Operating instructions

RCT Power Battery



Manufacturer

RCT Power GmbH

Line Eid Str. 1

78467 Konstanz, Germany

Tel. Tech. Service: +49 39484 9763 65

Mail: info[at]rct-power.com

Copyright

© RCT Power GmbH 2024

Subject to technical modifications without prior notification.

No part of this Operating instructions is permitted to be reproduced in whatever form (photocopy, microfilm or any other process) or - by using electronic systems - edited, duplicated and distributed without the written agreement of RCT Power GmbH. We reserve the right to file a claim for damages should this ruling be infringed.

The reproduction of utility marks, trademarks, brand names and product designations etc. in this Operating instructions does not entitle them as envisaged under the trademark and brand protection legislation to be both freely viewed and used.

Document No. 02/2024

Contents

1 Overview 5
1.1 Information on this Operating instructions 5
1.1.1 Presentation conventions 5
1.2 Use as intended 6
1.3 Use contrary to that intended 6
1.4 Symbol explanations 7
1.5 Warranty and liability 8
1.6 Conformity statement as per Low Voltage Directive 2014/35/EU 8
1.7 Application example 9
1.8 Scope of delivery 10
1.8.1 Power Battery Master 10
1.8.2 Power Battery module 11
1.9 Assembly description 11
1.9.1 Power Battery Master 11
1.9.2 Nameplates 12
1.9.3 Power Battery module 12
2 Safety instructions 13
2.1 Symbols 13
2.2 Basic safety instructions 14
2.3 Personnel and qualifications 15
3 Mechanical assembly 16
3.1 Preparing the point of assembly 16
3.2 Battery system set-up 19
4 Electrical installation 22
4.1 Earthing the components 22
4.2 Setting up the network connection 23
4.3 Setting up the DC connection 24
4.4 Connection preparation to the Power Storage 24
4.5 Aligning the Power Battery and fastening to the wall 25
4.6 Setting up connection to the Power Storage 25
4.6.1 Power Storage DC 4.0 / 6.0 (not for Power Battery 15.2 /19.2 /23.0) 26
4.6.2 Power Storage DC 8.0 / 10.0 26
4.6.3 Power Storage AC (not for Power Battery 15.2 /19.2 /23.0) 26

5 Commissioning 26
6 Operating 27
6.1 Normal mode 27
6.2 Troubleshooting 27
6.3 Periodic maintenance work 27
7 Storage, cleaning and disposal 28
7.1 Storage 28
7.2 Cleaning 28
7.3 Disposal 28
8 Handover protocol 29
9 Technical data 30

1 Overview

1.1 Information on this Operating instructions

This Operating instructions is an important part of the battery system - Power Battery. It includes information on working safely and efficiently with the battery system.

Always keep the Operating instructions near to the battery system.

Those carrying out maintenance and service work on the battery system need to have permanent access to the instructions and information of this Operating instructions.

Read the Operating instructions before you install the system. Take to heart the safety instructions, in particular.

This Operating instructions includes information on installing, wiring, commissioning and operating the battery system.

This document does not replace any laws, stipulations, regulations, standards or conventions.

1.1.1 Presentation conventions

The following conventions have been drawn up to improve the legibility and comprehensibility of the text:

Cross-references

Cross-references in this document are shown as follows: → Chapter 1.7 “Application example”, Page 9.

Handling instructions

Handling instructions are shown as follows:

Requirement

⇨ Handling step

  ↳ Handling result

⇨ Handling step

  ↳ Handling result

Operating elements

Operating elements are shown **bold**.

1.2 Use as intended

The battery systems - Power Battery - are stationary battery systems with lithium iron phosphate rechargeables (LiFeP04).

A Power Battery together with a Power Storage forms a Power Storage System which stores the generated PV energy smartly and highly efficiently and provides it - based on commercial aspects - to the consumer.

In particular, a Power Battery 15.2 /19.2 /23.0:

- is made up of 2 identical systems Power Battery 7.6, 9.6 or 11.5, also refer to → Chapter 1.8 "Scope of delivery", Page 10. Other combinations are not permitted.
- may only be operated with Power Storage DC 8.0 / 10.0. Operation with other AC/DC inverters as well as Power Storage DC 4.0 / 6.0 or Power Storage AC is not permitted.
- For detailed information on the combinations permitted, have a look in our technical documentation - TD25_RCT Power compatibility matrix - in the download section under www.rct-power.com

1.3 Use contrary to that intended

The Power Battery systems have not been developed for other applications or for connections to other appliances. Any use differing from the use as intended is held to be misuse.

RCT Power GmbH is not liable for damage resulting from misuse.

Any misuse terminates the warranty, guarantee and general liability of the manufacturer.

1.4 Symbol explanations

The following symbols may be attached to the nameplate and / or system components. These symbols are to be taken notice of at all times:



Refer to the operating manual!



Do not open enclosure! Touching any conducting parts can result in heart rhythm disturbance and shock.

Do not short-circuit batteries! A short-circuit can result in the flow of very high currents and in burns.



On no account is cleaning to be undertaken with synthetic fibre cloths or with a feather duster. Risk of electrostatic charging or discharging.



General hazards from batteries:
On electrolyte seeping out: switch off battery system at the main switch and contact manufacturer.



Battery must not get wet.



Defective batteries must not be operated.



This product must not be disposed of as normal household refuse, → Chapter 0 “ Storage, cleaning and disposal“, Page 28



CE conformity designation

1.5 Warranty and liability

Warranty and liability are oriented towards the conditions laid down in the contract.

Warranty limits

One or several of the following causes rule out any warranty or liability claims:

- Improper application or installation of the system.
- Installing or operating the product in a non-permitted environment.
- Ignoring relevant safety requirements at the place of operation, during installation and commissioning.
- Ignoring safety notices and instructions in all documents of relevance for the product.
- Installing or operating the product under false safety or protective conditions.
- Effecting a change to the product or installing a software with no entitlement to do so.
- Defect in the product from adjoining appliances or from those operated outside the permitted limits.
- Damage from force majeure.

Property rights

All rights to drawings, software and other documents as well as all powers of disposition, such as copy and transfer rights, rest with RCT Power GmbH.

Storage

RCT Power GmbH assumes no warranty at all for damage brought about by incorrect storage, → Chapter 7.1 "Storage", Page 28.

Transport

We wish to point out that improper transport is no justification for any compensation or warranty claim. At all events, do consult RCT Power GmbH before transporting the system.

1.6 Conformity statement as per Low Voltage Directive 2014/35/EU

RCT Power GmbH declares that the battery system specified in this document concurs with the basic requirements and other relevant conditions of the directives listed below.

- Directive 2014/35/EU (Low voltage directive)
- Directive 2014/30/EU (Electromagnetic Compatibility, EMC)
- Directive 2011/65/EU (RoHS)

A detailed conformity statement can be found in http://www.rct-power.com.

1.7 Application example

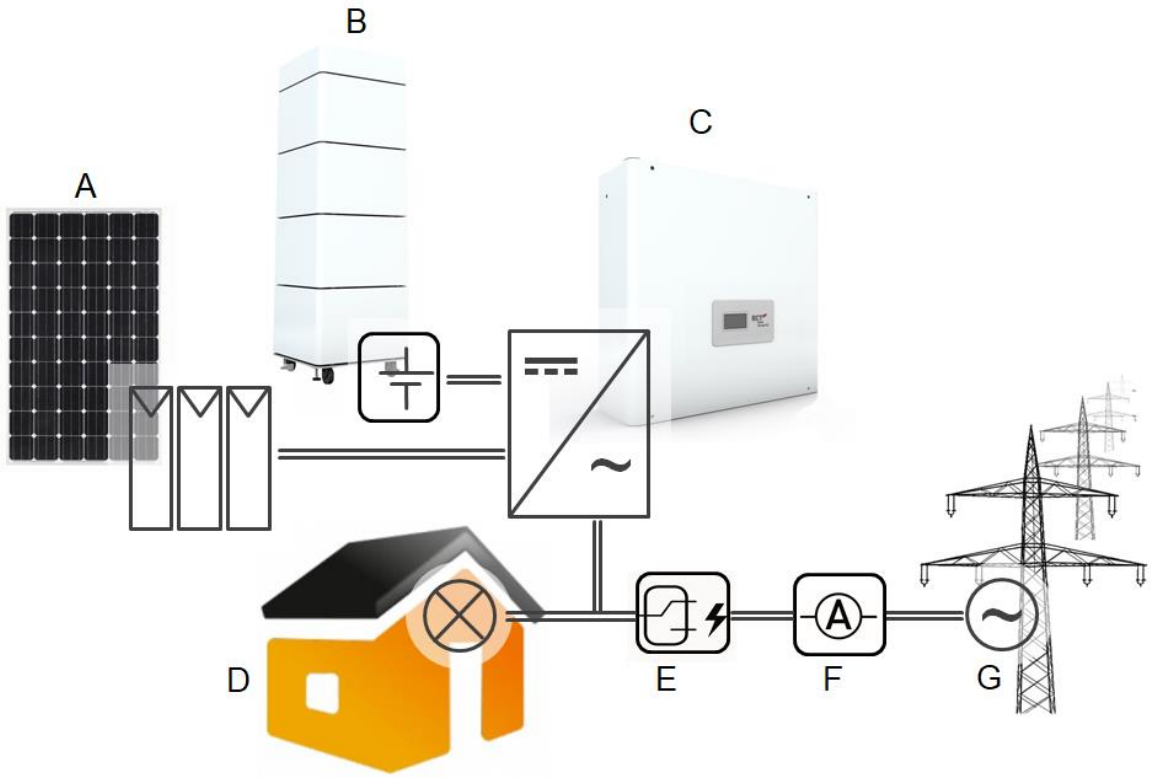


Fig. 1: Example of a PV system with Power Battery, Power Switch and Power Sensor

Item	Description	Comment
A	PV generator	Monocrystalline silicon; polycrystalline silicon or thin layer modules without earthing and with Protection Class II
B	Battery system	Power Battery consisting of Power Battery Master and Power Battery modules
C	Inverter	Power Storage 4.0, 6.0, 8.0, 10.0
D	Household	Power consumers
E	Power Switch	A switch over is made to island mode given a grid failure
F	Power Sensor	Power sensors for detecting the AC power
G	Supported grid systems	TT, TN-C, TN-S, TN-C-S

1.8 Scope of delivery

Our products are checked for being in a proper condition before their delivery.

Despite thorough packaging, damage in transport may occur which, as a rule, haulage companies are responsible for.

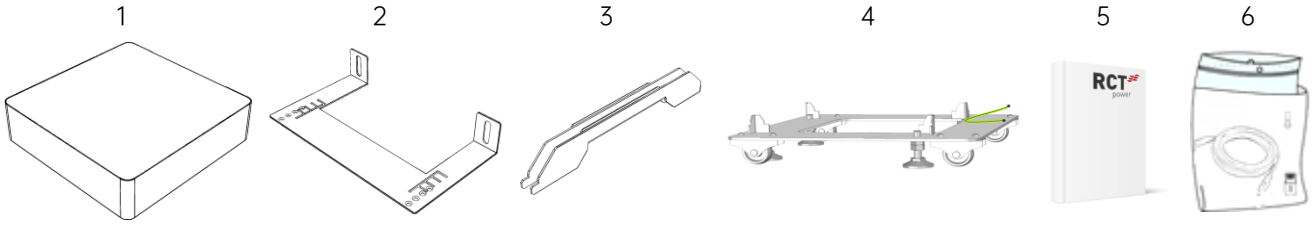
If you detect damage to the packaging or to the Power Battery, then do immediately contact the haulage company. A damaged Power Battery must not be commissioned.

Every battery system is made up either of 1 Power Battery BMS Master* combined with 2 to 6 Power Battery modules or 1– 2 Power Battery BMS Master+* combined with 8 to 12 Power Battery modules:

Version	Number of BMS	in ...	Power Battery modules in ...
Power Battery 3.8	1	1 cardboard box	2 cardboard boxes
Power Battery 5.7	1	1 cardboard box	3 cardboard boxes
Power Battery 7.6	1	1 cardboard box	4 cardboard boxes
Power Battery 9.6	1	1 cardboard box	5 cardboard boxes
Power Battery 11.5	1	1 cardboard box	6 cardboard boxes
Power Battery 15.2	2	2 cardboard boxes	8 cardboard boxes
Power Battery 19.2	2	2 cardboard boxes	10 cardboard boxes
Power Battery 23.0	2	2 cardboard boxes	12 cardboard boxes

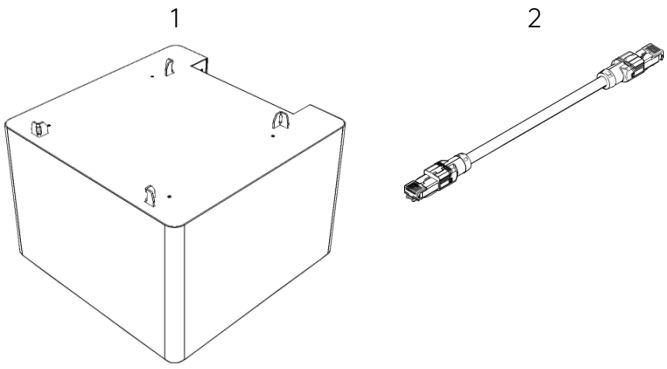
*within the document BMS, Power Battery Master, Power Battery BMS Master and Battery Master are considered synonyms

1.8.1 Power Battery Master



Item	Description
1	1x Power Battery Master
2	1x wall fixture for fastening the top Power Battery module
3	2x assembly handle
4	1x base frame, horizontally adjustable • Art. 210-0001 without earthing connection • Art. 210-0003 with earthing connection
5	1x operating instructions (this document)
6	1x accessories with: - 1x terminal resistor (RJ45) - 1x patch cable RJ45/Cat5e 5 m - 1x ring eyelet for earthing PE conductors of a 6 mm² cross-section

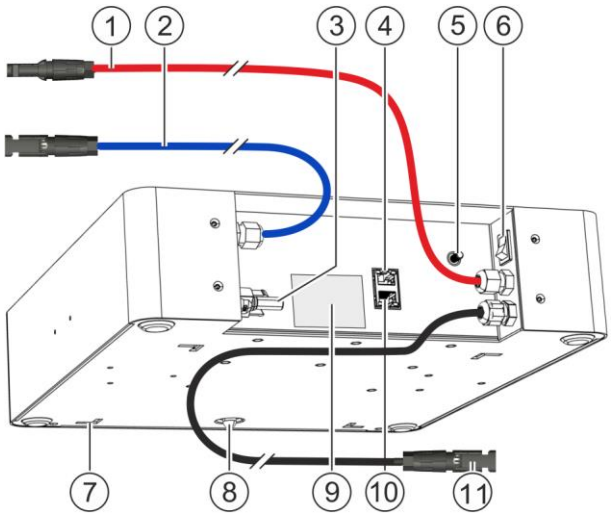
1.8.2 Power Battery module



Item	Description
1	1x Power Battery module
2	1x patch cable RJ45/Cat5e 15 cm

1.9 Assembly description

1.9.1 Power Battery Master

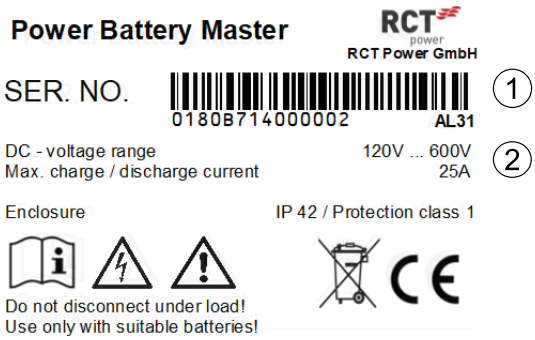


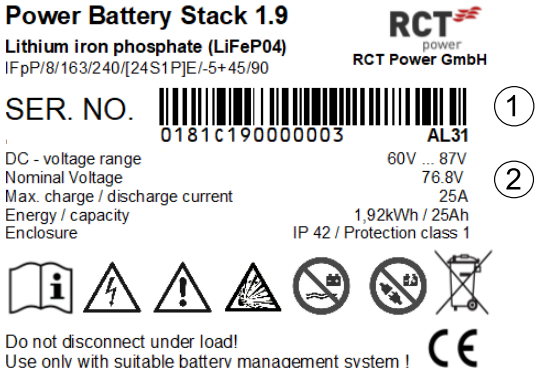
1 DC cable (+) to the Power Storage*
2 DC cable (-) to the Power Storage*
3 Connector for DC cable (-) from the top module
4 RJ45 socket for the network cable to the Power Storage
5 Connection for the PE conductor
6 On / Off switch
7 Ports for stacking on the top module
8 LED status indicator
9 Nameplate
10 RJ45 socket for network cable to the top module
11 DC cable (+) to the top module

*Art. 210-0001: The DC cables to the Power Storage need to be prepared, the DC cables to the bottom module are already attached to the Master when delivered.

*Art. 210-0003: The DC cables to the Power Storage and to the bottom module are already attached to the Master when delivered.

1.9.2 Nameplates

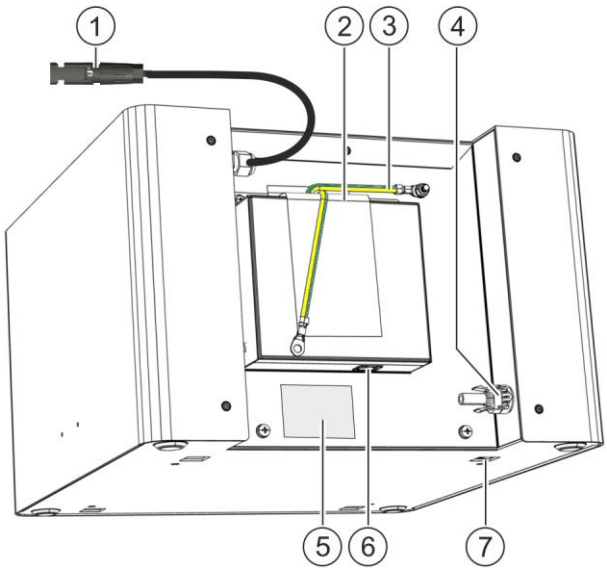




The nameplates indicate the serial number (1) of the components and details (2) of the voltages arising in the components and of the IP protection class.

Explanation of the symbols → Chapter 1.4 "Symbol explanations", Page 7.

1.9.3 Power Battery module



1 DC cable to the module above, in the case of the top module to the Master
2 RJ45 socket for network cable to the module above
3 PE conductor
4 Connector for DC cable from the module below, in the case of the bottom module from the Master
5 Nameplate
6 RJ45 socket for network cable to the module below, in the case of the bottom module for the terminal resistor
7 Ports for stacking on the module below, in the case of the bottom module on the base frame

2 Safety instructions

2.1 Symbols

In this document safety-relevant notices are marked with the following symbols and signal words:

⚠WARNING **Danger to life or risk of severe injuries!**

Disregarding the sign could **possibly** be fatal or result in a serious injury!

- Remedy...

⚠CAUTION **Danger to life or risk of severe injuries!**

Disregarding the sign could result in injury!

- Remedy...

NOTICE **Risk of property damage!**

Disregarding the sign could result in property damage (time loss, data losses, equipment fault etc.)!

2.2 Basic safety instructions

A correctly assembled Power Battery is intrinsically safe.

⚠WARNING Injury risk from electric shocks!

Inside the Power Battery components there are high-voltage elements also able to generate a high amperage! Metal parts of the batteries are carrying voltage at all times. A short-circuit can result in the flow of very high currents and in burns. Touching any conducting parts can result in heart rhythm disturbances and shock.

- Do not open enclosure!
- Ensure that cables are not damaged.
- Only use appropriate and fault-free protection and measuring equipment.
- Do not commission any defective cables or components with a damaged enclosure.
- Do not short-circuit batteries.
- Ensure that no liquid gets into cables or enclosures and the battery system is not subject to any condensing moisture.
- Do not place any tools or metal parts on the components.
- Make sure the components are correctly earthed when assembling them.
- Do not subject components to either pressure or knocks. In particular, ensure they do not fall over or during assembly fall down.
- Carry out all electrical installations in accordance with the local and national standards and directives.
- Do not remove the nameplate.

⚠WARNING Fire risk from flammable substances!

The Power Battery is not authorized to be used in explosive environments.

- Ensure that in its vicinity no explosive gases, liquids or other substances are stored or made use of.

2.3 Personnel and qualifications

To avoid any damage or injuries, only those qualified are allowed to install, cable, connect, start up and commission the Power Battery.

Qualified personnel entitled to carry out the tasks listed in this document have the following skills and knowledge:

- They have been trained to install electrical equipment.
- They understand the functional operation of a battery system and know how it works.
- They know about lithium iron phosphate rechargeables (LiFeP04).
- They have read and understood the documents supplied with the appliance.
- They know about the tools and appliances in question and use them to carry out the work.
- They know about the applicable laws, provisions, standards and directives for electrical equipment.
- They know about the safety requirements and the safety-relevant directives for electrical equipment.
- They are familiar with the occupational health & safety legislation and directives.
- They know about the Personal Protective Equipment in question and wear it.
- They should have gone through instructional training and product launches.

3 Mechanical assembly

3.1 Preparing the point of assembly

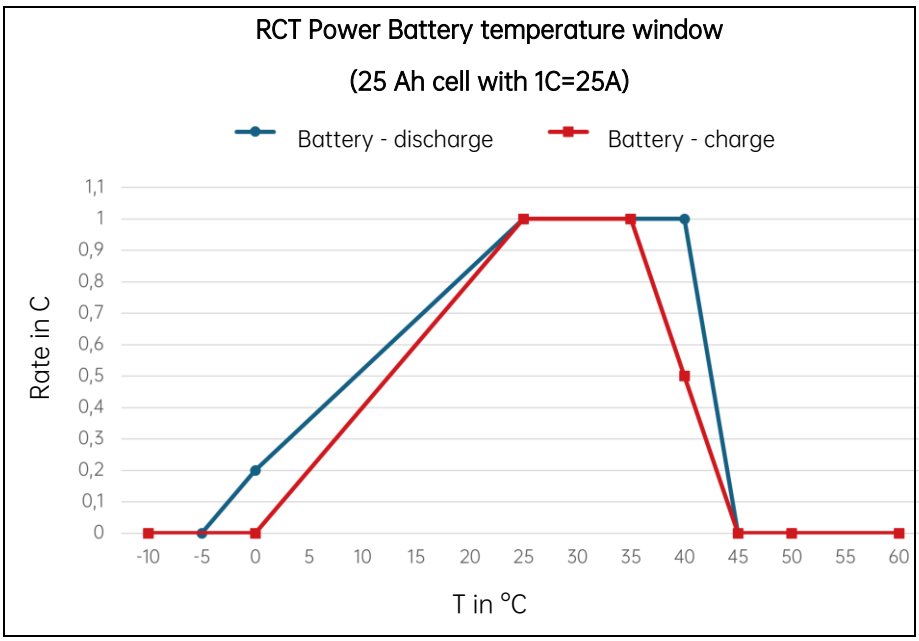
⚠WARNING Injury risk from electric shocks and a heavy weight!

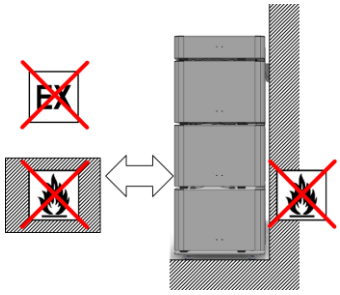
Inside the Power Battery components there are high-voltage elements (up to 1,500 V) which can also generate a high amperage! Metal parts of the batteries are energized at all times. A short-circuit can result in the flow of very high currents and in burns. Touching any conducting parts can result in heart rhythm disturbances and shock. If set up incorrectly, the battery system may topple over and cause injuries. A Power Battery module weighs more than 20 kg.

- Only have a qualified electrician assemble and electrically connect the battery system.
- Do not set up the Power Battery in potentially explosive zones.
- Ensure that the electrically conductible surfaces of the Power Battery are earthed.
- Use a wall fixture to stop the Power Battery from falling over.
- Do not subject components to either pressure or knocks. In particular, ensure they do not fall over or during assembly fall out.
- Carry out all electrical installations in accordance with the local and national standards and directives.

NOTICE Possible reduced capacity of the Power Battery!

- Do not cover the Power Battery and, in particular, not its top side.
- Maintain the clearances to ensure convection cooling.
- Only operate or store the Power Battery between -5 °C and +45 °C.

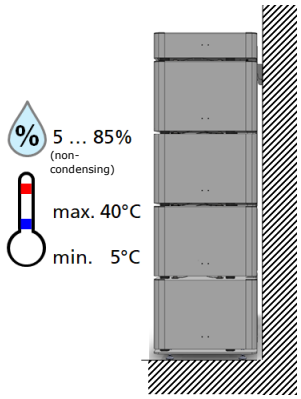




⇨ Ensure that the assembly base is of a flame-retarding material.

⇨ Do not install the battery system in a potentially explosive environment

⇨ Ensure that no corrosive gases develop at installation site.



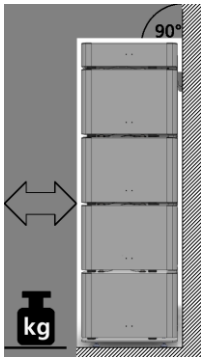
The battery system is only authorized for indoors.

⇨ Shield battery system from direct heat radiation (e. G. sun, heating etc.).

The following requirements must be met:

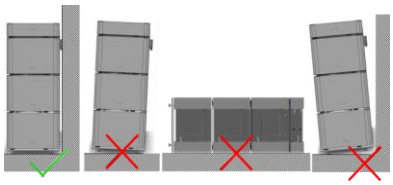
- Set up indoors, air-conditioned
- Ambient temperature 5 – 40 °C
- Relative air humidity 5 – 85 %, non-condensing

⇨ Protect from pollution, dust and ammonia gases

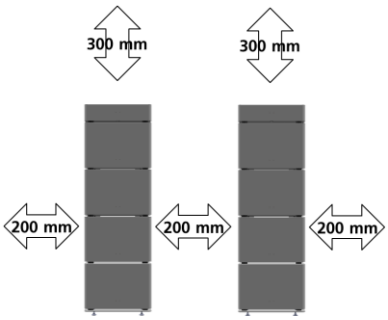


The assembly base needs to be firm and one to constantly bear the weight.

The selected site needs to be easily and securely accessible at all times without additional aids, such as ladders or supporting structure.

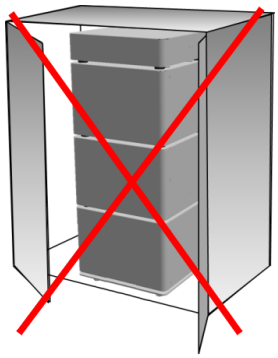


⇨ Vertically install the battery system but not where livestock are kept.



⇨ Keep to the minimum clearances for adequate, unimpeded convection.

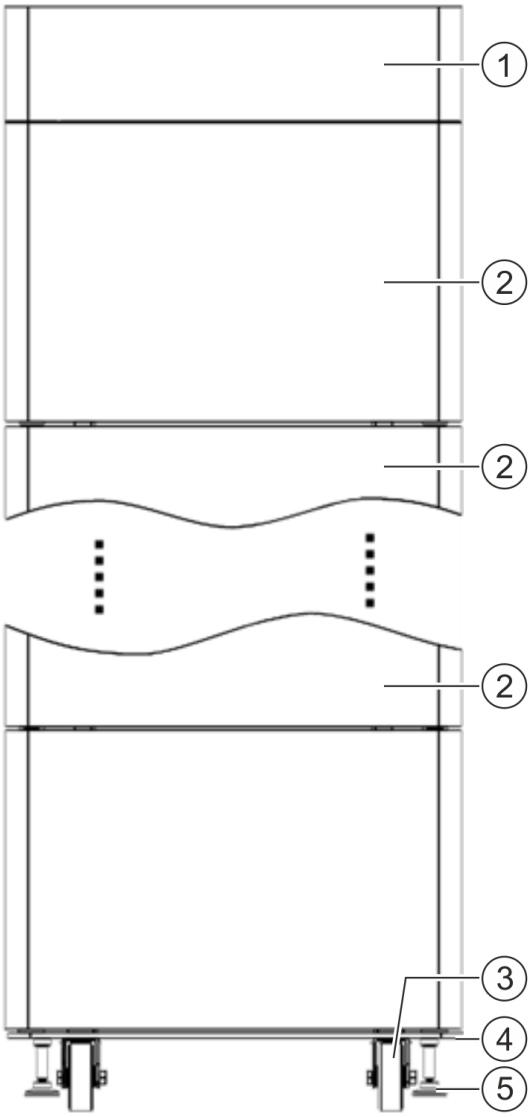
⇨ On reaching a specified temperature threshold, the charging and discharging capacity of the battery is automatically lessened linearly.



Installation in the enclosed cabinet is forbidden.

⇨ Ensure that the system is provided with sufficient convection and is on a suitable spot for installation.

3.2 Battery system set-up

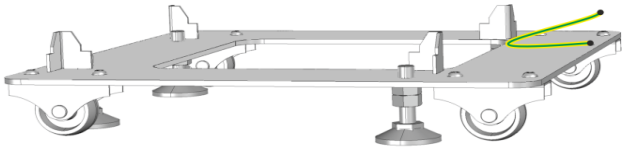


Overview

1 Power Battery Master
2 Power Battery module
3 Base frame castors
4 Base frame
5 Height-adjustable pedestals

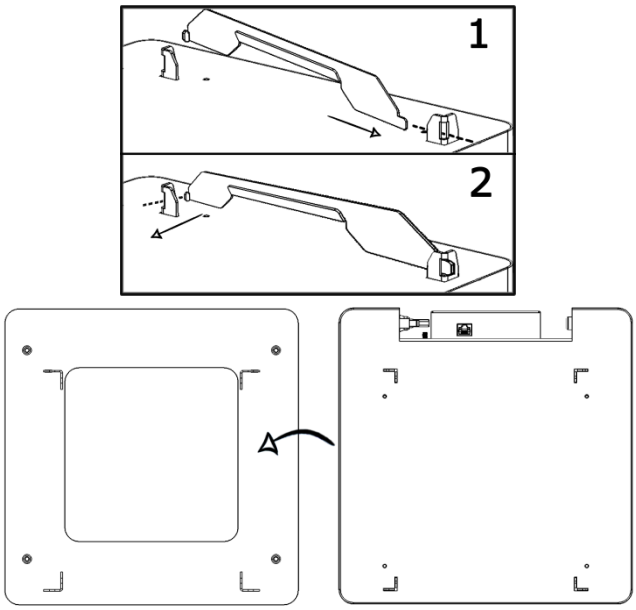
In the following order, the battery system is

- plugged together on its base frame (4)
- cabled
- fastened to the wall



⇨ Set up the base fame where the Power Battery is to stand. In this process, the side with the PE conductor must face the wall.

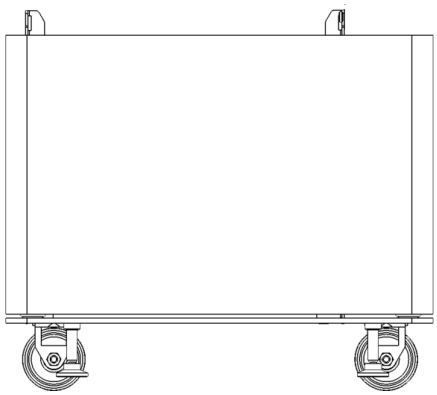
⇨ Also keep to the 200 mm safety clearance to the wall.



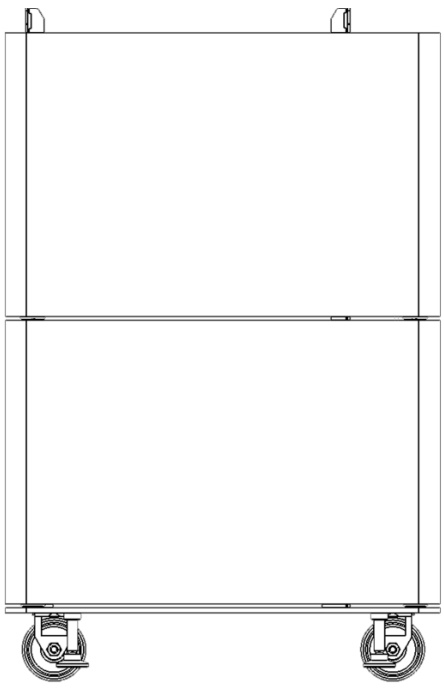
Setting up the Power Battery modules

⇨ Using the enclosed assembly handles, position a module onto the base frame so that the connections are facing the wall.

↳ Correctly fitting the module ensures its automatic centring.



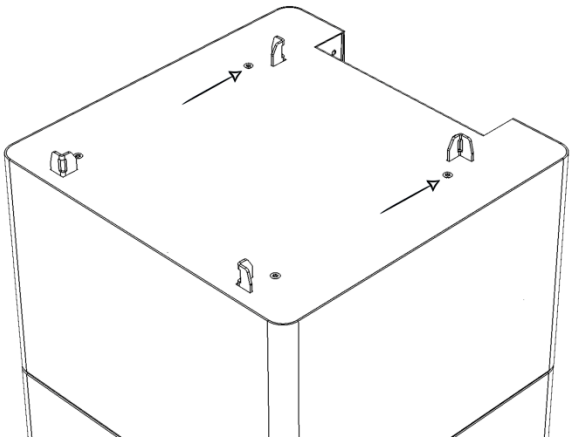
⇨ Ensure when assembling that no cables are pinched and that the Power Battery components are parallel with the base.



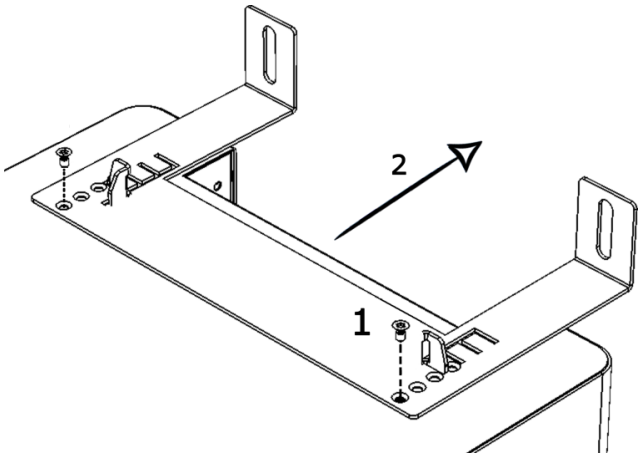
⇨ Place a further module on the previous one so that both are parallel to each other.

↳ Correctly fitting the module ensures its automatic centring.

⇨ Put on the rest of the modules one after the other.



⇨ To fasten the wall fixture, remove the 2 screws on the top module, screw head preference for Torx T20.



Mark drill holes for wall fixture

⇨ Mount the wall fixture with both the screws (1) on the top module.

⇨ Carefully push the battery system to the wall.

⇨ Place markings for the drill holes centrally and vertically in the wall fixture slots.

Screwing into the wall is only undertaken once the battery system, → Chapter 4.5 “Aligning the Power Battery and fastening to the wall”, Page 25 is cabled.

⇨ Position the Power Battery Master on the top module so that the DC cables remain accessible and are not pinched.

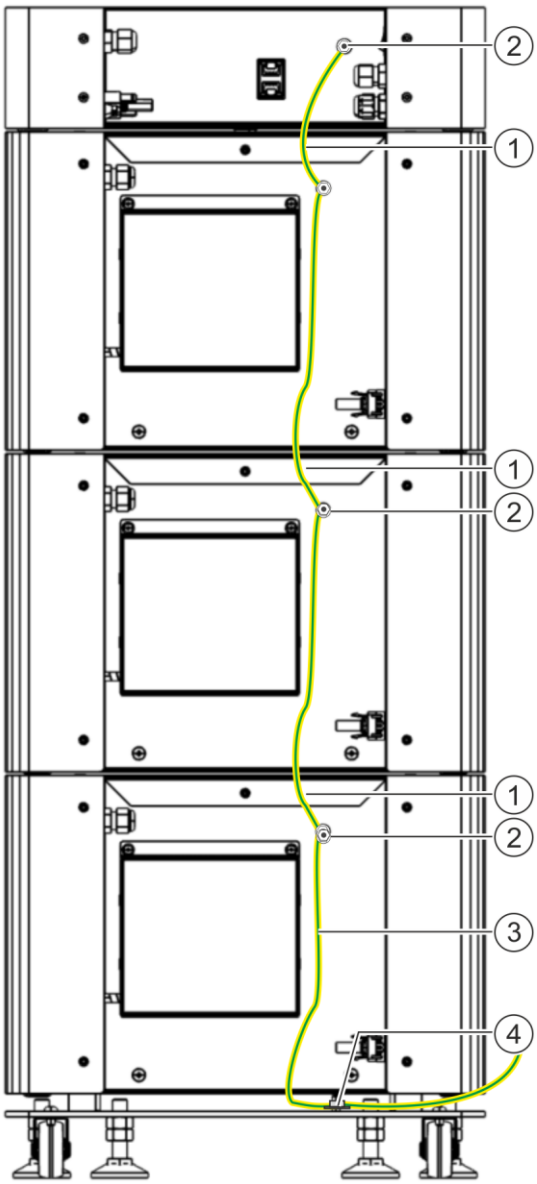
4 Electrical installation

4.1 Earthing the components

⚠WARNING Injury risk from electric shocks!

Inside the Power Battery components there are high-voltage elements also able to generate a high amperage! Earthing faults can lead to electric shocks!

- Only have a qualified electrician assemble and electrically connect the battery system!
- Make sure all metallic components are correctly earthed!



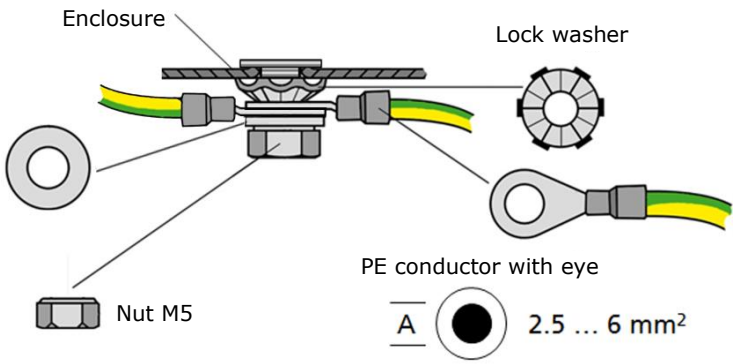
For a clearer overview, the firmly fitted DC cables have not been included in the adjoining drawing.

⇨ Attach the PE conductors (1) of the modules to the PE conductor connection (2) of the module mounted above - beginning with the PE conductor (3) of the base frame.

Attach the PE conductor connection (4) of the base frame to an on-site PE conductor connection.

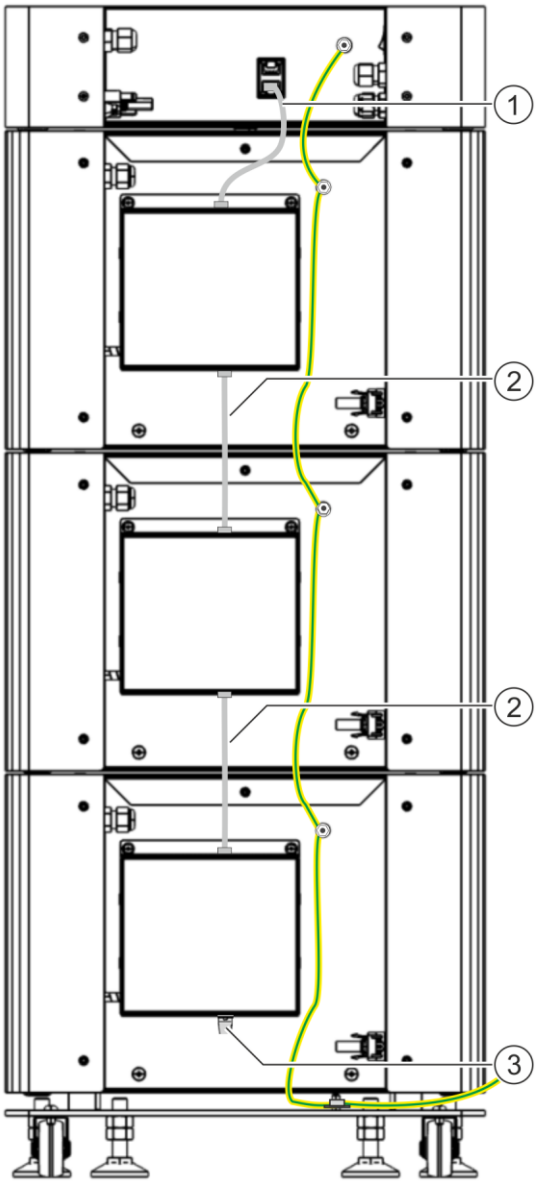
With a Power Battery 15.2 /19.2 /23.0 **both** base frames need to be **separately** attached to an on-site PE connection.

PE connection in detail



⇨ Tighten M5 nuts of the PE connections to 2.5 Nm.

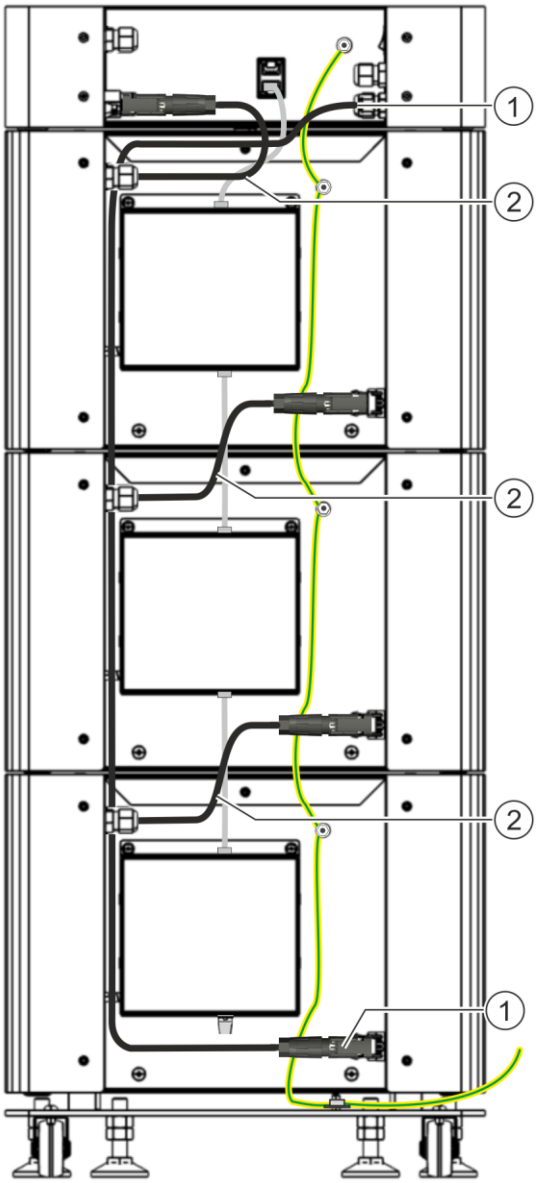
4.2 Setting up the network connection



For a clearer overview, the firmly fitted DC cables have not been included in the adjoining drawing.

- ⇨ Use the enclosed patch cables and terminal resistor for inter-module communication.
- ⇨ Connect the top module to the RJ45 connection (1) underneath at the Power Battery Master.
- ⇨ Connect the other modules with the module above in each instance (2).
- ⇨ Complete lower connection of the bottom module with the terminal resistor (3).

4.3 Setting up the DC connection



The modules are operated in series.

The Power Battery Master is therefore attached to the top and bottom module.

⇨ Connect the Master DC cable (1) to the connection jack (+) of the lowest module. We suggest running the cable between enclosure and the module cables.

⇨ Connect the DC cables (2) of the other modules to the connection jack (+) of the module above.

⇨ Connect the DC cable (2) of the top module to the connection jack (-) of the Master.

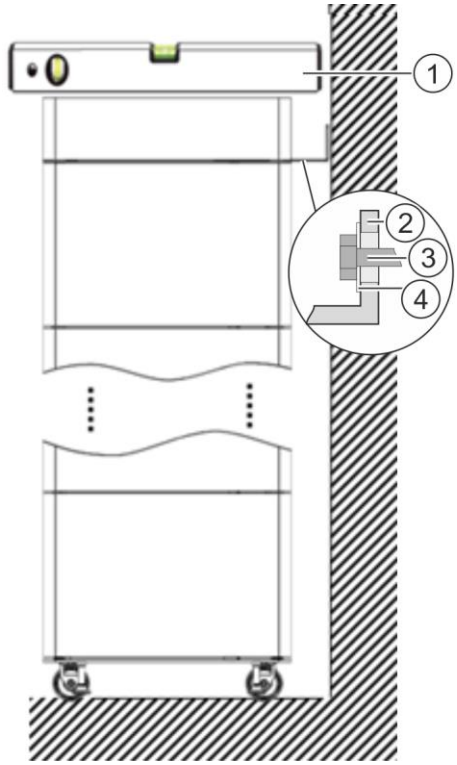
4.4 Connection preparation to the Power Storage

Art. 210-0001: The DC cables to the Power Storage need to be prepared, the DC cables to the bottom module are already attached to the Master when delivered.

Art. 210-0003: The DC cables to the Power Storage and to the bottom module are already attached to the Master when delivered.

⇨ Ensure the cables are not pinched during the following steps.

4.5 Aligning the Power Battery and fastening to the wall



- To prevent any accidental toppling over, fasten the Power Battery to the wall.

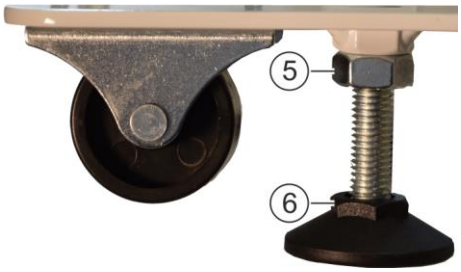
Additionally needed material (not included in the scope of delivery):

- 2 hexagon-head screws (3) with a max. 8 mm diameter and matching dowels
- Matching open-end spanner
- Matching washers (4) with an external diameter of at least 15 mm

⇨ Use the previous markings and drill the holes matching the dowels, → Mark drill holes for wall fixture, Page 21.

⇨ Push the Power Battery carefully up to the wall and firstly screw the 2 screws (3) lightly into the dowels so the wall fixture (2) can be vertically adjusted.

⇨ Horizontally align the Power Battery using the adjustable pedestals of the base frame and a spirit level (1) so weight is taken off the castors and the Power Battery is secure on the pedestals.



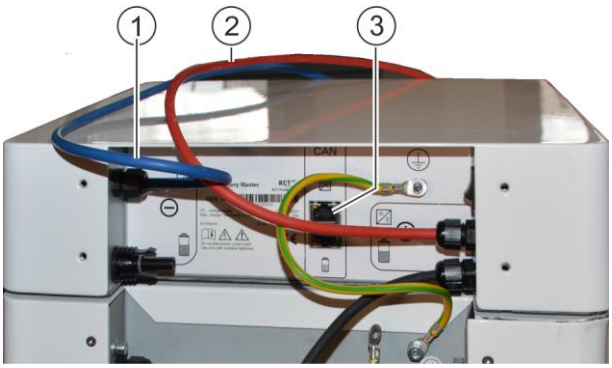
Adjusting the pedestal vertically

⇨ Slacken all 4 counter nuts (5).

⇨ If required, adjust height by turning the pedestal (6).

⇨ After adjusting all 4 pedestals (6), retighten all the counter nuts (5).

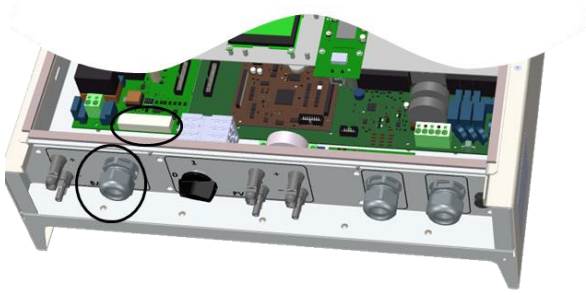
4.6 Setting up connection to the Power Storage

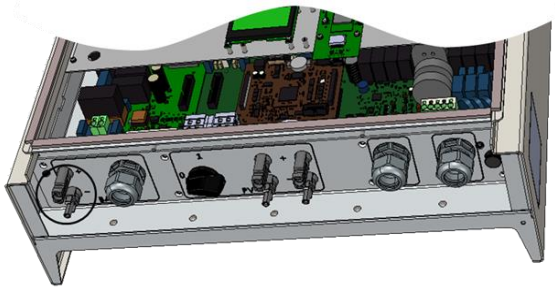


⇨ Insert RJ45 cable into the top jack (3) of the Master/ Masters.

⇨ Properly run DC cable and RJ45 cable to the Power Storage.

4.6.1 Power Storage DC 4.0 / 6.0 (not for Power Battery 15.2 /19.2 /23.0)

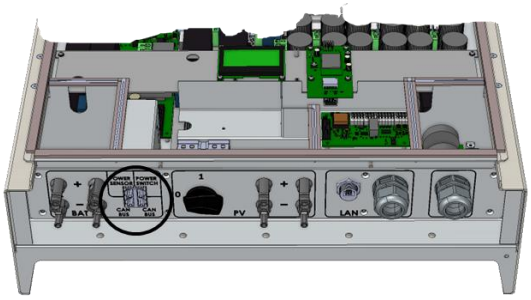


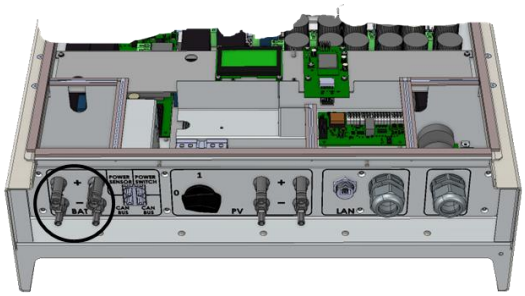


⇨ Run RJ45 cable through the cable entry and insert into the X403 "CAN" interface.

⇨ Plug DC cables into the matching connectors.

4.6.2 Power Storage DC 8.0 / 10.0

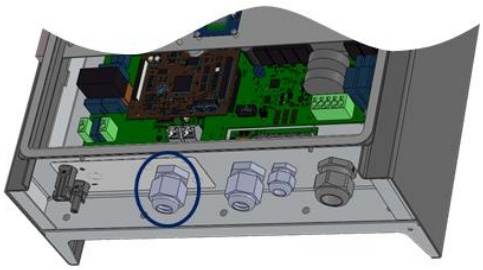


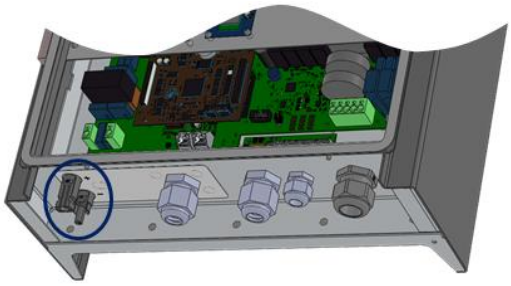


⇨ Insert RJ45 cable into the "CAN" RJ45 connector.

⇨ Plug DC cables into the matching connectors.

4.6.3 Power Storage AC (not for Power Battery 15.2 /19.2 /23.0)





⇨ Run RJ45 cable through the cable entry and insert into the CAN BUS "A" interface.

⇨ Plug DC cables into the matching connectors.

5 Commissioning

To commission the system, please follow the procedure in *Setup/ Manual Power Storage*.

6 Operating

6.1 Normal mode



The Power Battery itself does not require any operating. The LED status display at the base of the Power Battery Master lights up green.

It can depict the following states:

LED indicator	Status Power Battery
Green	In operation (battery is connected to the Power Storage).
Red	Malfunction (battery is not connected to the Power Storage).
Orange	Initialization (battery is not connected to the Power Storage).
Red / orange flashing	CAN connection to the Power Storage is interrupted.
Red / green flashing	Software update (battery is not connected to the Power Storage).
Orange (flashing)	Active connecting process

6.2 Troubleshooting

On a malfunction arising (LED status indicator does not light up green) warnings appear on the Power Storage display. They can also be retrieved through the RCT Power App.

In the case of a malfunction:

⇨ Switch off Power Battery at the on/off switch, → Chapter 1.9.1 “Power Battery Master”, Page 11.

⇨ Consult the installer.

⇨ Consult the manufacturer's Technical Service.

6.3 Periodic maintenance work

The Power Battery is not provided with any parts requiring maintenance.

In the case of malfunctioning, do turn to the Technical Service of RCT Power GmbH.

7 Storage, cleaning and disposal

7.1 Storage

⇨ Store the Power Battery modules in a tidy, dry, cool and frost-free space on incombustible and non-conductive bases.
An over-high storage temperature results in a more rapid self-discharge and premature ageing.

⇨ To avoid damage, store the Power Battery modules where the relative air humidity is < 85 %, no corrosive gas is on hand and the storage temperature is -30 °C to 40 °C.

⇨ In the event of storage exceeding 3 months, store the Power Battery modules where the relative air humidity is < 65 %, no corrosive gas is on hand and the storage temperature is -10 °C to 25 °C.

⇨ After 6 months at the latest, measure the voltage at the Power Battery modules and contact the manufacturer.

7.2 Cleaning

⇨ Clean the surfaces with a slightly moistened cotton cloth.

⚠WARNING Injury risk from electric shocks!

Inside the Power Battery components there are high-voltage elements also able to generate a high amperage! Earthing faults can lead to electric shocks! A short-circuit can result in the flow of very high currents and in burns. Touching any conducting parts can result in heart rhythm disturbances and shock.

- Do not open enclosure!
- Ensure that enclosure and cables are not damaged!
- Ensure that no liquid gets into either cables or enclosure!
- Only have a qualified electrician assemble and electrically connect the battery system!
- Make sure all metallic components are correctly earthed!

7.3 Disposal



This symbol points to the fact that on ending its lifetime the appliance must not be added to the household refuse but disposed of as electronic scrap.
Follow the local regulations!

Data protection information: if the appliance has a data memory possibly including personal data, then do ensure in your own interest that it is dependably deleted before disposing of the appliance.

8 Handover protocol

Installer

Company: _____

Name: _____

Address: _____

E-mail: _____

Telephone: _____

Power Battery	Serial No.	Installation date
Power Battery Master		
Power Battery module		
Power Battery module		
Power Battery module		
Power Battery module		
Power Battery module		
Power Battery module		
Power Battery Master		
Power Battery module		
Power Battery module		
Power Battery module		
Power Battery module		
Power Battery module		
Power Battery module		

Installer's signature: _____

9 Technical data

Single tower **Double tower**	**3.8**	**5.7**	**7.6** ***15.2***	**9.6** ***19.2***	**11.5** ***23.0***
ELECTRICAL PARAMETERS					
Nominal capacity	3.84 kWh	5.76 kWh	7.68 kWh *15.36 kWh*	9.60 kWh *19.20 kWh*	11.52 kWh *23.04 kWh*
Usable capacity 90 % DoD	3.46 kWh	5.18 kWh	6.91 kWh *13.82 kWh*	8.64 kWh *17.28 kWh*	10.37 kWh *20.74 kWh*
Number of cycles at 80 % remaining capacity	5,000				
Voltage range	120 – 173 V	180 – 260 V	240 – 346 V	300 – 432 V	360 – 520 V
Nominal voltage	154 V	230 V	307 V	384 V	461 V
Max. charge /discharge current	25 A/25 A				
Intrinsic consumption	< 5 W				
COMMUNICATION/ INTERFACES					
Power Storage interface	CAN				
GENERAL					
Battery technology	LiFeP04				
Dimensions per tower Height x width x depth	0.53x0.34x0.34m	0.78x0.34x0.34m	1.03x0.34x0.34m	1.27x0.34x0.34m	1.52x0.34x0.,34m
Weight per tower (1 module 24 kg)	54 kg	78 kg	102 kg	126 kg	150 kg
Number of modules per tower	2	3	4	5	6
IP-protection class	IP42				
Installation type	standing, indoor				
Max. installation height above sea-level	2,000 m				
Relative air humidity	5 – 85 % (non-condensing)				
Pollution degree	2				
Over-voltage category	CAT II				
Operating temperature range	5 – 40 °C				
Plug type	Weidmüller PV stick				
SAFETY/ STANDARDS					
Protection class	1				
Certification	IEC 60730-1, EN 61000-6-2, EN 61000-6-3, IEC 61010-1, IEC 62619, UN 38-3,				
EMC	EN 61000-6-2, EN 61000-6-3				