SOLAR ELECTRIC

KOSTAL

KOSTAL HELIVOR HV

High-voltage energy storage unit made by ZYC Energy

Operating manual

Legal notice

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General note on gender equality

KOSTAL Solar Electric GmbH is aware of how language impacts on gender equality and always makes an effort to reflect this in documentation. Nevertheless, for the sake of readability we are unable to use non-gender-specific terms throughout and use the masculine form instead.

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Valid from:

12/2025

Contents

1. About this documentation

This documentation contains important information on the functional principles of your product as well as its safety and usage.

Read this documentation carefully and in full before you work with the product. Follow the instructions and safety specifications in this documentation during all activities.

Contents

1.1 Validity of the documentation

This documentation applies to the battery:

- KOSTAL HELIVOR HV

1.2 Content, function and intended audience of the documentation

Content and function of the document

This documentation is an operating manual and is part of the product it describes.

This documentation provides you with important information on the following topics:

- Structure and function of the product
- Handling the product safely
- Explanations, specifications and instructions for handling the product, from transportation to disposal
- Technical data

Target groups

This documentation is aimed at the following categories of people:

- System planners
- Plant owners
- Qualified staff in transport, storage, mounting, installation, operation, maintenance and disposal

1.3 Applicable documents and further information

To fully understand the content of this documentation and to perform the described work steps safely and in full, you require the following additional documents and information sources.

You can find all of the information about the product on our website in the ***Download*** area: **www.kostal-solar-electric.com/download/**

Applicable documentation

- The Quick Start Guide provided as part of the product's scope of delivery
- Documentation for other components in the system
- List of countries whose specifications the product meets
- List of approved batteries along with information as to which inverter the battery is approved for.
- Certificates and manufacturer declarations to forward to the energy supplier

Further information

- List of compatible partners: An overview of products from external partners that can be combined with products from KOSTAL Solar Electric GmbH to create optional upgrades.

Regulations

- Plant owner's operating regulations at the place of use
- Accident prevention regulations
- Regulations on work equipment safety
- Regulations on disposal and environmental protection
- Other applicable regulations at the place of use

1.4 Notes in this manual

A distinction is made in this manual between warnings and information notes. All notes are identified in the text line with an icon.

1.4.1 Warnings

DANGER

Indicates a direct hazard with a high level of risk, which, if not avoided, will result in death or serious injury.

WARNING

Indicates a hazard with a moderate level of risk, which, if not avoided, will result in death or serious injury.

CAUTION

Indicates a hazard with a low level of risk, which, if not avoided, will result in minor or slight injury or property damage.

INFO

Contains important instructions for installation and for trouble-free device operation in order to avoid damage to property and financial damages.

1.4.2 Meaning of symbols in information notes

The symbol indicates activities that may only be carried out by an electrician.

Information

2. Safety

This chapter provides you with important information on handling your product safely.

Contents

2.1 Proper use

Intended purpose

- The product is a battery and is used to store energy generated by the inverter.

Fields of use

- The product is intended for professional and private use.
- The product can be operated with compatible inverters in grid-connected mode and backup mode.

Place of use

- The product is not intended for use in explosive or aggressive environmental conditions. Observe the specifications for the installation location.
- The product is intended for use indoors and outdoors.
- The product is only intended for stationary use.

Specifications for additional components, replacement parts and accessories

Additional components, replacement parts and accessories may only be used if they have been approved by KOSTAL Solar Electric GmbH for this product type.

You can find all of the information about the product on our website in the ***Download*** area: **www.kostal-solar-electric.com/download/**

2.2 Improper use

- Any use of the product other than the use described in this documentation and in the applicable documentation is improper and is therefore not permitted.
- Making any changes to the product that are not described in this documentation is not permitted. Prohibited changes to the product will result in loss of warranty.
- The battery is not suited to supplying power to medical life-support devices.
- Ensure that injuries cannot result from the battery system experiencing a power outage.

2.3 The operator's obligations

When using the product, the following obligations must be met:

Instruction

- Providing this documentation:
  - The operator must ensure that staff who carry out activities on and with the product have understood the content of the documentation for this product.
  - The operator must ensure that the documentation for this product is accessible to all users.
- Readability of the warning signs and labels on the product:
  - Warning signs and labels on the product must always remain legible after the product is installed.
  - The operator must replace any warning signs and labels that are no longer legible because they are old or damaged.

Occupational safety

- The operator must ensure that staff performing activities on and with the product are qualified to do so.
- The operator must ensure that the system is immediately shut down if there are discernible defects and must ensure that the defects are remedied.
- The operator must ensure that the product is only operated with the specified safety devices.

2.4 Qualification of the staff

The activities described in this documentation must only be performed by people who are qualified for the task. Depending on the activity, they require specific specialist knowledge in the following areas and knowledge of the relevant specialist terms:

- Electrics

The following additional, specific qualifications are required:

- Knowledge of all safety requirements for handling batteries
- Knowledge of the applicable regulations for handling the product. See Applicable documents and further information.

2.5 Sources of danger

The product has been developed and tested in accordance with international safety requirements. Despite this, residual risks still exist and could cause personal injury and damage to property.

2.5.1 Danger of injury

Serious danger of injury or death from electric shock

There may be high DC voltage present on the DC cables. Touching damaged live DC cables leads to life-threatening injuries or even death.

- Do not touch exposed live parts or cables.
- Before working on the product: De-energise product and secure it against being switched back on.
- For all work on the product: Wear suitable protective equipment and use suitable tools.

2.5.2 Material damage

Risk of fire due to damaged supply cables

There is a high DC voltage present on the DC cables running to the inverter. Damaged inverter supply cables or damaged plugs can cause a fire.

- Carry out regular visual checks on the supply cables and plugs.
- If you detect defects: Notify qualified staff and have the parts replaced.

Risk of fire resulting from damaged battery modules

Damage to the battery may result in electrolytes leaking, and contact with the electrolytes may cause breathing complications, skin irritations or chemical burns.

- Therefore, regularly check the battery modules for damage or deformations.
- If you detect defects: Switch the battery off immediately, inform qualified staff and have battery modules replaced.

2.6 Personal protective equipment

For certain activities, staff are obligated to wear protective equipment. The required protective equipment is specified in the relevant chapters.

An overview of the required protective equipment

- Rubber gloves
- Protective glasses

2.7 Emergency procedure

2.7.1 Fire procedure

1. Leave the danger zone immediately.
2. Notify the fire service.
3. Tell the emergency services that a PV system is in operation and state the location of modules, inverters, battery and separators.
4. Have any other measures carried out by qualified staff only.

2.7.2 Risk of fire

A fire may occur if the battery is located in the direct vicinity of a flame or the ambient temperature is unusually high. Should the battery catch fire, carbon monoxide, carbon dioxide and other gases may be produced and smoke may be released.

- Clear the scene of the fire quickly and use self-contained breathing apparatus (SCBA) and full personal protective equipment to fight the fire.
- Use a dry powder fire extinguisher to cool the battery and put out the fire to prevent it from spreading.

2.7.3 Damaged battery module

Do not continue to use a damaged battery. Dispose of it in the proper manner or return it to a specialist.

Damage to the battery may result in electrolytes leaking, and contact with the electrolytes may cause breathing complications, skin irritations or chemical burns. Should the following situations arise, you should take the corresponding actions immediately:

- Contact with eyes: Gently rinse the eyes for at least 15 minutes under running water and seek medical attention straight away.
- Contact with skin: Rinse the area of skin affected for at least 15 minutes under running water, take off contaminated clothing and seek medical assistance.
- Inhalation or swallowing: Move out of the contaminated area and seek medical attention straight away.

2.8 Observed standards and guidelines

The EU Declaration of Conformity lists standards and guidelines, the requirements of which are met by the product.

You can find all of the information about the product on our website in the ***Download*** area:
www.kostal-solar-electric.com/download/

3. KOSTAL HELIVOR HV high-voltage battery

The ***KOSTAL HELIVOR HV*** high-voltage energy storage unit has been developed and manufactured by ZYC Energy Company Limited. It was designed specifically to work with KOSTAL inverters.

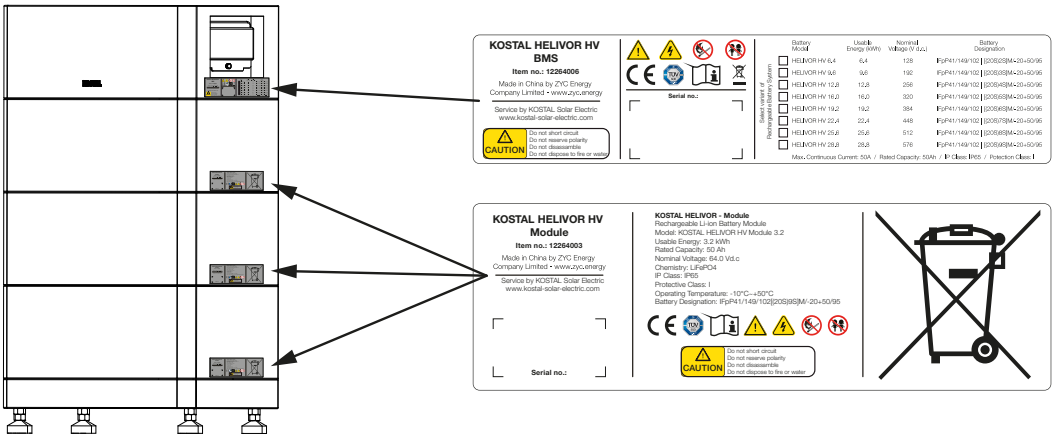
The ingenious design enables rapid and space-saving installation. There is no need for separate commissioning or configuration. The system is ready for use right way and is always up-to-date thanks to automatic or manual software updates via the inverter.

Up to 9 battery modules can be switched in series per energy storage unit. Parallel operation of up to 8 battery systems allows for flexible applications with capacities of between 6.4 kWh and 230.4 kWh – ideal for personal, commercial and industrial applications.

As the central contact, KOSTAL Solar Electric GmbH handles all service and support requirements, as well as the product warranty. Its 10-year warranty provides maximum investment security.

Further details of the technical data can be found in the **Technical data, Page 53** section.

4. Type plate and labels on the device



The type plate and other labels are attached to the device housing. These signs and labels must not be altered or removed.

The type plate gives you a quick overview of the most important data about the battery storage. You will also require this information if you contact our service team.

You will find the following information on the type plate:

- Manufacturer
- Model
- Serial number and article number
- Characteristics specific to the device
- Bar code containing the following information: Serial number
- Details of installed capacity
- Safety symbols

Symbol	Explanation
	Danger notice
	Danger due to electrical shock and discharge

Symbol	Explanation
	Keep the battery modules away from naked flames.
	Keep the battery modules away from children.
	CE marking The product satisfies the applicable EU requirements.
	The product has been tested and certified by TÜV.
	Observe and read operating manual
	WEEE marking Device must not be disposed of with household waste. Observe the local application of disposal requirements.

5. Glossary

Designation	Meaning
BMS	Battery Management System
LFP	Lithium iron phosphate ($LiFePO_4$)
SoC	State of Charge
SoH	State of Health

6. Transport and scope of delivery

6.1 Transport

- During transport, batteries should be shipped with their connections covered to prevent contact with metal objects and short circuits.
- Before shipment, the batteries should be discharged to a specific charging status to comply with international transport specifications.
- If possible, batteries should be transported in the manner intended by the manufacturer: horizontal and secured.
- Avoid transporting in a vertical position wherever possible and limit the number of batteries stacked on top of one another.
- To avoid damage, do not place heavy objects on the battery.

6.2 Storage

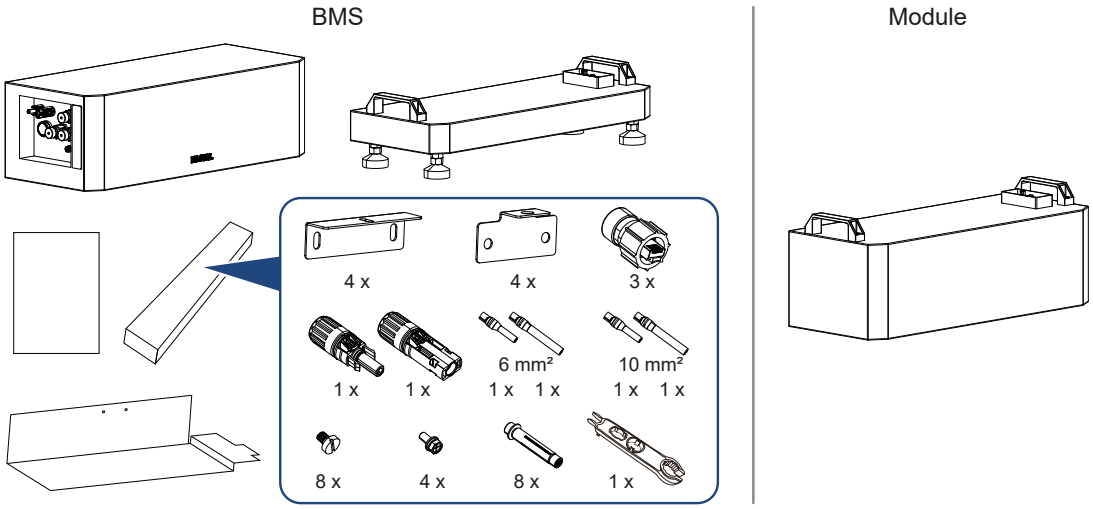
- Store the battery as indicated on the packaging.
- Do not store the batteries on their heads. Observe the symbols on the packaging.
- Do not store the battery somewhere subject to direct sunlight and keep it away from sources of heat.
- Keep at an adequate safe distance from flammable materials and areas at risk of explosion.
- Do not store the battery in an environment with high levels of humidity.
- Protect the battery from rain and moisture.
- Batteries, which are stored for long periods (≥ 6 months), should be charged regularly to prevent irreversible damage resulting from deep discharge.
- If the battery is stored for longer, the ambient temperature should be roughly 25 °C. The ambient temperature for short-term storage should be between 0 °C and 35 °C.

6.3 Handling

Installers should exercise care during installation to prevent damaging the battery.

- If the battery has been damaged before installation, e.g. due to housing damage or damaged connection ports, do not use it and contact our Service department.
- Protect the battery against damage when transporting and handling.
- Do not clean the battery with cleaning agents and prevent foreign objects from entering the battery. The battery may only be wiped down with a dry cloth.
- Do not disconnect any cables while the battery is up and running.
- Do not use the battery in combination with other brands or types of battery.
- Avoid short circuits on the battery modules.
- Avoid external influences impacting the battery, such as those caused by dragging across the floor or placing heavy objects on the battery.

6.4 Scope of delivery



Scope of delivery – BMS module with battery base

- BMS module (Battery Management System)
- Base for battery system
- Accessories:
  - 4 x retaining plates for battery module
  - 4 x retaining plates for wall mounting
  - 3 x RJ45 connectors
  - 2 x DC plugs with DC pins for 6 mm^2 or 10 mm^2 crimping (hydraulic crimping tool needed)
  - 4 x M5x10 hexagon bolts
  - 8 x M5x20 slotted screws
  - 8 x expansion bolt for wall mounting
  - 1 x DC installation tool
- Short manual
- Mounting template

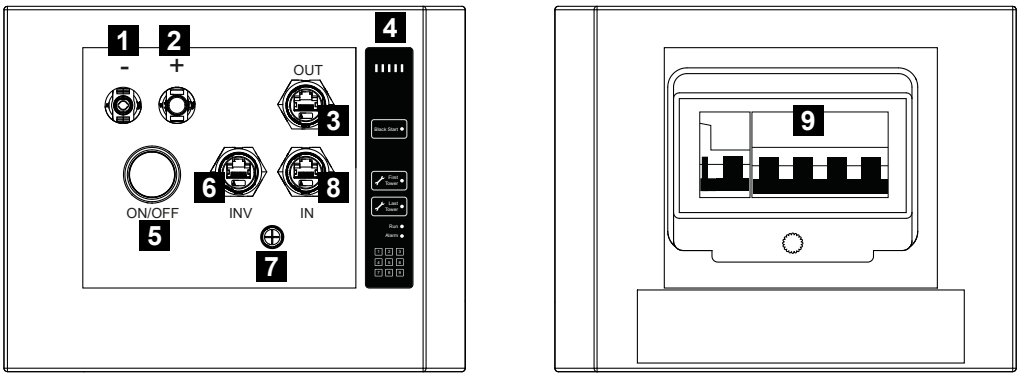
Scope of delivery – battery module

- Battery module

7. Operation

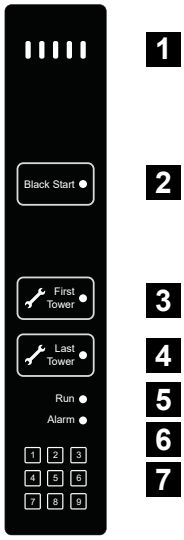
7.1 The connection and control panel

Battery Management System (BMS) – control elements



1 DC - (negative DC input)
2 DC + (positive DC input)
3 OUT (communication output for connection between battery towers/parallel connection)
4 Control panel (HMI – Human Machine Interface)
5 ON/OFF (On/Off switch)
6 INV (communication connection to inverter)
7 PE (protective conductor connection)
8 IN (communication input for connection between battery towers/parallel connection)
9 Fuses/break switches for battery system

The control panel



1 The SoC status display is a visual indication of the system's current state of charge (SoC). Each LED represents 20% of the battery capacity.

2 Function currently being prepared

3 Only activate First Tower at the first tower, which is directly connected to the inverter. If there are several towers, First Tower must be deactivated for the other towers.

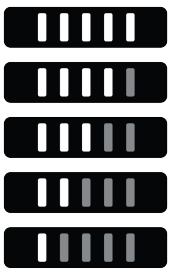
4 Last Tower marks the last tower in the system. Only activate Last Tower at the last tower. If there are several towers, Last Tower must be deactivated for the remaining towers.

5 Indicates the communication status with the inverter. LED green: Communication OK / LED off: Communication fault.

6 Status display alarm. If an LED is lit up, there is an error.

7 Numbers 1-9 correspond to the modules, running from top to bottom. If the modules are working properly, the LEDs are off. If a module fails, the corresponding number lights up orange.

SoC status display



The SoC status display is a visual indication of the system's current SoC (State of Charge). Each LED represents 20% of the battery capacity.

When discharging, the last bright LED flashes quickly (once a second).

When charging, the last bright LED flashes slowly (once every 2 seconds).

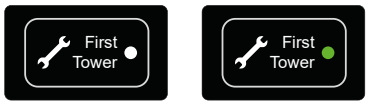
Black Start

Function currently being prepared.

Black Start is a function for powering the inverter up again using energy reserves from the battery if it has been powered down in backup mode, for example.

Pressing the ***Black Start*** button makes the energy in the battery available to the inverter in order to start the system. As soon as the inverter starts to run, the ***Black Start*** function terminates automatically and the LED goes out.

First Tower



The ***First Tower*** function is used to confirm in the system the tower that is connected directly to the inverter.

After commissioning, the ***First Tower*** LED lights up (default setting). This means that the tower illuminated as the First Tower is the tower that is connected directly to the inverter.

If several towers are being connected in parallel, ***First Tower*** should only be activated for the tower that is connected to the inverter. ***First Tower*** should be deactivated for all other towers.

Last Tower

Last Tower is used to confirm the last tower in the system and to terminate the communication connection.

Last Tower is activated as standard upon delivery.

Unlike ***First Tower***, only one tower may be defined as the last tower otherwise the communication loop cannot be fully closed.

Last Tower may only be activated for the last tower.

Therefore, press the ***Last Tower*** button on each battery system to check whether the function has been deactivated everywhere other than the last tower (LED off).

If just one tower is being used, ***First Tower*** and ***Last Tower*** should both be activated for this tower.

Run

If the system is working properly, the ***Run*** display will be green.

If the system is not working properly, the ***Run*** display will be off. An error has occurred if this happens

and you should check the error messages in the inverter.

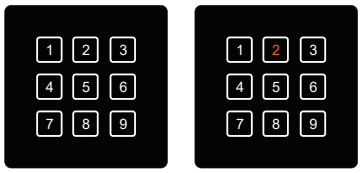
Alarm

If the system is working properly, the ***Alarm*** display remains off.

In the event of a serious error (including overvoltage, overcurrent, etc.), the ***Alarm*** display lights up orange

and you should check the error messages in the inverter.

Module status display



This area indicates the status of up to 9 modules in one single tower. Numbers 1-9 correspond to the modules in the tower, running from top to bottom.

If the module is working properly, the corresponding LED display remains off.

If there is an error in a module, the corresponding number lights up orange

and you should check the error messages in the inverter.

8. Installation

8.1 Safety

Read through this manual carefully before installation to ensure that the product is installed and used correctly and safely.

During installation, commissioning, operation and maintenance of the product, strictly observe the safety requirements contained in the manual. Improper operation or work practices may result in damage to the product and other objects, or the operator or third parties being injured or killed.

Installation and operation must be carried out by qualified specialist staff, and the system must be installed in areas with restricted access.

The battery module is of a considerable weight and should ideally be installed by at least two people, with the aid of tools if required.

When securing the product with bolts or other parts, use the right tool and tighten to the torque stated in the manual or on the product label because the product may otherwise become unstable or be damaged. Ensure you are proficient in how to use the various tools in advance to avoid the installer being injured as a result of improper handling.

Before installation and use, ensure that there is a fire extinguisher near by.

DANGER

Risk of death due to electrical shock and discharge!

Because of the battery, the power cable and plug carry a high voltage. Exercise particular care when wiring.

8.2 Selecting the installation site

The installation site should be suitable for operation and long-term use. Wherever possible, select a site which meets the following conditions:

Protection from direct sunlight.

Protection from rain water and splashes.

Protection from falling parts.

Protection from dust, contamination and ammonia gases. Rooms and areas containing livestock are not permitted as installation sites.

Only rooms with good aeration and good air circulation

Mount on a stable installation surface that can safely bear the weight.

Mount on a vertical installation surface.

Do not mount in a combustible environment.

A sufficient safety distance from flammable materials and potentially explosive areas in the vicinity must be ensured.

Only install up to an altitude of 3000 m.

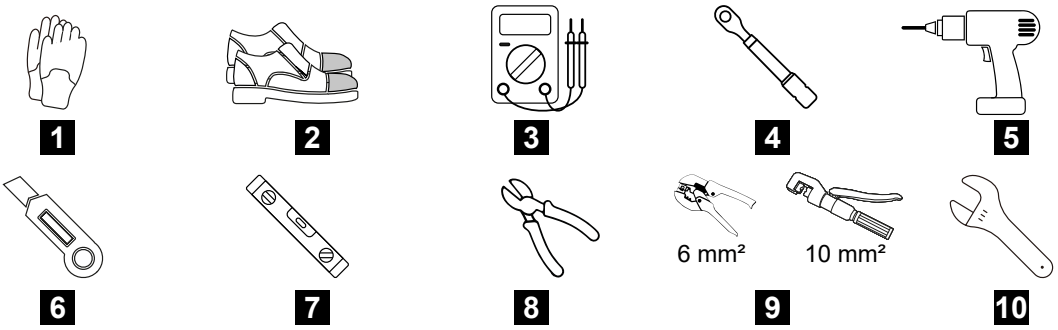
The ambient temperature must be between -10 °C and +55 °C.

The air humidity should be between 5 and 95% (non-condensing).

Keep out of reach of children and pets to avoid accidents

8.3 Tools

The following tools are required to install the battery system. Ensure that you are well prepared before you get started.



1 Insulated gloves
2 Safety boots
3 Multimeter
4 Torque wrench
5 Drill/cordless screwdriver
6 Knife
7 Spirit level
8 Side cutters
9 Crimp tool for 6 mm^2 or hydraulic tool for 10 mm^2. Depending on DC connection to inverter used.
10 Adjustable open-end wrench (M5)

8.4 Additional parts needed

The following parts are not part of the scope of delivery but are needed to connect to the inverter.

- DC cable, min. 6 mm^2 (≥10 AWG) for battery connection to inverter.
- PE cable, min. 10 mm^2 (≥8 AWG)
- Cable shoe for PE connection (SC10-5)
- Shielded communication cable (Cat7 or higher) for connection to inverter.

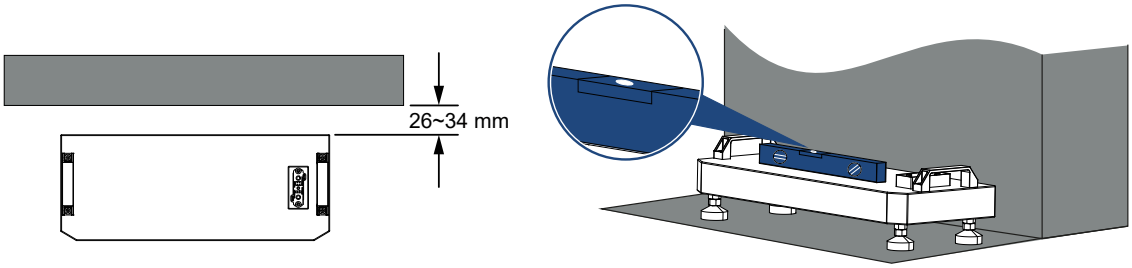
8.5 Locating the base

The installation site should be suitable for safe operation and long-term use.

Position the base on something solid to prevent the battery system from tipping or sinking during use.

There are four feet for adjusting the base to compensate for uneven floor areas.

When positioning the base, ensure that there is a wall nearby to which the system can be fastened and maintain a distance of between 26 and 34 mm between the base and wall.



8.6 Installing the modules

The storage system does not need any additional fastening elements between the individual battery modules. Instead, fasteners are used to secure the system to the wall and thereby prevent it from tipping over.

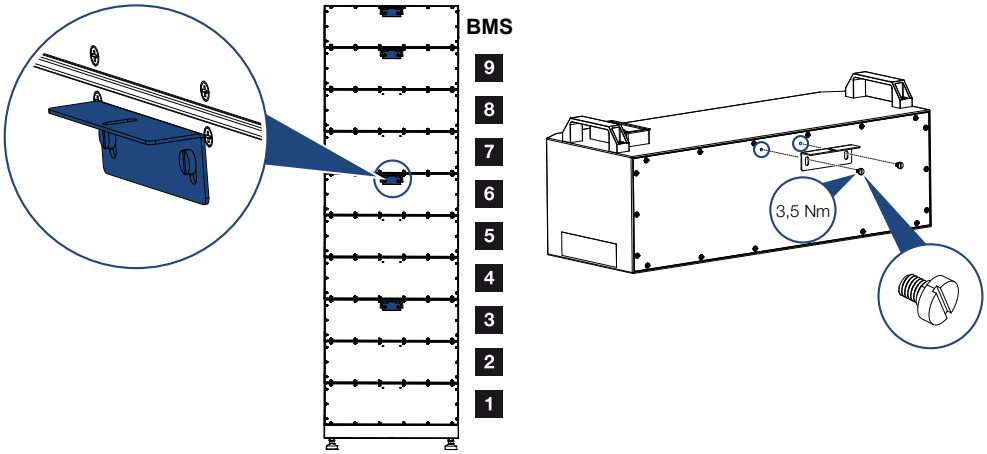
A fastener can be attached to each battery module and the Battery Management System (BMS).

We would recommend securing every third battery module with a fastener. In each configuration, the Battery Management System (BMS) is separately fastened to the wall with a fastener.

Holes will have to be drilled in the wall to mount the fasteners and stably fix the system.

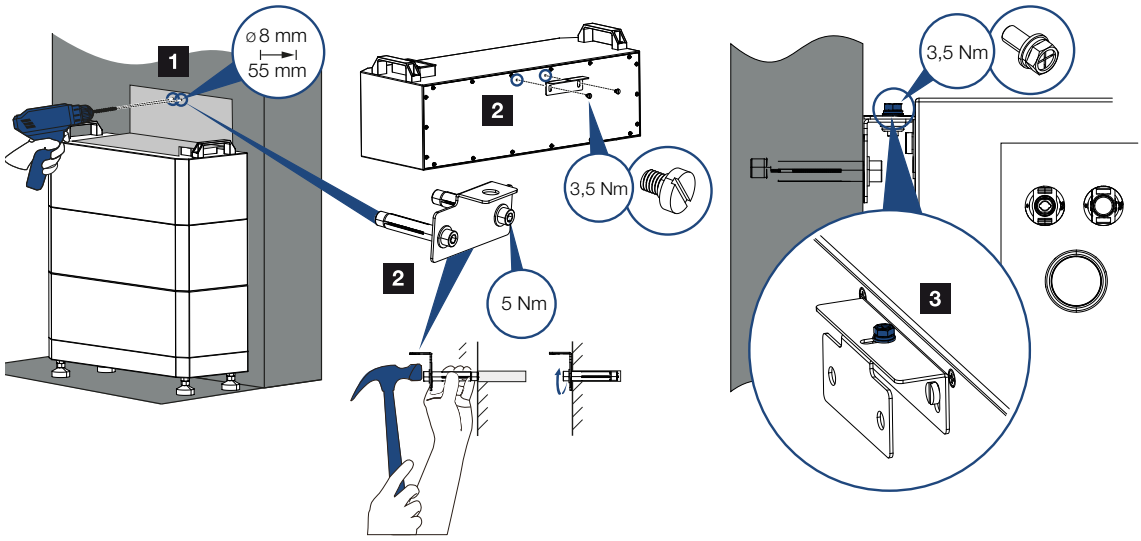
Refer to the table below to see which battery module requires a fastener. The quantity and position depend on the number of modules.

Battery modules per tower	Number of fasteners	Position of fastening points
BMS	1	BMS always
2	None	None
3	1	Battery module 3
4	1	Battery module 4
5	2	Battery module 3/5
6	2	Battery module 3/6
7	2	Battery module 3/7
8	3	On battery module 3/6/8
9	3	On battery module 3/6/9



8.7 Fastening battery system to the wall

1. Before attaching the module, which has to be fastened to the wall, use the template to mark the holes to be drilled.
2. Drill the holes in the wall.
3. Fasten the retaining plate for wall mounting to the wall.
4. Fasten the module retaining plate to the module.
5. Stack the modules and connect both retaining plates with the M5 hex bolt (3.5 Nm).
6. Finally, use a bracket to fasten the BMS to the wall.



9. Electrical connection

9.1 Approved inverter / battery combinations

Consult the **Approved batteries** document available from KOSTAL for details of the inverters approved for this battery. Here you will also find information about establishing communication with the inverter. The document can be found in the download area for the inverter.

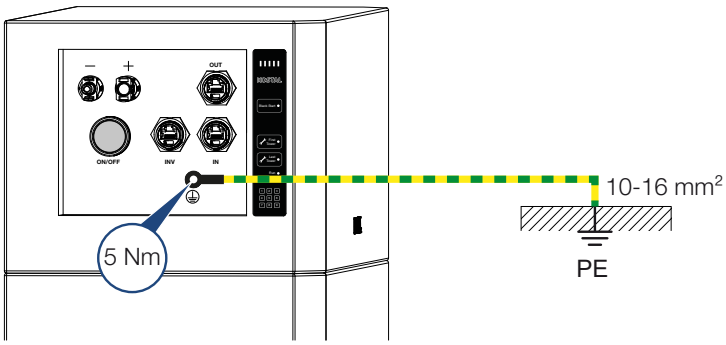
https://www.kostal-solar-electric.com/plenticore_released_batteries

9.2 PE connection for battery

Make sure that the PE cable is correctly connected before starting to connect the DC cables.

Use a connection cable of at least 10 mm² (≥8 AWG) and a cable shoe (SC10-5).

1. Crimp the cable shoe on to the PE cable.
2. Connect the PE cable to the battery's PE connection. The torque for fastening the PE cable is 5 Nm.



9.3 DC connection for battery/inverter

Mounting plug on DC cable

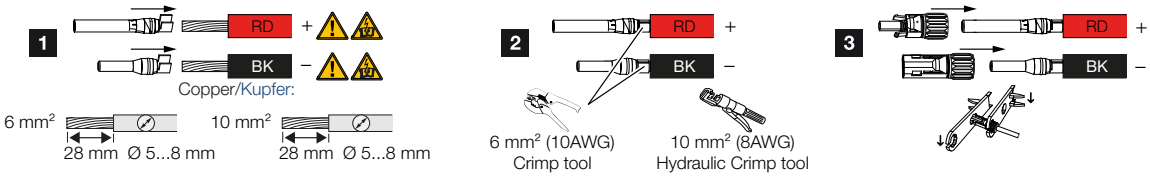
Use a cable cross-section of at least 6 mm² (10 AWG) as the DC battery cable. The cable cross-section must be selected taking into account the system size and also the requirements of the inverter.

INFO

Using a crimping tool

If a cable cross-section of 10 mm² is used, a hydraulic crimping tools should be used.

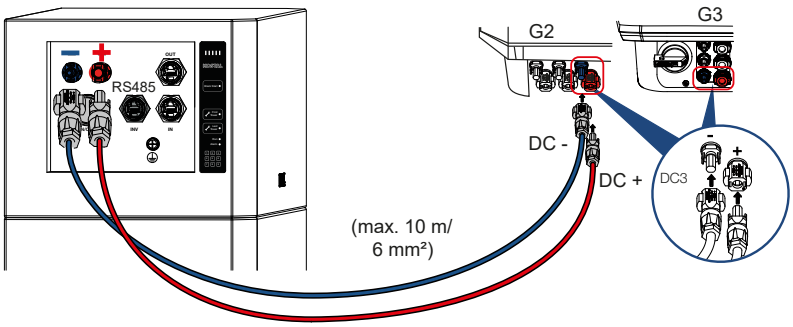
At the battery end, use the DC plugs for the battery provided.



At the inverter end, use the DC plugs that were provided for the inverter and fit these.

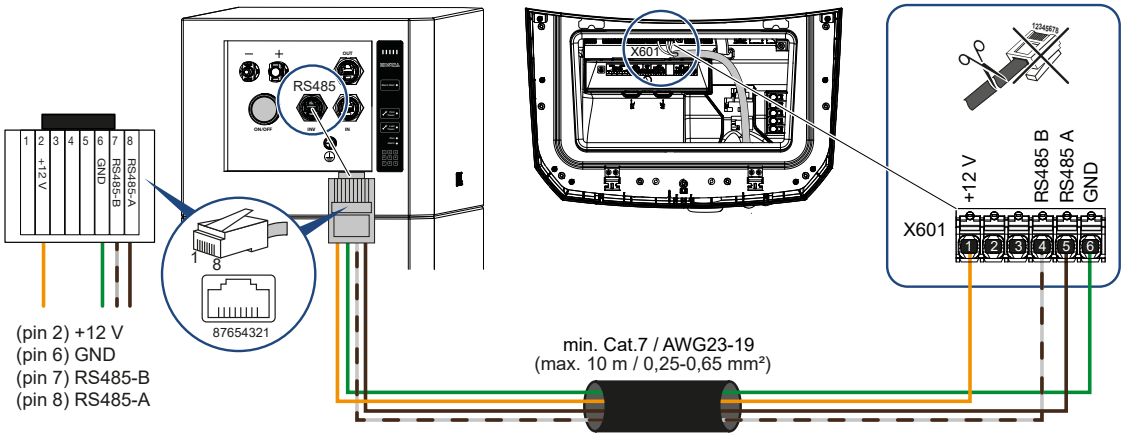
Connecting DC cables to the battery and inverter

Plug the DC cables into the battery until they engage. Then attach the DC cables to the inverter until they engage.



9.4 Connection for communication

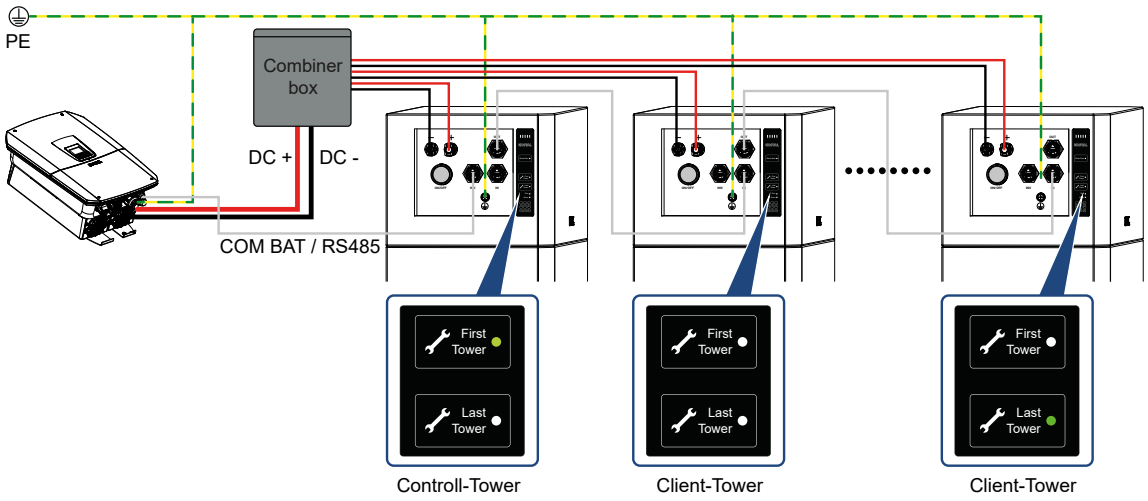
Establish communication between inverter and battery.



Meaning	PIN assignment on battery	PIN assignment on inverter	Cable
+12 V	2	1	min. Cat.7 AWG23-19 Twisted pair max. Ø 7.5 mm max. 10 m
GND	6	6	
RS485 B	7	4	
RS485 A	8	5	

The table shows the RJ45 pin assignment and the assignment at the INV connection on the battery's BMS. Use the table and the installation instructions for the inverter used to check the assignment and adjust the assignment order to establish the communication connection.

9.5 Connecting towers in parallel



The system allows up to 8 towers to be operated in parallel (1 controller tower and 7 client towers). In order to connect several towers in parallel, please take the following steps:

1. Ensure that the towers you wish to connect in parallel have the same number of modules. A parallel connection would fail if there is a disparity in voltage between the towers.
2. Connect the PE cable of each tower to the PE busbar.
3. Connect the towers with one another via the communication cable.
   From the controller tower's ***Out*** connection to the ***In*** connection to client 1, then from client 1's ***Out*** connection to the ***In*** connection of the next client tower.
4. Connect the inverter to the controller tower via the communication cable, from the controller tower's ***INV*** connection to the inverter.
5. Connect the DC cables of all towers to the busbar (combiner box accessory) and then connect the busbar to the inverter.
6. Switch on the line circuit breakers/break switches of all towers.
7. Then press the ***On/Off*** button on the controller tower to start the entire system and check the status of each tower on the control panel.

Activating first tower and last tower

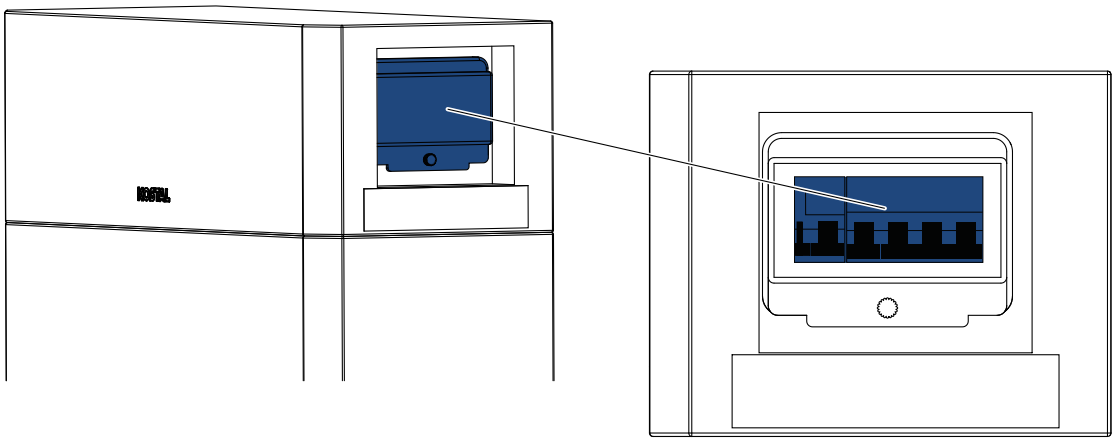
1. On the **first tower,** the ***First Tower*** function is activated (LED on) and the ***Last Tower*** function is deactivated.
2. On the **last tower**, the ***First Tower*** function is deactivated and the ***Last Tower*** function is activated (LED on).
3. For all other towers, ***First Tower*** and ***Last Tower*** are deactivated.

10. Commissioning

10.1 Switching on line circuit breakers

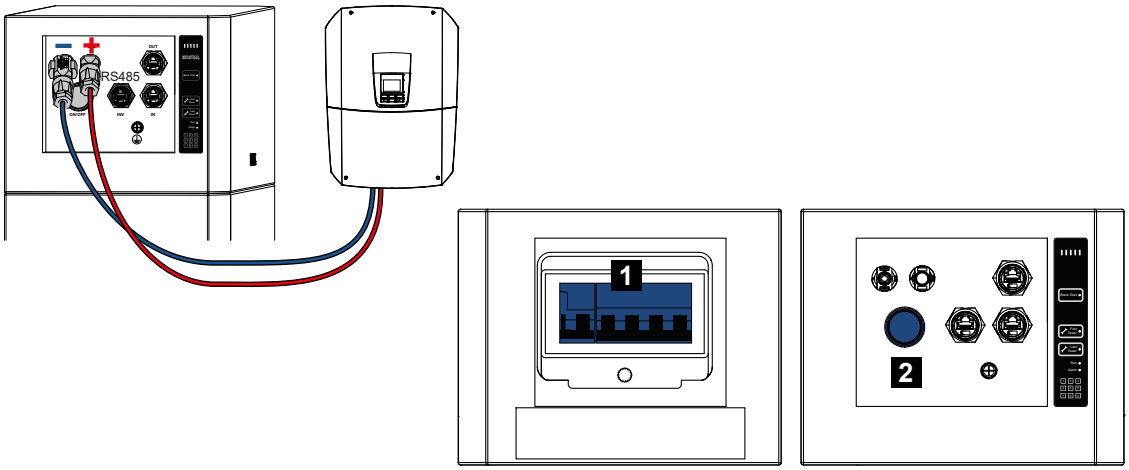
Every BMS has a line circuit breaker/break switch to protect all modules in an individual tower.

The line circuit breaker is located on the right-hand side of the BMS and automatically terminates the connection in the event of overcharging or deep discharging to protect the modules from damage. The line circuit breaker also protects the modules in the event of internal errors.



10.2 System start

Before starting the system, ensure that all PE and power cables, as well as communication cables, are properly connected.



1 Line circuit breaker/break switch
2 On/Off button

Follow the steps to start the system:

1. Switch on the battery's line circuit breaker/break switch.
2. Press the ***On/Off*** button to start the system.

✓ The battery system is running.

Configuration after system start-up

By default, ***First Tower*** and ***Last Tower*** are enabled on delivery.

If only one tower is used, ***First Tower*** and ***Last Tower*** must be activated simultaneously on that tower.

In a parallel connection of several towers, ***First Tower*** must only be activated on the tower connected to the inverter. ***First Tower*** and ***Last Tower*** must be deactivated on all others. ***Last Tower*** must only be activated on the last tower. **Connecting towers in parallel, Page 47**

10.3 Switching off the battery system

If you want to switch off or power down the battery system, take the following steps:

1. Use the DC switch to switch off the inverter.
2. Press and hold the ***On/Off*** button on the BMS for 3 seconds.
3. Check the LED display on the control panel to ensure that the system is switched off.
4. Switch off the line circuit breaker/break switch on the battery system.

✓ The battery system is switched off.

10.4 Charging and discharging

The battery is a powerful high-voltage battery, equipped with the latest low-temperature technology. The recommended charging/discharging temperature is between -10 °C and 55 °C.

When combined with KOSTAL inverters, the charge/discharge power may be different.

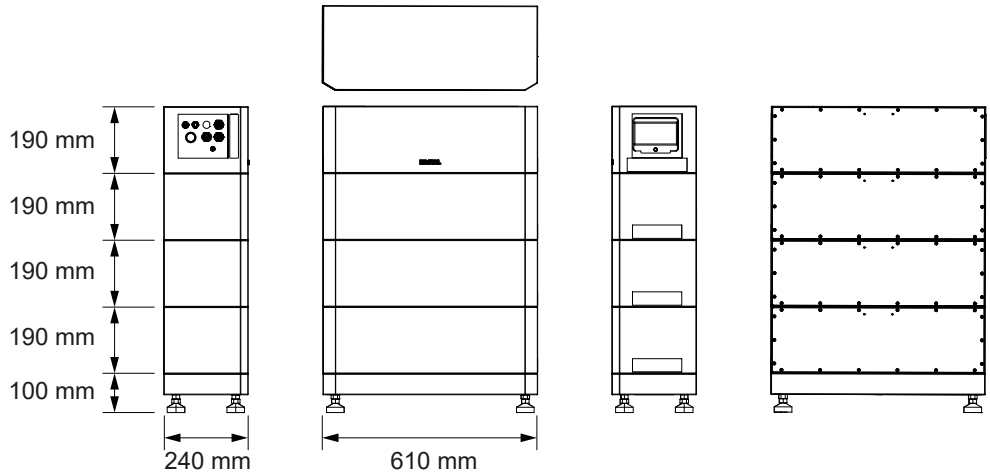
INFO

Charge/discharge power when combined with KOSTAL inverter

The **PLENTICORE with battery – Technical specification** data sheet contains the precise details of the charge/discharge power when combined with your KOSTAL inverter. You will find the document in the download area for your product under Data sheet.

11. Technical data

KOSTAL HELIVOR HV		6.4	9.6	12.8	16	19.2	22.4	25.6	28.8
module type		Li-Ion LFP, 3.2 kWh, 64 V, 50 Ah, 36.4 kg							
Number of battery modules		2	3	4	5	6	7	8	9
Usable capacity 100% DoD	kWh	6.4	9.6	12.8	16.0	19.2	22.4	25.6	28.8
Usable capacity 95% DoD	kWh	6.1	9.1	12.2	15.2	18.2	21.3	24.3	27.4
Nominal voltage	V	128	192	256	320	384	448	512	576
Voltage range	V	120 – 146	180 – 219	240 – 292	300 – 365	360 – 438	420 – 511	480 – 584	540 - 657
Max. charge/discharge current for battery system	A	50/50							
Max. current (peak for 5 seconds)	A	65							
Weight	kg	93	129	166	202	238	275	311	348
Altitude	mm	670	860	1050	1240	1430	1620	1810	2000
Width/depth	mm	610/240							
Cycle efficiency	%	≥96							
Charging temperature range	°C	-10…55							
Discharging temperature range	°C	-20…55							
Air humidity (not condensing)	%	5…95							
Operating altitude	m	≤ 3000							
Housing protection category		IP65							
Interface to inverter		RS485							
Warranty	Years	10							
Parallel connection of towers		1-8							
Directives / Certification		CE / IEC 62619 / UN 38.3 / VDE2510-50							



12. Maintenance

12.1 Cleaning

We would recommend cleaning the battery on a regular basis. If there is dust or flecks on the housing, use a brush or soft cloth to carefully wipe down the housing and remove the dust.

Do not use corrosive solutions or materials, which could damage the battery when cleaning the housing.

12.2 Maintenance

The battery should be stored at a temperature of between -10 °C and 50 °C and charged every 6 months.

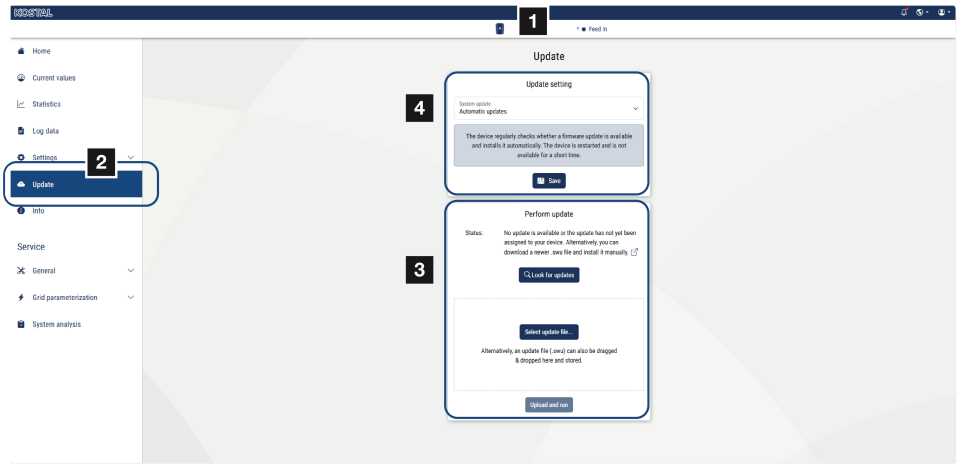
When regularly charging the battery, use a charging speed of no more than 0.5C to bring the battery up to a state of charge (SoC) of 30%.

12.3 Updating software

The battery software is updated via the inverter to which the battery is connected. You will find an accurate description of updates in the operating manual for the inverter.

Performing manual updates

1. Open the inverter's Webserver.
2. Go to ***Update*** in the Webserver.
3. Update the battery's software by going to ***Look for updates*** or select the current update file in .bin format by going to the ***Select update file*** option on your PC. You can find the current updates on our website in the **download area** for your product and by going to ***Software & Updates***.



Switching updates to automatic updates

1. To do this, open the inverter's Webserver.
2. Go to ***Update*** in the Webserver.
3. Under System updates, select ***Automatic updates***.
4. Save the settings.

✓ From now on, the battery will always be automatically updated with the latest updates.

12.4 Extending modules

The battery supports capacity extension over its entire life cycle.

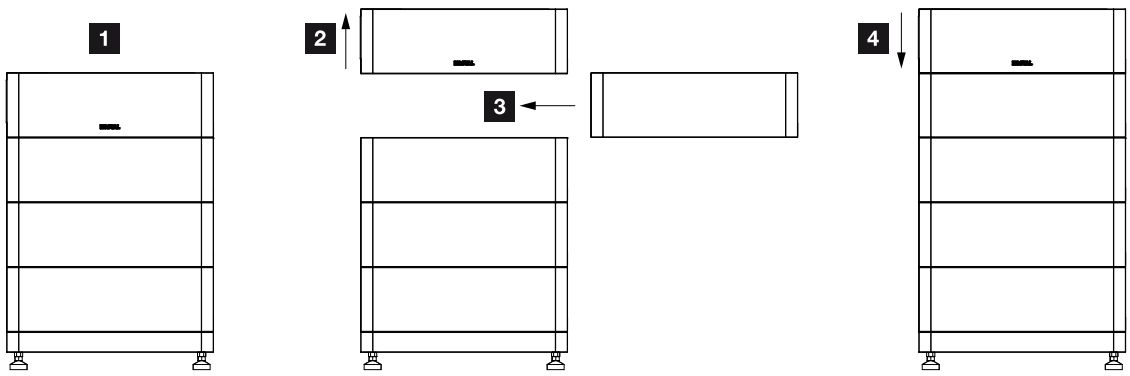
Progressive balancing technology provides seamless and efficient support for balancing the system.

For optimum performance, it is advisable to extend the system when the SoC value is less than 50%, ideally at 30%, to ensure faster module balancing.

Take the steps below to extend the system:

1. Switch off the inverter.
2. Switch off the battery system.
3. Remove the BMS and place the new module on the top.
4. Finally, put the BMS back on.
5. Switch the battery system back on again.
6. Switch the inverter back on again.

✓ Module extension complete.



13. Disposing of the battery

Checking the condition of a battery module

Before shipping or disposing of battery modules, be sure to accurately check their condition. A battery module may be dangerous if it is damaged.

Immediately inform your installer or sales partner if you believe that the status of a battery module may be critical or it is damaged. An accurate appraisal should then be undertaken by a specialist.

- Battery modules may be dangerous if they display the following symptoms:
  - Battery module smells odd.
  - There are gases coming out of the battery module.
  - The battery module's housing is misshapen/swollen.
  - The battery module's housing is very hot.
- Battery modules not considered dangerous are, for example, battery modules that do not display any of the above signs but are to be replaced or which have too low a capacity.

Disposal

When disposing of the battery, please observe the local regulations relating to the disposal of electrical waste and used batteries.

Observe the following requirements:

- Do not dispose of the battery along with your household waste.
- Do not store used batteries in direct sunlight or at high temperatures.
- Do not dispose of used batteries in environments with a high level of humidity or in corrosive environments.
- Damaged batteries must be taken out of use immediately.
- To avoid short circuits and potential fires, battery pins, loose cables and cable ends must be covered or isolated. To do this, use the plug seals provided or, for example, insulating tape intended for this purpose.
- Ensure that defective batteries are taken away as quickly as possible.

Providers of disposal services

As a battery installer, you are responsible for the return and disposal of the battery. Contact KOSTAL Solar Electric GmbH to dispose of batteries. You will find everything you need to know about disposing of batteries here. You will find contact details on our website at **www.kostal-solar-electric.com**.

14. Accessories

14.1 Combiner Box

The Combiner Box can be used to quickly and easily interconnect several towers.

Combiner Boxes are available for connecting 3 or 8 storage towers in parallel.

- Combiner Box 3T (SCB3-50) for 3 storage towers
- Combiner Box 8T (SCB8-50) for 8 storage towers

This enables up to 230.4 kWh of usable capacity and applications in the residential to small commercial segment.

15. Warranty and service

Information about the service and warranty conditions can be found in the download area for the product at **www.kostal-solar-electric.com**.

For service information and in the event of parts being needed, we require your device type and the serial number. You will find this information on the type plate on the exterior of the housing.

If you have any technical questions, please call our service hotline:

- Germany and other countries (language: German, English):
  +49 (0)761 477 44-222
- Switzerland:
  +41 32 5800 225
- France, Belgium, Luxembourg:
  +33 16138 4117
- Greece:
  +30 2310 477 555
- Italy:
  +39 011 97 82 420
- Poland:
  +48 22 153 14 98
- Spain, Portugal (language: Spanish, English):
  +34 961 824 927

Spare parts

If spare parts or accessories are required for troubleshooting, use only original spare parts and accessories manufactured and/or approved by the manufacturer.

www.kostal-solar-electric.com

4/2026 - EN - DOC03844754-0001 - Subject to technical changes. Errors excepted.
You can find current information at www.kostal-solar-electric.com. Manufacturer: Made in China by ZYC Energy Company Limited – www.zyc.energy