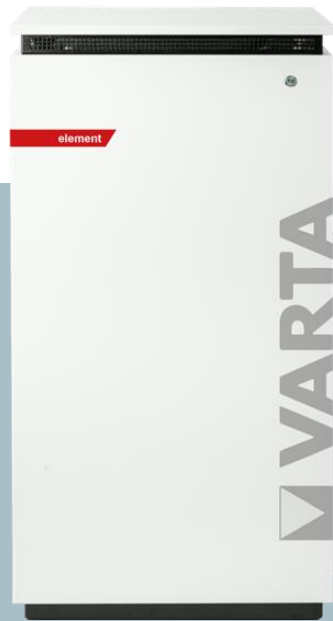


INSTRUCTION MANUAL

VARTA element 3 / VARTA element 6





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 element 3 / element 6 energy storage systems. 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 VATRA element 3/6

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About this manual

Read this manual carefully to ensure the VARTA element 3 and VARTA element 6 energy storage systems (VATRA element 3/6) 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 VATRA element 3/6 and must be permanently available to all individuals involved in working on the storage battery.

Scope

This instruction manual applies for VATRA element 3/6 products from VARTA Storage GmbH.

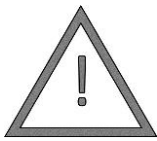
Disclaimer

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.

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Special attention required



NOTICE!

Property damage from deep discharge of the battery modules!

The energy storage system may be switched off only for maintenance purposes.

General

1 Information about this manual

1.1 Explanation of symbols

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






 DANGER!	<p>Indicates an instruction which, if not followed, will immediately lead to death or serious injuries.</p>
 WARNING!	<p>Indicates an instruction which, if not followed, can lead to death or serious injuries.</p>
 CAUTION!	<p>Indicates an instruction which, if not followed, can lead to minor or slight injuries.</p>
 NOTICE!	<p>Indicates an instruction which, if not followed, can lead to property damage.</p>
	<p>Indicates useful hints for handling VATRA element 3/6.</p>

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

VATRA element 3/6 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, VATRA element 3/6 must not be used:

- for mobile use on land, water or in the air
- for using medical equipment

2.3 Requirements regarding qualified electricians



WARNING!

Potential mortal danger if the electrician lacks the proper training!

Make sure that all activities on the VATRA element 3/6 system (e.g. installation, service and maintenance work) are carried out by qualified electricians certified by VARTA Storage GmbH!

General

Operation

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

Installation

2.4 General hazards



NOTICE!

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.

Operation (Service)

Maintenance

- 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 VATRA element 3/6 system features multiple safety devices, including a NA-protected activation point in accordance with VDE-AR-N 4105, closed electrical operating area, over temperature cut-out and a door contact switch. This switches off the system if an attempt is made to open the storage cabinet before it has been de-energised.

We also recommend installing a smoke detector in the VATRA element 3/6 system installation room.

General

Operation

Installation

Operation (Service)

Maintenance

3 Function, scope of supply and technical parameters

3.1 Function

The VARTA element 3 / element 6 system is a battery storage system for operation in a 3-phase building grid, which offers the option of connecting a separate grid-connected photovoltaic system. This must be a generating unit which supplies 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 VATRA element 3/6 system increases the rate of own consumption 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 energy 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 VATRA element 3/6 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 energy 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 energy storage system has free charge capacity, the system will be charged. During this process, the battery inverter located in the VARTA element 3 / element 6 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 energy storage system then discharges capacity into the building system in order to minimize external power consumption and the associated costs.

Before the VARTA element 3 / element 6 energy storage systems 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 VARTRA element 3/6 system includes:

- Storage cabinet with integrated energy and battery management
- Battery module(s)
- Battery inverter
- Battery charger with 3 x communication cable, 1 x power cable (only VARTA element 3), 2 x power cable (only VARTA element 6)
- Extra items: 50 A power sensor with sensor board and sensor cable, 1 x AC connector, 8 x mounting screws for battery modules, 1 x terminal resistor
- Instruction manual
- Customer folder (with accompanying letter, return envelope, commissioning report, service booklet,

warranty records, Online Portal Agreement, Technical Online Service Agreement)



Figure 1: VATRA element 3/6

3.3 System overview

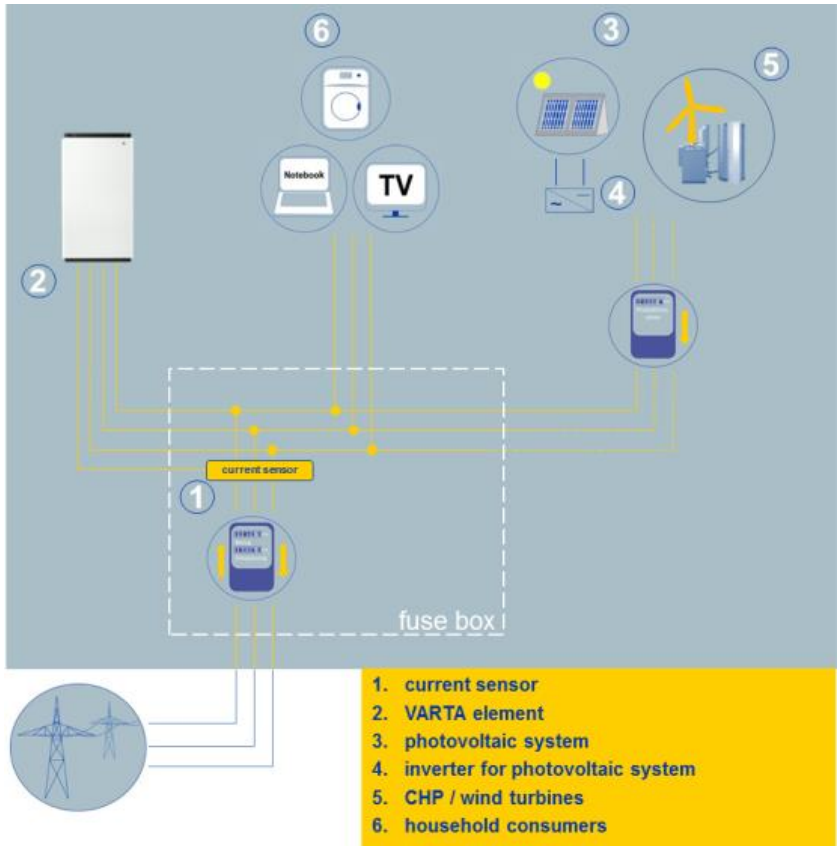


Figure 2: System overview

General

Operation

Installation

Operation (Service)

Maintenance

3.4 Type plates

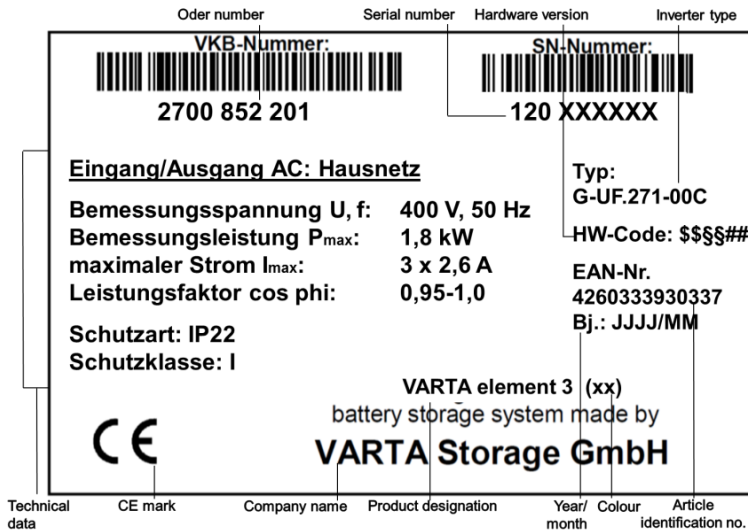


Figure 3: Type plate VARTA element 3

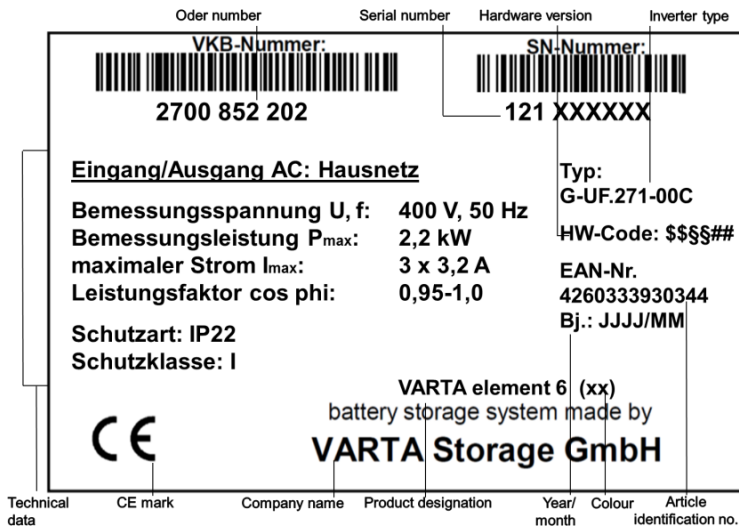


Figure 4: Type plate VARTA element 6

3.5 Technical parameters

▶ SYSTEM: ELEMENT 3

▶ Nominal capacity	3.2 kWh
▶ System power	1.6 kW
▶ Battery inverter layout	without isolation transformer
▶ Dimensions (W x H x D)	600 mm x 1,176 mm x 500 mm
▶ Weight (incl. battery module)	105 kg
▶ Installation location	inside the building
▶ 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
▶ System transport	vertical on pallet
▶ Packaging (W x H x D)	700 mm x 1,325 mm x 600 mm
▶ Grid fusing	16 A (B-character)

Table 3 Technical parameters – VARTA element

▶ SYSTEM: ELEMENT 6

▶ Nominal capacity	6.4 kWh
▶ System power	2.0 kW
▶ Battery inverter layout	without isolation transformer
▶ Dimensions (W x H x D)	600 mm x 1,176 mm x 500 mm
▶ Weight (incl. battery module)	145 kg
▶ Installation location	inside the building
▶ 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
▶ System transport	vertical on pallet
▶ Packaging (W x H x D)	700 mm x 1,325 mm x 600 mm
▶ Grid fusing	16 A (B-character)

Table 4: Technical parameters – VARTA element

General

Operation

Installation

Operation (Service)

Maintenance

▶ BATTERY MODULE

▶ Electrochemistry cell	Lithium-ion
▶ Nominal module capacity	461 Wh
▶ Discharge depth	90 %
▶ Usable module capacity	2.9 kWh
▶ Module output	1.6 kW
▶ Connection	touch safe
▶ Cell monitoring	integrated
▶ Dimensions (W x H x D)	445 mm x 600 mm x 122 mm
▶ Weight	35 kg
▶ Charge/discharge time	~2 h (to max. charge state)
▶ Module packaging (W x H x D)	800 mm x 460 mm x 600 mm

Table 5: Technical parameters - Battery module

▶ ENVIRONMENTAL CALCULATION DATA

▶ Environment category	Climate-controlled in interior rooms*
▶ Classification of wet rooms	Wet rooms not permitted
▶ Contamination level	2
▶ Penetration protection	IP22
▶ Ambient temperature	+5 °C to +30 °C
▶ Relative humidity	80 %
▶ Max. altitude	2000 m above sea level
▶ Overvoltage category	III
▶ Protection class	1

*The energy storage system is completely enclosed by a building or enclosure. This protects the energy 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.

4 LED 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!

Never open the cabinet door!



WARNING!

Property damage from deep discharge of the battery modules!

The energy storage system may be switched off only for maintenance purposes.

4.1 Switching on and off

The *On/Off* button on the front of the cabinet is pressed by the certified installation engineer during commissioning and for service work.

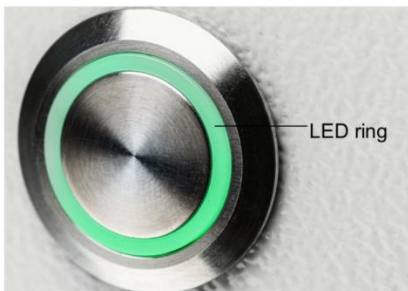


Figure 5: *On/Off* button with LED ring

General

Operation

Installation

Operation (Service)

Maintenance

In case of damage (see Chapter 6.2), the system can be shut-down using the *On/Off* button.

4.2 LED ring indicators

The LED ring in the *On/Off* button indicates the states and events which occur while the energy storage system is in operation.

LED colour	LED actions	Operating state
Green	Flashes every second (approx. 90 s)	System check
Green	Steady light (approx. 60 s)	Ready
Green	Flashes every 3 seconds	Standby
Green	Pulses with increasing intensity	Charging
Green	Pulses with decreasing intensity	Discharging
Red	Steady light	Error*
*The i-button on the welcome page of the web interface displays information about current errors (see Chapter 4.3.2).		

Table 7: LED ring indicators at the *On/Off* button

4.3 Web interface

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

4.3.1 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 3 and Figure 4.

- 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 14.
- Enter into the address line of your browser after `http://varta` the serial number of your energy storage system, e.g.:

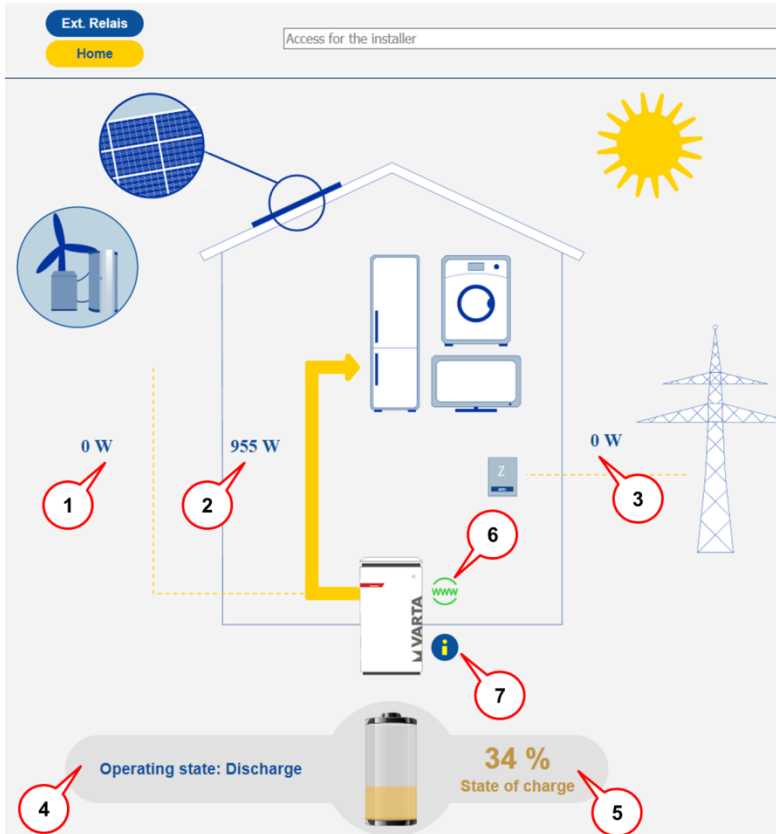
`http://varta121023456`

- 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.



4.3.2 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.

4.3.3 Ext. relay (optional)

Up to four external relays 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.

4.3.4 Portal (optional)

The www.varta-storage-portal.com portal serves to monitor and visualise the VARTA element 3 / element 6 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.

General

Operation



NOTICE!

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

All work on the VATRA element 3/6 system is to be documented by the qualified electrician in the service book.

Only original parts are to be used for maintenance work.

Installation

Operation (Service)

5.1 Maintenance work

Maintenance of the VATRA element 3/6 energy storage system comprises:

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

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

Maintenance



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 VATRA element 3/6 energy 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 energy storage system see Chapter 11.3.

6 Malfunction/Damage event



WARNING!

Potential mortal danger due to incorrectly executed troubleshooting!

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

General

Operation



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

Installation

6.1 Malfunction indicators

6.1.1 Malfunction indicators of the LED ring

The LED ring of the *On/Off* button on the front of the cabinet indicates malfunctions. See Table 7 in Chapter 4.2.

6.1.2 Malfunction indicators on the web interface

Malfunctions are displayed on the welcome page of the web interface.

- To do this, click on the *i* icon.
- A window will open. Any pending system errors and the last five grid faults can be read from this window.

Operation (Service)

Maintenance

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 element 3/6 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.
- Have the cabinet and the battery modules transported by several persons.
- 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.
- Transport the battery modules only in their transport packaging.
- 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 element 3 / element 6 energy 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.

- The storage cabinet may be damaged.
- 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 6: ShockWatch® label

7.3 Storage



NOTICE!

Incorrectly stored component causes property damage!

Store the components in accordance with the regulations!

The storage cabinet and the battery modules must be stored dry (air humidity < 80 %) and at a constant temperature (5-30 °C, optimum: 18 °C).



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 Luftfeuchtigkeitsgrenzen 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 will be commissioned by a qualified electrician certified by VARTA Storage GmbH no later than eleven weeks after delivery by the manufacturer.

General

Operation

Installation

Operation (Service)

Maintenance

8 Assembly and installation



DANGER!

Potential mortal danger due to installing damaged components!

Check the storage cabinet, battery modules, cable set and other accessories for visible damage.

Do not install damaged components!



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



CAUTION!

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!

General

8.1.1 Installation location

Provision must be made for a minimum footprint of 70 cm x 55 cm (width x depth) at the installation location. The distance to the adjacent installations must be approx. 5 cm to the right and approx. 10 cm to the left. A clear space of approx. 120 cm deep is required in front of the device, since all installation and maintenance work is carried out via the front door. The screws for opening the storage cabinet on the left next to the front door must be accessible.

Operation

Installation

A minimum clearance of 30 cm must be left above the storage cabinet. No objects may be placed on the top of the storage cabinet. The clearance between the wall and the rear of the cabinet must remain free to enable cooling air to escape from the device unhindered.

Operation (Service)

A minimum of 30 m³ is recommended for the room in which VATURA element 3/6 is installed. A continuous air exchange must essentially be guaranteed, if necessary via forced ventilation, such as windows, air conditioning system, ventilation system or similar. The clearance to the ventilation system must be at least 100 cm.

Maintenance

- 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.

8.1.2 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)

8.2 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 label for the battery module is 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.




VKB-Nummer:  2700 852 201	SN-Nummer:  120 XXXXXX
Eingang/Ausgang AC: Hausnetz	Typ: G-UF.271-00C
Bemessungsspannung U, f: 400 V, 50 Hz	HW-Code: \$\$\$##
Bemessungsleistung P _{max} : 1,8 kW	EAN-Nr. 4260333930337
maximaler Strom I _{max} : 3 x 2,6 A	Bj.: JJJJ/MM
Leistungsfaktor cos phi: 0,95-1,0	
Schutzart: IP22	
Schutzklasse: I	
	VARTA element 3 battery storage system made by VARTA Storage GmbH

Figure 7: ID label for the system (inside the storage cabinet)




Description: VARTA element battery module		 M4860P1BCLAJMMDDXXXX
VKB / SAP: 56460728099 / 715093		
SN / PDC: M4860P2SBMA JJMMDD XXXX		
Energy: 3200 Wh		
Voltage: 51,8 V		
Capacity: 62 Ah		
EAN No.:	 4260333930368	

Figure 8: ID label for a battery module (provided with the packaging)



Description:	VARTA element 3	 Unlock code: 5F5E1D7
Battery capacity:	3.2 kWh	
No. of battery modules:	1	
Serialnumber:	120 000 123	
	VARTA element 3 battery storage system made by VARTA Storage GmbH	

Figure 9: 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.

General

Operation



CAUTION!

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

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

Protect the device connection on the energy 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 energy storage system without PE and N.

Installation

Operation (Service)

Maintenance



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 1a/1b and 2a/2b in the attachment).

8.3.1 Connections at the distributor

The following connections must be prepared:

- Device connection: 5 x 2.5 mm²
 - Sensor cable: RJ12
 - LAN connection
-



Do not expose the RJ12 cable to mechanical load.



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

General

8.3.2 Preparation of the AC port for the building grid

To connect to the building grid, the 5-wire AC cable must be attached to the supplied AC connector.

- Strip the cable 4 cm at the end.

Operation



A flexible plastic-sheathed cable facilitates assembly work.

Installation

- The PE conductor must be 0.5 cm longer than the other four conductors (L1, L2, L3, N). Shorten these conductors accordingly.
- Strip the wires for the building connection approx. 8 mm at the ends.
- Ferrules must be used for fine-stranded conductors.
- Open the socket: Do this by loosening the union nuts of the strain relief and detaching the strain relief from the socket part. Release the catch by pressing on the two side lugs at the same time.

Operation (Service)

Maintenance

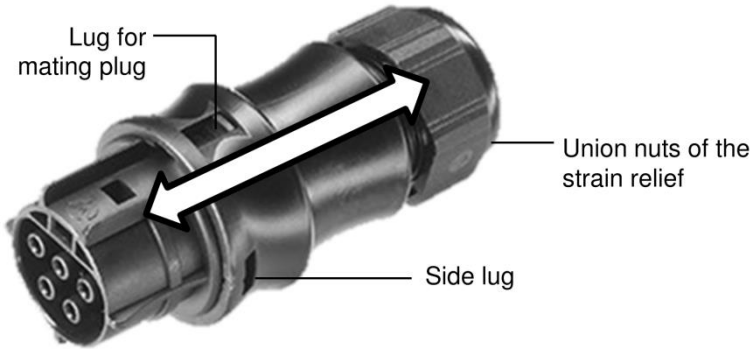


Figure 10: AC socket

Push the strain relief over the cable

- Insert the wires as shown in Figure 11 into the screwed connections of the socket and screw in place.
- Push socket and strain relief into one another: The two parts must audibly snap into one another with the aid of the side lugs.
- Tighten the union nuts of the strain relief.

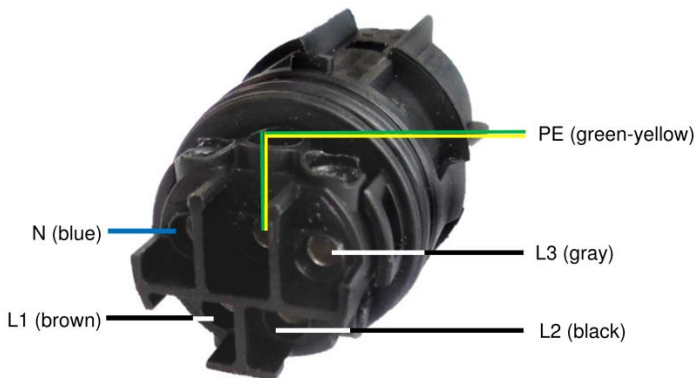


Figure 11: Assignment of screwed connections AC-socket - connection side

8.3.3 Current sensor



NOTICE!

Disruption to the charge and discharge function of the energy 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. The sensor is therefore located immediately behind the consumption and feed meter.

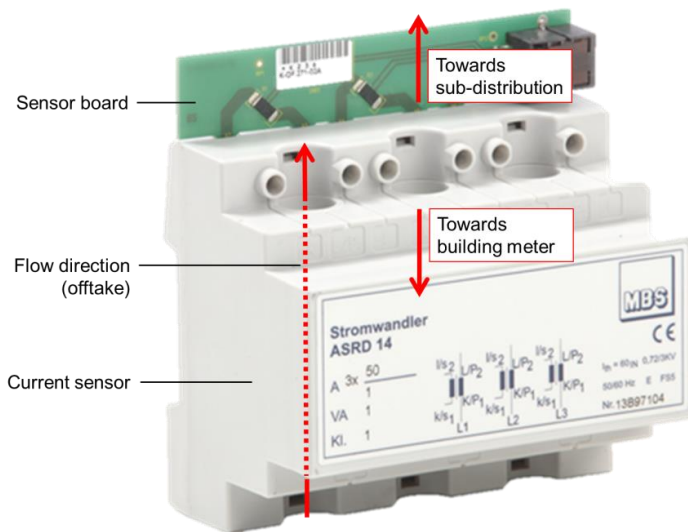


Figure 12: Current sensor - direction of installation

General

Operation

Installation

Operation (Service)

Maintenance

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 12.

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.

Connect the current sensor supplied with the sensor cable to the energy storage system. See the current measurement socket in Figure 14.

For the connection arrangement, see figures 1a/1b and 2a/2b in the attachment.

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
- 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 and electrical connection of the cabinet



DANGER!

Mortal danger from electric shock!

Before making the electrical connection, switch off the storage cabinet.

Make sure that the *On/Off* button on the front of the cabinet is unlatched (= not depressed).

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



NOTICE!

Condensation caused by cold weather.

Property damage caused by switching on electronic components from cold.

The storage cabinet must have reached room temperature before being switched on.



The cabinet weighs approximately 70 kg!

It must always be assembled by two or more people!

- Tilt cabinet by maximum 45° at the installation location → Risk of slipping away!

General

Operation

Installation

Operation (Service)

Maintenance

- Plug the AC connector into the AC port. The catch audibly engages.

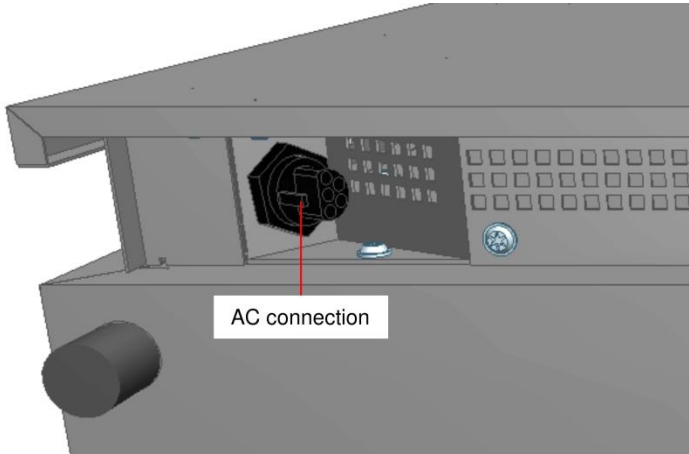


Figure 13: AC port on the rear of the storage cabinet

- Insert the sensor cable and the network cable into the corresponding sockets.

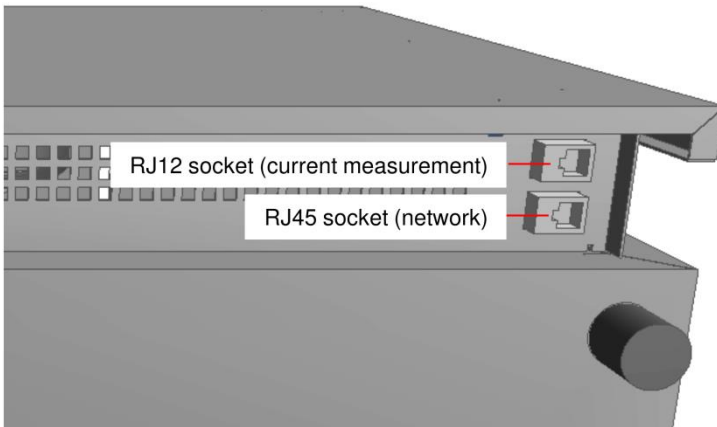


Figure 14: RJ12 and RJ45 sockets on the rear of the storage cabinet



Changes to the factory settings require a network connection.

- Position cabinet at the installation location.
- Screw your storage cabinet with suitable fasteners at the back wall. For this, turn the mounting angle 90 ° outwards.

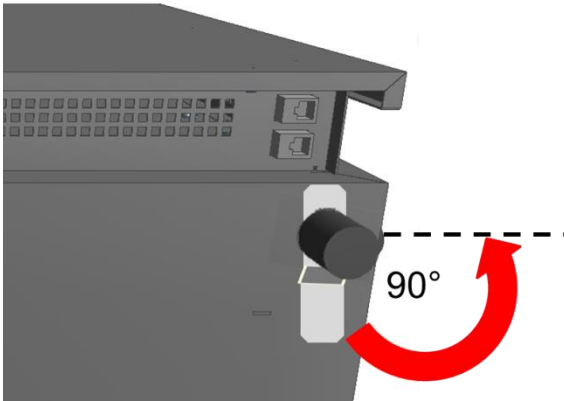


Figure 15: Wall mounting VATRA element 3/6

- 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.

8.6 Assembling the battery modules



DANGER!

High voltage! Mortal danger from electric shock!

The storage cabinet may be opened only by qualified electricians certified by VARTA Storage.



DANGER!

High voltage! Mortal danger from electric shock!

The contacts on the battery module and on the battery charger can remain energised at hazardous levels for up to 3 minutes after switching off.



The storage cabinet must always be switched off for 3 minutes before installing or removing any components.

The device must not be operated with the battery charger compartments opened.



CAUTION!

The battery modules weigh 35 kg!

Injury hazard during assembly!

Have two people lift and carry the battery modules.

8.6.1 Opening the cabinet

- Make sure that the *On/Off* button on the front of the cabinet is set to "Off" (= not depressed).
- To open the cabinet, undo the screws to the side near the door.

Aid: Torx 25 screwdriver



Figure 16: Opening the cabinet

8.6.2 Checking the battery modules

- Unpack the battery modules.
- Battery modules must not be/become damaged or contaminated.
- Remove the plastic cover from the rear Figure 17.

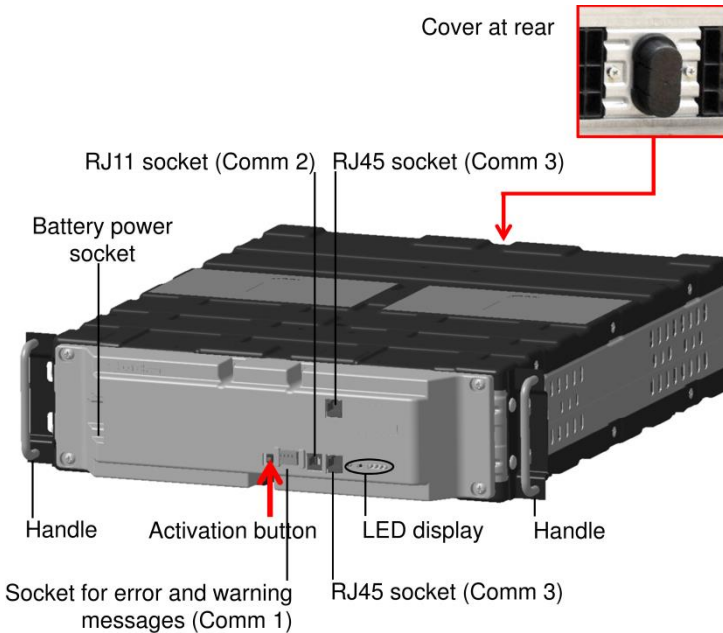


Figure 17: VATURA element 3/6 battery module

- Check the functionality of the battery modules. Do this by pressing the activation button (arrowed).
- The following LED indicator on the battery module indicates standby mode:



- Press the activation button again to switch off the battery module. (Hold down the button until the LED extinguishes.)



If the battery module is contaminated, damaged or not in standby mode, contact VARTA Storage.

8.6.3 Removing and connecting battery modules



The battery modules are charged.

Uncontrolled discharge poses a risk of property damage.

ACHTUNG!

The battery modules must be switched off before being installed in the storage cabinet.

Up to two battery modules can be installed. The battery modules are placed in a **suspended** position (see Figure 18).

- Lift the battery module/battery modules onto the two mounting rails using the handles.

Note: The battery power connection is on the left battery module.

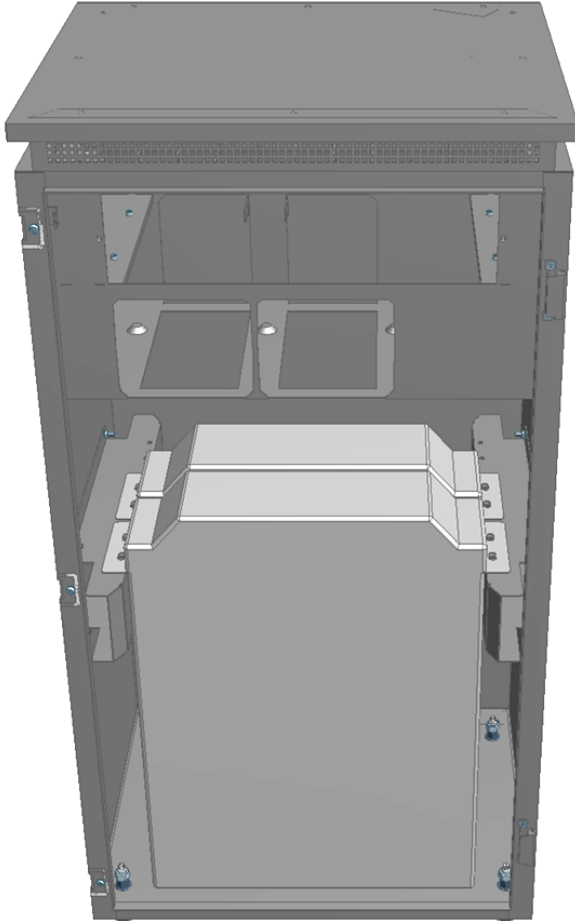


Figure 18: Installing the battery module(s)

Installing one battery module (only VARTA element 3)

Make the connections according to Figure 19 (see also Figure 17).

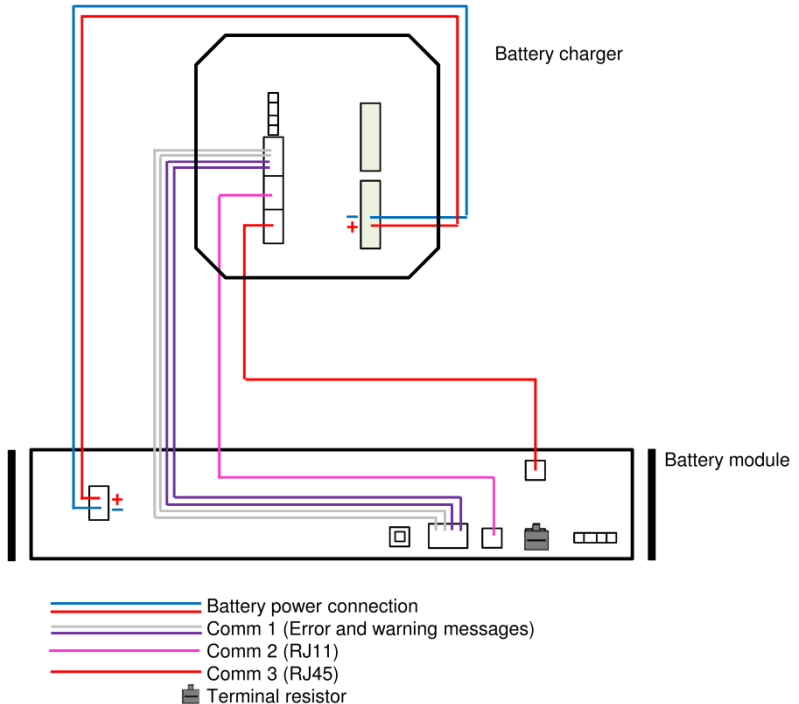


Figure 19: Connecting the battery charger to one battery module

- **Battery power connection:** Position the plug on the battery module and screw in place.
- **Communication 1:** Insert the four wires into the openings in the clamping connector on the battery module. For the pin assignment, see Figure 20.

Note: The connections for error and warning messages are self-clamping.

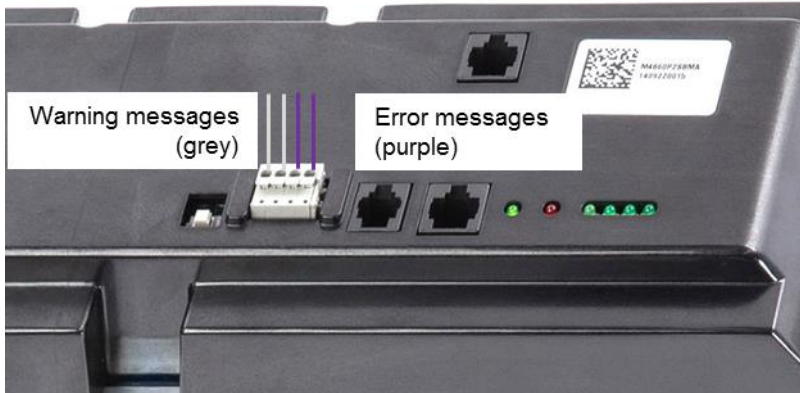


Figure 20: Clamping connections for error and warning messages



Risk of property damage due to transposed wires for error and warning messages!

Observe the colour-coding of the wires!

NOTICE!

- **Communication 2:** Remove the blanking plug from the RJ11 socket on the battery module. Connect the RJ11 cable.
- **Communication 3:** Remove the two RJ45 blanking plugs on the battery module. Connect the battery module to the battery charger by means of the RJ45 cable. Replace the second RJ45 blanking plug with a terminal resistor.
- Push the battery module over the mounting holes in the centre of the rails (see Figure 18).

- Fasten the battery module handles using the screws supplied.
Aid: Hexagon socket driver, size 4
- Press the activation button on the battery module (see Figure 17).
- The following LED indicator on the battery module indicates standby mode:



Installing two battery modules (only VARTA element 6)

If two battery modules are installed, one module (Module 1) is placed in the centre of the storage cabinet, the other (Module 2) at the front. Module (1) is the master module. Module 2 is the slave module.

Make the connections according to Figure 21 (see also Figure 17):



Make sure that the battery modules are switched off and no LED indicator is lit.

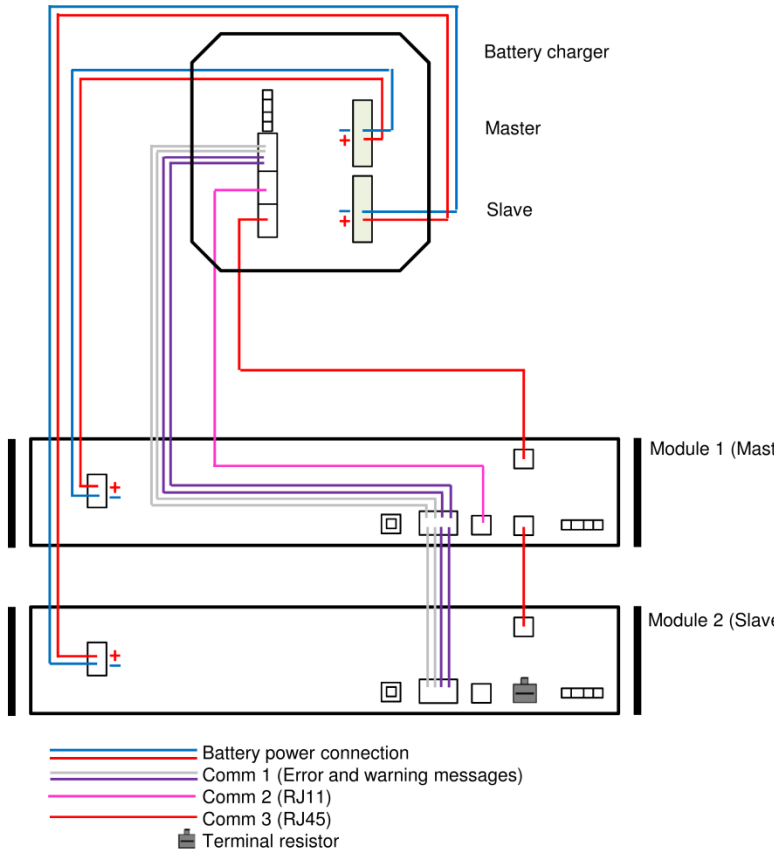


Figure 21: Connecting the battery charger to two battery modules

- **Battery power connection:** Position the plugs on the battery modules and screw in place.
- **Communication 1:** Insert the four double ferrules into the openings in the clamping connector on the master module. Insert the four ferrules into the openings in the clamping connector on the slave module. For the pin assignment, see Figure 20.

Note: The connections for error and warning messages are self-clamping.



Risk of property damage due to transposed wires for error and warning messages!

Observe the colour-coding of the wires!

NOTICE!

- **Communication 2:** Remove the blanking plug from the RJ11 socket on the master module. Connect the RJ11 cable on the battery module.
- **Communication 3:** Remove the RJ45 blanking plugs on the battery modules.
Connect the two modules together by means of short RJ45 cables.
Connect the master battery module to the battery charger by means of long RJ45 cables.
Replace the second RJ45 blanking plug with a terminal resistor on the slave module.
- Push the master module onto the centre fastening holes (see Figure 18 and the slave module onto the front fastening holes.
- Fasten the battery module handles using the screws supplied.
Aid: Hexagon socket driver, size 4
- Press the activation button on the **master battery module** (see Figure 17).
- The following LED indicator on the **two** battery modules indicates standby mode:



8.6.4 Closing storage cabinet

- If contamination accumulates inside the cabinet, vacuum out the cabinet. Do not use water for cleaning.
- Close the storage cabinet door and secure with screws.



Do not leave any tools in the cabinet!

8.7 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!

8.7.1 Switching on

The following steps are required to switch on the VATRA element 3/6 energy storage system:

- Make sure that the network cable is connected.
- Connect the fuse at the building grid.
- Activate storage system using *On/Off* button. The button engages.



Figure 22: On/Off button

The initialisation process can be tracked at the LED ring of the *On/Off* button (see also Table 7):

- Flashes green every second: System check (duration: approx. 90 s).
- Steady green light: The storage system is ready (duration: approx. 60 s).
- Steady red light: Probable error = the battery modules have not yet been configured.

→Continue with commissioning.

Note: If the LED ring fails to respond, check the following:

- *On/Off* button correctly latched?
- Fuses connected?
- Grid connection correct?
- Door contact switch not damaged?

8.7.2 Password entry

The storage cabinet must be connected to the router of the home network by means of the network cable.

- Connect your PC/Notebook to the customer's network.
- Enter into the address line of your browser after `http://varta` the serial number of your energy storage system, e.g.: `http://varta121123456`

(The serial number can be found on the rating plate on the outside of the cabinet.)

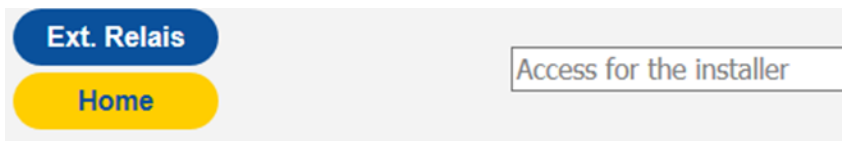
- The welcome page of the web interface will appear.

If the storage system cannot be accessed via the customer's network, a connection can be established by means of the VARTA network configurator (NCT). Enter your user name and password to download this from:

<https://www.varta-storage.com/de/nc/b2b.html>

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

- Enter the password into the field for installation engineer access.



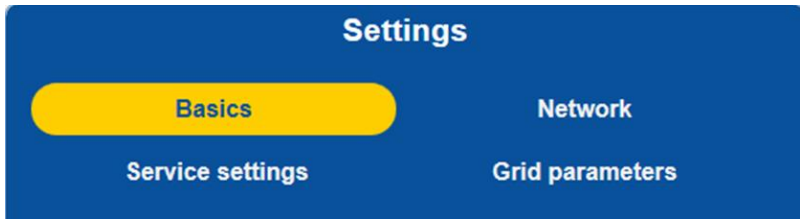
- Further tabs appear in the header.

8.7.3 Enter device name and serial number of the battery modules

- Click on the *Settings* tab (arrowed).



- The *Settings* page opens.



- Click on the *Basic settings* tab.

Device name:	<input type="text" value="Varta_S"/>
Date:	<input type="text" value="2015-10-06"/>
Time:	<input type="text" value="15:38:35"/>
Time zone:	<input type="text" value="GMT+1"/> ▼
Language:	<input type="text" value="German"/> ▼
Serial number battery module 1:	<input type="text" value="860P2SBMA1501190071"/>
Serial number battery module 2:	<input type="text" value="860P2SBMA1501190072"/>
<input type="button" value="Reset"/> <input type="button" value="Factory default"/> <input type="button" value="Accept"/>	

- Enter a name for the device. The maximum length is 20 characters.
- Enter the serial number(s) of the installed battery module (VARTA element 3) or installed battery modules (VARTA element 6).
- Click on *Apply*.



The storage system cannot be correctly commissioned unless the correct serial numbers of the battery modules are stated.

- Once the correct serial number has been entered, the LED ring indicator changes from red to green.

Remedy: The LED ring remains red

Error 1: In Settings, check whether the serial number(s) of the battery module(s) have been correctly entered. Correct the numbers if necessary and then switch the battery storage system off and back on again.

Error 2: Switch off the energy storage system and open the door. Check the LED indicators on the battery modules.

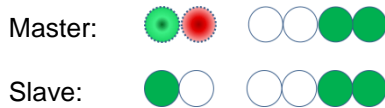
- **Option 1:** On the Master **and** Slave modules, the two **left** LEDs flash green and red in alternation.

Master: 

Slave: 

- Check whether the communication cable is inserted between the battery modules. If not, insert it.
- Press the activation buttons on **both** battery modules, one after the other, for 20 s. **All** LEDs on both battery modules must then extinguish.
- Activate the Master module with the activation key.
- Close the door and switch the storage system back on.

- **Option 2:** Only on the Master module, the first and second LEDs from the left flash green and red in alternation. On the Slave module, the left LED lights up green permanently.



- Check whether the communication cables are correctly assigned as shown in Figure 21. Re-arrange the cables if necessary.
- Press the activation buttons on **both** battery modules, one after the other, for 20 s. **All** LEDs on both battery modules must then extinguish.
- Activate the Master module with the activation key.
- Close the door and switch the storage system back on.

If the LED ring is still red, contact VARTA Storage GmbH.

8.7.4 Portal connection

- Select the *Network* tab from *Settings*.

By default, the storage device uses the customer's network settings. Check the selection field next to *Activate DHCP* and enter the network mask.

IP address:	<input type="text" value="0.0.0.0"/>
Netmask:	<input type="text" value="255.255.255.0"/>
DNS address:	<input type="text" value="0.0.0.0"/>
Gateway:	<input type="text" value="0.0.0.0"/>
Enable DHCP:	<input checked="" type="checkbox"/>
<input type="button" value="Reset"/> <input type="button" value="Factory default"/> <input type="button" value="Accept"/>	

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).



If IP address, DNS address and gateway are to be set up statically, knowledge of the static address assignment is required. This is needed to read out the router's network configuration, for example.

See Chapter 9.4.2.

8.7.5 Country code NA Protection

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

- Click on the *Grid parameters* tab.
- The *Grid parameters* page will appear.
- Change the settings - if necessary.

Automatically:	<input checked="" type="checkbox"/> Germany
Minimum grid frequency:	<input type="text" value="4750"/> 0.01 Hz
Maximum grid frequency:	<input type="text" value="5150"/> 0.01 Hz
Minimum grid voltage:	<input type="text" value="184"/> V
Maximum grid voltage:	<input type="text" value="264"/> V
Maximum grid voltage over 10 minutes:	<input type="text" value="253"/> V
Minimum voltage between phases:	<input type="text" value="320"/> V
Maximum voltage between phases:	<input type="text" value="460"/> V
<input type="button" value="Reset"/> <input type="button" value="Factory default"/> <input type="button" value="Apply"/>	

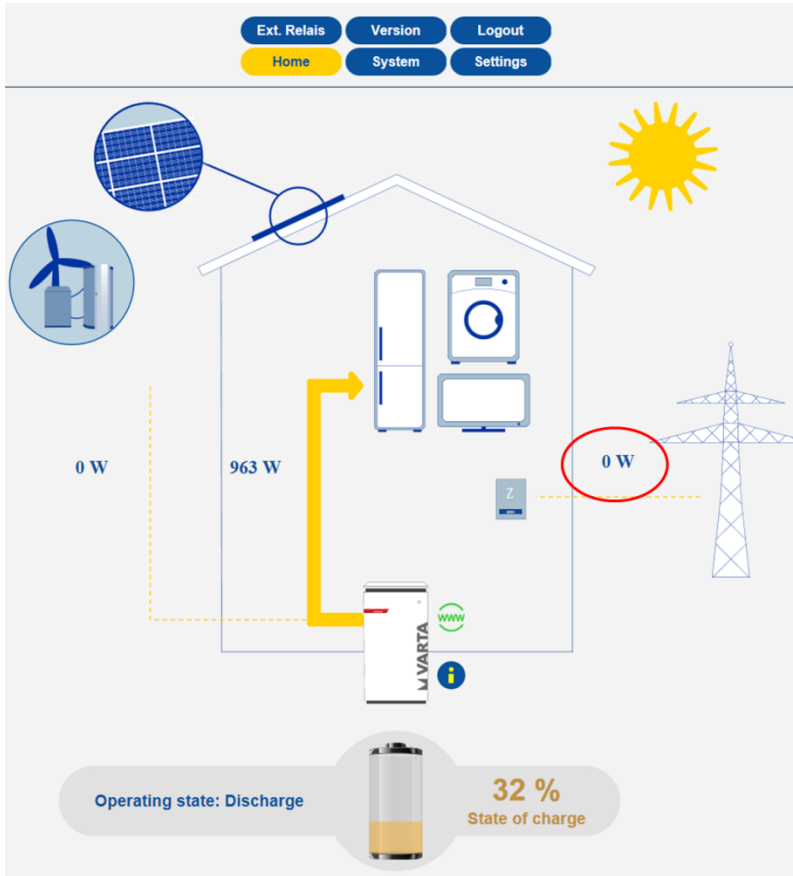
Setting: Automatic

- Check the *Automatic* option.
- Select the country for which the settings are to apply from the dropdown list.
- Click on *Apply*.

The *Automatic* setting uses the default values that are saved for the selected country (see Table 8).

For the individual grid parameter settings, see Chapter 9.4.4.

8.7.6 Checks on the welcome page of the web interface



- Check the current sensor data for plausibility (circled).

8.7.7 Checking the connections

Once the energy storage system has been installed and connected, it is necessary to check whether the system signals a current flow in all three phases (plausibility).

- Return to the welcome page and click on the *System* tab.

Overview battery inverter

	L1	L2	L3
U Backup	232 V	226 V	226 V
U Grid	232 V	227 V	225 V
I Inv	0.08 A	0.01 A	0.04 A
I Grid	0.10 A	0.33 A	-0.25 A
Temperature	26 °C	25 °C	25 °C
P Grid	42 W		
P Inv	30 W		
SOC	0 %		
U N → PE	-3.0 V		

- Check the measured values for I Grid for plausibility.
- An error has occurred if the value for I Grid hovers between +0.01 and 0.01 at all three phases. Check the cable connection to the current sensor.

Note: The system may need to have a large load at all three phases.

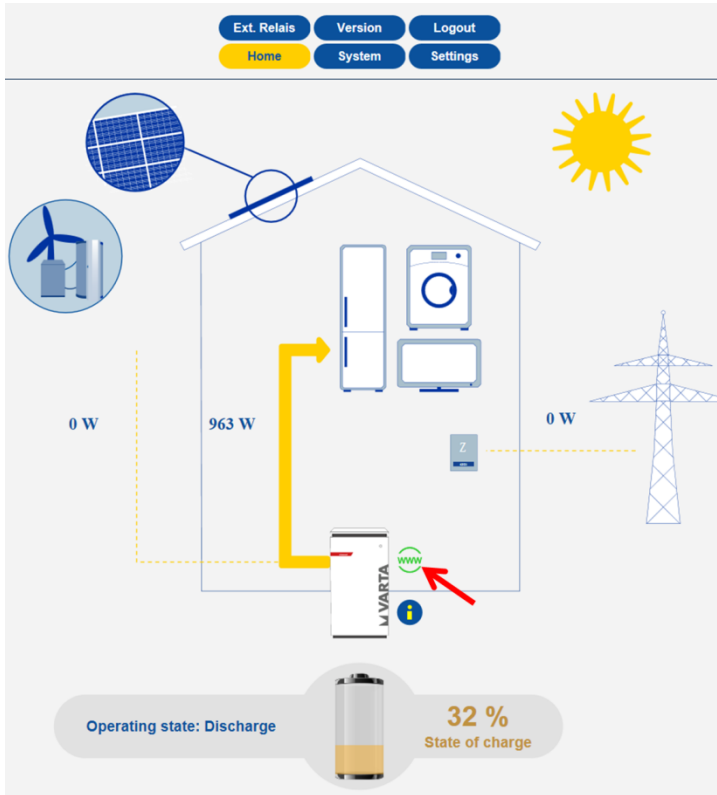
8.7.8 Reboot

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

- Turn the storage system off and then back on again at the *On/Off* button.

8.7.9 Checks after the reboot

- Check the online status on the welcome page (arrowed).



- On the *System* page, check whether all the installed battery modules are displayed (arrowed).

Overview battery modules - battery chargers 1

UBatt [V]	51.2	IBatt [A]	38.8	TempMin [°C]	21.3	TempMax [°C]	21.5
UMinModuleID	1	UMaxModuleID	1	TempMinModuleID	1	TempMaxModuleID	2
Alarms	0x0000	Warnings	0x0000	Faults	0x0000		

Modul 0 - M4860P2SBMA1501190074			
U [V]	51.3	I [A]	18.7
Temp1 [°C]	21.4	Temp2 [°C]	21.3
TempAvg [°C]	21.4	Warnings	0x0000
Faults	0x0000	Status	Charging

Modul 1 - M4860P2SBMA1501190122			
U [V]	51.2	I [A]	19.7
Temp1 [°C]	21.5	Temp2 [°C]	21.5
TempAvg [°C]	21.5	Warnings	0x0000
Faults	0x0000	Status	Charging

- On the *Settings* page, select the *Service settings* button.
- From battery module settings, select *Discharge* and enter 1000 W. Then click on *Apply* to confirm.

Time of reboot:	3 o'clock
Days of reboot:	<input type="checkbox"/> Mo <input type="checkbox"/> Di <input type="checkbox"/> Mi <input type="checkbox"/> Do <input type="checkbox"/> Fr <input type="checkbox"/> Sa <input checked="" type="checkbox"/> So
Manual control of the fan:	Automatic
Air filter change - Resetting the time	<input type="checkbox"/>
Battery module control setting:	Charging <input type="text" value="0"/>
<input type="button" value="Reset"/> <input type="button" value="Factory settings"/> <input type="button" value="Apply"/>	

- Select the *System* page.
- Check the operating state of the battery modules/battery module for plausibility.

Overview battery modules - battery chargers 1

UBatt [V]	51.2	IBatt [A]	38.8	TempMin [°C]	21.3	TempMax [°C]	21.5
UMinModuleID	1	UMaxModuleID	1	TempMinModuleID	1	TempMaxModuleID	2
Alarms	0x0000	Warnings	0x0000	Faults	0x0000		

Modul 0 - M4860P2SBMA1501190074			
U [V]	51.3	I [A]	18.7
Temp1 [°C]	21.4	Temp2 [°C]	21.3
TempAvg [°C]	21.4	Warnings	0x0000
Faults	0x0000	Status	Charging

Modul 1 - M4860P2SBMA1501190122			
U [V]	51.2	I [A]	19.7
Temp1 [°C]	21.5	Temp2 [°C]	21.5
TempAvg [°C]	21.5	Warnings	0x0000
Faults	0x0000	Status	Charging

8.7.10 Exiting the password-protected area

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

- Click on the *Logout* tab.

Operation (password-protected area)

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

9 The password-protected area

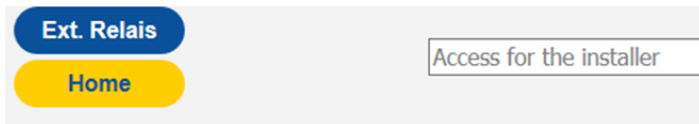
Note: this section is for qualified electricians certified by VARTA Storage GmbH.

9.1 Entering the Password

The procedure for accessing the web interface is described in the Operation section. See Chapter 4.3.1.

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

- Enter the password into the field for installation engineer access.



- Further tabs appear in the header.
- Click on a tab.



9.2 System

Overview battery chargers

Nr	SerNr	UBatt	IBatt	P1st	PSoll	SoC	UZwk	UVcc	UCool	THT	TTR	TBoard	Status
0	K463102	52.57 V	29.78 A	1565 W	2000 W	54 %	707.3 V	11.4 V	386.2 V	45 °C	49 °C	37 °C	Charging
1	K463120	51.47 V	38.66 A	1989 W	2000 W	34 %	705.7 V	11.4 V	381.4 V	48 °C	54 °C	37 °C	Charging

Overview battery inverter

	L1	L2	L3
U Inv	223 V	223 V	225 V
U Grid	224 V	224 V	225 V
I Inv	5.53 A	5.56 A	5.53 A
I Grid	-5.68 A	-5.65 A	-5.85 A
Temperature	45 °C	45 °C	45 °C
P Grid	-3854 W (from the grid)		
P Inv	3717 W (Charging)		
Nominal power	0 W		
SOC	44 %		
TempBoard	41 °C		
Fan	31		
Cont. Inv	Betrieb (24)		
Cont. EMS	Betrieb (35)		
Cont. ENS	Betrieb (30)		
EMS mode	Service (3)		
U N → PE	0.0 V		
RCMU	0.6 mA		
Uvcc	11.8 V		
Uzwk	710.0 V / 353.0 V		
Ext. Relais	0		

Overview battery modules - battery chargers 0

UBatt [V]	52.3	IBatt [A]	30.3	TempMin [°C]	23.8	TempMax [°C]	24.0
UMinModuleID	1	UMaxModuleID	1	TempMinModuleID	1	TempMaxModuleID	1
Alarms	0x0000	Warnings	0x0000	Faults	0x0000		
Modul 0 - M4860P2SBMA1501200006							
U [V]	52.3	I [A]	30.3				
Temp1 [°C]	23.8	Temp2 [°C]	24.0				
TempAvg [°C]	23.9	Warnings	0x0000				
Faults	0x0000	Status	Charging				

Overview battery modules - battery chargers 1

UBatt [V]	51.2	IBatt [A]	38.8	TempMin [°C]	21.3	TempMax [°C]	21.5
UMinModuleID	1	UMaxModuleID	1	TempMinModuleID	1	TempMaxModuleID	2
Alarms	0x0000	Warnings	0x0000	Faults	0x0000		
Modul 0 - M4860P2SBMA1501190074							
U [V]	51.3	I [A]	18.7				
Temp1 [°C]	21.4	Temp2 [°C]	21.3				
TempAvg [°C]	21.4	Warnings	0x0000				
Faults	0x0000	Status	Charging				
Modul 1 - M4860P2SBMA1501190122							
U [V]	51.2	I [A]	19.7				
Temp1 [°C]	21.5	Temp2 [°C]	21.5				
TempAvg [°C]	21.5	Warnings	0x0000				
Faults	0x0000	Status	Charging				

Serial numbers of the modules
M4860P2SBMA1501200006
M4860P2SBMA1501190074
M4860P2SBMA1501190122

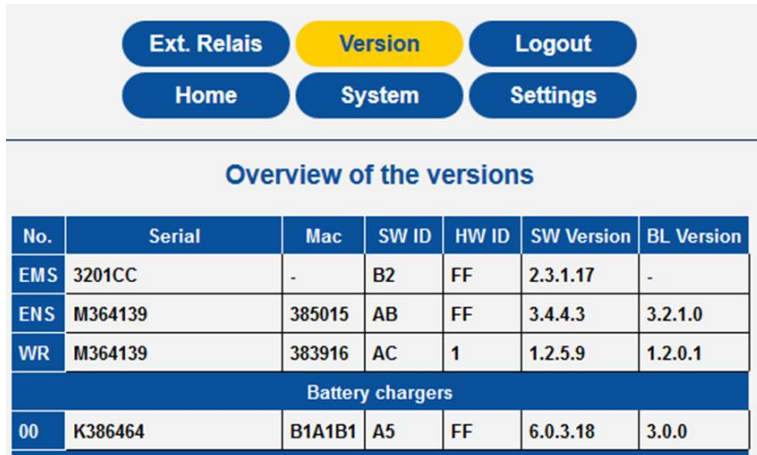
Error list	NA error list
0x061a Battery chargers: Topti Max	0x0403 Battery chargers: System frequency too high

This page provides an up-to-date overview of the serial numbers and operating state of the battery modules and of the battery chargers. The overview also includes the battery inverter data.

Grid and system faults are displayed in the system fault list and GS fault list fields.

9.3 Version

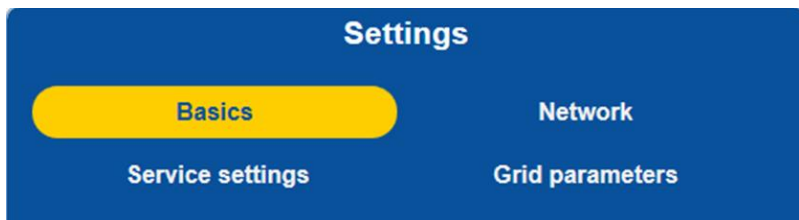
The versions of the system components can be viewed on this page.



No.	Serial	Mac	SW ID	HW ID	SW Version	BL Version
EMS	3201CC	-	B2	FF	2.3.1.17	-
ENS	M364139	385015	AB	FF	3.4.4.3	3.2.1.0
WR	M364139	383916	AC	1	1.2.5.9	1.2.0.1
Battery chargers						
00	K386464	B1A1B1	A5	FF	6.0.3.18	3.0.0

9.4 Settings

The *Settings* page gives you access to other input screens.



- Click on a tab.
- Enter the parameters or check the corresponding selection box.
- Confirm your entries by clicking on the *Apply* button.

- Alternatively, you can restore the *Factory settings* or return to the previous operating state via *Return*.

9.4.1 Basic settings

Device name:	Varta_S
Date:	2015-10-06
Time:	15:38:35
Time zone:	GMT+1
Language:	German
Serial number battery module 1:	860P2SBMA1501190071
Serial number battery module 2:	860P2SBMA1501190072
<input type="button" value="Reset"/> <input type="button" value="Factory default"/> <input type="button" value="Accept"/>	

Basic settings can be changed on this page:

- **Device name:** The name of the device is usually entered during the commissioning procedure. The maximum length is 20 characters.
- **Date and time** can be entered here. As a rule, these parameters are automatically synchronised via the time server.
- **Time zone:** For Germany, the time is GMT+1 (Greenwich Mean Time + 1 h).
- **Language:** The language display on the web interface can be selected.

- **Serial number of battery module 1 (battery module 2):**
Enter the serial number(s) of the battery module/battery modules here.

9.4.2 Network

IP address:	<input type="text" value="0.0.0.0"/>
Netmask:	<input type="text" value="255.255.255.0"/>
DNS address:	<input type="text" value="0.0.0.0"/>
Gateway:	<input type="text" value="0.0.0.0"/>
Enable DHCP:	<input checked="" type="checkbox"/>
<input type="button" value="Reset"/> <input type="button" value="Factory default"/> <input type="button" value="Accept"/>	

By default, the storage device uses the customer's network settings. Check the selection field next to *Activate DHCP* and enter the network mask.

- **IP address:** is read out automatically.
- **Network mask:** must be entered manually if DHCP is not activated.
- **DNS address:** is read out automatically.
- **Gateway:** is read out automatically.
- **DHCP:** This option is used to activate the automatic referencing of the customer's network parameters.



If IP address, DNS address and gateway are to be set up statically, knowledge of the static address assignment is required. This is needed to read out the router's network configuration, for example.

9.4.3 Service settings

Time of reboot:	3 o'clock
Days of reboot:	<input type="checkbox"/> Mo <input type="checkbox"/> Di <input type="checkbox"/> Mi <input type="checkbox"/> Do <input type="checkbox"/> Fr <input type="checkbox"/> Sa <input checked="" type="checkbox"/> So
Manual control of the fan:	Automatic
Air filter change - Resetting the time	<input type="checkbox"/>
Battery module control setting:	Charging 0
<input type="button" value="Reset"/> <input type="button" value="Factory settings"/> <input type="button" value="Apply"/>	

The following parameters can be set on this page:

- **Time reboot:** By default, the system reboots at between 3 and 4 o'clock. Any hour between 0 and 24 hrs can be entered for the reboot time.
- **Days reboot:** The weekday/s of the reboot are determined via checkboxes. At least one checkbox needs to be selected.
- **Manual fan control:** It is possible to toggle between automatic (= 0), medium setting (= 1) and the highest setting (= 2).

- **Air filter – reset the time:** The time until the next air filter change can be reset. Check the selection field - if the air filter is actually replaced or cleaned.
- **Battery module control:** The energy storage system can be discharged for test purposes.

9.4.4 Grid parameters NA protection

The grid parameters for NA protection have to be adjusted to the requirements of the country in question.

Automatically:	<input checked="" type="checkbox"/> Germany
Minimum grid frequency:	4750 0.01 Hz
Maximum grid frequency:	5150 0.01 Hz
Minimum grid voltage:	184 V
Maximum grid voltage:	264 V
Maximum grid voltage over 10 minutes:	253 V
Minimum voltage between phases:	320 V
Maximum voltage between phases:	460 V
<input type="button" value="Reset"/> <input type="button" value="Factory default"/> <input type="button" value="Apply"/>	

- **Automatic:** If the selection box is checked, the saved settings will be used for GS protection. The country for which the settings are to apply can be selected from the dropdown list.

Table 8 contains the default values that are saved for Germany, Austria, France, Italy and the Netherlands.

In addition to the default values, the minimum and maximum values for the voltage between the phases can be set via the numerical input fields.

- **Minimum voltage** between two of the three phases (within the limits: 0 – 600 V)
- **Maximum voltage** between two of the three phases (within the limits: 0 – 600 V)

Grid parameters					
Country	FNETWORK_MIN (in Hz)	FNETWORK_MAX (in Hz)	UNETWORK_MIN (in V)	UNETZ_MAX (in V)	UNETZ_MAX10 (in V)
Germany	47.50	51.50	184	264	253
Austria	47.50	51.50	184	264	258
France	47.50	51.50	184	264	253
Italy	47.50	51.50	184	264	253
Netherlands	47.50	51.50	184	264	253

Table 8: Grid parameter default settings

Note: If the *Automatic* option is **not** selected, the following parameters can also be set to suit the individual requirements of the grid operator:

- Minimum grid frequency (FGRID_MIN)
- Maximum grid frequency (FGRID_MAX)
- Minimum grid voltage (UGRID_MIN)

- Minimum grid voltage (UGRID_MAX)
- Minimum grid voltage over 10 minutes (UGRID_MAX10)

9.4.5 Logging out

Finally, it is necessary to ensure that the customer is unable to access the password-protected area.

- Click on the Logout tab.

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 VATRA element 3/6 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 VATRA element 3/6 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 VATRA element 3/6 energy 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 Checking the storage cabinet from outside

11.1.1 Checking the storage cabinet from outside

- Is the ventilation strip on the storage cabinet cover (see Chapter 11.3.7) clogged/contaminated? → The ventilation strip can be cleaned from inside once the cover has been removed (see Chapter 11.3.7).
- 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 screw as necessary.

11.2 Checking the system parameters

The service and repair work must also include a system parameter check. This work is done via the web interface. For operation in the password-protected area, see Chapter 9.

The checks to be recorded in the service booklet (Sections 11.2.1 to 11.2.5) are tagged with the reference **(Service)**. Observe also the service booklet.

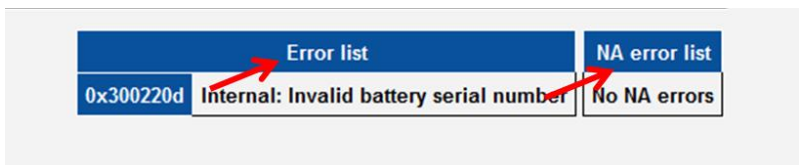
11.2.1 Checking the online status (Service)

On the web interface welcome page, the WWW icon indicates whether the energy storage system is connected to the VARTA server (green = online, red = offline).

11.2.2 Error history (Service)

Reading out the error history

- Select the *System* button from the header.
- The error lists for the storage system and the grid and system (GS) protection will be displayed (arrowed).



Error rectification

- Verify the errors using the fault descriptions.
- Check the GS settings if applicable. See Chapter 9.4.4.

- Rectify any errors.
- Restart the storage system. Turn the storage system off and then back on again at the *On/Off* button.
- If the errors cannot be rectified, notify VARTA Service.

11.2.3 Checking the software version (Service)

- Select the *Version* tab from the header.
- The software versions can be read off.

Overview of the versions

No.	Serial	Mac	SW ID	HW ID	SW Version	BL Version
EMS	3201CC	-	B2	FF	2.3.1.17	-
ENS	M364139	385015	AB	FF	3.4.4.3	3.2.1.0
WR	M364139	383916	AC	1	1.2.5.9	1.2.0.1
Battery chargers						
00	K386464	B1A1B1	A5	FF	6.0.3.18	3.0.0
Battery modules						
00	860P2SBMA1501190071	-	8	261	-	-
01	860P2SBMA1501190072	-	8	261	-	-

11.2.4 Software update (Service)

Software updates are required for energy storage systems that are operated offline or if a "Technical Online Service of VARTA Storage" Agreement has been concluded.



A software update is useful only if the errors have been rectified, no further errors appear on the web interface and the system was restarted.

11.2.5 Air filter change: Resetting the time (Service)

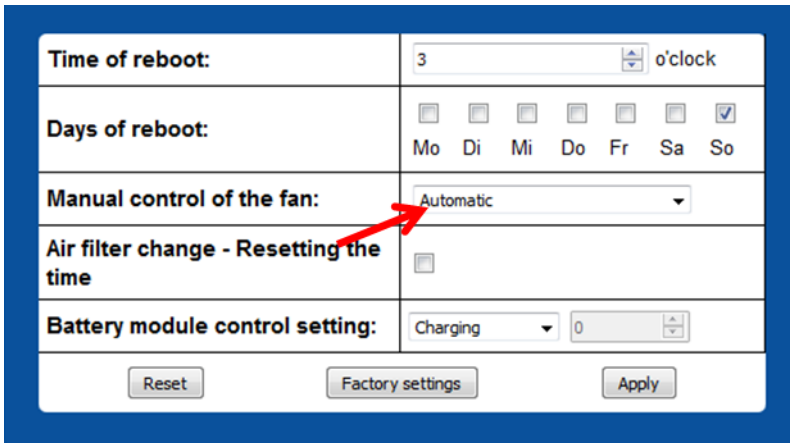
The air filter must be replaced at every second service. See Chapter 11.3.5.

- From the *Settings* tab, select the *Service settings* item.
- Check the *Reset air filter* box.
- Click on *Apply*.

Time of reboot:	3 <input type="text"/> o'clock
Days of reboot:	<input type="checkbox"/> Mo <input type="checkbox"/> Di <input type="checkbox"/> Mi <input type="checkbox"/> Do <input type="checkbox"/> Fr <input type="checkbox"/> Sa <input checked="" type="checkbox"/> So
Manual control of the fan:	Automatic <input type="text"/>
Air filter change - Resetting the time	<input checked="" type="checkbox"/>
Battery module control setting:	Charging <input type="text"/> 0 <input type="text"/>

11.2.6 Checking the fan (Service)

- From the *Settings* tab, select the *Service settings* item.
- Use *Manual fan control* to toggle between settings 0 (= automatic), 1 (= medium setting) and 2 (= highest setting).



The screenshot shows a settings menu with the following fields:

Time of reboot:	3 o'clock
Days of reboot:	<input type="checkbox"/> Mo <input type="checkbox"/> Di <input type="checkbox"/> Mi <input type="checkbox"/> Do <input type="checkbox"/> Fr <input type="checkbox"/> Sa <input checked="" type="checkbox"/> So
Manual control of the fan:	Automatic
Air filter change - Resetting the time	<input type="checkbox"/>
Battery module control setting:	Charging 0

Buttons at the bottom: Reset, Factory settings, Apply. A red arrow points to the 'Automatic' dropdown menu.

- Check whether the fan is blowing out air at the top. Wait for 10 to 15 s until the fans have reached a constant speed.

Note: It is possible that the fans are already running.

- Pay attention to noises that indicate mechanical damage.
- Reset to the *Automatic* (0) setting.

To replace and clean the fan, see Chapter 11.3.7.

11.2.7 Checking the current sensor values

- Select the *System* page.

	L1	L2	L3
U Backup	232 V	226 V	226 V
U Grid	232 V	227 V	225 V
I Inv	0.08 A	0.01 A	0.04 A
I Grid	0.10 A	0.33 A	-0.25 A
Temperature	26 °C	25 °C	25 °C
P Grid	42 W		
P Inv	30 W		
SOC	0 %		
U N → PE	-3.0 V		

- Check the current sensor values I Grid1, I Grid 2 and I Grid 3 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. See chapter 9.4.3.

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.

11.2.8 Checking the battery chargers

- On the *System* page, check the operating state of the battery chargers for plausibility.

Overview battery chargers													
Nr	SerNr	UBatt	IBatt	PIst	PSoll	SoC	UZwk	UVcc	UCool	THT	TTR	TBoard	Status
0	K463102	52.57 V	29.78 A	1565 W	2000 W	54 %	707.3 V	11.4 V	386.2 V	45 °C	49 °C	37 °C	Charging
1	K463120	51.47 V	38.66 A	1989 W	2000 W	34 %	705.7 V	11.4 V	381.4 V	48 °C	54 °C	37 °C	Charging



11.2.9 Checking the battery modules

- The warnings and errors of the battery modules are displayed on the *System* page.

Note: The individual modules are counted starting from 0, e.g. in case of two modules, from 0 to 1.

Overview battery modules - battery chargers 1

UBatt [V]	51.2	IBatt [A]	38.8	TempMin [°C]	21.3	TempMax [°C]	21.5
UMinModuleID	1	UMaxModuleID	1	TempMinModuleID	1	TempMaxModuleID	2
Alarms	0x0000	Warnings	0x0000	Faults	0x0000		

Modul 0 - M4860P2SBMA1501190074			
U [V]	51.3	I [A]	18.7
Temp1 [°C]	21.4	Temp2 [°C]	21.3
TempAvg [°C]	21.4	Warnings	0x0000
Faults	0x0000	Status	Charging

Modul 1 - M4860P2SBMA1501190122			
U [V]	51.2	I [A]	19.7
Temp1 [°C]	21.5	Temp2 [°C]	21.5
TempAvg [°C]	21.5	Warnings	0x0000
Faults	0x0000	Status	Charging

General

Operation

11.2.10 Discharging the battery modules

The battery modules can be discharged manually for test purposes.

- Select *Settings* and then the *Service settings* tab.

Installation

Operation (Service)

Maintenance

- From the Battery module control setting, select *Discharge*.
- Enter a value of 1000 W, for example.
- Click on *Apply*.

11.3 Service and repair: cabinet interior



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.



DANGER!

The energy storage system components carry current.

Mortal danger from electric shock!

De-energise the energy storage system prior to carrying out any work:

Switch off the system at the *On/Off* button (button unlatched)!

Disconnect the fuses of the device connection!



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!

11.3.1 Opening the cabinet

- To open the door, remove the three screws on the left side of the cabinet.
Aid: Torx 25 screwdriver



Figure 23: Opening the door

11.3.2 Remove battery inverter

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



Figure 24: 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.

11.3.3 Removing and installing the battery charger



WARNING!

The battery module is electrically charged!

Uncontrolled discharge poses a risk of property damage to battery charger and battery module.

Switch off the battery module at the activation button prior to removing the battery charger.

- Make sure no LEDs are lit on the battery module/battery modules.

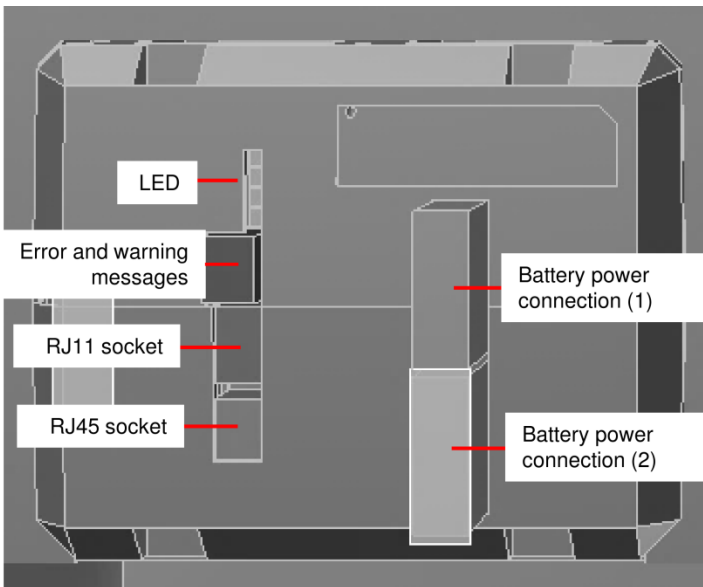


Figure 25: Connections on the battery charger

- Remove the following power cables from the battery charger:
 - Battery power connection,
 - Comm 1 (error and warning messages)
 - Comm 2 (RJ11) and
 - Comm 3 (RJ45)
- Push a screwdriver into the side mounting slots to dislocate the battery charger.
Aid: Slotted screwdriver
- Pull the battery charger approximately half-way out of the compartment.
- Remove the inverter connection at the rear.

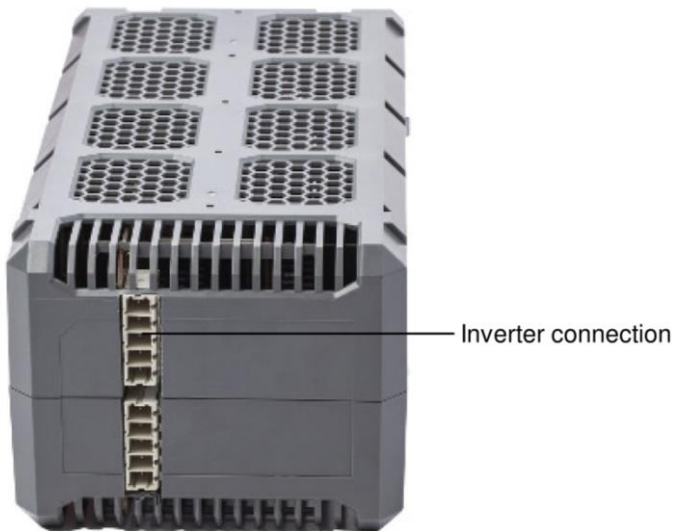


Figure 26: Battery charger - rear

- Pull the battery charger out of the compartment using both hands.

- To reinstall, perform the working steps in reverse order. The battery charger locks in the end position. It is not necessary to use a screwdriver.
- Switch the master battery module back on at the activation button to restore the configuration.

11.3.4 Removing and installing battery modules



CAUTION!

The battery modules weigh 35 kg!

Injury hazard during assembly!

Have two people lift and carry the battery modules.



NOTICE!

The battery module is electrically charged!

Uncontrolled discharge poses a risk of property damage to battery charger and battery module.

Switch off the battery module at the activation button prior to removal.



NOTICE!

Property damage due to incorrect handling!

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

Removing battery modules

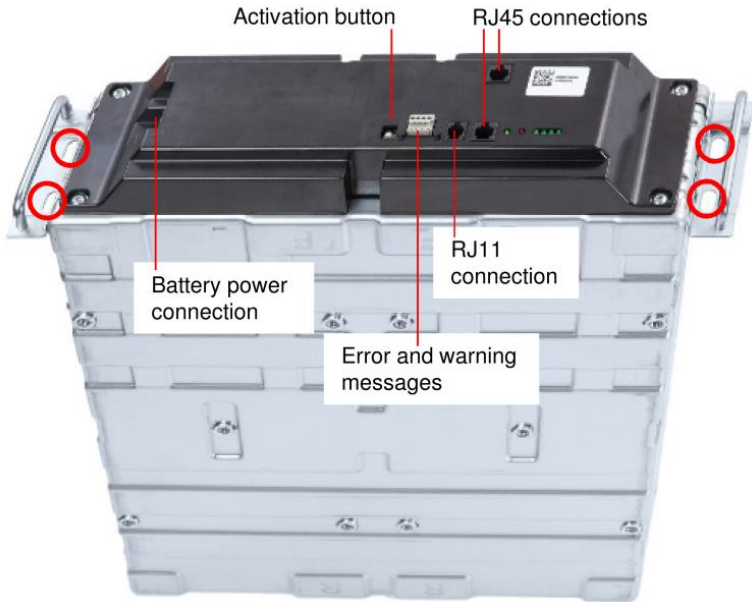


Figure 27: Removing the battery module

- Switch off the battery module at the activation button. (Hold down the button until the LED extinguishes.)
- Remove the following power cables:
 - Battery power connection
 - Comm 1 port, warning and error messages
 - Comm 2 (RJ11)
 - Comm 3 (RJ45)

Note: The battery power connection is easier to screw off once the battery module has been removed.

- Loosen the mounting screws (circled).
Aid: Hexagon socket driver, size 4

- Use the handles to pull the battery module forward onto the rails.
- Lift the battery module out of the storage cabinet.

Installing battery modules

- Reinstall the battery modules in reverse order.



Make sure that the battery modules are switched off and no LED indicator is lit.

-
- Following installation, switch on the master module.

11.3.5 Replacing/cleaning the air filter

- Unscrew the filter holder.
Aid: Torx 25 screwdriver
- The air filter can be removed.
- Clean the area around the filter with a cloth.
- Clean the air filter with a vacuum cleaner if necessary.



Make sure no dust from the air filter gets inside the storage system.

-
- Replace the air filter (at every second service) and re-mount the filter holder.

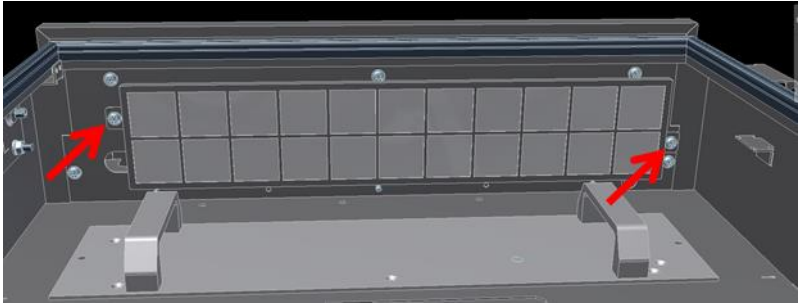


Figure 28: Removing and replacing the air filter - view from front and below

11.3.6 Disassembling the storage cabinet cover

The storage cabinet cover is connected to the storage cabinet by eight screws.

- Loosen the mounting screws (5 x) at the front of the opened storage cabinet.
Aid: Torx 25 screwdriver

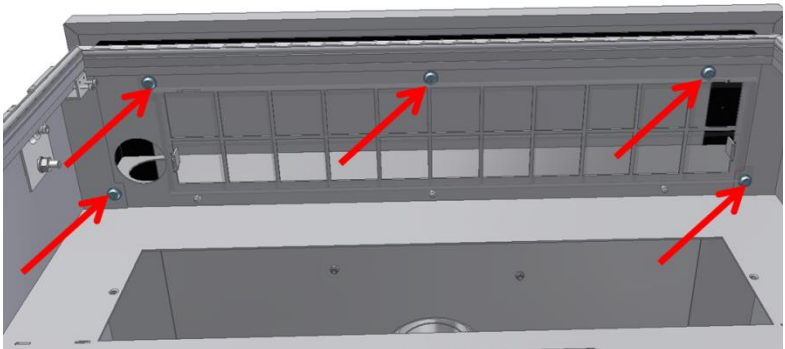


Figure 29: Mounting screws on storage cabinet cover – view from front and below

- Loosen the mounting nuts (3 x) at the rear of the storage cabinet.
Aid: No. 10 flat wrench



Figure 30: Mounting screws on storage cabinet cover – view from rear and below

- Lift off the cover.
- Remove the ground conductor from the ground lug on the inside of the cover.

11.3.7 Replacing/cleaning the fan

The fan is accessible after the cover has been removed.

- Check the fan for contamination and clean as required.



Figure 31: Disconnecting the fan

- Check the bearing play and ease of movement of the fan by hand.
- Disconnect the fan (circle).
- Loosen the four screws (arrowed) on the fan cover.
Aid: Size 4 hexagon socket wrench



Figure 32: Disconnecting the fan

- Refit the fan -or replace if necessary
Aid: Hexagon socket driver, size 4
- The working steps are in the reverse order to removal.



WARNING!

**Loose parts/cables can get inside the fan.
Risk of property damage.**

When reinstalling the cover, attach the PE cable to the ground lug.

General

Operation

Installation

Operation (Service)

Maintenance

11.4 Completion of service and repair work



DANGER!

The battery storage system components conduct current after a restart. .

Mortal danger from electric shock!

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!

11.4.1 Checking operating state

- Make sure that no contamination or material residues are inside the device. Clean using a vacuum cleaner or similar if necessary.
- Switch the master battery module back on.
- Close the door and secure with screws.
- Check whether the fuses have been re-connected.
- Switch on the energy storage system using the *On/Off* button. The button engages.
- Check whether the LED ring indicates the following operating states after switch on:
 - (1) flashes green (approx. 90 s),
 - (2) illuminates green (approx. 60) and then
 - (3) pulses green (= charging or discharging) or flashes every 3 s (= standby).

- If necessary, check whether error messages appear on the web interface (see Chapters 4.3.2 and 9.2 and rectify the errors if possible.

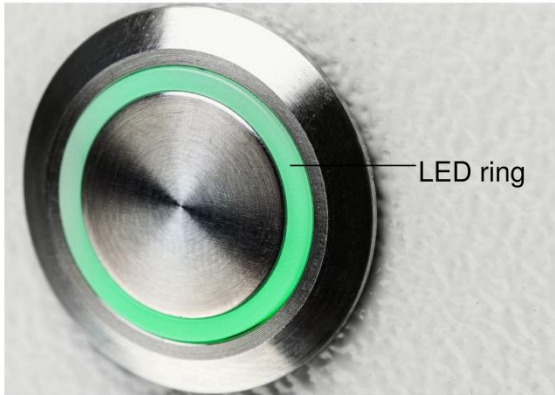


Figure 33: On/Off button with LED ring

- Check the fan for proper function. See Chapter 11.2.6.
- If battery modules have been replaced, enter the serial number of the modules at the web interface. See the basic settings page in chapter 9.4.1.

11.5 Cleaning



NOTICE!

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 VARTRA element 3/6 energy storage system using a damp (not wet!) cloth. Solvents must not be used.

12 Malfunctions



WARNING!

Potential mortal danger due to incorrectly executed troubleshooting!

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

12.1 Malfunction displays of the LED ring

The LED ring at the *On/Off* button indicates malfunctions. See Table 7, page 26.

12.2 Malfunction indicators on the web interface

Malfunctions are displayed on the *System* page of the web interface.

- Select the *System* tab from the header.
- The error lists for the storage system and the NA protection can be read out.

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



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.



DANGER!

The energy storage system components carry current.

Mortal danger from electric shock!

De-energise the storage system prior to disassembly:

Switch off the system at the *On/Off* button (button unlatched)!

Disconnect the fuses of the device connection!

General

Operation

Installation

Operation (Service)

Maintenance



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!

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

- To open the storage cabinet and disassemble the components, see Chapter 11.3, Page 96.
- The battery modules should have a low charge state. Discharge the modules if necessary. Observe chapter 11.2.10, page 95.
- Switch off the battery modules at the activation button and remove **prior to all other components**.

13.2 Disposal

The VARTA Storage GmbH system must not be disposed of in the household waste. The following disposal routes must be observed:

- The packed battery modules will be collected by VARTA Storage GmbH or by a company assigned by VARTA Storage GmbH. Please contact VARTA Storage GmbH (entsorgung@varta-storage.com) to request packaging for hazardous goods. The packaging and collection costs shall be paid by VARTA Storage GmbH.
- The cabinet can be disposed of as electrical scrap, e.g. at a recycling centre.

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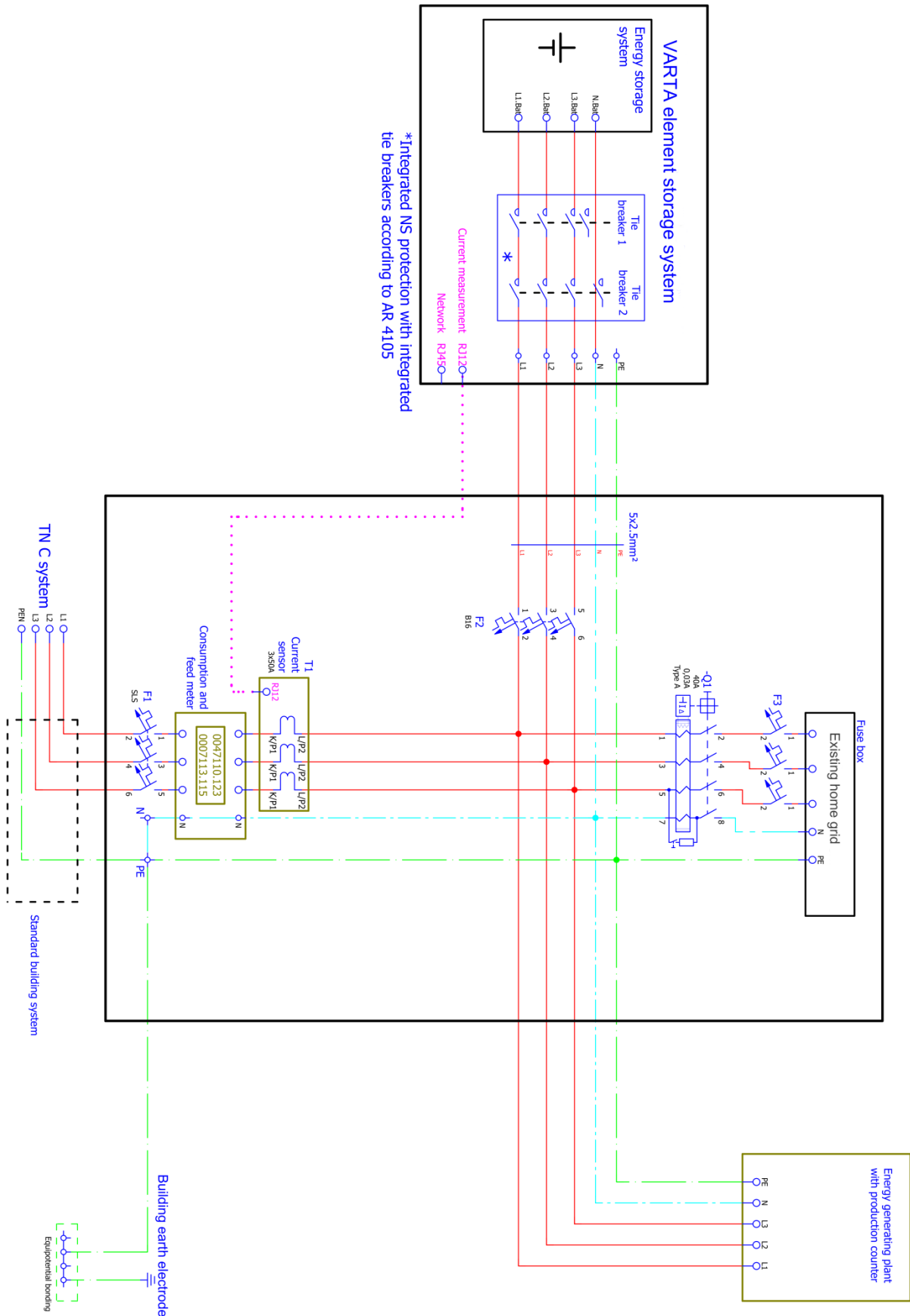
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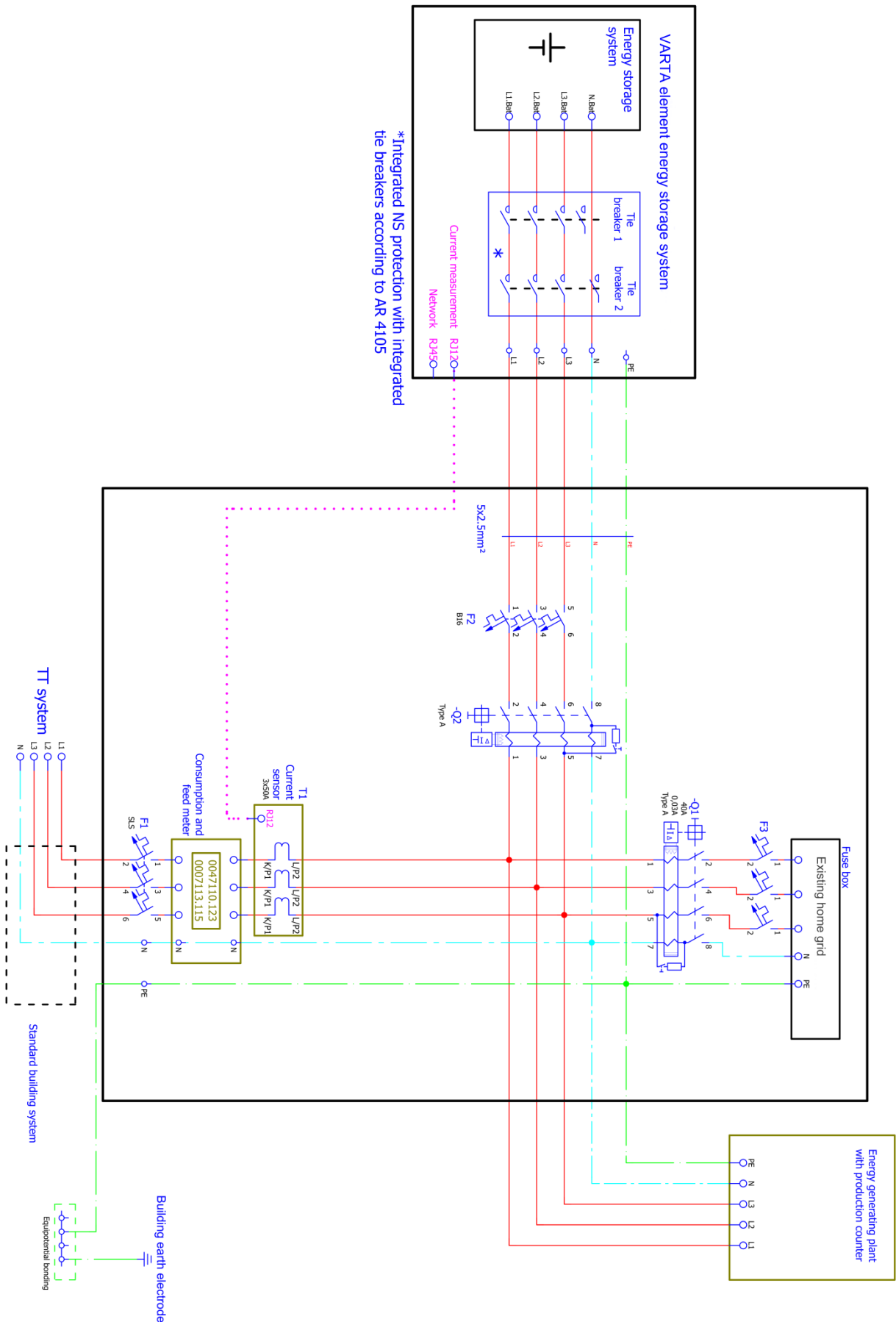
Attachment

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Attachment

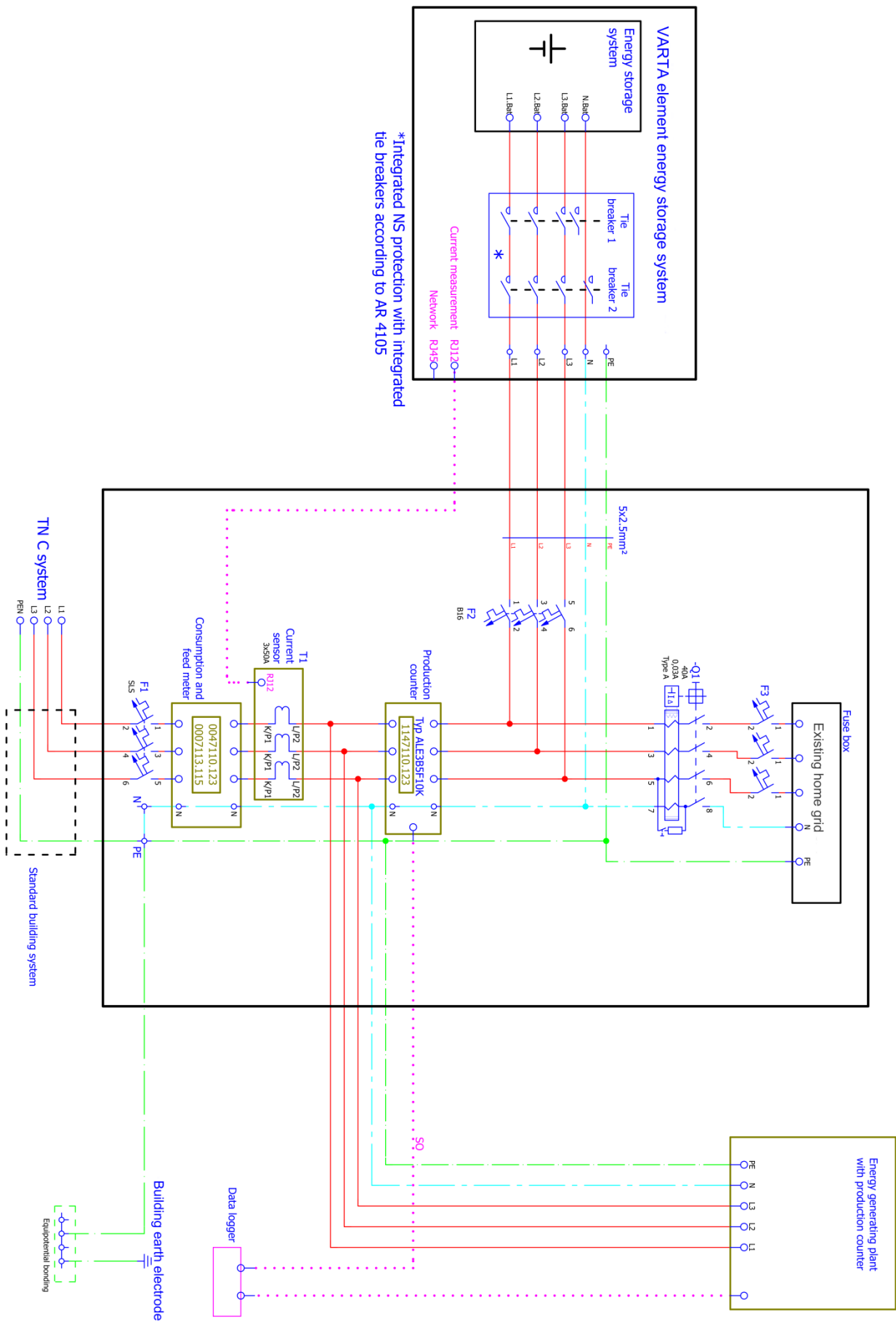


Attachment 1a: Connection diagram of the TN system

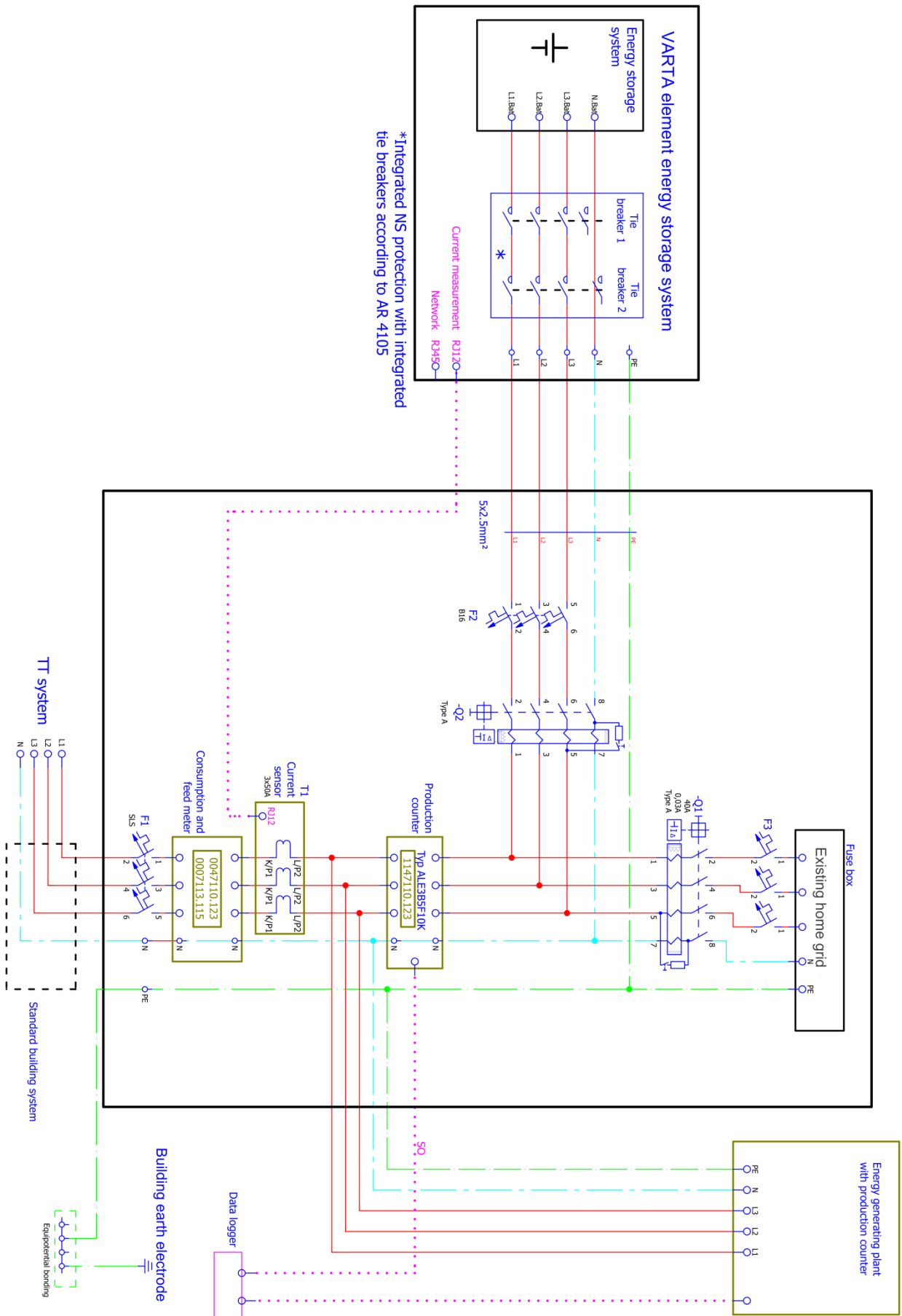


*Integrated NS protection with integrated the breakers according to AR 4105

Attachment 1b: Connection diagram of the TT system



Attachment 2a: Connection diagram of the TN system with data logger



Attachment 2b: 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: VARTA element 3

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 19.08.2015



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GM Marketing & Sales



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Registergericht: Augsburg
HRB 27028

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Attachment 3a: EC Declaration of Conformity – VARTA element 3

EG-Konformitätserklärung

Der Hersteller

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erklärt hiermit, dass die Produkte
Produktbezeichnung: Batteriespeichersystem
Fabrikat: VARTA element 6

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
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Nördlingen den 19.08.2015



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Attachment 4b: EC Declaration of Conformity –VARTA element 6