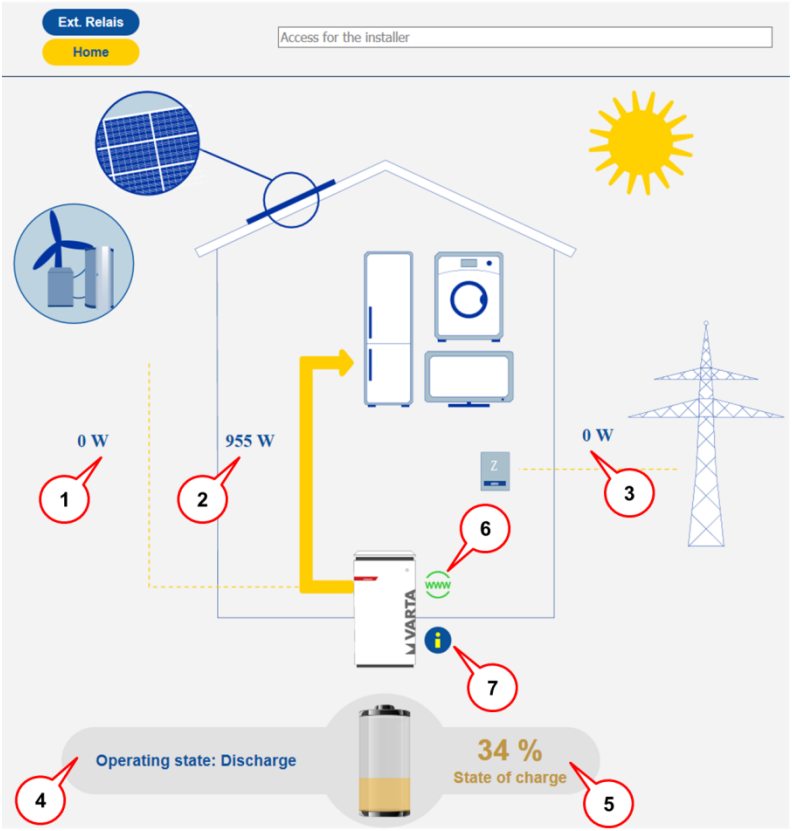
- Enter into the address line of your browser after http://varta the serial number of your energy storage system, e.g.:

  http://varta121023456

- The welcome page of the web interface will appear.

Access to the web interface also requires the browser to be refreshed.

The web interface is factory-tested in the stated versions of the following browsers: Firefox 36.0, Internet Explorer 10.0, Chrome 41.0 und Opera 28.0.



4.6.2 Information on the welcome page (Home)

The welcome page provides an overview of the current power values and the states of the energy storage system:

- **(1) Charge power of the battery inverter in Watt (W):** The energy storage system is charged to this power (power of the generating unit, e.g. PV system, CHP, less the direct internal consumption).

- **(2) Discharge power of the battery inverter in Watt (W):** The energy storage system is discharged to this power.
- **(3) Power of the grid supply/grid draw (W):** The power supplied into the public grid or drawn from the public grid is displayed.
- **(4) Operating state of the energy storage system:** The operating state, e.g. *Standby*, *Operating*, *Passive,* is displayed.
- **(5) The state of charge of the energy storage system in %:** The charge level of the energy storage system is displayed.
- **(6) WWW:** Indicates whether the energy storage system is connected to the VARTA server (green = online, red = offline).
- **(7) i:** Displays information about the storage system, e.g. IP address, energy counter or the most recent grid fault.

To see further explanations, move the cursor over the symbols.

4.6.3 Ext. relay (optional)

Via web interface an external relay can be individually programmed for controlling special functions, including switching loads or generating units on and off. Clicking the *Ext. relay* button shows the corresponding page.

This function is optional. A download available from www.varta-storage.com provides further information.

4.6.4 Portal (optional)

The www.varta-storage-portal.com portal serves to monitor and visualise the VARTA family/home energy storage systems. To ensure continuous data transmission, the router must not be switched off for longer than five days.

Access to the portal is activated once the "I wish to use the VARTA Storage Online Portal" prompt that appears during online login to the storage system is confirmed. A download is available from www.varta-storage.de for the online login to the storage system and for use of the portal.

Alternatively, you can tick the "I wish to use the VARTA Storage Online Portal" box on the warranty card and return it to VARTA Storage GmbH.

Use of the Online Portal is free-of-charge. The Internet connection costs must be paid by the customer. However, there is no entitlement to access the portal (see the Terms and Conditions for the Online Portal in the download area).

The data displayed on the VARTA Storage Portal cannot be used for computation purposes.

5 Instructions for maintenance and Cleaning

WARNING!

Potential mortal danger if maintenance work is carried out improperly!

Ensure that only qualified electricians certified by VARTA Storage GmbH carry out the maintenance work.

NOTICE!

Maintenance work that is not carried out correctly will cause physical damage!

All work on the VARTA family/home system is to be documented by the qualified electrician in the service book.

Only original parts are to be used for maintenance work.

5.1 Maintenance work

Maintenance of the VARTA family/home battery storage system comprises:

- Service (= inspection and maintenance)
- Repair and technical improvements and any additions.

To preserve the warranty entitlement (for handling warranty claims outside of Germany, Austria and Switzerland :), the first service is to be carried out within two years of the installation date. Subsequent servicing must be at three year intervals.

Retain the service book
together with the instruction manual.

5.2 Cleaning

WARNING!

Property damage from water impact!

Penetrating water can cause damage to the device for which VARTA Storage GmbH accepts no liability.

The operator can clean the outside of the battery storage system using a damp (not wet!) cloth. Solvents must not be used.

5.3 Instructions for disassembly and disposal

For disassembly and disposal of the battery storage system see Chapter 13.

6 Malfunction/Damage event

WARNING!

Potential mortal danger due to incorrectly executed troubleshooting!

Work on the VARTA family/home is reserved for qualified electricians certified by VARTA Storage GmbH.

In case of malfunction, contact a qualified electrician certified by VARTA Storage GmbH.

6.1 Malfunction displays

6.1.1 Malfunctions of the indicator lamps

The indicator lamps on the control element display malfunctions (see Chapter 4.1.1).

6.1.2 Malfunctions on the display

Malfunctions are described briefly in the main menu.

16.06.2014 14:06:20 No. of BM implausible P Inverter 2 kW P Grid 0 kW	• This example shows: "The number of battery modules is not plausible."

6.2 What to do in case of damage

WARNING!

Potential mortal danger from electric shock during fire fighting or due to flooding!

Turn off system and disconnect fuses!

Notify the fire service immediately in case of fire!

Inform the fire service that the VARTA family/home system contains lithium-ion batteries!

NOTICE!

Technical defects can damage the battery cells!

Turn off system and disconnect fuses in case of acrid odour or heat development!

Avoid sparks and naked flames!

Ventilate!

Contact a qualified electrician certified by VARTA Storage GmbH!

In case of fire, flooding or similar, loss can be limited by level-headed behaviour.

Installation

Note: this section is for qualified electricians certified by VARTA Storage GmbH.

7 Transport and storage

7.1 Transport

WARNING!

Failure to wear protective equipment while transporting and installing the system can cause injury!

Wear personal protective equipment while transporting and installing the system!

WARNING!

Potential mortal danger and property damage to components caused by incorrect transport!

Exercise caution when delivering and unloading the components!

- Observe the symbols on the packaging.
- The cabinet must not be moved if it already contains battery modules.
- Do not place any limbs below the device.
- Place the cabinet in the vehicle in a vertical position to prevent slippage.

- Secure the cabinet in the vehicle with retaining straps to prevent tilting.
- The cabinet should be transported by several persons. **VARTA home only:** If necessary use a hand cart. Due to the components located inside, the cabinet must not be placed on its back.
- Transport the cabinet and battery modules only in closed vehicles.
- Cabinet and battery modules must not be stored in the vehicle, especially during the winter.

Lithium-ion batteries constitute hazardous goods. The battery modules are constructed and tested such that they can be transported, up to a total weight of 333 kg, in compliance with the conditions of ADR 1.1.3.6 (transport without labelling requirement, insofar as no other hazardous goods are on or in the vehicle). The other requirements of the GGVSEB (Hazardous Goods Regulations for Road, Rail and Inland Navigation) and the ADR (European Agreement on the International Transportation of Dangerous Goods by Road) must also be satisfied. Delivery is made in certified hazardous goods packaging.

The lithium-ion batteries have been successfully subjected to the UN 38.3 Transport Test (UN Manual of Tests and Criteria, Part III, subsection 38.3), and have passed this test. The storage cabinet is packed separately from the battery modules.

Transport regulations and safety instructions:

- The VARTA family/home battery storage system must be transported by the manufacturer or by personnel so instructed by the manufacturer. The instructions must be documented and given repeatedly.

- A certified ABC fire extinguisher with a minimum capacity of 2 kg must be carried.
- Smoking ban in the vehicle and in the vicinity of the vehicle during loading and unloading!
- The outer packaging of a battery module must not be opened by either the vehicle driver or his co-driver.

When exchanging a battery module, request new hazardous goods packaging if required, pack the battery module and have it picked up by the supplier. The other requirements of the GGVSEB (Hazardous Goods Regulations for Road, Rail and Inland Navigation) and the ADR (European Agreement on the International Transportation of Dangerous Goods by Road) must also be satisfied. Delivery is made in certified hazardous goods packaging.

7.2 Packing/transport check

DANGER!

Mortal danger due to installing damaged components!

Never accept, and under no circumstances install, storage cabinet and battery modules in visibly damaged packaging.

Contact VARTA Storage GmbH!

Storage cabinet and battery modules are supplied in two separate packing units. The battery modules are individually packed and shipped in security boxes. The storage cabinet is shipped upright on a pallet. The installation engineer removes the packaging after installation.

Please examine the shipment for completeness and damage:

- If damage is evident even from the packaging, annotate this on the delivery documents and have the driver sign to confirm.
- Reject shipments in severely damaged packaging.

A ShockWatch® label is affixed to the outside of the packaging for detecting improper handling during transport. If the shock indicator goes red, the consignment has been exposed to strong vibrations.

- A storage cabinet may be damaged.
- Don’t reject the consignment!
- Annotate "Indicator red" on the transport note.
- Have all parts packed in the original packaging and demand a damage inspection by the shipper without delay.

Figure 7: ShockWatch® label

7.3 Storage

WARNING!

Incorrectly stored component causes property damage!

Store the components in accordance with the regulations!

The storage cabinet and the battery modules must be stored at a constant temperature (5–30 °C, the optimum being 18 °C) and in a dry environment.

NOTICE!

Condensate formation due to temperature differences!

Risk of corrosion and short circuit on the electronic components.

Speicherschrank und Batteriemodule so lagern, dass die Temperatur- und Luft-feuchtigkeitsgrenzen eingehalten werden!

- Storage cabinet and battery modules must not be stored outdoors.
- Storage cabinet and battery modules must not be temporarily stored in the transport vehicle.
- Avoid sudden temperature changes.

The battery modules must be commissioned by a qualified electrician certified by VARTA Storage GmbH no later than eleven weeks after delivery by the manufacturer.

8 Assembly and installation

WARNING!

Potential mortal danger due to installing damaged components!

Check the storage cabinet and battery modules for visible damage.

Do not install damaged components!

Contact VARTA Storage GmbH!

WARNING!

Potential mortal danger through improper installation and assembly!

Assembly and installation work is reserved for qualified electricians certified by VARTA Storage GmbH!

8.1 Requirements for the installation location

NOTICE!

Crushing injuries caused by incorrect installation and lack of space!

Place the cabinet in a position that will ensure, assuming proper use, safe assembly, operation and disassembly!

Do not place any limbs below the cabinet!

NOTICE!

Property damage from the effects of weather with indoor installations.

Install the storage cabinet only inside buildings!

8.1.1 Installation location and the surrounding area

The cabinet must not be installed in the following locations:

- at which temperatures may reach freezing point, such as garages, carports or other locations
- at which air humidity can exceed 80 % and condensation
- can penetrate the saline moisture
- flood areas
- earthquake zones – additional safety procedures are required in such areas
- that contain ammonia
- at heights of over 2000 meters
- potentially-explosive atmospheres
- exposed to direct sunlight
- that undergo major ambient temperature fluctuations
- wet areas (environment category 2)

8.1.2 Installation location

The installation location within the dwelling must have a minimum reserve of 70 cm x 45 cm (width x depth). The distance to the rear wall and to adjacent facilities must be approx. 5 cm. A depth clearance of approx. 120 cm is required in front of the device, since all installation and maintenance activities are carried out via the entrance door.

VARTA family:
A minimum clearance of 30 cm must be left above the storage cabinet so that the cooling air can escape from the device unhindered. This area must be kept clear.

VARTA home:
The clearance between the wall and the rear of the cabinet must remain free to enable cooling air to escape from the device unhindered. The service access cover must remain accessible at all times.

No objects may be placed on the top of the storage cabinet. A minimum of 30 m³ is recommended for the room in which VARTA family/home is installed.

A continuous air exchange must essentially be guaranteed, if necessary via forced ventilation, such as windows, air conditioning system, and ventilation system or similar. The clearance to the ventilation system must be at least 100 cm.

- The room temperature must always be between 5 °C and 30 °C, ideally approx. 18 °C.
- Recommended: well-ventilated room without external heat sources.
- Adequate rodent protection must be provided.

- The substrate, connecting walls and ceiling must not be made of heat-sensitive material.
- The installation location must conform to a pollution index of 2.
- Access to the shut-down functions must be guaranteed. The *On/Off* key must not be blocked.
- Smoking is prohibited at the installation location.

8.2 Warranty

For the warranty to be effective (to safeguard any warranty claims outside Germany, Austria and Switzerland), VARTA Storage GmbH must be in possession of the following data:

- Commissioning report (including date of commissioning)
- Serial number of the VARTA system. (The ID label for the system is affixed to the inside of the storage cabinet door.)
- Serial number(s) of the battery module/battery modules. (The ID labels for the battery modules are provided with the packaging.)

The installation engineer enters these data in the VARTA Storage GmbH installation engineer portal. Within four weeks of the installation date, the customer must register their data (name, address, email address, telephone number) at www.varta-storage-portal.com and enter the serial number of the VARTA system and the activation code. The installation engineer can also register the data, subject to the customer's consent.

- The activation code label is affixed to the inside of the storage cabinet door. This label is provided for the customer's personal records.

As an alternative to this procedure, the completed and signed warranty records (commissioning report and warranty card, together with the affixed ID label for the VARTA system and battery modules) can be sent to VARTA Storage GmbH within four weeks of the installation date.

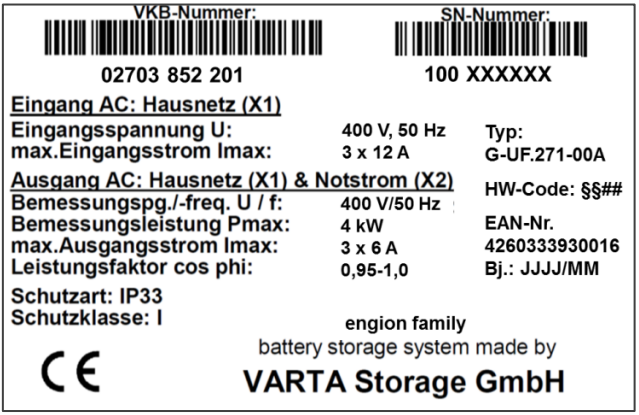


Figure 8: ID label for the system (inside the storage cabinet)

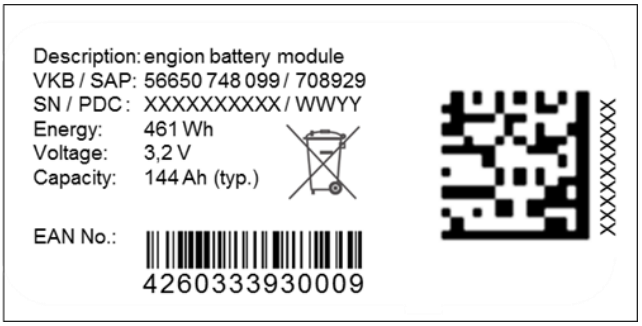


Figure 9: ID label for a battery module (provided with the packaging)

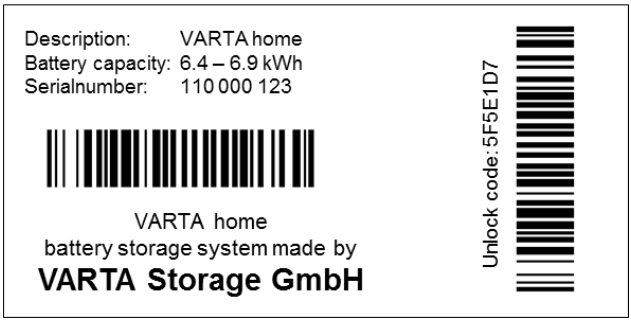


Figure 10: Activation code label (inside the storage cabinet)

8.3 Preparing the electrical connection

DANGER!

Mortal danger from electric shock!

Before working on electrical equipment, disconnect the fuses devices, secure to prevent reconnection and check the equipment has been disconnected from the power supply.

WARNING!

Even after a power failure, the emergency power supply's electrical circuits are still under electric tension.

Potential mortal danger from electric shock!

Before working on the emergency power supply system the VARTA family/home battery storage system must be switched off as well.

CAUTION!

Risk of injury and property damage if the electrical connections are incorrectly installed!

The fuse upstream of the battery storage system must be three-pole. This satisfies the requirements for an isolator.

Protect the device connection on the battery storage system with a type B, three-pole, 16-A fuse.

Observe the shut-off conditions in accordance with VDE 0100-410.

Install LS and FI for connecting the consumers entitled to the emergency power supply.

Never connect the battery storage system without PE and N.

NOTICE!

Property damage if the electrical connections are incorrectly installed!

During installation, respect the conductor cross-sections specified in the instructions!

A suitable interruption facility must be installed between power grid and customer plant (e.g. selective automatic cut-out 'SAC'), which can be used for all-poles disconnection of the customer plant from the grid during maintenance work.

The position of the interrupt facilities is marked in the connection diagrams (see Figures 2a/2b and 3a/3b in the Appendix).

8.3.1 Connections at the distributor

The following connections must be prepared:

- Device connection: 5 x min. 2.5 mm²
- Earth cable length: min. 10 mm²
- Sensor cable: RJ12
- Emergency power supply (optional): 5 x 1.5 mm²

Do not expose the RJ12 cable to mechanical load.

- LAN connection (optional)
- Control lines (optional)

To minimise losses, the cable run between storage system and connection must not exceed 20 m.

8.3.2 Current sensor

NOTICE!

Disruption to the charge and discharge function of the battery storage system due to interchanged phases!

Phases L1, L2, L3 must be identical for building connection, current sensor and terminal block. Executing the connection purely as a right-hand phase rotation is not sufficient.

For the own consumption optimisation mechanism to function, the current sensor must record all consumption and feed values.

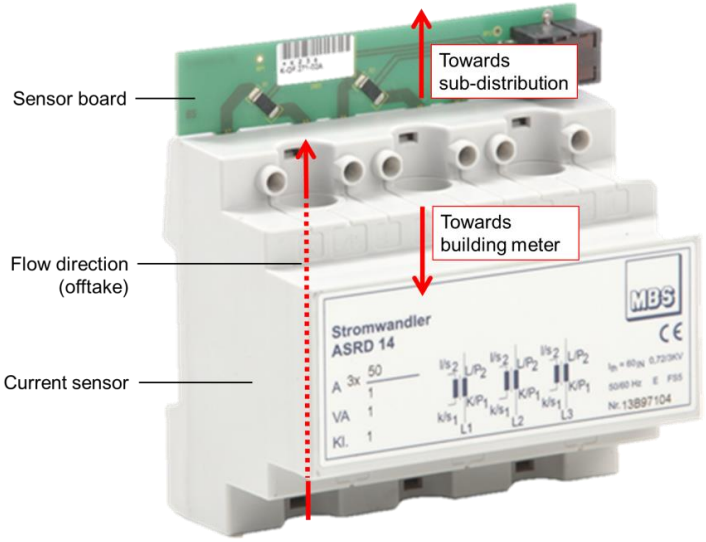


Figure 11: Current sensor - direction of installation

The sensor is therefore located immediately behind the consumption and feed meter. The current sensor is designed for top hat rail mounting and for a maximum current of 50 A per phase. For installation, the sensor board points towards the sub-distributor. For installation direction, see also Figure 11.

Phases L1, L2, L3 must be identical for building connection, current sensor and terminal block. This means, phase L1 of the building connection leads through opening L1 of the current sensor to terminal L1 on the terminal block in the storage cabinet.

The current sensor is connected to the battery storage system via the RJ12 cable supplied.

For the connection arrangement, see figures 2a/2b and 3a/3b in the attachment.

8.3.3 Emergency power mode

DANGER!

Mortal danger if medical devices are used!

In the event of a storage battery malfunction, no power is supplied to the consumers, both within the emergency power supply system and in hybrid operation.

Do not connect medical devices to the VARTA family/home emergency power supply system.

WARNING!

Even after a power failure, the emergency power supply's electrical circuits are still under electric tension.

Potential mortal danger from electric shock!

Before working on the emergency power supply system the VARTA family/home battery storage system must be switched off as well.

NOTICE!

Danger of physical damage if power supply is interrupted!

In the event of a storage battery malfunction, no power is supplied to the consumers, both within the emergency power supply system and in hybrid operation.

Do not connect information and communication technology devices (such as computers or network routers) and cooling systems to the VARTA family/home emergency power supply system.

Before working on the emergency power supply system, make sure that the *On/Off*-button on the control element is in the "*OFF*" position.

Figure 12: *On/Off*-button on the control element

The battery storage system's emergency power function allows selected consumers to continue in operation in the event of power failure. This ensures emergency lighting in a building, for example. The consumers entitled to the emergency power supply are typically specified in consultation with the VARTA Storage-certified electrician when the storage battery is installed.

The emergency power function must first be enabled on the display before it can be used. In the event of a power failure, the storage system automatically switches to emergency power mode.

Consumers which cannot operate on a current of 6 A in the start-up phase (1.5 s) cannot be operated in emergency power mode.

The consumers for the system part entitled to the emergency power supply can be connected to terminal X2 in the storage cabinet (see Figure 17 and Figure 16).

It is important to ensure that the connected consumers are wisely distributed across the emergency power supply. Switches and sockets of the system part entitled to the emergency power supply must be colour-coded. Generating plant must not be connected.

The integrated inverter (VARTA family: 4 kW, VARTA home: 2.1 kW) permits a maximum of 1.33 kW to be connected per phase.

- The storage battery's maximum available power depends on the number of battery modules and their charge state.
- The recommended power rating for the emergency power supply system is 100 W continuous output per battery module.
- This output can be apportioned asymmetrically up to a limit of 1.33 kW per phase.
- The maximum power differential between phases may not exceed 1 kW.
- The emergency power function may take approximately 5 s to become fully functional.

Emergency power supply fusing:

- Switches and power sockets of that part of the system entitled to the emergency power supply are to be colour coded.
- One type B6 fuse must be provided for each phase.
- Cables to the emergency power area in the sub-distribution unit must have a minimum cross section of 1.5 mm^2.

- The main earthing bus-bar must be fitted with an additional earthing cable with a cross-section of 10mm^2. The building earthing must meet the requirements of the generally valid standards and regulations.

For the connection arrangement, see figures 2a/2b and 3a/3b in the attachment.

- A type B (0.03 A) FI circuit breaker must be installed for emergency power mode, since the generation unit can generate DC components in case of malfunction.
  For the TN system, 0.2 s are required on the AC side and 0.4 s on the DC side; for the TT system, 0.07 s on the AC side and 0.2 s on the DC side.

- The FI fuse must be tested to ensure correct function as defined by DIN VDE 0100-410, Table 41.1.

Affix the enclosed warning label so as to be easily visible on the distributor to which the battery storage system is connected (see Figure 13).

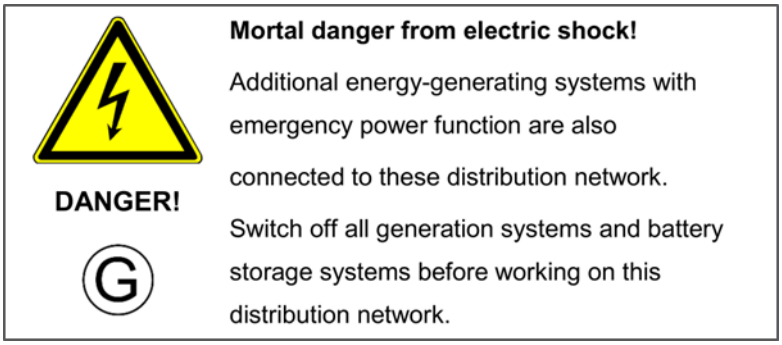


Figure 13: Warning label

8.4 Preparing for assembly

Make sure that the substrate is adequately load-bearing, have the structural analysis checked if necessary. The preconditions for mechanical assembly at the installation location are as follows:

- an even surface
- any unevenness compensated
- fixing dowels selected to match the wall
- a wall without lines running in front or inside

The technical requirements for the storage cabinet connection must be satisfied by a qualified electrician certified by VARTA Storage GmbH.

8.5 Installing the storage cabinet

WARNING!

Potential mortal danger due to incorrect fastening of the storage cabinet!

Make sure that the storage cabinet is adequately fastened!

- The cabinet weighs 110 kg (VARTA family) / 90 kg (VARTA home)! → It must always be assembled by two or more people!
- Tilt cabinet by maximum 45° at the installation location → Risk of slipping away!
- Position cabinet at the installation location.

8.5.1 Installing VARTA family

The storage cabinet is supplied with four crane eyes. This facilitates transport within the building. The crane eyes are replaced by supplied screws. The fastening bracket is fixed by the two rear screws.

- Set the screw feet to a height of approx. 4 cm (max. 5 cm).
- Align the storage cabinet using a spirit level. A fine adjustment can be made using the screw feet.
- Fasten the cabinet to the wall using the fastening brackets.

8.5.2 Installing VARTA home

- Remove service cover. Do this by removing the screws on the spacers to the wall and pushing back the cover.

Figure 14: Opening service area

- Push cables through the cable bushings at the rear of the cabinet and guide approx. 10 cm to the terminal block.
- Screw the cable bushings tight.

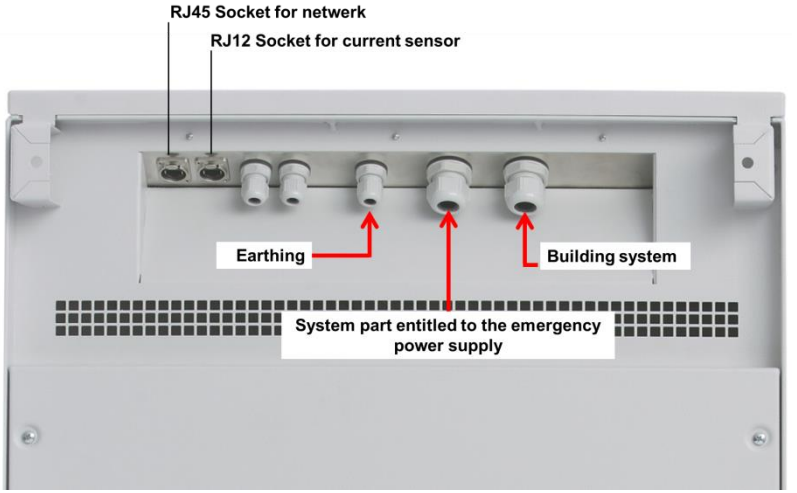


Figure 15: Cable bushings and RJ connections

- Align the storage cabinet using a spirit level. A fine adjustment can be made using the screw feet.
- Optionally, the storage cabinet can be fastened to the wall from inside using two screws (Ø 8 mm) and anchor bolts.

8.6 Electrical connection of the cabinet

DANGER!

Mortal danger from electric shock!

Before making the electrical connection, switch off the storage cabinet at the control element.

At the electrical equipment, disconnect the fuses, secure to prevent reconnection and check the equipment has been disconnected from the power supply.

- **VARTA family only:** Pull the cables through the rubber grommets on the cabinet floor.
  Make sure that the power cables are pulled through the left grommets and the control cables through the right grommets. → Must be tight.

Property damage from penetrating dust!

Only pre-cut the grommets, do not cut open or out.

NOTICE!

- Cut cables to length. When stripping the cables, make sure that the strip length is approx. 9–10 mm.
- Clamp cable in the cabinet.

  VARTA family: the terminal block is situated in the vicinity of the base of the cabinet.

  VARTA home: the terminal block is situated in the service area of the cabinet.

Mortal danger from connected voltage!

Nothing may be connected to the terminals shown as placeholders.

DANGER!

Property damage from residual current!

Do not interchange L and N conductors!

NOTICE!

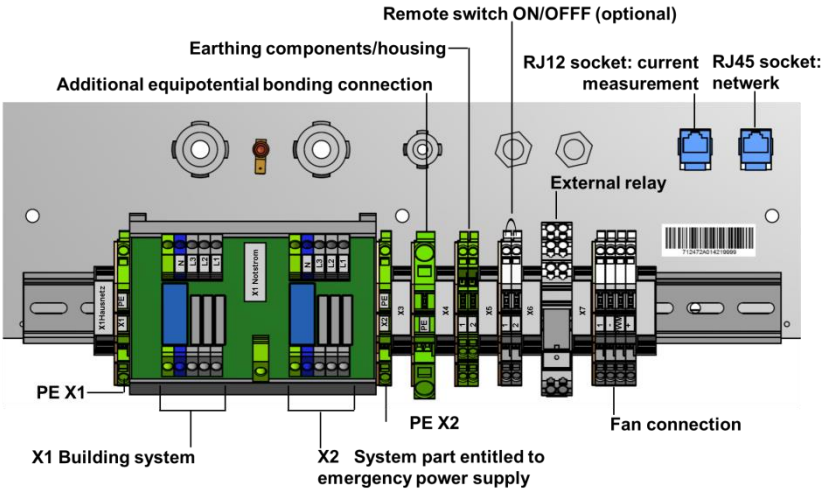


Figure 16: Terminal block and terminal layout – VARTA home

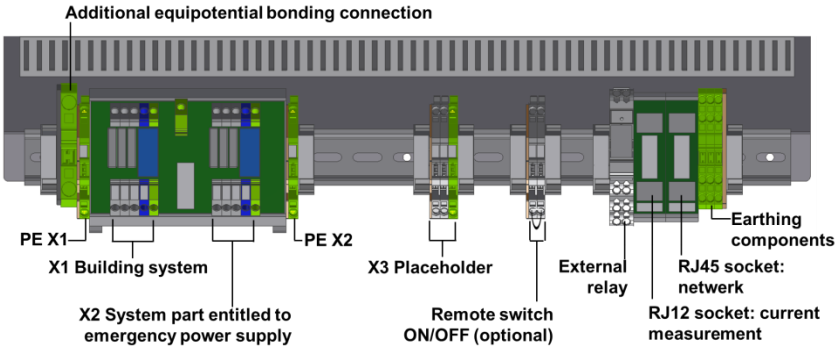


Figure 17: Terminal block and terminal layout – VARTA family

Connectible conductor cross-section, fine-wire, with or without wire end ferrule	to 4.0 mm^2
Connectible conductor cross-section, single-wire	to 4.0 mm^2
Execution of electrical connection	Spring balancer connection
Connection position	inclined
Colour of conductors L1, L2, L3	brown, black, grey
Colour of N conductor	blue
Colour of PE conductor	yellow-green

Table 10: Terminal characteristics

8.7 Assembling the battery modules

DANGER!

High voltage! Mortal danger from electric shock!

The battery contacts can remain under voltage for up to 3 min. after switch-off.

Never reach into the battery module compartment!

The storage cabinet must be switched off for 3 min. every time a battery module is installed or removed.

8.7.1 Opening and closing the cabinet

VARTA family: a cylinder key is needed to open and close the cabinet. This is given to the qualified electrician upon certification.

VARTA home: to open or close the cabinet, rotate the lever in the service area upwards or to the side.

Figure 18: Releasing door lock

8.7.2 Assembly steps

- Make sure that the *On/Off* key on the control element is set to "*Off*" (see Figure 21).
- Unpack the battery modules.

Do not damage or remove the label bearing the DATAMATRIX code from the battery module.

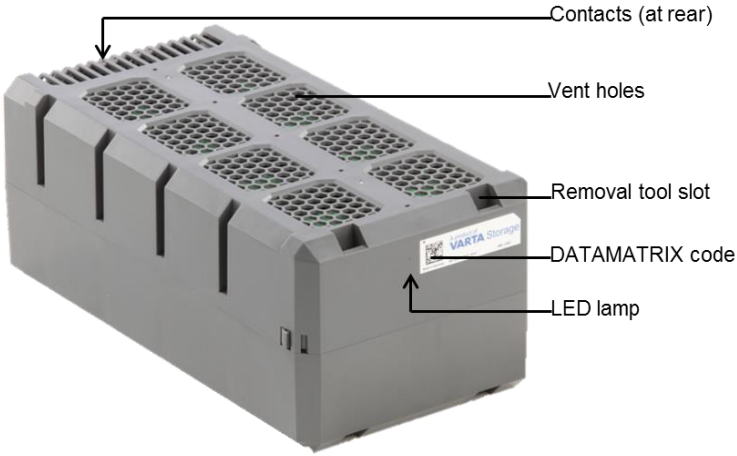


Figure 19: VARTA family/home Battery module

- Battery modules must not be/become damaged or contaminated.

NOTICE!

Property damage from penetrating foreign bodies!

No foreign bodies may penetrate the battery modules.

- For the installation sequence, observe Figure 20!
- Completely assemble the uppermost row.
- Assembly all subsequent rows without interruption.
- The last row may be incomplete.

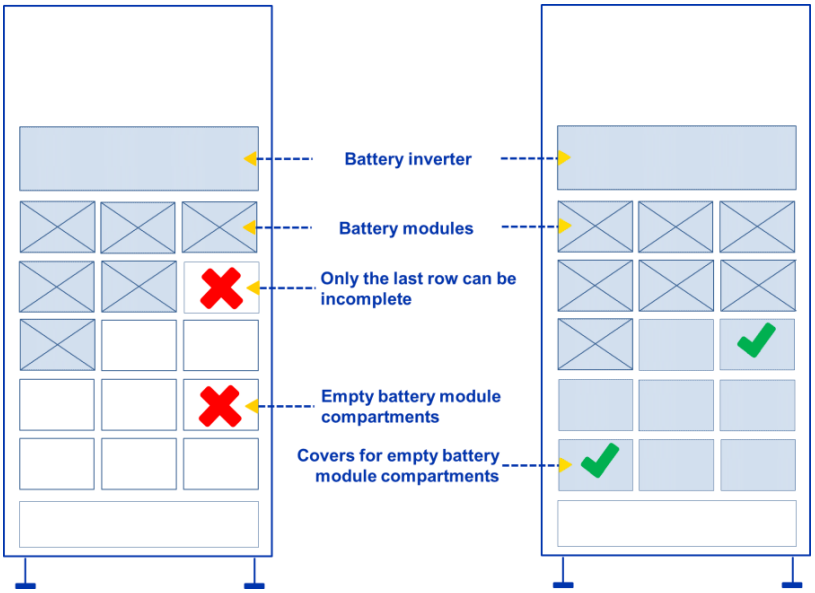


Figure 20: left: incorrectly assembled cabinet; right: correctly assembled cabinet

- The battery modules are constructed so that they can be inserted into the battery module compartments in one position only.
- Make sure the battery modules are inserted in the correct position, thereby preventing damage to the installation locks.
- Push the battery modules into the compartment until the locks engage.
- Do not apply force.

NOTICE!

Property damage from incorrect contacts!

Do not bend the contacts at the rear of the battery module compartment!

- Empty battery module compartments must be fitted with the battery module compartment covers supplied immediately (see Figure 20).

DANGER!

High voltage! Mortal danger from electric shock!

The battery module compartments are live during operation and for 3 min. after switch-off.

The device must not be operated with the battery module compartments open.

- To remove battery module compartment covers, carefully push the snap hooks down using a slotted screwdriver. This loosens the cover and allows it to be removed.

8.7.3 LED on the battery module

The LED on the battery module illuminates in different ways to indicate the state.

Off/standby	LED does not illuminate
Ready	LED flashes *green* (short interval)
Charging	LED flashes *orange* (long interval)
Discharging	LED flashes *green* (long interval)
Error	LED illuminates *red* continuously
Service	When a module is selected in the *Service* menu, the LED flashes *red-green* (short interval)

Table 11: LED on the battery module - overview

8.7.4 Close storage cabinet

- If contamination accumulates inside the cabinet, vacuum out the cabinet. Do not use water for cleaning.
- Once the storage cabinet is assembled, close the doors.

Do not leave any tools in the cabinet!

VARTA family only:

The cylinder key does not remain with the end customer.

8.8 Commissioning

Potential mortal danger and property damage if commissioning is performed by inadequately qualified personnel!

WARNING! Commissioning installation work is reserved for qualified electricians certified by VARTA Storage GmbH!

8.8.1 Switching on

The following steps are required to switch on the VARTA family/home battery storage system:

- Connect the fuse at the building system.
- Switch on storage system using the *On/Off* key on the control element.

Figure 21: Control element

- Wait for the system to initialise: The four indicator lamps on the display and the LEDs on the charge state indicator on the cabinet door illuminate briefly twice. A beep sounds at the same time.
- Tapping the control key switches on the display and the main menu is displayed.

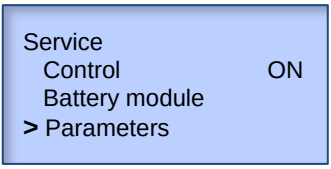
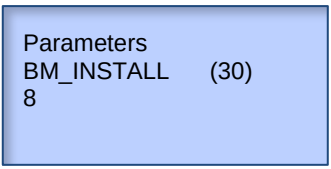
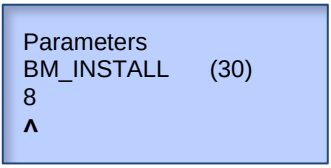
8.8.2 Access to the password-protected area

Certain parameters may be changed only by trained, qualified personnel, and not by the operator!

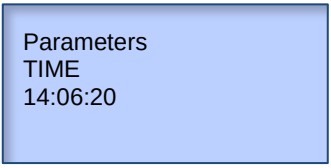
Selection Emergency **>** Service Version	• Press the *OK* key in the main menu. • The selection menu opens. • Use the *Up/down* keys to select the *Service* sub-menu. • Press *OK* to confirm. • The *Enter password* window opens.
Password _ _ _ _ **^**	• Enter the password. • Use the *Up/down* keys to enter the numbers! Use the *Left/right* keys to move the arrow. • Press *OK* to confirm. • The *Service* sub-menu appears.

8.8.3 Entering the number of battery modules

The number of battery modules installed must be entered into the system.

	• You are in the *Service* menu. • Use the *Up/down* keys to select the *Parameters* sub-menu. • Press *OK* to confirm.
	• From the *Parameters* menu, select *BM_INSTALL*. • Press *OK* to confirm.
	• Use the *Up/down* keys to enter the numbers. • Press *OK* to confirm.

8.8.4 Setting the time

	• You are in the *Parameters* sub-menu. • Use the *Up/down* keys to select *TIME*. • Press *OK* to confirm.

Parameters TIME 14:06:20 ^	• The window for entering the time will appear. • Use the *Up/down* keys to enter the numbers. Use the *Left/right* keys to move the position of the arrow (hours:minutes:seconds). • Press *OK* to confirm.

8.8.5 Setting the date

Parameters DATE 14.06.2014	• You are in the *Parameters* sub-menu. • Use the *Up/down* keys to select *DATE*. • Press *OK* to confirm.
Parameters DATE 14.06.2014 ^	• Use the *Up/down* keys to enter the numbers! Use the *Left/right* keys to move the position of the arrow (day:month:year). • Press *OK* to confirm.

8.8.6 Country code NA Protection

The NA protection settings have to be adjusted to the requirements of the country in question.

Check country code

NA Protection NA Settings NA Errors **>** Change country	• From the Selection menu, use the *Up/down* keys to select the *NA Protection* menu and press *OK* to confirm. • Use the *Up/Down* keys to select *Change country* and press *OK* to confirm.
Change Country Current DE New DE **>** OK	• The Change country submenu will appear. • If you do not want to change the setting (DE = Germany, AUT = Austria), press the *Left* key.

To change the country code and NA protection settings see Chapter 9.2.7.

8.8.7 Portal connection (optional)

The portal offers the option of displaying the system parameters graphically and viewing error messages and faults. To ensure continuous data transmission, the router must not be switched off for more than six days.

Once the customer has signed the warranty card and ticked "I would like the VARTA Storage GmbH online service", the VARTA

family/home system can be activated for the portal (www.varta-storage-portal.com).

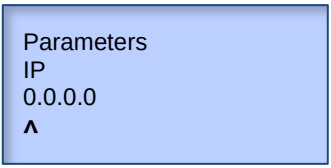
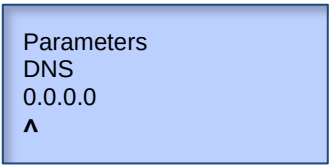
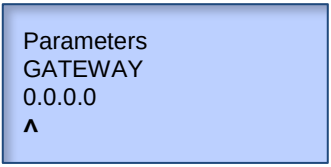
To connect to the portal, attach the RJ45 socket in the terminal block to the customer network router. To do so, use the Ethernet patch cable. Figure 17 and Figure 16 show the connection for the external LAN. If you are unable to connect the VARTA family/home to the network router using the network cable, data can also be transmitted via power line (not included in the scope of supply).

The DHCP protocol of the VARTA family/home system enables the customer network parameters to be read out automatically (IP address, DNS address, Gateway address).

If the parameters are not read out automatically, refer to the instructions for the network router. With standard DSL routers, DNS and gateway address are usually identical. With company systems, they can differ. Release of ports 4500, 21 and 37 is also required for the connection (does not apply for all users).

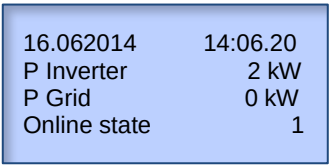
On the control element of the VARTA family/home battery storage system, the following steps are carried out in the password-protected area to connect to the portal:

Service Control ON Battery module **>** Parameters	• From *Service*, select the *Parameters* sub-menu. • From *Parameters*, select *IP*. • Press *OK* to confirm.

	• Use the *Up/down* and the *Right/left* keys to enter the IP address. • Press *OK* to confirm.
	• From *Parameters*, select *DNS*. • Use the *Up/down* and the *Right/left* keys to enter the DNS address. • Press *OK* to confirm.
	• From Parameters, select GATEWAY. • Use the *Up/down* and the *Right/left* keys to enter the Gateway address. • Press *OK* to confirm.

Checking the online state

Once the portal connection has been established, it is necessary to check the online status.

	• Return to the main menu. • Press the *Down* key. • You are at the *Online state* parameter (0 = not connected, 1 = connected).

8.9 Checking the connections

Once the battery storage system has been installed and connected, it is necessary to check whether the system signals a current flow in all three phases (plausibility). This is done by checking the three measured values from the current sensor for plausibility in the *Inverter* sub-menu.

System **>** Inverter Battery module	• From the *System* menu, select the *Inverter* sub-menu. • Use the *Up/down* keys to activate parameters IV1, IV2 and IV3.
Inverter IV1: + 3,1 A IV1: - 1,3 A IV1: - 1,8 A	• Check the values for plausibility. • Check the current flow through all three phases, using the current probe if necessary.

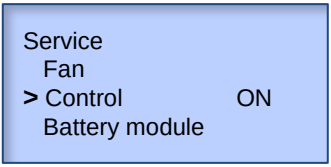
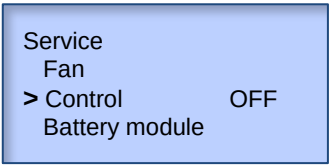
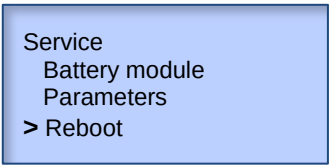
The system may need to be loaded with a large consumer in all three phases.

8.10 Exiting the password-protected area

8.10.1 Reboot

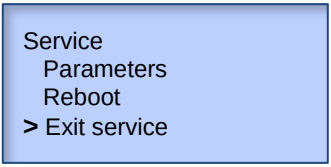
After changing settings in *Parameters*, a reboot must be performed subsequently.

Before the system is restarted, the control must be switched off.

 	• From the *Service* menu, use the *Up/down* keys to select the *Control* menu option. • Press *OK* to confirm. • Use the *OK* key to switch between *Control ON* and *Control OFF*.
	• From the *Service* menu, select the *Reboot* option and press *OK* to confirm. • You are in the *Selection* menu. Select the *Control* menu option and press *OK* to switch to *Control ON*.

8.10.2 Exit service

Finally, it must be ensured that the customer does not have access to the password-protected area.

	• In *Service*, use the *Up/down* keys to select the *Exit service* parameter and press *OK* to confirm. • The control exits the password-protected area.

Operation (password-protected area)

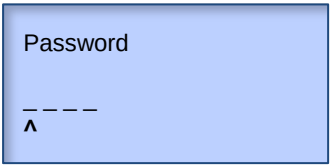
Note: this section is for qualified electricians certified by VARTA Storage GmbH.

9 The password-protected area

9.1 Entering the Password

Certain data is not visible to the end customer and is password-protected.

- From the Selection menu, use the *Up/down* keys to select the *Service* menu.
- Press *OK* to confirm.
- Enter the password and press *OK* to confirm.

	• Use the Up/down keys to enter the numbers, and the Right/left keys to move the arrow. • Once the correct password has been entered, the Service menu opens.

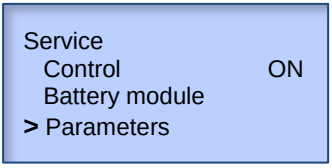
9.2 Service

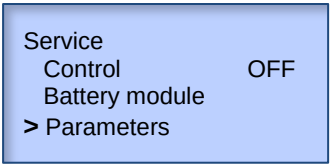
The following menu options can be controlled using the *Up/down* keys:

Service Error history Air filter **>** Fan 0	• **Error history:** Error messages can be called up and deleted. • **Air filter:** The time until air filter replacement can be reset. • **Fan:** The characteristics of the fan can be set manually.
Service Control ON Battery module **>** Parameters	• **Control:** The control by the energy management system can be switched on and off manually. • **Battery module:** The battery modules can be charged and/or discharged manually.
Service Parameters Reboot **>** Exit service	• **Parameters:** The system settings are displayed and can be changed. • **Reboot:** A restart can be initiated here. • **Exit Service:** Access to the password-protected area can be ended.

9.2.1 Control

- When the control is switched on, the *Service* menu displays the *Control on* menu option.
- Use the *Up/down* keys to move the arrow to *Control ON*.
- Pressing the *OK* key allows you to switch between *Control OFF* and *Control ON.*





- **Control:** The control by the energy management system can be switched on and off manually.

9.2.2 Battery module

- In the *Service* menu, use the *Up/down* keys to select the Battery module sub-menu.
- Press *OK* to confirm.
- Select Discharge all or Stop process and press *OK* to confirm.

Battery module **>** Discharge all Stop process	• **Discharge all:** The battery modules are discharged to a defined power. • **Stop process:** Discharging is stopped.

9.2.3 Error memory

- In the *Service* menu, use the Up/down keys to select the *Error history* sub-menu.
- Press *OK* to confirm.
- Select *Show errors* or *clear error list* and press *OK* to confirm.

Error history **>** Display errors Clear error list	• **Display errors:** Number and type of errors are displayed. • **Clear error list:** The *Delete errors* sub-menu is opened.
Clear error list? **>** No Yes	• **No/Yes:** If you confirm *Yes*, the error messages will be deleted.

9.2.4 Air filter

- From the Selection menu, use the *Up/down* keys to select the *Air filter* menu and press *OK* to confirm.
- The time until air filter replacement can be reset.

Air filter Time to renew: 6000 hours OK - Reset	• **Time to renew:** The number of hours remaining until the air filter replacement is displayed. • **OK - Reset:** After a reset, the number of hours from 6000 are counted down.

9.2.5 Fan

- In the *Service* menu, use the *Up/down* keys to select the *Fan* menu option.
- Pressing the *OK* key allows you to switch between *Fan 1, Fan 2* and *Fan 0.*

Service Error history Air filter **>** Fan 0 Service Error history Air filter **>** Fan 1	• **Fan 0:** The fan runs automatically. • **Fan 1:** The fan runs with mid-range output. • **Fan 2:** The fan runs with full output.

9.2.6 Parameters

- From *Service*, select the *Parameters* sub-menu.
- Press *OK* to confirm.
- An overview appears showing all system parameters that can be changed manually.
- Enter any changes using the arrow keys and press *OK* to confirm.

Parameters IP 0.0.0.0 ^	• **IP:** Network address • **VPN_EN:** Switch on/off VPN server (Virtual Private Network) • **VPN_SERV:** VPN (Virtual Private Network) server address Other parameters are explained in Figure 1b in the Attachment.

9.2.7 Grid parameters (in the parameters menu)

The power factor cos φ is set to 0.95 in the factory. This may have to be adjusted as specified by the relevant grid operator.

cos φ entry procedure

Parameters QFKT (1) 1 Parameters QFKT (1) 0 ^	• In Parameters, use the *Up/down* keys to select the *QFKT* menu option and press OK to confirm. • To enter cos φ, select: 0 = manual 1 = as per Q(P) characteristic 2 = as per Q(U) characteristic • Press *OK* to confirm.

Manual setting of the cos φ

- In *Parameters* enter the value 0 for *QFKT*.
- In *Parameters*, select the *QMAN* menu option.

Parameters QMAN (0) 0 ^	• Use the *Up/Down* keys to enter the power factor according to Table 12. • Press *OK* to confirm.

Attention must be paid to the following table when inputting the cos φ:

	Target value for cos(phi)	Inverter setting
Under-excited	0,95	-50
	0,96	-40
	0,97	-30
	0,98	-20
	0,99	-10
	1,00	0
Over-excited	0,99	10
	0,98	20
	0,97	30
	0,96	40
	0,95	50

Table 12: Grid parameter settings

Setting as per Q(P) characteristic

You will find the settings for *QPX1* and *QPX2* in Figure 22. Table 12 provides the settings for *QPY1* and *QPY2*.

Parameter	Meaning
QPX1	Starting point of the Q(P) characteristic on the power axis. The parameter is entered in %. Example: QXP1 = 50 → The characteristic begins at 50% of the rated maximum power.
QPY1	Power factor at the start of the Q(P) characteristic. The setting is to be found in Table 12. Normally the power factor is at the beginning of the characteristic 1. According to the table that means that the value 0 is to be set for QPY1.
QPX2	End point of the Q(P) characteristic on the power axis. The parameter is entered in %. Example: QPX2 = 90 → The characteristic ends at 90% of the rated maximum power.
QPY2	Power factor at the end of the Q(P) characteristic. The setting is to be found in Table 12. Normally the power factor at the end of the characteristic is 0.95 under-excited. According to the table that means that the value - 50 is to be entered for QPY2.

Table 13: Setting as per Q(P) characteristic

- In *Parameters* enter the value 1 for *QFKT*.
- In *Parameters* set the menu options *QPX1*, *QPY1*, *QPX2* and *QPY2*.

Parameters QPX1 (50) 50 ^	• Use the *Up/Down* keys to enter the respective values for the Q(P) characteristic. • Press *OK* to confirm.

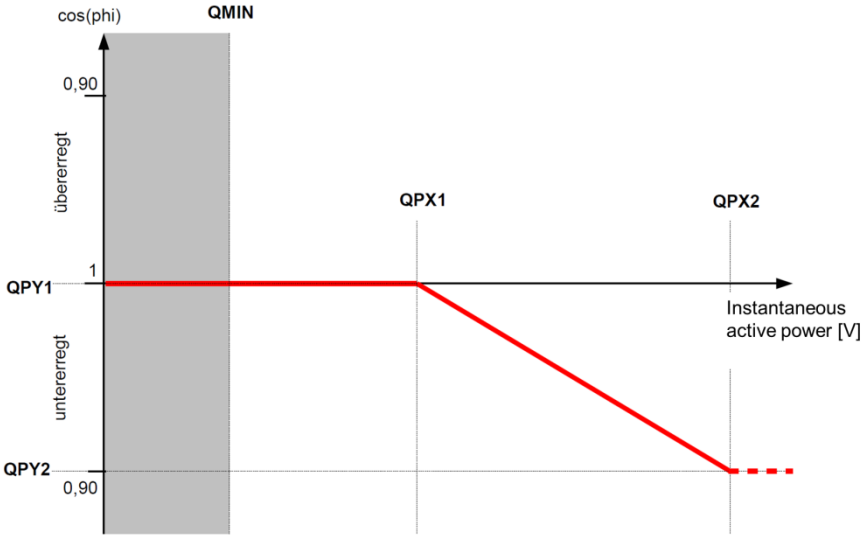


Figure 22: Q(P) characteristic

Setting as per Q(U) characteristic

Extract the settings for *QUX1* to *QUX4* in Figure 23. Table 12 provides the settings for *QUY1* to *QUY4*.

Parameter	Meaning
QUX1	Start of the first section of the Q(U) characteristic on the voltage axis. The parameter is entered in V. Example: The characteristic begins at 190 V → the value of QUX1 is 190.
QUY1	Power factor at the start of the Q(U) characteristic. If the grid voltage falls below the value defined by QUX1, the characteristic is limited to the value set in QUY1. The setting is to be found in Table 12.
QUX2	End of the first section of the Q(U) characteristic on the voltage axis. The parameter is entered in V. Example: The first section of the characteristic ends at 220 V → the value of QUX2 is 220.
QUY2	Power factor at the end of the first section of the Q(U) characteristic. If the grid voltage increases beyond the value defined by QUX2, the characteristic is limited to the value set in QUY2. The setting is to be found in Table 12. Normally the parameter is set to 0, i.e. no reactive power is produced.
QUX3	Start of the second section of the Q(U) characteristic on the voltage axis. The parameter is entered in V. Example: The characteristic begins at 235 V → the value of QUX3 is 235.
QUY3	Power factor at the start of the Q(U) characteristic. If the grid voltage falls below the value defined by QUX3, the characteristic is limited to the value set in QUY3. The setting is to be found in Table 12. Normally the parameter is set to 0, i.e. no reactive power is produced.
QUX4	End of the second section of the Q(U) characteristic on the voltage axis. The parameter is entered in V. Example: The second section of the characteristic ends at 240 V → the value of QUX4 is 240.
QUY4	Power factor at the end of the first section of the Q(U) characteristic. If the grid voltage increases beyond the value defined by QUX4, the characteristic is limited to the value set in QUY4. The setting is to be found in Table 12.

Table 14: Setting as per Q(U) characteristic

- In *Parameters* enter the value 2 for *QFKT*.
- In *Parameters* set the menu options *QUX1*, to *QUX4* and *QUY1* to *QUY4*.

Parameters QUX1 (218) 218 ^	• Use the *Up/Down* keys to enter the respective values for the Q(U) characteristic. • Press *OK* to confirm.

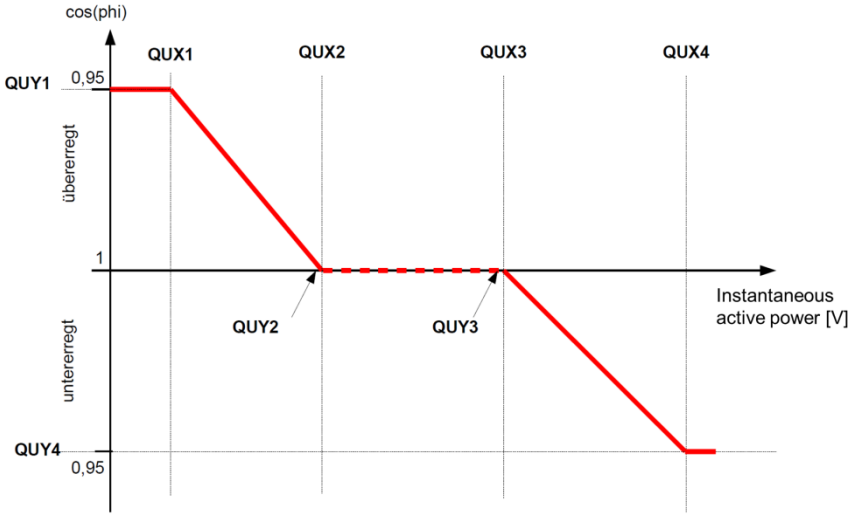


Figure 23: Q(U) characteristic

When setting the parameters, the following condition must be adhered to:

QUX1 ≤ QUX2 < QUX3 ≤ QUX4

Setting the control time

The *QTIME* parameter sets the period of time after which the reactive power is controlled.

- In *Parameters*, select *QTIME*.

Parameters QTIME (20) 20 ^	• Use the *Up/down* keys to enter the time in s and press *OK* to confirm.

Setting the lower limit

The *QMIN* parameter sets the limit beyond which the reactive power is controlled.

- In *Parameters*, select *QMIN*.

Parameters QMIN (20) 20 ^	• Enter the power in %. • Press *OK* to confirm.

Changing the NA protection settings

Changing the settings presupposes that the selected country's default values are held (see Table 15).

- In Parameters, select the grid parameters *FNETZ_MIN, FNETZ_MAX, UNETZ_MIN, UNETZ_MAX* and *UNetz_MAX10.*

Parameters FNETZ_MAX (5150) 5150 ^	• Use the Up/down keys to enter the numerical values. • In each case, press *OK* to confirm.

9.2.8 Reboot

After changing settings in *Parameters*, a reboot must be performed subsequently.

Before the system is restarted, the control must be switched off.

- From the *Service* menu, use the *Up/down* keys to select the *Control* menu option.
- Press *OK* to confirm.
- Use the *OK* key to switch between *Control on* and *Control off*.
- From the *Selection* menu, select the *Reboot* option and press *OK* to confirm.

Service Battery module Parameters > Reboot	• **Reboot:** The control element restarts. • You are in the *Selection* menu. Select the *Control* menu option and press *OK* to switch to *Control ON*.

9.2.9 Exit service

- From the *Service* menu, use the *Up/down* keys to select the *End service* option.
- Press *OK* to confirm.

Service Parameters Reboot **>** Exit service	• **Exit service:** Exits the password-protected area. The password must be re-entered to be able to view and change the data in the service menu again.

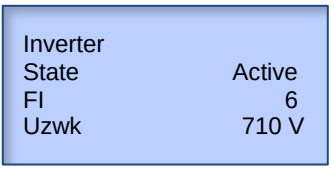
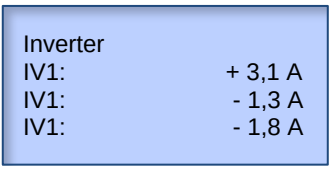
9.2.10 Additional menu options in the password-protected area

Additional menu options in the operating menu can be selected when the password is entered.

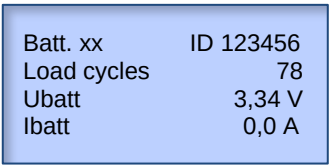
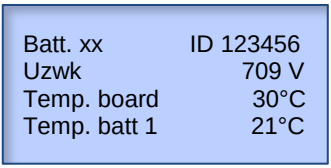
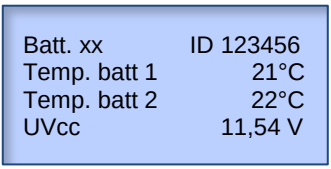
Main menu

16.062014 14:06.20 P Grid 0 kW EMS: normal Online state 1	• **EMS:** Energy management system mode (normal = automatic/own consumption optimisation, 0 = off). In *normal* mode, the EMS controls charging and discharging itself.

Inverter

 	• **FI:** Ground fault circuit interrupter • **Uzwk**: Voltage of the intermediate circuit • **IV1 (IV2 und IV3):** Measurement results of the current sensor in the current system

Battery module

 	• **Ubatt:** Cell voltage • **Ibatt:** Actual current in selected battery module • **Uzwk:** Voltage of the intermediate circuit at the selected battery module • **Temp. board:** Temperature of the electronics in the selected battery module in °C
	• **Temp. batt 1:** Temperature of cell string 1 • **Temp. batt 2:** Temperature of cell string 1 • **UVcc:** Voltage supply to the selected battery module

NA Protection

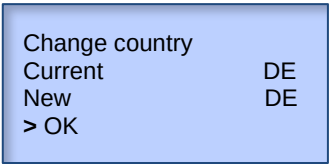
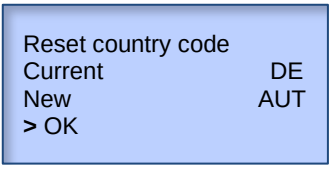
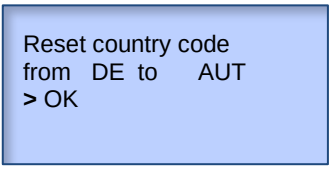
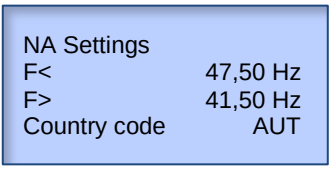
NA Protection NA Settings NA Errors **>** Change country	• **Change country:** the NA protection settings have to be adjusted to the requirements of the country in question.

When the country code is changed the default settings are applied in accordance with Table 15. This presupposes that the selected country's default values are held. For changing the NA protection settings, see Chapter. 9.2.6.

Grid parameters	Germany (DE)	Austria (AUT)
FNETZ_MIN	47,50 Hz	47,50 Hz
FNETZ_MAX	51,50 Hz	51,50 Hz
UNETZ_MIN	184 V	184 V
UNETZ_MAX	264 V	264 V
UNETZ_MAX10	253 V	258 V

Table 15: Default grid parameter settings (explanation of parameters in Annex 1b)

Change country

	• Use the *Up/Down* keys to change country in the NA protection submenu and press *OK* to confirm. • The *Country* submenu will appear.
	• Use the *Up/Down* keys to switch between country codes (e.g. DE = Germany, AUT = Austria). • Press *OK* to confirm.
	• The *Reset country code* window will appear. • Press *OK* to confirm.
	• The current *NA Settings* are displayed.

Maintenance

Note: this section is for qualified electricians certified by VARTA Storage GmbH.

10 Maintenance basics

10.1 Safety instructions

WARNING!

Potential mortal danger if maintenance work is carried out improperly!

Only qualified electricians certified by VARTA Storage GmbH are permitted to carry out maintenance work.

Ensure the work place is clean!

Loose parts can cause accidents!

NOTICE!

Maintenance work that is not carried out correctly will cause physical damage!

All work on the VARTA family/home system is to be documented by the qualified electrician in the service book.

Only original parts are to be used for maintenance work.

The instruction manual is to be followed for all work on the VARTA family/home system.

- Make sure adequate space is available for assembly.
- Do not place any limbs in narrowing spaces.
- Switch off the system before starting work.
- Once all work is complete, restore connections and attachments to a clean condition.
- Make sure nobody is in the hazard zone before connecting the power supply.

No work on the storage system shall be permitted unless the system is switched off and no voltage is present. Both the device's 16 A mains fuse and emergency power connection 6 A fuses must be enabled.

10.2 Scope of maintenance

Maintenance of the VARTA family/home battery storage system comprises:

- Service (= inspection and maintenance).
- Repair and technical improvements and any additions.

For documentation of maintenance see Chapter 5.1.

11 Service and repair work

11.1.1 Checking the storage cabinet from outside

- **VARTA family only:** Is the vent grille on the upper side of the cabinet clogged/contaminated? →The ventilation grill can be cleaned from inside once the fan has been removed (see Chapter. 11.5.6).
- Is the perforated grille ahead of the air filter (in the door) clogged/contaminated? → The perforated grille can be cleaned from inside once the air filter has been removed (see Chapter. 11.5.3).
- Is the room temperature between 5 and 30 °C (the ideal temperature is 18 °C)? → Consult with the customer as to how the temperature in the installation room can be maintained. An active fan may need to be installed.
- Are the feet steady? → Adjust as necessary using the screw feet.
- Is the wall mounting stable? → Tighten or replace the screwing of the mounting bracket as necessary.
- Wipe away any contamination of the control element with a damp (not wet!) cloth. Solvents must not be used.
- Check whether the four indicator lamps illuminate twice after switch-on (= self-test).
- Check whether the LEDs illuminate twice after switch-on and whether a beep sounds at the same time (= self-test).

11.2 Checks in the area around the distributor

- Check whether the emergency power supply system sockets are colour coded.

- Check whether the warning label is affixed to the distributor. Replace the warning label if necessary.

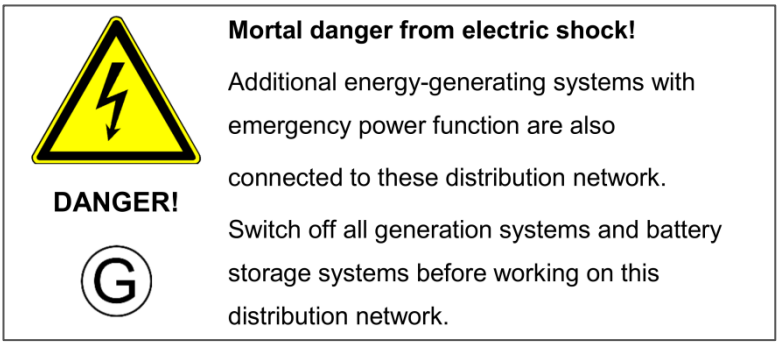


Figure 24: Warning label

11.3 Check the system parameters (during servicing)

Check the following system parameters on the control element.

11.3.1 Online state

16.06.2014 14:06:20 Ready P Inverter 2 kW P Grid 0 kW	• Pressing the *OK* key opens the main menu. • Press the *Down* key. • You are at the *Online state* parameter (0 = not connected, 1 = connected).
16.06.2014 14:06:20 P Inverter 2 kW P Grid 0 kW Online state 1	

11.3.2 Software version

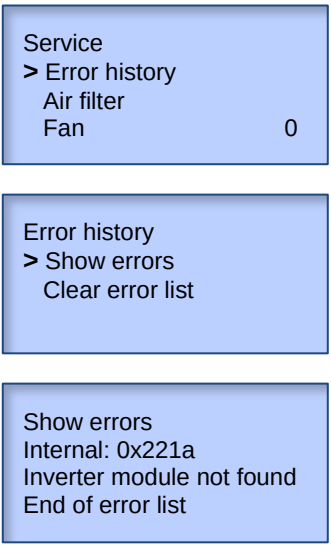
Selection Emergency Service **>** Version	• Press the *OK* key. • The selection menu opens. • Use the *Up/down* keys to select *Version* and press *OK* to confirm!
ID: 100000009 00-50-c2-c6-f2-bb IP 192.168.96.173 FW V2.0.8 ID: 100000009 IP 192.168.96.173 FW V2.0.8 NA V1.0.1	• The *Version* menu option appears. • Press the *Down* key to display additional data.

11.3.3 Entering the password

The following parameters can only be checked once the password has been entered (see Chapter 9.1).

11.3.4 Error history

Reading out the error history

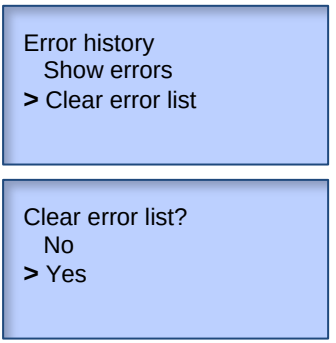


- From the *Service* menu, select the *Error history* sub-menu and press *OK* to confirm.
- The *Error history* sub-menu appears.
- Select *Show errors*.
- An error list appears in the display.
- Pressing the *OK* key returns you to the *Error history* menu.

Rectifying errors

- Verify the errors using the malfunction tables in Chapter 12.2.
- Rectify any errors.

Resetting the error history



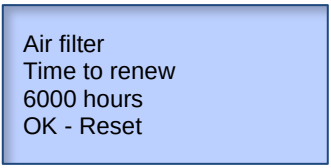
- In *Error history*, select the *Clear error list* menu option.
- The *Clear error list* menu option appears.
- Select *Yes* and press *OK* to confirm.

11.3.5 Software update

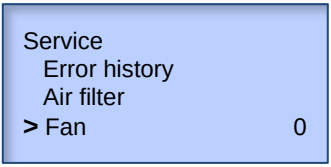
Once the error memory has been reset, the software can be updated. This procedure is required for offline battery storage systems or if a "Technical online service of VARTA Storage" contract has not been concluded.

11.3.6 Resetting the air filter

The air filter must be replaced after 6000 hours.

 	• From the *Selection* menu, select the *Air filter* menu and press *OK* to confirm. • The *Air filter* sub-menu appears. • Press the *OK* key. • The *Reset filter* window opens. • Use the *Up/down* keys to select *Yes* and press *OK* to confirm.

11.3.7 Fan

 **Note:** It is possible that the fan is already running.	• From the *Service* menu, select the *Fan* sub-menu. • Press *OK* to switch between settings 0 (= automatic), 1 (= medium setting) and 2 (= highest setting). • Check whether the fan is blowing out air at the top. Wait for 5 to 10 s until the fan has reached a constant speed. • Reset to 0.

11.4 Checking of other parameters (during servicing)

Checking these parameters requires the password to be entered (see Chapter 9).

11.4.1 Current sensor values

- The inverter status should be *Active*.
- Check the current sensor values IV1, IV2 and IV3 for plausibility:

  If a current sensor value is approx. 0, although this phase is currently loaded, the connection between current sensor and battery storage system may be erroneously.

  If necessary, load all phases separately: Switch on selected consumers or manually discharge the battery storage system. In this chapter, see the section on battery modules entitled *Discharge all*.

  Note: During a manual discharge, current from the battery storage system is systematically applied to the phases.

- Check the current flow through all three phases, using the current probe if necessary!

Procedures in case of unusual current sensor values:

- If the current sensor value of one or multiple phases is 0 despite load, check the connection between battery storage system and current sensor.
- If necessary, replace the connection cable (RJ12 cable).
- Check whether the current sensor board is correctly connected.

11.4.2 Battery module

The *System* and *Service* menus contain the *Battery module* sub-menu. In the service menu, the battery modules can be controlled manually. The *System* menu displays the current battery module state.

Discharging battery modules (in the Service menu)

In the service menu, the battery modules can be discharged for test purposes.

Battery module **>** Discharge all Stop process	• In the *Service* menu, Use the *Up/down* keys to select the *Battery module* sub-menu. • Use the *Up/down* keys to select the *Discharge all* menu option and press *OK*.
Battery module **>** OK Stop process	• When the discharge process is complete, OK appears briefly in place of the *Discharge all* message. • **Note:** The battery modules are discharged to 100 W via the *Discharge all* command. This excludes those modules with a SOC towards 0 %.

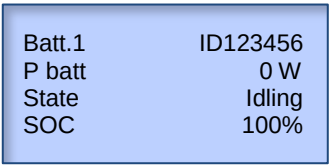
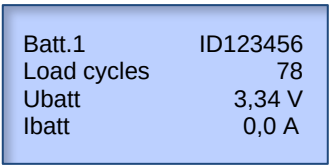
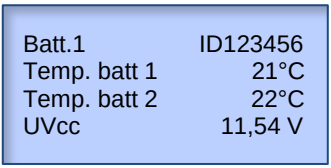
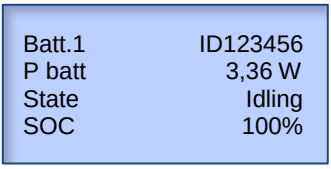
Checking status and charge state of the battery modules (in the System menu)

The operating state and charge state (SOC) of the battery modules can be checked in the System menu. The individual modules are counted starting from 0, e.g. from 0 to 7 for eight modules.

System Inverter **>** Battery module	• Select the *System* menu and press the *OK* key. • From the System menu, select the *Battery module* sub-menu. • Press the *OK* key.
Batt.1 ID123456 P batt -100 W State discharge SOC 40% Batt. 2 ID123456 P batt 0 W State Idling SOC 0%	• The menu screen of a battery module appears. (Press the *Up/down* keys to switch between the battery modules). • Check whether the *Discharge* state is displayed for all battery modules. • Flat battery modules cannot be discharged. In this case, *No load* and *SOC 0 %* is displayed.
Batt.1 ID123456 P batt 0 W State Error SOC 11%	• If a battery module has the *Error* state, notify VARTA Service.

Checking the temperature of the cell strings (in the System menu)

The temperature of the cell strings (*Temp. batt 1 and 2*) can be checked in the *System* menu.

	• You are in the *Battery module* sub-menu of the *System* menu. The menu screen of a battery module will appear. • Press *OK*.
 	• The battery module parameters appear. • Use the *Up/down* keys to select other parameters. • Check the temperature of cell strings 1 and 2 (*Temp. batt 1 and Temp. batt 2*). • The temperature should be < 32 °C.
	• Press *OK* twice. • You will be returned to the menu screen of the battery module. (Use the *Up/down* keys to select other battery modules.) • Now check parameters *Temp. batt 1* and *Temp. batt 2* for all other battery modules.

Procedures in case of elevated temperature data:

- Clean the vent grille if necessary (upper side of cabinet). See Chapter 11.1.1.
- If necessary, clean the perforated grille ahead of the air filter (in the door). See Chapter 11.5.3.
- Visually examine the fan for contamination and check by hand for bearing play and ease of movement. Replace the fan if necessary. See Chapter 11.5.6 and 11.5.7.
- Check whether the room temperature is between 5 °C and 30 °C (18 °C is the ideal temperature).
- If the problem cannot be resolved, notify VARTA Service.

11.5 Service and repair: cabinet interior

DANGER!

Mortal danger from electric shock!

The battery storage system components conduct current.

De-energise the system before starting work on the battery storage system:

Switch off system at the control element.

Disconnect fuses for the device connection and emergency power connection.

Ensure that stand-alone operation is not initiated!

DANGER!

Mortal danger from electric shock due to failing to respect the discharge time!

The battery storage system requires 3 min. of discharge time until it has fully discharged.

After switch-off, wait 3 min. before working on the energy storage system!

11.5.1 Opening the cabinet (VARTA family)

- Open the cabinet with the key that was handed to you upon certification.

11.5.2 Opening the cabinet (VARTA home)

- Loosen the two screws at the spacers to the wall.
  Aids: Screwdriver

Figure 25: Opening service area (left), releasing door lock (right)

- Push back and raise the service cover.
- Release the door lock.

11.5.3 Replacing the air filter

- **VARTA family:** Unscrew the right guide strip of the air filter.
- **VARTA home:** Unscrew the left guide strip from the air filter. Loosen the bottom three screws on the right guide strip.
  Aids: Wrench with 10-way socket or no. 10 flat wrench
- Pull out the air filter to the side.
- Clean the inside of the perforated grille with a cloth.
- Push the replacement air filter into the left guide rail from the side.
- Screw the guide rail/rails back on.
- Check the air filter for a clean fit.

Figure 26: Removing and replacing the air filter – VARTA home

11.5.4 Install and remove battery inverter

- Undo the two screws M 5 x 16 (arrows!) on the battery inverter.
  Aid: Hexagon socket driver, size 4

Figure 27: Undoing screws on the battery inverter

- Pull the battery inverter out of the grips using both hands!
- To reinstall, perform the working steps in reverse order.

11.5.5 Replacing the back-up battery

Replace the backup battery at six-year intervals.

- The back-up battery is accessible once the battery inverter has been removed.

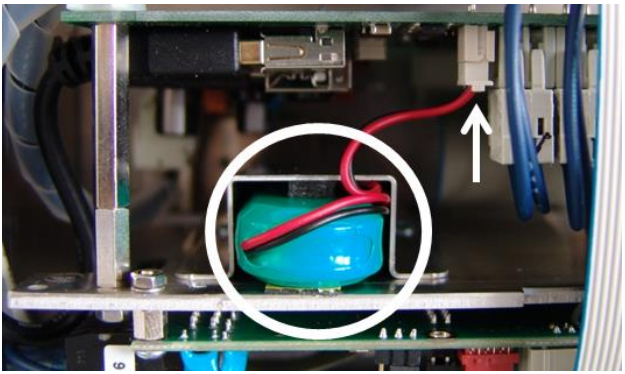


Figure 28: Backup battery in the battery inverter

- Pull the backup battery (→ circle) out of the holder using two fingers.
- Detach the plug (→ arrow).
- Refit the replacement battery in the reverse order.

11.5.6 Replacing/cleaning the fan (VARTA family)

Figure 29: Fan - View after the battery inverter has been removed

- The fan is accessible after the battery inverter has been removed.
- Check the fan for contamination and clean as required.
  Aid: Compressed air
- Check the bearing play and ease of movement of the fan by hand.
- Replace the fan if necessary, and check their function (see Chapter 11.3, Fan). This is done in the reverse order to removal.
  Aid: Hexagon socket driver, size 4

11.5.7 Replacing/cleaning the fan (VARTA home)

- Remove the terminal block from the service area. Do this by loosening the five screws (arrows).
  Aids: Power screwdriver with TORX 25 bit
- You have access to the fan.

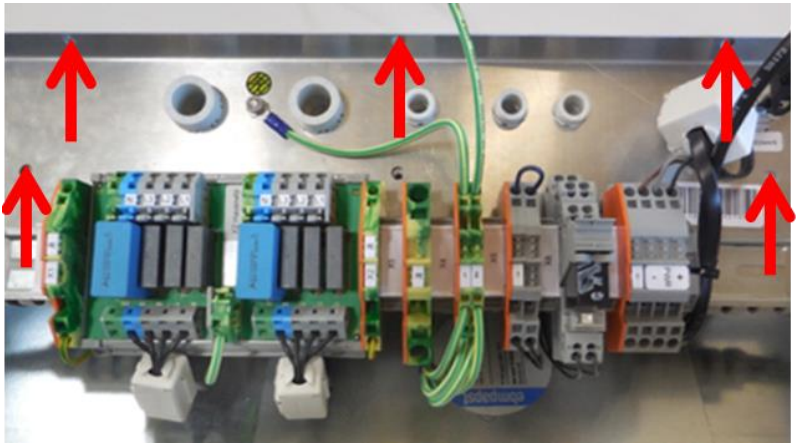


Figure 30: Removing the fan

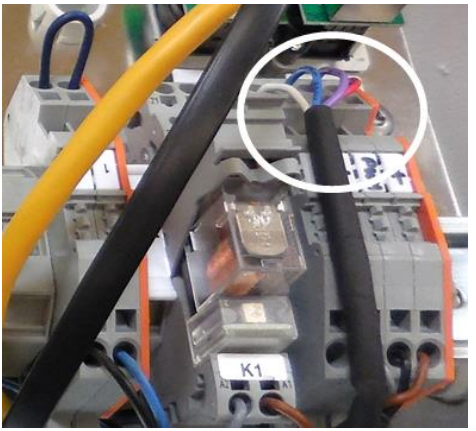


Figure 31: Disconnecting the fan

- Disconnect the fan (circle).
- Loosen the four screws (arrows) on the fan cover.
  Aids: 4-way Allen key

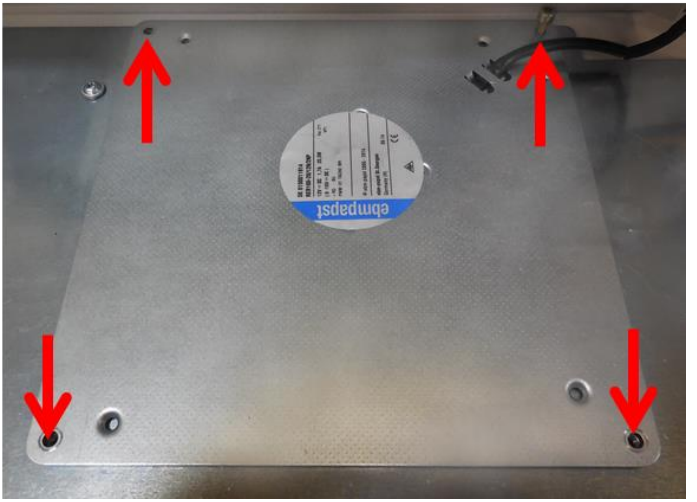


Figure 32: Removing the fan

- Pull out the fan from the top.
- Check the fan for contamination clean if necessary.
  Aids: Compressed air
- Refit the fan -or replace if necessary -. The working steps are in the reverse order to removal.
  Aids: 4-way Allen key
- Screw the terminal block back on.
  Aids: Power screwdriver with TORX 25 bit

11.5.8 Removing and installing battery modules

Battery modules

NOTICE!

Property damage due to incorrect handling!

The battery modules are maintenance free and must not be opened under any circumstances.

Do not bend or touch the spring contacts of the battery modules!

Removing battery modules

- (1) Hook the removal tool, with the two claws at the top, into the openings in the battery module.
- (2) Push the removal tool against the front of the battery module.
- The removal tool engages.

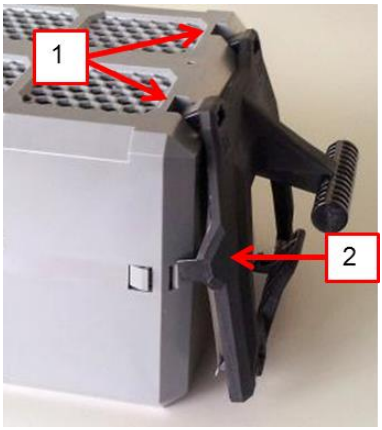


Figure 33: Mounting of the removal tool

- Pull the battery module in the module compartment forward using the removal tool.
- Take the battery module out of the battery module compartment using both hands.
- To detach the removal tool, push on the tab (arrow).

Figure 34: Battery module with removal tool

Installing battery modules

- Carefully push in the battery modules until they engage in the battery module bays. (Use of the removal tool is not mandatory.)
- Assemble the uppermost row and the subsequent rows without interruption.
- The last row may be incomplete.

11.6 Completion of service and repair work

DANGER!

Mortal danger from electric shock!

The battery storage system components conduct current after a restart.

Once all work is complete, restore connections and attachments to a clean condition and check!

Make sure nobody is in the hazard zone before connecting the power supply!

Checking operating state

- Check that the cabinet is locked.
- Check whether the fuses have been re-connected.
- Check at the control element whether the battery storage system has been switched on (see Figure 21, p. 82).

After the replacement/addition of components

- If a fan has been replaced, check its function (see Chapter 11.3.7).

- If battery modules have been replaced or retrofitted, check or correct the number of modules (see Chapter 8.8.3).

11.7 Cleaning

WARNING!

Property damage from water impact!

Penetrating water can cause damage to the device for which VARTA Storage GmbH accepts no liability.

The operator can clean the outside of the battery storage system using a damp (not wet!) cloth. Solvents must not be used.

12 Malfunction

WARNING!

Potential mortal danger due to incorrectly executed troubleshooting!

Work on the VARTA family/home is reserved for qualified electricians certified by VARTA Storage GmbH.

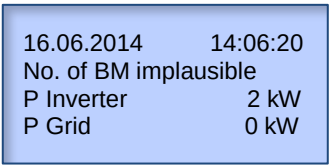
12.1 Malfunction displays

12.1.1 Malfunctions of the indicator lamps

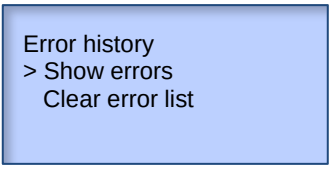
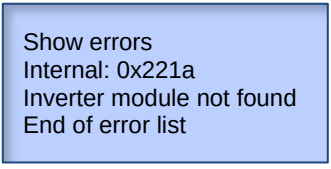
The indicator lamps on the control element display malfunctions (see Figure 6, p. 29).

12.1.2 Malfunctions on the display

Malfunctions are described briefly in the main menu.

	• This example shows: "The number of battery modules is not plausible."

The malfunction codes can be called up in the error memory.

	• From the *Service* menu, select the *Error history* option. • Select Show errors. • Press OK to confirm!
	• The displayed error codes can be verified using the malfunction tables (see Chapter 12.2).

12.2 Malfunction tables

The malfunction tables below show which party is responsible for rectifying which malfunction.

ENS malfunctions (1/2)

K = Malfunction category

1 Temperature/system malfunction
2 Component malfunction (restricted function)
3 Serious malfunction (storage system not ready)

Z = Responsibility

1 (Customer): End customer can rectify malfunction
2 (Service): Qualified service technician certified by VARTA Storage GmbH can carry out the repair
3 (VARTA): VARTA service technician can carry out the repair

Code	Malfunction	Procedures	K	Z
0x0400	System voltage too low (see Chapter 9.2.7)	Check the system voltage at the storage system inlet, check the connections on the device (terminals), check the building connection fuses	1	2
0x0401	System voltage too high	Check the system voltage at the storage system inlet	1	2
0x0402	System frequency too low	Check the system frequency at the storage system inlet, check the connections on the device (terminals)	1	2
0x0403	System frequency too high	Check the system frequency at the storage system inlet	1	2
0x0404	Internal communication interrupted	Reset system, check the USB plug on the control element, contact VARTA Service	1	1 2
0x0405	Backup battery flat, Fault > 1h after commissioning	Replace backup battery	2	2
0x0406	Voltage of the backup battery > 9.0 V	Replace inverter	2	2

ENS malfunctions (2/2)				
Code	**Malfunction**	**Procedure**	**K**	**Z**
0x0407	RCMU unit defective (residual current too high during self-test)	Reset system, replace inverter	3	1 2
0x0408	RCMU too large (residual current too high)	Check the system and installation (insulation and ground fault)	3	2
0x040a	UVcc out of tolerance	Check voltage at terminal X5 and contact the VARTA service department, check whether this cable's insulation was caught, check connections at the On/Off button for damage; contact VARTA Service	3	2
0x040b	Phase conductor voltage outside of tolerance (too large or too small)	Check the grid quality at the storage entrance	1	2

Table 16: ENS malfunctions

Inverter malfunctions (1/3)

K = Malfunction category

1 Temperature/system malfunction
2 Component malfunction (restricted function)
3 Serious malfunction (storage system not ready)

Z = Responsibility

1 (Customer): End customer can rectify malfunction
2 (Service): Qualified service technician certified by VARTA Storage GmbH can carry out the repair
3 (VARTA): VARTA service technician can carry out the repair

Code	Malfunction	Procedures	K	Z
0x0500	System frequency too low	Check the system voltage at the storage system inlet, check the connections on the device	1	2
0x0501	System frequency too high	Check the system voltage at the storage system inlet	1	2
0x0502	System voltage too low	Check the system voltage at the storage system inlet	1	2
0x0503	Grid voltage too high	Check the system voltage at the storage system inlet	1	2
0x0504	R relay defective	Reset System, Replace inverter	3	1 2
0x0505	Phase current too high	Check inverter, replace inverter	2	2
0x0506	Temperature 1 too high	Check ambient temperature and heat dissipation from the device (check fan/ventilation grille)	1	1 2

Inverter malfunctions (2/3)				
Code	**Malfunction**	**Procedures**	**K**	**Z**
0x0507	Temperature 2 too high	Check ambient temperature and heat dissipation from the device,(check fan/ventilation grille)	1	1 2
0x0508	Temperature 3 too high	Check ambient temperature and heat dissipation from the device (check fan/ventilation grille)	1	1 2
0x0509	Phase current difference too large (current difference in 2 of the phases greater than 10 A (un-balanced load))	Reset system, contact VARTA Service	1	2
0x050a	CAN Timeout	Reset system, contact VARTA Service	1	2
0x050b	An analogue channel is defective	Check current sensor/ working resistance, contact VARTA Service	2	3
0x050c	PDP static	Reset system, replace inverter	2	3
0x050d	Difference between the voltages in 2 phases > 40 V	Reset system, check the installation, replace inverter	1	2
0x050e	Controller not plausible	Reset system, replace inverter	1	2
0x050f	PDP interrupt	Reset system, contact VARTA Service	3	2
0x0510	V. N → PE too high (voltage too high when running idle)	Check of the system and installation (insulation and earth), check of the earth leads	3	2

Inverter malfunctions (3/3)				
Code	**Malfunction**	**Procedures**	**K**	**Z**
0x0511	V. N → PE too high (voltage too high in operation)	Check of the system and installation (insulation and earth), check of the earth leads	3	2
0x0512	Undervoltage (Voltage dip in converter unit)	Contact VARTA Service	2	3
0x0513	Undervoltage HF static	Contact VARTA Service	2	3
0x0514	DC voltage low	Reset system, replace inverter	3	3
0x0515	Delta UMP	Reset system, replace inverter	3	2
0x0518	No ENS-Signal	Reset system, contact VARTA Service	3	1 2
0x0519	DC voltage too high	Reset system, contact VARTA Service	3	2
0x051a	Relay control implausible	Reset system, contact VARTA Service	3	1 2
0x051b	N-Relay defect	Contact VARTA Service	2	3
0x051c	Voltage in emergency power supply outside of tolerance	Check maximum load of the emergency power supply, check connected consumers at the emergency power supply, check electrical system	1	1 2 2
0x051d	Voltage between phase conductors outside of tolerance	Check the grid quality at the storage entrance	1	2

Table 17: Inverter malfunctions

Battery malfunctions (1/4)

K = Malfunction category

1 Temperature/system malfunction
2 Component malfunction (restricted function)
3 Serious malfunction (storage system not ready)

Z = Responsibility

1 (Customer): End customer can rectify malfunction
2 (Service): Qualified service technician certified by VARTA Storage GmbH can carry out the repair
3 (VARTA): VARTA service technician can carry out the repair

Code	Malfunction	Procedures	K	Z
0x0600	Ambient temperature (too high in the battery)	Check ambient temperature and heat dissipation from the device (check fan/ventilation grille)	2	1 2
0x0601	TempBatt1max (Temperature in cell string 1 too high)	Check ambient temperature and heat dissipation from the device (check fan/ventilation grille)	2	1 2
0x0602	TempBatt1min (Temperature in cell string 1 too low)	Check ambient temperature and heat dissipation from the device (check fan/ventilation grille)	2	1 2
0x0603	TempBatt2max (Temperature in cell string 2 too high)	Check ambient temperature and heat dissipation from the device (check fan/ventilation grille)	2	1 2
0x0604	TempBatt2min (Temperature in cell string 2 too low)	Check ambient temperature and heat dissipation from the device (check fan/ventilation grille)	2	1 2

Battery malfunctions (2/4)				
Code	**Malfunction**	**Procedures**	**K**	**Z**
0x0605	UVcc low (internal voltage supply too low)	Check battery module contacts in switched off state, check external circuit breaker	2	2
0x0606	UBatt Max (Battery voltage too high)	Replace battery module, contact VARTA Service	2	2
0x0607	UBatt Min (Battery voltage too low)	This battery module must be charged! Check battery module	2	2
0x0608	Batt disabled	Replace battery module contact VARTA Service	2	2
0x0609	Uzwk_dUdt (implausible voltage jump in the intermediate circuit voltage)	Contact VARTA Service	2	2
0x060a	Ibatt1_dIdT (Current surge in cell string 1)	Replace battery module	2	2
0x060b	Ibatt2_dIdT (Current surge in cell string 2)	Replace battery module	2	2
0x060c	Uzwk_Max	Contact VARTA Service	2	3
0x060d	Ibatt1_Max (Charge current in cell string 1 too high)	Contact VARTA Service	2	3
0x060e	Ibatt1_Min (Discharge current in cell string 1 too high)	Contact VARTA Service	2	3
0x060f	Ibatt2_Max (Charge current in cell string 2 too high)	Contact VARTA Service	2	3

Battery malfunctions (3/4)				
Code	**Malfunction**	**Procedures**	**K**	**Z**
0x0610	Ibatt2_Min (Discharge current in cell string 2 too high)	Contact VARTA Service	2	3
0x0611	Current difference	Replace battery module, contact VARTA Service	2	2
0x0612	An analogue channel has assumed an inadmissible value	Reset system, contact VARTA Service	2	3
0x0614	HW ISR (Hardware monitoring triggered the interrupt)	Contact VARTA Service	3	3
0x0615	UVL OVL ISR (Hardware monitoring of the over/undervoltage triggered the interrupt)	Contact VARTA Service	2	3
0x0616	Uzw_Min (intermediate circuit voltage too low)	Reset system, contact VARTA Service	2	2
0x0617	CAN Timeout	Reset system, contact VARTA Service	2	2
0x0618	CAN ShutDown	Reset system, contact VARTA Service	2	2
0x0619	Ucool	Reset system, contact VARTA Service	2	2
0x061a	Topti Max	Check ambient temperature and heat dissipation of the device (check fan and ventilation grille), contact VARTA Service	2	1 2 3

Battery malfunctions (4/4)				
Code	**Malfunction**	**Procedures**	**K**	**Z**
0x061b	Temp HT	Check ambient temperature and heat dissipation of the device (check fan and ventilation grille), contact VARTA Service	2	1 2 3
0x061c	HW coding (differentiation old/new hardware failed)	Contact VARTA Service	2	3

Table 18: Battery malfunctions

EMS malfunctions (1/3)

K = Malfunction category

1 Temperature/system malfunction
2 Component malfunction (restricted function)
3 Serious malfunction (storage system not ready)

Z = Responsibility

1 (Customer): End customer can rectify malfunction
2 (Service): Qualified service technician certified by VARTA Storage GmbH can carry out the repair
3 (VARTA): VARTA service technician can carry out the repair

Code	Malfunction	Procedures	K	Z
0x2100	File system (error in file system of SD card)	Replace SD card	2	2
0x2101	Memory card (no communication with SD card)	Replace SD card	2	2
0x2202	RTC (no communication with timer)	Device can continue operating, time is set via the Internet	2	1
0x2203	No ready signal from ENS	Replace inverter	3	2
0x2204	UZwk timeout	Replace inverter	3	2
0x2205	Invalid BM count (number in BM_INSTALL not set correctly or BM defective)	Write real BM number to BM_INSTALL, if BM defective, contact VARTA Service	2	2
0x2206	No BM in standby (number approaching 0)	Replace inverter, if unsuccessful, check rear wall wiring	3	2
0x2218	Reset final stage (unexpected inverter reboot)	The battery storage system is attempting to restart; if error remains, replace inverter	2	2

EMS malfunctions (2/3)				
Code	**Malfunction**	**Procedures**	**K**	**Z**
0x221a	Inverter module not found (inverter module not registered in the CAN)	Re-install inverter, contact VARTA Service	3	2
0x221c	ENS module not found (ENS module not registered in the CAN)	Check plug connections, contact VARTA Service	3	2
0x221f	Final stage not ready (no signal from inverter to confirm its voltage supply is OK)	Check plug connections, contact VARTA Service	3	2
0x2220	No PowerOn from inverter (no signal from inverter to confirm its voltage supply is OK)	Check plug connections, contact VARTA Service	3	2
0x2223	Wrong SW in inverter module (firmware in inverter module is incompatible with EMS firmware)	Check software versions, update corresponding software	3	2
0x2224	NA check confirmed that the relays are defective	Check plug connections, contact VARTA Service	3	2
0x2225	Wrong SW in ENS (firmware in ENS module is incompatible with EMS firmware)	Check software versions, update corresponding software	3	2

EMS malfunctions (3/3)				
Code	**Malfunction**	**Procedures**	**K**	**Z**
0x2226	Isolated mode implausible	Check plug connections, contact VARTA Service	3	2
0x2227	N relay defective	Check plug connections, contact VARTA Service	3	2
0x2228	Backup battery flat or overcharged	Contact VARTA Service	2	2

Table 19: EMS malfunctions

13 Disassembly and disposal

WARNING!

Potential environmental damage and mortal danger due to incorrect disassembly and disposal!

Disassembly and disposal is reserved for qualified electricians certified by VARTA Storage GmbH!

13.1 Disassembly

The system is disassembled by qualified electricians certified by VARTA Storage GmbH.

13.2 Disposal

The VARTA family/home system must not be disposed of in the household waste. The following disposal routes must be observed:

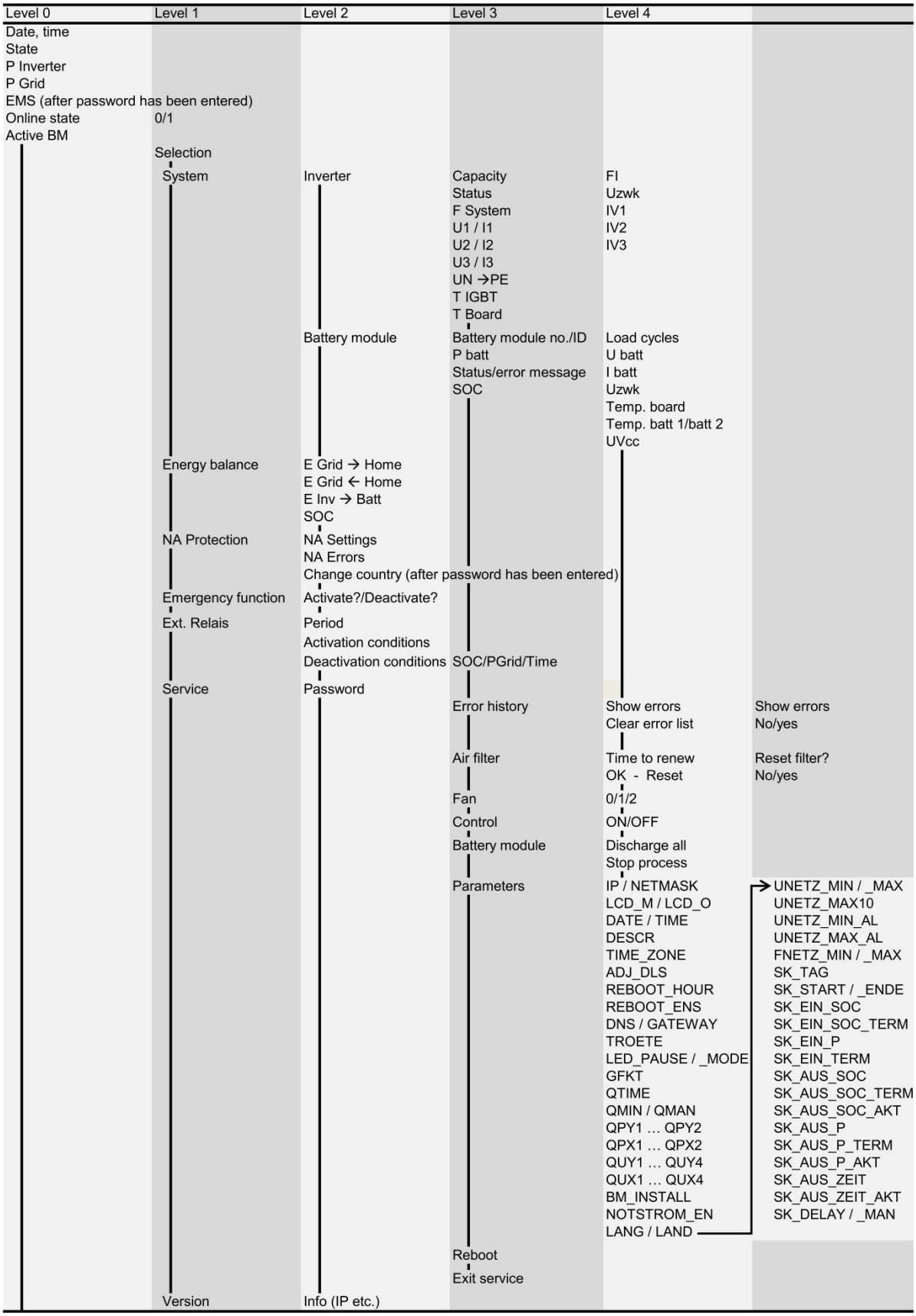
- The battery modules are collected by VARTA Storage GmbH or a company it has assigned. Please contact VARTA Storage GmbH (entsorgung@varta-storage.com). The costs will be paid by VARTA Storage GmbH.
- The cabinet can be disposed of as electrical scrap, e.g. at a recycling centre.

Figures

Tables

Attachment

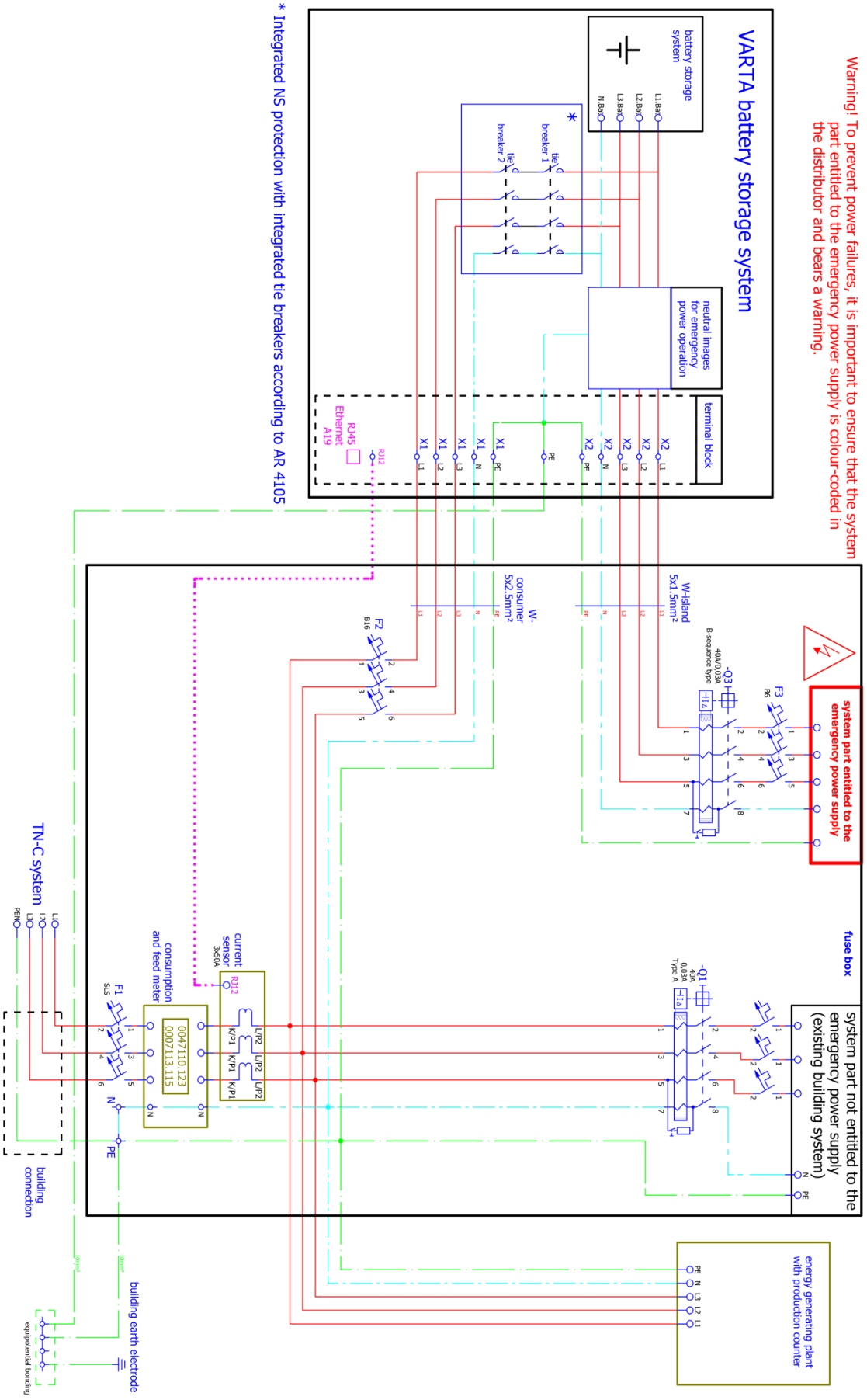
Attachment



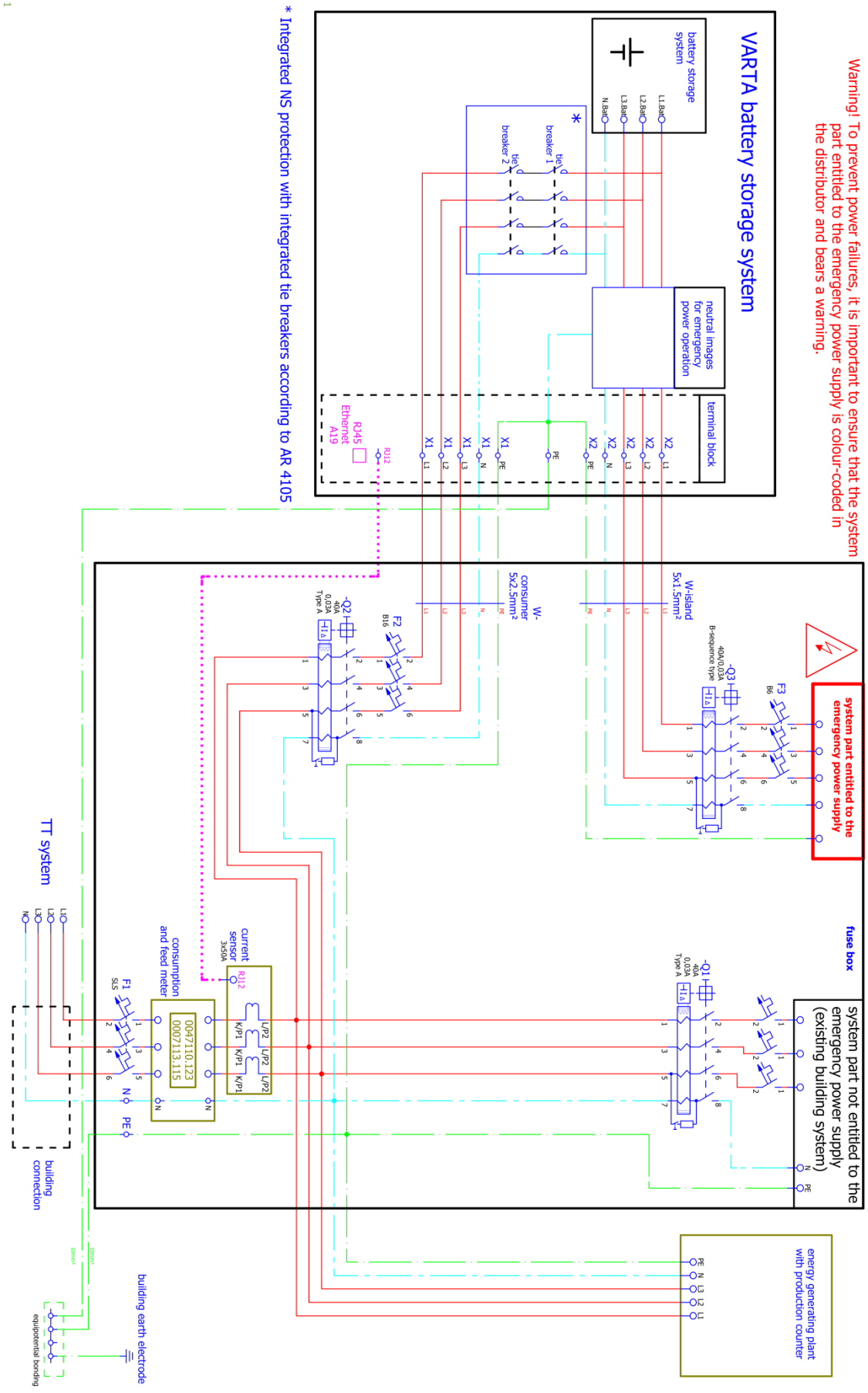
Attachment 1a: Menu structure

Menu option	Menu	Action * = optional	Explanation
ADJ_DLS	Parameters	Enter	Automatic summer/winter changeover (1 = on, 0 = off)
Active BM	Main menu	Read off	Number of battery modules detected by the system. (The red LED flashes if *Invalid BM count* or 0.)
BM_INSTALL	Parameters	Enter	Number of battery modules installed. (The red LED flashes if *Invalid BM count* or 0.)
DATE	Parameters	Enter	Current date
DESCR	Parameters	Enter*	Name of installation location/storage system (DESC = description)
DNS	Parameters	Enter*	Network address (Basis: **D**omain **N**ame **S**ystem). For external connections, the network address of the DNS server must be entered here.
E Grid → Home/ E Grid ← Home	Energy balance	Read off	Energy supplied from the public grid to the building / Energy supplied from the building to the public grid (cannot be used for settlement with energy supplier)
E Inv → Batt	Energy balance	Read off	Energy supplied from the inverter of the storage system to the battery modules
EMS	Main menu	Read off	Energy management system mode (off, normal (= own consumption optimisation), service)
FI	Inverter	Read off	Ground fault circuit interrupter
F Grid	Inverter	Read off	Grid frequency in Hertz (Hz)
FNETZ_MAX / _MIN	Parameters	Enter	Upper/lower limit of the grid frequency
FW	Version	Read off	Firmware version
GATEWAY	Parameters	Enter*	= computer network entry/exit. For external connections, the network address of DNS server must be entered. If the parameter is at 0.0.0.0, the DHCP client is automatically activated.
I batt	Battery module	Read off	Actual current in selected battery module
ID (battery module)	Battery module	Read off	**Id**entifier (= serial number) for clear identification of the battery module
ID (cabinet)	Version	Read off	**Id**entifier (= serial number) for clear identification of the cabinet
IP	Version	Read off	Network address. If the value is at 0.0.0.0, the DHCP client is automatically activated.
IP	Parameters	Enter*	Network address. If the value is at 0.0.0.0, the DHCP client is automatically activated.
IV	Inverter	Read off	Measurement results of the current sensor in the current system (IV)
LAND	Parameters	Enter	Country code of the NA Protection
LANG	Parameters	Enter*	Menu display language (0 = D, 1 = GB, 2 = F, 3 = I, 4 = NL)
LCD_M	Parameters	Enter	Increase in characteristic curve for temperature compensation of the display contrast
LCD_O	Parameters	Enter	Offset of the characteristic curve for temperature compensation of the display contrast
LED_PAUSE	Parameters	Enter	Pause between the cycles of the LED light in the LED bar for visualising the charge/discharge operation (count value = period of the pause, 0 = deactivated)
Load cycles	Battery module	Read off	Number of load cycles
NA	Version	Read off	Software version of the NA protection
NETMASK	Parameters	Read off	Number (= NETMASK) of bits at the start of an IP address that belong to the network section.
NOTSTROM_EN	Parameters	Enter	1 = activate emergency function, 2 = deactivate emergency function
Online state	Main menu	Read off	State of the online connection to VARTA Storage (0 = OFF, 1 = ON)
P batt	Battery module	Read off	Power of a battery module in W
P Grid	Main menu	Read off	Power currently measured at the current sensor in kW. Positive values indicate supply, negative values indicate consumption.
P Inverter	Main menu	Read off	Power currently measured at storage inverter in kW. Positive values indicate charge, negative values indicate discharge.
QMAN	Parameters	Enter	Manual setting of the reactive power function
QMIN	Parameters	Enter	Limit in % to which the reactive current is not controlled.
QPX1-QPX2/QPY1-QPY2	Parameters	Enter	Parameters for setting the reactive power function according to Q(P) characteristic
QTIME	Parameters	Enter	After this time, the reactive power to be controlled according to the Q characteristic
QUX1-QUX4/QUY1-QUY4	Parameters	Enter	Parameters for setting the reactive power function according to Q(U) characteristic
Reboot	Service	Run	A restart must be executed following changes to the parameters menu option.
REBOOT_ENS	Parameters	Enter	0 = EMS is rebooted, 2 = the complete storage system is rebooted
REBOOT_HOUR	Parameters	Read off	Time for daily restart of the display
SK_ …	Parameters	Read off	Internal parameters of the external relay (no setting required)
SOC	Energy balance	Read off	**S**tate **o**f **c**harge of the overall system
SOC	Battery module	Read off	**S**tate **o**f **c**harge of the selected battery module in %
T Board	Inverter	Read off	Electronic temperature in the inverter of the energy storage system
T IGBT	Inverter	Read off	Temperature of the transistors in the power part of the inverter
Board temp	Battery module	Read off	Temperature of the electronics in the selected battery module in °C
Temp. batt 1/2	Battery module	Read off	Temperature of the cell sections in the selected battery module
TIME	Parameters	Enter	Current time
TIME_ZONE	Parameters	Enter	Time zone of the battery cabinet. (Germany = 1)
TROETE	Parameters	Enter	Acoustic signal (0 = OFF, count value = beep duration on error)
U N→PE	Inverter	Read off	Voltage gradient between neutral conductor protective conductor in V
U batt	Battery module	Read off	Cell voltage
UNETZ_MAX/ _MIN	Parameters	Enter	Upper/lower limit for grid voltage
UNETZ_MAX10	Parameters	Enter	Maximum 10-minute average for grid voltage
UNETZ_MAX_AL	Parameters	Enter	Maximum voltage between 2 of the 3 phases
UNETZ_MIN_AL	Parameters	Enter	Minimum voltage between 2 of the 3 phases
UVcc	Battery module	Read off	Voltage supply to the selected battery module
Uzwk	Inverter	Read off	Voltage of the intermediate circuit
Uzwk	Battery module	Read off	Voltage of the intermediate circuit at the selected battery module

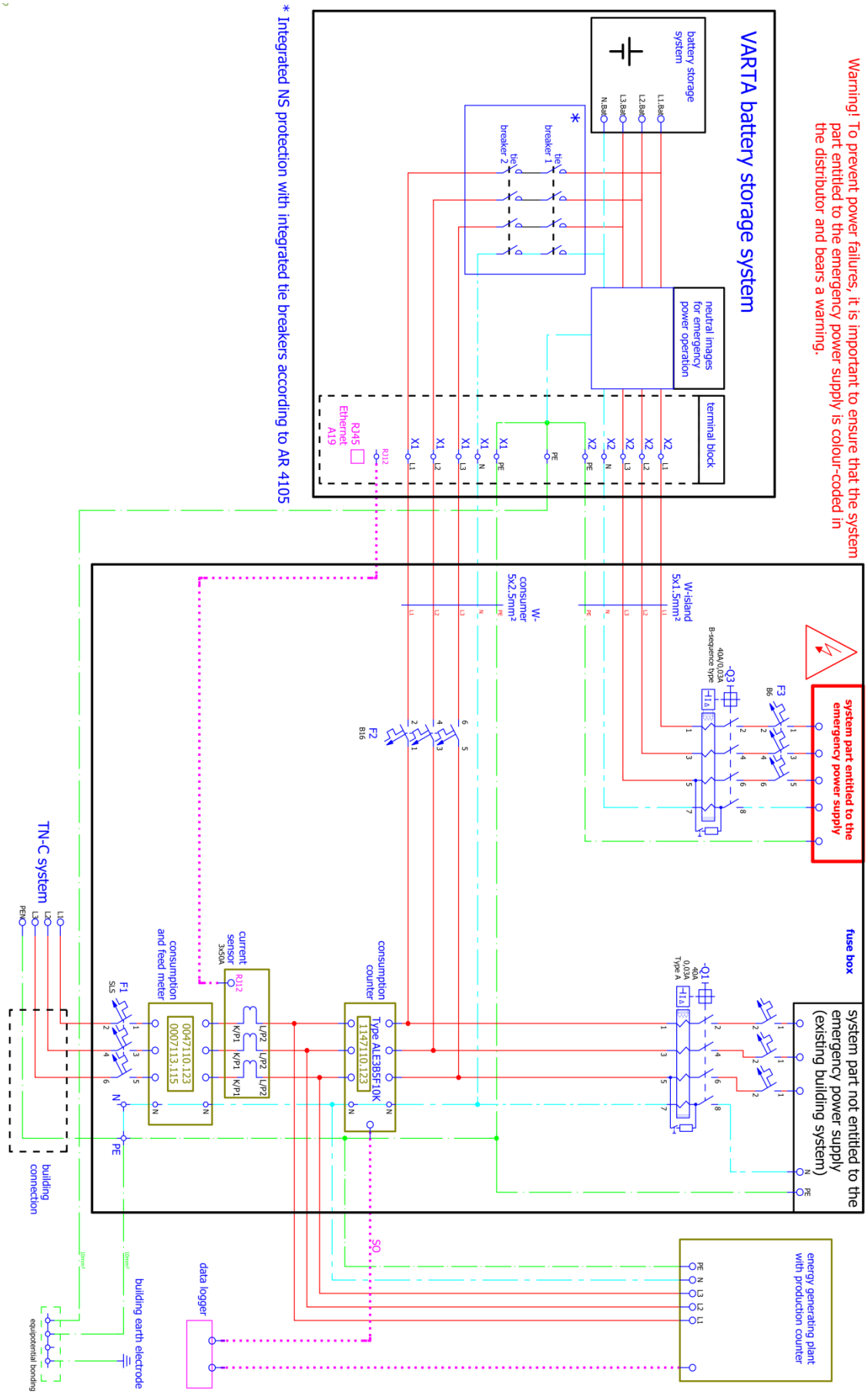
Attachment 1b: Function of the menu points



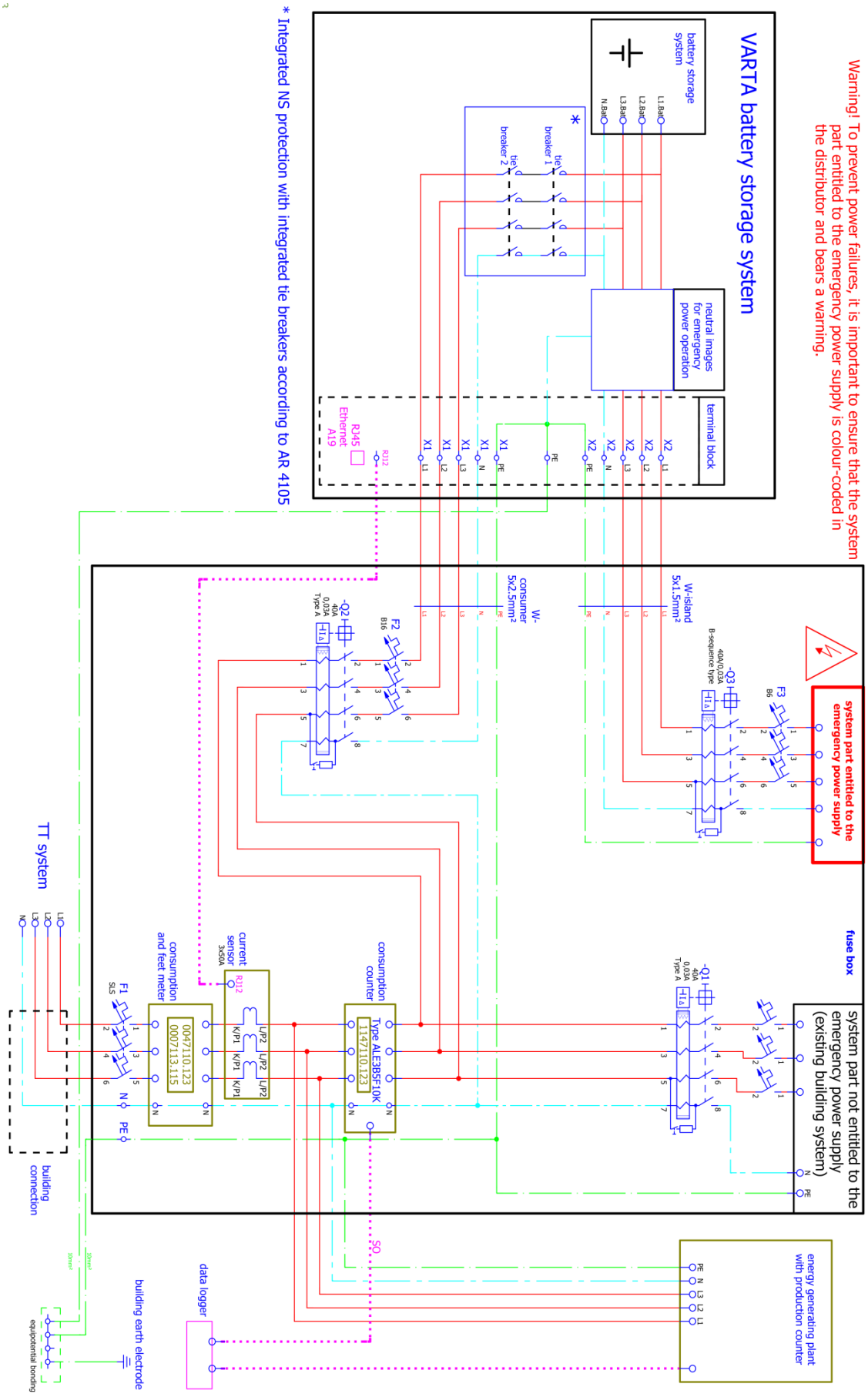
Attachment 2a: Connection diagram of the TN system



Attachment 2b: Connection diagram of the TT system



Attachment 3a: Connection diagram of the TN system with data logger



Attachment 3b: Connection diagram of the TT system with data logger

EG-Konformitätserklärung

Der Hersteller

VARTA Storage GmbH
Emil-Eigner-Str.1
86720 Nördlingen
Deutschland

erklärt hiermit, dass die Produkte
Produktbezeichnung: Batteriespeichersystem
Fabrikat: engion family

den Bestimmungen der folgenden Richtlinien entsprechen:

- Richtlinie 2004/108/EG des Europäischen Parlaments und des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten über die elektromagnetische Verträglichkeit und zur Aufhebung der Richtlinie 89/336/EWG
- Richtlinie 2006/95/EG des Europäischen Parlaments und des Rates zur Angleichung der Rechtsvorschriften der Mitgliedstaaten betreffend elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen

Die Konformität dieser Richtlinien wird nachgewiesen durch Einhaltung folgender Normen:

- EN 61000-6-2:2005: Elektromagnetische Verträglichkeit (EMV) - Teil 6-2: Fachgrundnormen - Störfestigkeit für Industriebereiche (IEC 61000-6-2:2005)
- EN 61000-6-3 (2007-09): Elektromagnetische Verträglichkeit (EMV) Teil 6-3: Fachgrundnormen – Störaussendung für Wohnbereich, Geschäfts- und Gewerbebereiche sowie Kleinbetriebe (IEC 61000-6-3:2006)
- DIN EN 62109-1:2011 Sicherheit von Wechselrichtern zur Anwendungen in photovoltaischen Energiesystemen – Teil 1: Allgemeine Anforderungen

Nördlingen den 18.11.2015

Fred Schellert
GM Marketing & Sales

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Technical Director

Branch of
VARTA Storage GmbH.

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Herbert Schein (CEO)

Sitz: Nördlingen
Registergericht: Augsburg
HRB 27028

Ein Unternehmen der VARTA Micro AG, Daimlerstraße 1, 73479 Ellwangen, Deutschland

Attachment 4a: EC Declaration of Conformity – VARTA family

EG-Konformitätserklärung

Der Hersteller

VARTA Storage GmbH
Emil-Eigner-Str.1
86720 Nördlingen
Deutschland

erklärt hiermit, dass die Produkte
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Fabrikat: engion home

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Nördlingen den 18.11.2015

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Attachment 4b: EC Declaration of Conformity – VARTA home