Operating Instructions

Fronius Reserva

6.3 kWh / 9.5 kWh / 12.6 kWh / 15.8 kWh



EN-US | Operating instructions

42,0426,0564,EA 001-26032025

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Safety rules

Explanation Safety instructions

⚠ WARNING!

Indicates a potentially dangerous situation.

▶ If it is not avoided, death or serious injury may result.

⚠ CAUTION!

Indicates a potentially harmful situation.

▶ If it is not avoided, slight or minor injuries and damage to property may result.

NOTE!

Indicates the possibility of impaired work results and damage to equipment.

If you see one of the symbols shown in the "Safety instructions" chapter, increased attention is required.

Presentation conventions

The presentation conventions described below have been defined to make the documentation easier to read and understand.

Application notes

IMPORTANT! Indicates instructions for use and other useful information. It is not a signal word for a harmful or dangerous situation.

Software

Software functions and elements of a graphical user interface (e.g. buttons, menu items) are highlighted in the text with this **label**.

Example: Click the **Save** button.

Handling instructions

1 Action steps are displayed with consecutive numbering.

✓ *This symbol indicates the result of the action step or the entire instruction.*

General information

The appliance is manufactured according to the state of the art and in compliance with recognized safety regulations. In the event of incorrect operation or misuse, there is a risk to

- life and limb of the operator or third parties,
- the appliance and other property belonging to the operator.

All persons involved in the commissioning, maintenance and servicing of the appliance must
- be appropriately qualified,
- have knowledge of electrical installations and
- read these operating instructions in full and follow them exactly.

In addition to the operating instructions, the generally applicable and local regulations on accident prevention and environmental protection must be observed.

Keep all safety and danger notices on the appliance
- in a legible condition,
- do not damage them,
- do not remove,
- do not cover, paste over or paint over.

Only operate the appliance if all safety devices are fully functional. If the safety devices are not fully functional, there is a risk to
- the life and limb of the operator or third parties,
- the appliance and other property belonging to the operator.

Have safety devices that are not fully functional repaired by an authorized specialist company before switching on the appliance.

Never bypass safety devices or put them out of operation.

The positions of the safety and danger notices on the appliance can be found in the "Information on the appliance" section of the operating instructions for your appliance.

Eliminate faults that impair safety before switching on the appliance.

Ambient conditions

Operation or storage of the device outside the specified area is considered improper use. The manufacturer is not liable for any resulting damage.

Dangers from the battery

Risks of electrolyte leakage
- Do not expose the battery to strong vibrations.
- Do not compress or pierce the battery.
- Prevent the battery from falling. If the battery falls, switch it off immediately and do not use it again.
- Do not open or damage batteries. Released electrolyte is harmful to eyes and skin.

Fire risks
- Do not expose the battery to direct sunlight.
- Avoid contact with conductive objects such as terminals or exposed wires.
- Keep battery away from sources of fire and flammable, explosive and chemical materials.
- Do not place batteries in fire as they may explode.

Risks of electric shock
- Do not touch the battery with wet hands.
- Keep battery out of reach of children and animals.
- A battery can pose a risk of electric shock and burns due to a high short-circuit current.
- Battery installation and cable connections must be carried out by qualified personnel.

Risks of damage
- Do not immerse the battery in water or expose it to moisture.
- Do not expose the battery to high voltage.
- Place the battery on a flat surface. Do not place any foreign objects on the battery or step on the battery.

Recommended measures for emergencies

Electrolyte leakage
- Inhalation: Leave the contaminated area immediately and provide fresh air.
- Ingestion: Induce vomiting.
- Contact with eyes: Rinse eyes under clean, running water for 15 minutes.
- Contact with skin: Wash thoroughly with soap and water.
- After first aid measures, seek medical attention immediately.
- Take measures to prevent leaking liquids from entering the soil or groundwater. Clean up contamination in accordance with applicable national regulations.
- Clean and check the parts that have come into contact with the electrolyte

Fire (battery can ignite if heated above 150 °C)
The following measures must be taken:
- If the battery catches fire during operation, turn off the switch between the battery and the inverter, provided there is no direct danger.
- Use an ABC or carbon dioxide fire extinguisher before the battery catches fire.
- If the battery catches fire, evacuate people first and then call the fire department.

Wet battery
- If the battery is wet or under water, do not access it. Contact customer service or dealer immediately for technical support.

Damage
- Damaged batteries are dangerous and must be handled with extreme care. They must not be used and may pose a danger to people or property. If the battery is damaged, stop using it immediately and return it to the dealer.

Qualified personnel

The information in these operating instructions is intended for qualified personnel only. An electric shock can be fatal. Do not carry out any activities other than those specified in the documentation. This also applies if you are qualified to do so.

All cables must be secure, undamaged, insulated and adequately dimensioned. Loose connections, damaged or undersized cables must be repaired immediately by an authorized specialist company.

Maintenance and repairs may only be carried out by an authorized specialist company.

There is no guarantee that externally sourced parts are designed and manufactured to withstand the stresses and ensure safety. Only use original spare parts.

Do not make any modifications, installations or conversions to the appliance without the manufacturer's approval.

Replace damaged components immediately or have them replaced.

EMC measures

In special cases, interference may occur for the intended area of application despite compliance with the standardized emission limit values (e.g. if there is interference-sensitive equipment at the installation site or if the installation site is close to radio or television receivers). In this case, the operator is obliged to take measures to rectify the interference.

Electromagnetic fields

During operation, local electromagnetic fields (EMF) occur in the vicinity of the inverter and the Fronius system components as well as in the area of the PV modules including the supply cables due to the high electrical voltages and currents.

If the products are used as intended and the recommended distance of at least 20 cm is maintained, the required limit values for human exposure are complied with.

According to the current state of scientific knowledge, no health-endangering effects are to be expected from EMF exposure if these limit values are observed. If wearers of prostheses (implants, metal parts in and on the body) and active body aids (pacemakers, insulin pumps, hearing aids, etc.) are in the vicinity of components of the PV system, they must consult their doctor regarding possible health risks.

Data backup

With regard to data security, the user is responsible for:
- backing up any changes made to the factory settings
- saving and storing personal settings

Copyright

Copyright of these operating instructions remains with the manufacturer.

Text and illustrations were accurate at the time of printing, subject to change. We are grateful for suggestions for improvement and information on any discrepancies in the operating instructions.

Protective earthing (PE)

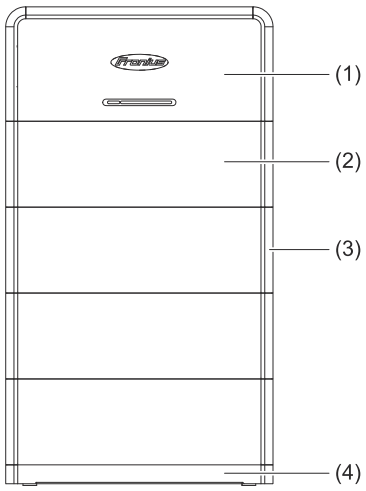
Connection of a point in the device, system or installation to earth to protect against electric shock in the event of a fault. When installing a safety class 1 inverter (see **Technical data**), the protective conductor connection is required.

When connecting the protective conductor, ensure that it is secured against unintentional disconnection. All the points listed in chapter **Electrical connection** on page **35** must be observed. When using cable glands, it must be ensured that the protective earth conductor is the last to be loaded in the event of the cable gland failing. When connecting the protective conductor, the minimum cross-section requirements specified in the relevant national standards and directives must be observed.

General information

Fronius Reserva

Device concept



(1) Battery management module
(2) Battery module
(3) Base plate
(4) Covers

The Fronius Reserva battery is a stackable battery system that can be expanded up to 4 battery systems in parallel operation. The lithium iron phosphate (LFP) batteries are known for their high thermal and chemical stability. The multi-stage safety design and intelligent safety monitoring systems ensure safe operation throughout the entire life cycle. The storage system offers over 6,000 charge and discharge cycles.

The battery has a modular design and supports the parallel connection of multiple batteries to expand capacity.

In combination with an emergency power-capable Fronius inverter and emergency power switchovers with the appropriate configuration, the Fronius Reserva can be used for emergency power supply.

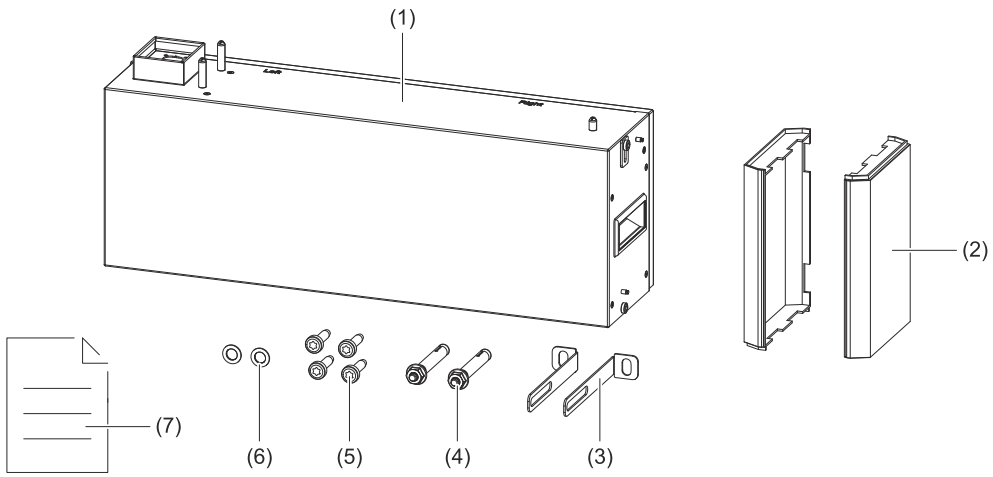
Function overview

Function	Function Description
Monitoring	Cell voltage and temperature as well as battery voltage and current are detected.
SOC estimation	Alarm for: - Overvoltage - Undervoltage - Low temperature
Alarm on	Alarm on: - Overvoltage - Undervoltage - overcurrent - Overtemperature - Undertemperature

Function	Function Description
Protection against	Protection against - Overvoltage - undervoltage - overcurrent - overtemperature - Undertemperature - Cell error - Hardware error
Report	Transmission of alarm messages and operating data to the inverter via the RS485 interface.
Capacity	Supports 2 - 5 Reserva modules in series connection.
Shutdown due to faults	The battery switches off in the event of level three protection events, such as undervoltage, 0 V cell and series connection error.
Forced disconnection	If the battery system is not connected to the power grid, switch the DC isolator on the inverter to OFF to switch off the battery modules.
Activate	Input of 80 V - 750 V at the DC+/DC connection activates the battery from the off state to the standby state.

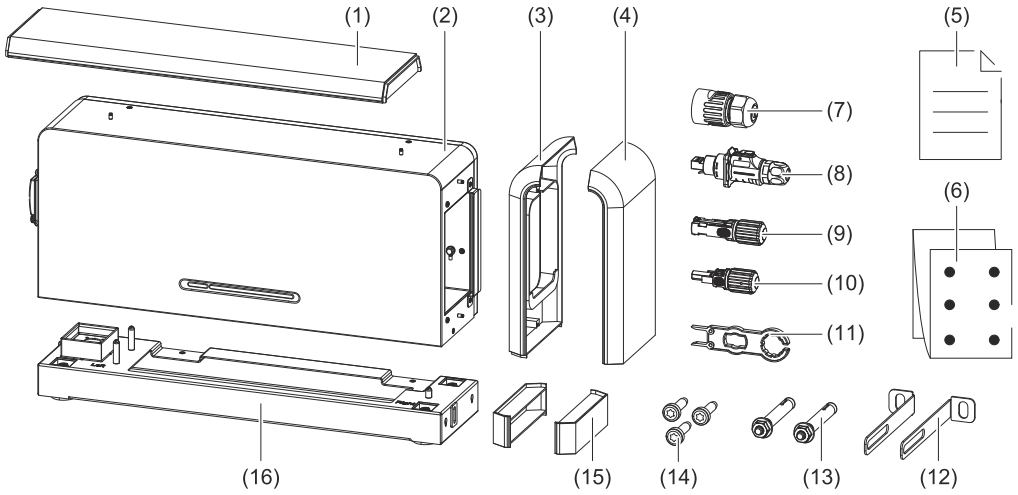
Scope of delivery

Reserva module



No.	Designation
(1)	1x battery module
(2)	2x cover
(3)	2x L-shaped mounting bracket
(4)	2x bolt anchor
(5)	4x M6x12 TX 30 screw
(6)	2x M6 washer
(7)	Quick Start Guide

Reserva BMS



No.	Designation
(1)	1x cover (top)
(2)	1x Battery Management System (BMS)
(3)	1x cover (left)
(4)	1x cover (right)
(5)	Quick Start Guide
(6)	Drilling template
(7)	2x RJ 45 screw connection (battery parallel operation)
(8)	1x LP-16-C/RJ 45 plug (battery to inverter)
(9)	2x Amphenol plug (+)
(10)	2x Amphenol plug (-)
(11)	1x Amphenol plug tool
(12)	2x L-shaped mounting bracket
(13)	2x bolt anchor
(14)	3x M6x12 TX 30 screw
(15)	2x covers for the base plate
(16)	1x base plate

Storage

Storage period	Storage temperature	Relative humidity
7 days	-30 °C to -20 °C or 45 °C to 60 °C	5 % - 95 %
180 days	-20 °C to 45 °C	5 % - 95 %

If the battery is not used for **more than 1 week**, the following storage conditions must be observed:

- Store according to the instructions on the packaging and do not turn upside down.
- Store in a place protected from direct sunlight and rain.
- At least 2 meters away from heat sources (e.g. radiators).
- Avoid contact with corrosive and organic substances (including gas).
- Store defective batteries separately from intact batteries (e.g. by structural separation or different fire protection zones).
- The storage area should be dry, clean and well ventilated.

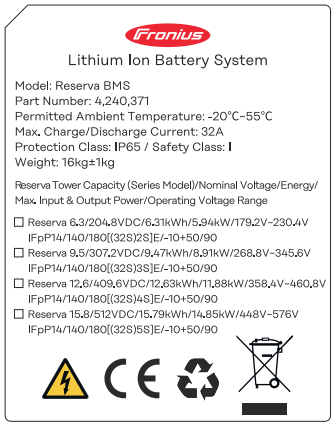
If batteries are not used for **more than 12 months**, the following measures are necessary:

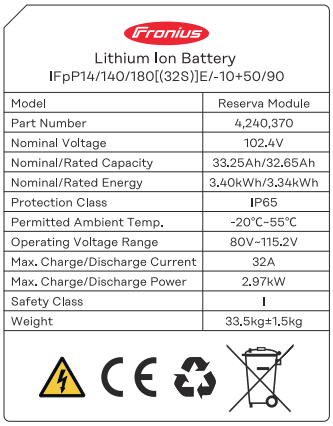
- Batteries must be recharged. Set the charging parameters to "CV = 113.6 V, CC = 5 A" and charge the battery for 2 hours until a voltage of 105.6 V - 108.8 V is measured at the battery module terminals.

Information on the device

IMPORTANT!
There are technical data, markings, warnings and safety symbols on the battery. This information must be kept in a legible condition and must not be removed, covered, pasted over or painted over. The information and symbols warn against incorrect operation, which can lead to serious personal injury and damage to property.

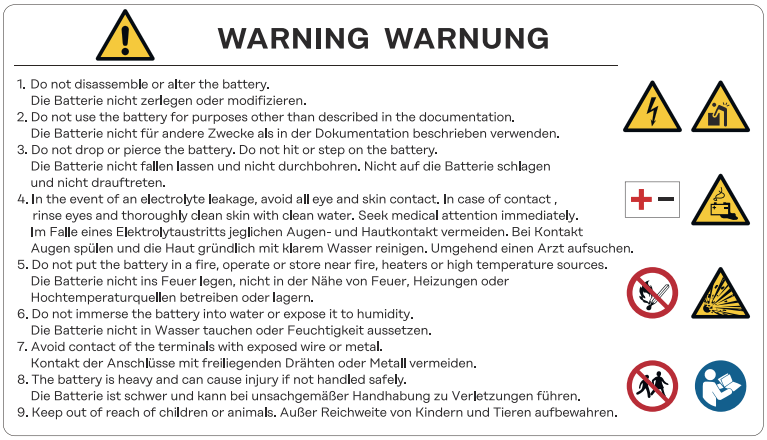
Rating plate





	Warning of electrical voltage
CE	CE label – confirms compliance with applicable EU directives and regulations.
	Recyclable - the product is recyclable or consists of recycled materials.
	WEEE marking – waste electrical and electronic equipment must be collected separately and recycled in an environmentally sound manner in accordance with the European Directive and national law.

Warning sign



	General warning sign
	Warning of electrical voltage
	Warning of weight
	Do not reverse polarities
	Warning of danger from charging batteries
	No naked flames; fire, open source of ignition and smoking prohibited
	Warning of explosive substances
	No naked flames; fire, naked source of ignition and smoking prohibited
	Follow instructions

Intended use

The Fronius Reserva battery is intended for storing electrical energy from photovoltaic systems. It is used to store surplus energy and release it again when required in order to optimize the energy supply and maximize self-consumption of solar energy. The battery is designed for use in private households and for small to medium-sized commercial applications.

The Fronius Reserva can be used for emergency power supply in combination with a Fronius inverter with emergency power capability and emergency power transfer switches with the appropriate configuration.

PV Point
Single-phase emergency power supply for electrical devices up to a maximum output of 3 kW.

Full Backup
Emergency power supply for the entire household, which also supports large and three-phase loads such as heat pumps.

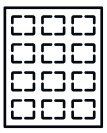
Foreseeable misuse

The following circumstances are considered reasonably foreseeable misuse:

- Use other than or beyond the intended use.
- Charging the battery beyond its maximum capacity.
- Use in unsuitable environments that are outside the specified operating conditions.
- Improper handling, such as dropping or exposing to strong vibrations.
- Missing changeover device when using the emergency power function.
- Improper configuration or operation of the emergency power switchover.
- Modifications to the battery that are not expressly recommended by Fronius.
- The installation of components that are not expressly recommended or offered by Fronius.
- Supplying loads that require an uninterruptible power supply (e.g. IT networks, life-sustaining medical devices).

Various operating modes

Operating modes - Explanation of symbols



PV module
generates direct current



Fronius hybrid inverter
converts the direct current into alternating current and charges the battery (battery backup is required to charge the battery).



Battery
is coupled to the inverter on the DC side and stores electrical energy.



Primary meter
records the load curve of the system and provides the measurement data for energy profiling in Fronius Solar.web. The primary meter also controls the dynamic feed-in control.

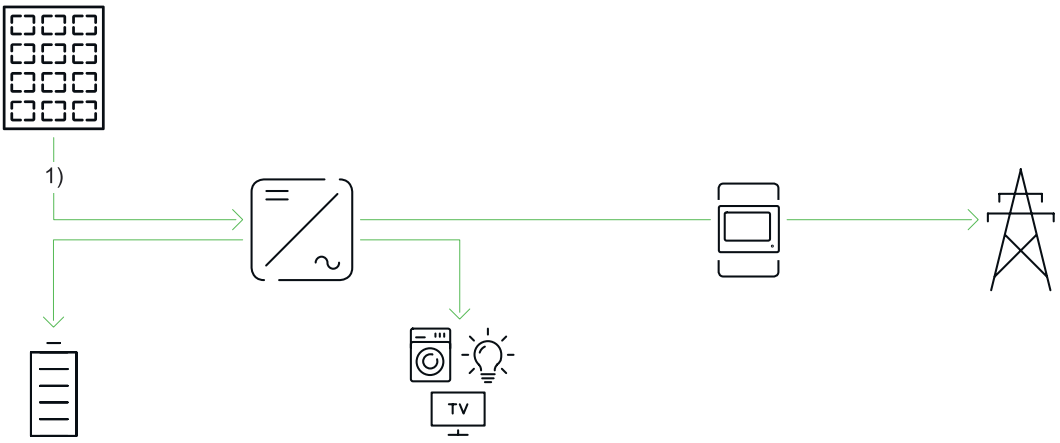


Consumers in the system
the consumers connected to the system.



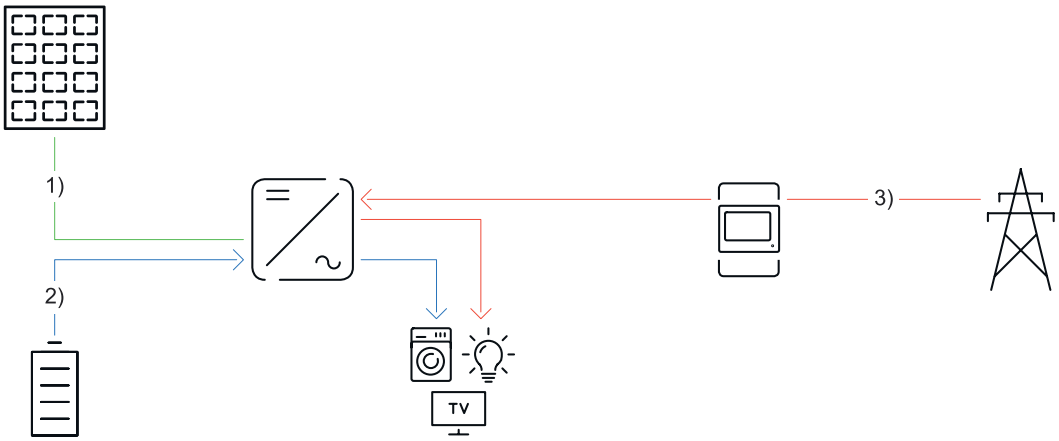
Power grid
supplies the loads in the system if there is not enough power available from the PV modules or the battery.

Operating mode - solar energy



(1) The solar energy generated supplies the consumers in the house, the battery is charged with solar energy and the surplus production is fed into the public grid.

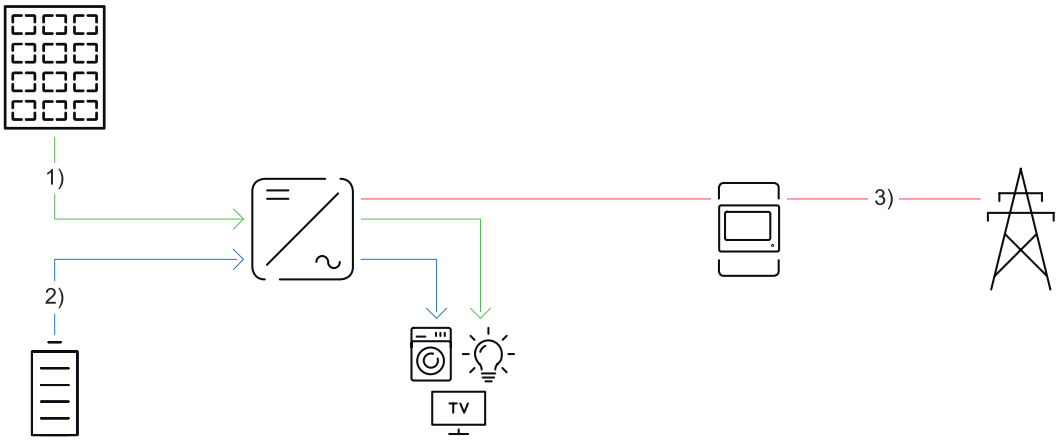
Operating mode - self-consumption optimization



(1) No solar energy is available from the PV modules.
(2) The loads in the house are supplied with energy from the battery.
(3) The loads in the house are supplied with energy from the public grid if the energy from the battery is not sufficient.

Operating mode - Emergency power

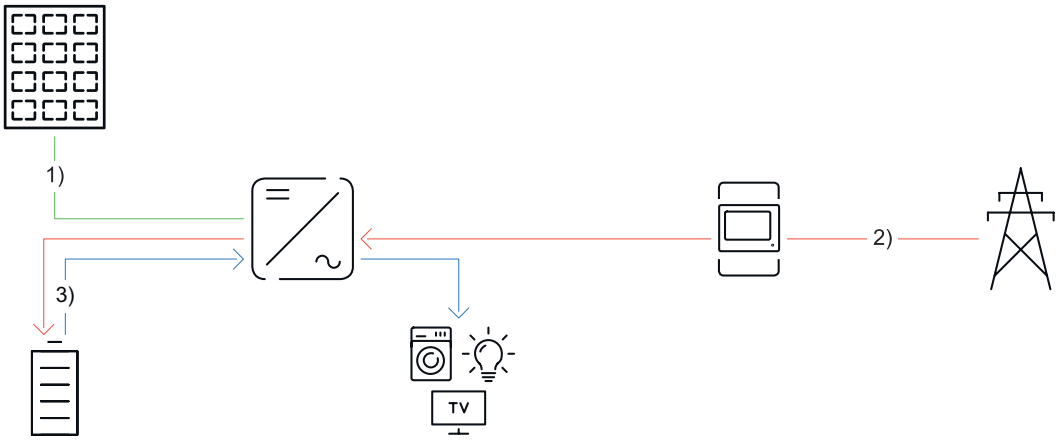
IMPORTANT!
A corresponding installation and configuration is required for the emergency power operating mode.



(1) The loads in the house are supplied with solar energy from the PV modules.
(2) The loads in the house are supplied with energy from the battery if the solar energy from the PV modules is not sufficient.
(3) No energy is available from the public grid.

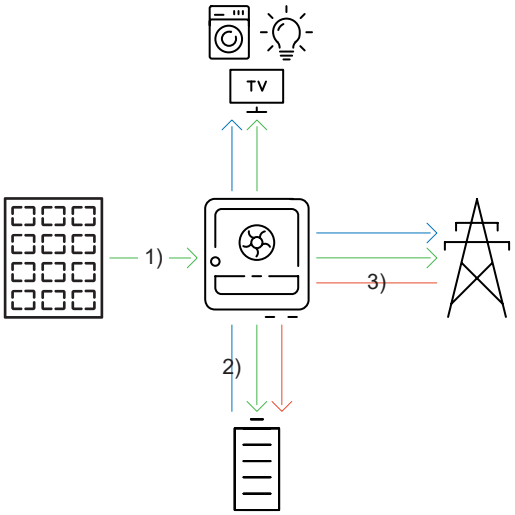
Operating mode - cost-optimized charging of the battery from the public grid

Prerequisites
- Flexible electricity tariff
- The "Energy Cost Assistant" function must be activated.
- The restrictions of the grid operator must be taken into account.



(1) No solar energy is available from the PV modules.
(2) The battery is charged with energy from the public grid when the electricity price is low.
(3) The loads in the house are supplied with energy from the battery.

Energy flow direction of the inverter



(1) PV module - inverter - load / grid / battery
(2) Battery - inverter - load/grid*
(3) Grid - inverter - battery*

* Depending on the settings and the local standards and directives.

Operating states (only for battery systems)

Battery systems distinguish between different operating states. The current operating status is displayed on the user interface of the inverter or in Solar.web.

Operating status	Operating state Description
Normal operation	Energy is stored or withdrawn as required.
Min. state of charge (SOC) reached	Battery has reached the minimum SOC specified by the manufacturer or the set minimum SOC. The battery cannot be discharged any further.
Energy-saving mode (standby)	The system has been set to energy-saving mode. Energy-saving mode is ended automatically as soon as sufficient excess power is available again.
Start	The storage system starts from energy-saving mode (standby).

Operating status	Operating state Description
Forced recharging	The inverter recharges the battery to maintain the SOC specified by the manufacturer or the set SOC (protection against deep discharge).
Deactivated	The battery is not active. It has either been deactivated/switched off or communication with the battery is not possible due to an error.

Manual system start

Prerequisite

No energy is available from the PV modules or from the public grid. If emergency power operation or battery operation is not possible (e.g. deep discharge protection of the battery), the inverter and battery switch off.

Notification of system shutdown

Status messages about the inactive status of the battery are displayed on the user interface of the inverter. Notification via e-mail can be activated in Fronius Solar.web.

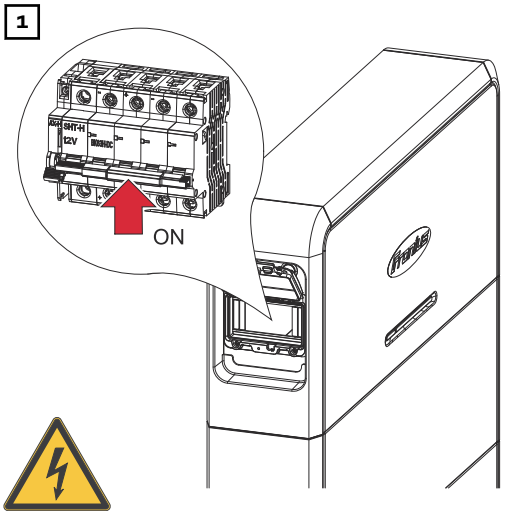
Manual battery start after system shutdown

As soon as energy is available again, the inverter and the battery start operation automatically. If the battery has switched off to protect against e.g. deep discharge, the battery must be started manually, see chapter **Switch on the photovoltaic system** on page **56**.

Starting emergency power mode after system shutdown

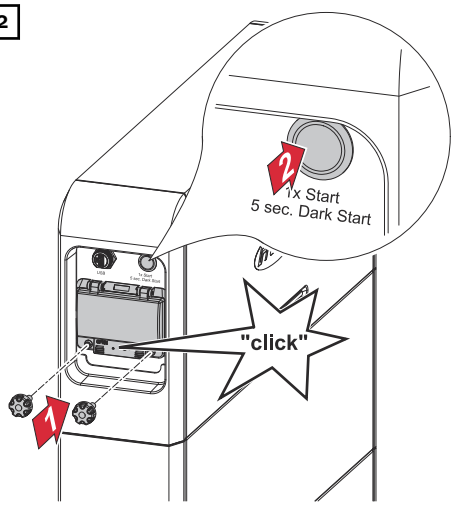
The inverter requires energy from the battery to start emergency power mode. This is done manually on the battery as described below.

1



Switch the DC isolator of the battery to the "On" switch position.

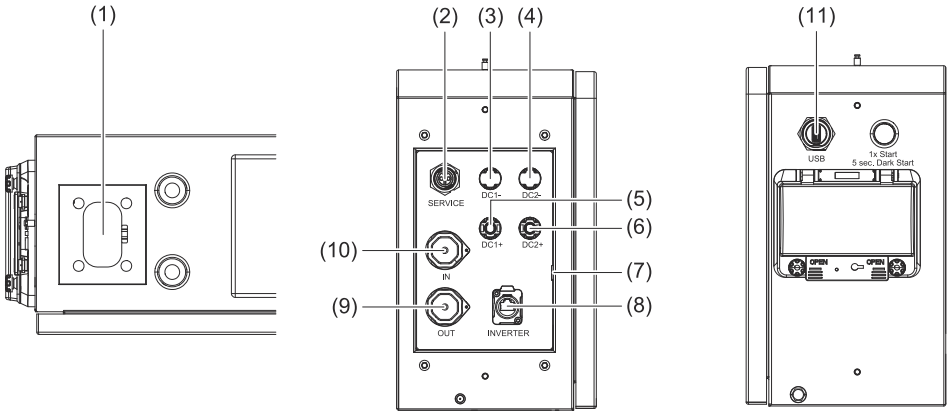
2



Close the cover of the DC isolator with an audible click and secure it with the screws to prevent unauthorized opening. Press and hold the start button for 5 seconds to start the battery.

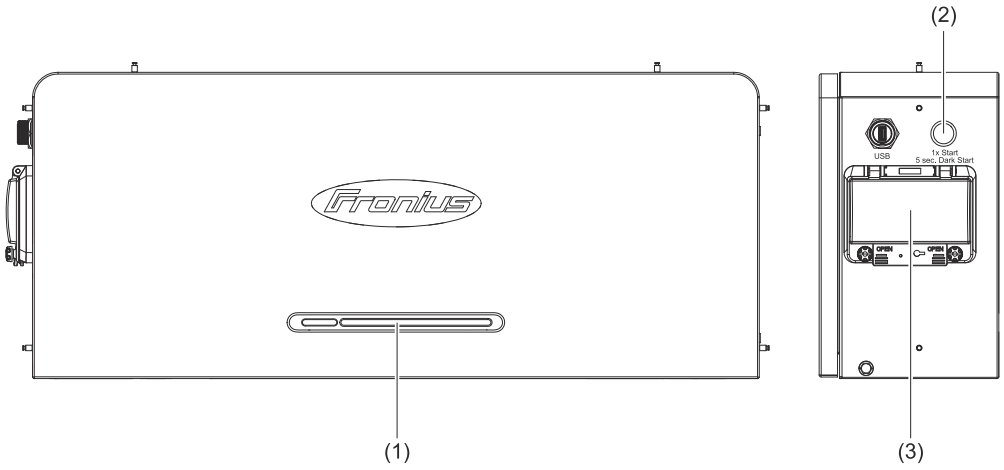
Operating controls and connections

Connection area



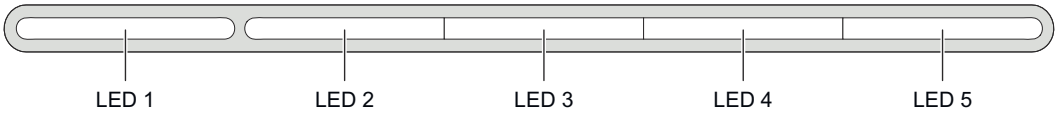
No.	Designation	Description
(1)	HVB connector	Stackable high-voltage battery (HVB) and data communication connector
(2)	SERVICE	12 V maintenance power connection
(3)	DC1-	Negative pole for the DC connection of the inverter or battery in parallel operation
(4)	DC2-	Negative pole for the DC connection of the inverter or battery in parallel operation
(5)	DC1+	Positive pole for the DC connection of the inverter or battery in parallel operation
(6)	DC2+	Positive pole for the DC connection of the inverter or battery in parallel operation
(7)	⏚	PE PE conductor connection
(8)	INVERTER	Data communication connection to the inverter
(9)	OUT	Data communication output between batteries in parallel operation
(10)	IN	Data communication input between batteries in parallel mode
(11)	USB PORT	For maintenance work (e.g. firmware update)

Operating elements



No.	Designation	Description
(1)	LED status display	Indicates the status of the battery
(2)	Start button	- Press once to start the battery - Press and hold for 5 seconds for manual battery start after system shutdown
(3)	DC disconnector	Interrupts the current flow between the battery and inverter

LED status indicators



Status	Status Description	LED status				
		LED 1	LED 2	LED 3	LED 4	LED 5
Start procedure		●●	●●	●●	●●	●●
Starting	Primary battery	▬	●●	●●	●●	●●
	Secondary battery 1	▬	-	-	-	●●
	Secondary battery 2	▬	-	-	●●	-
	Secondary battery 3	▬	-	-	●●	●●
Checking the application mode	Success check in parallel or single application mode	●●	State of charge (SOC) is displayed			
	Connection establishment of parallel operation	●	State of charge (SOC) is displayed			

Status	Status Description	LED status				
Charging (SOC)	0 % - 25,0 %	▬	●	-	-	-
	25,1 % - 50 %	▬	●	●	-	-
	50,1 % - 75 %	▬	●	●	●	-
	75,1 % - 99,9 %	▬	●	●	●	●
	100 %	▬	▬	▬	▬	▬
Discharge / idling	100 % - 75,1 %	▬	▬	▬	▬	▬
	75,0 % - 50,1 %	▬	▬	▬	▬	-
	50,0 % - 25,1 %	▬	▬	▬	-	-
	25,0 % - 0 %	▬	▬	-	-	-
Error case	There is an error, please contact the installer.	▬	*	*	*	*

● flashes green 1/s

●● flashes green 2/s

▬ lights up green

▬ lights up red

* The LED status varies depending on the fault.

Installation

General

Compatibility of system components

All components installed in the PV system must be compatible and have the necessary configuration options. The installed components must not restrict or negatively influence the functionality of the PV system.

NOTE!

Risk due to incompatible and/or limited compatible components in the PV system.

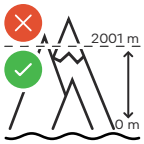
Incompatible components can restrict and/or negatively affect the operation and/or functionality of the PV system.

- ▶ Only install components recommended by the manufacturer in the PV system.
- ▶ Before installation, clarify the compatibility of components that are not expressly recommended with the manufacturer.

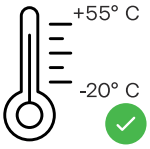
Choice of location and installation position

Selecting the battery location

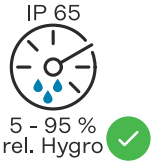
IMPORTANT!
The installation location must be selected so that all operating elements are easily accessible and simple to operate. The battery must not be covered or installed in enclosures.



The battery must not be installed and operated above an altitude of 2 000 m above sea level.



Max. Ambient temperatures: -20 °C to +55 °C



Relative humidity: 5 to 95 %



The battery is suitable for indoor installation.



Install the battery in a protected position, e.g. under a roof overhang.



To keep heating of the battery as low as possible, do not expose the battery to direct sunlight.



The battery is not suitable for unprotected outdoor installation.

The battery is dustproof and protected against water jets from all directions thanks to its IP 65 protection rating. The battery is not completely waterproof and must not be immersed in water.





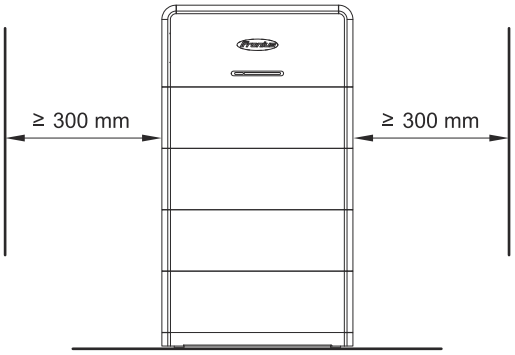
Do not install the battery near sources of fire or flammable, explosive or chemical materials.

Assembly

Selecting the fixing material

Depending on the substrate, use the appropriate fastening materials and observe the recommended screw dimensions for the L-shaped mounting brackets. The technical specialist is responsible for selecting the correct fixing material.

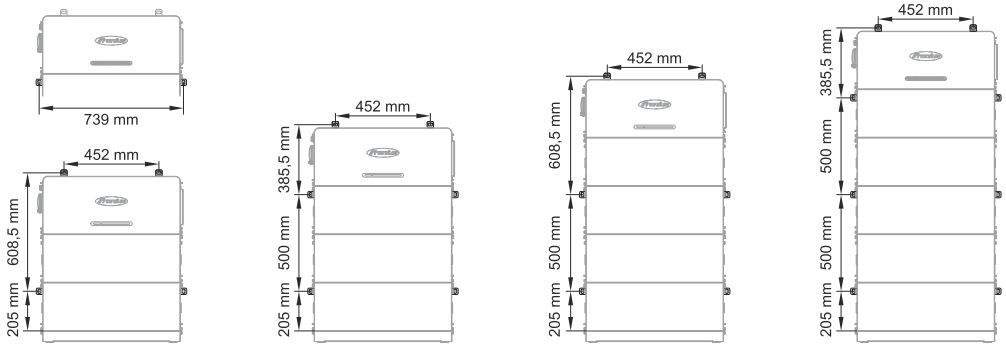
Wall mounting



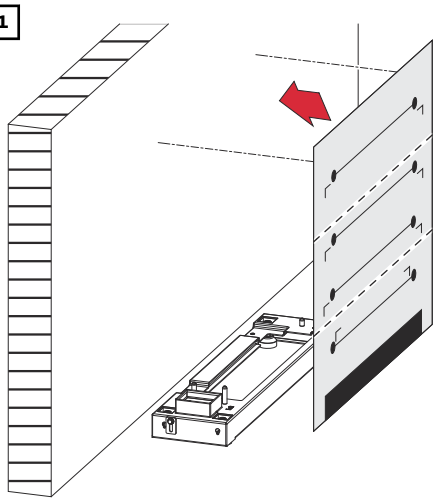
A minimum distance of 300 mm is recommended on the left and right side of the battery.

For detailed information on the dimensions of the battery, see chapter **Dimensions** on page **69**.

IMPORTANT!
Sufficiently stable and non-combustible surfaces (e.g. brick and concrete walls) are permitted for wall mounting. Ensure there are sufficient fixing points as described below. These depend on the number of Reserva modules used.

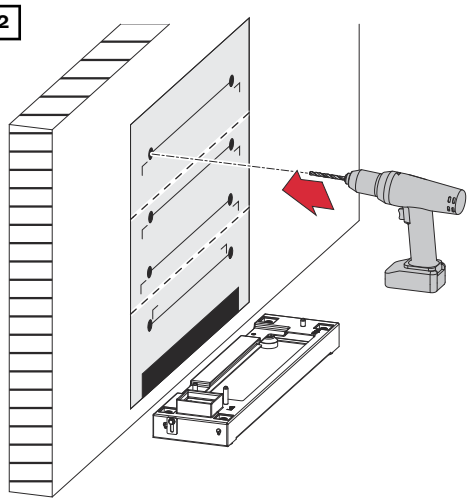


1



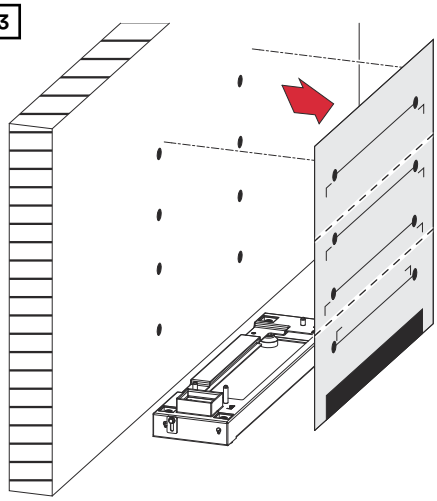
Align the drilling template horizontally on the wall and stick it on.

2



Drill holes at the required fixing points.

3



Carefully remove the drilling template from the wall.

Structure of the battery

⚠ WARNING!

Risk of electric shock due to live HVB connectors.
This can result in serious personal injury and damage to property.

- ▶ Use the integrated carrying handles for lifting and setting down.
- ▶ Wear personal protective equipment.
- ▶ Remove conductive objects such as watches, bracelets and rings.

⚠ WARNING!

Danger from contaminated battery connections.
This can result in serious personal injury and damage to property.

- ▶ Protect battery connections from contamination.
- ▶ Check battery connections for contamination.
- ▶ Only clean contaminated battery connections with personal protective equipment (insulated gloves, safety goggles, protective clothing) and a lint-free cloth without using cleaning agents.

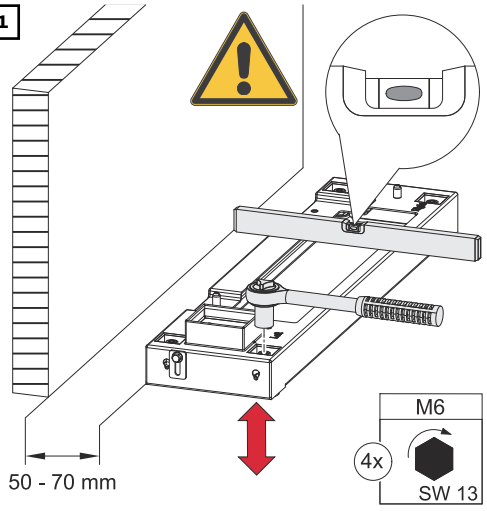
⚠ CAUTION!

Danger due to improper handling during transportation or installation of the battery.

Injuries may result.

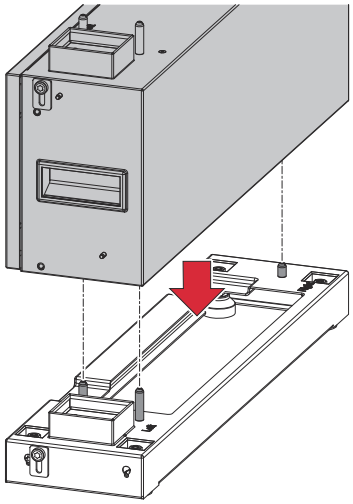
- ▶ Use the integrated carrying handles to lift and set down the battery.
- ▶ When setting down the battery, ensure that there are no limbs between the battery and attachments.
- ▶ Wear personal protective equipment.
- ▶ Ensure that there are sufficient attachment points to prevent the battery from tipping over.

1



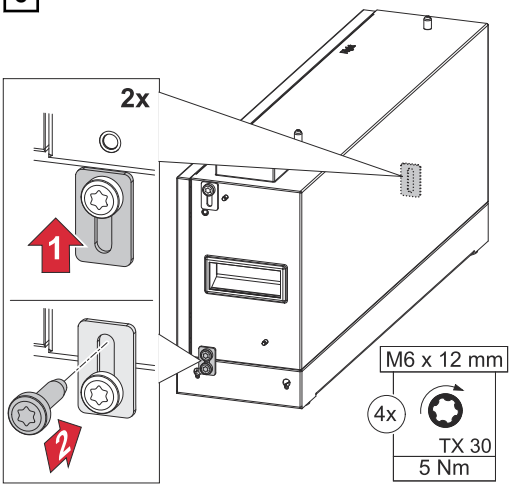
Position the base plate parallel to the wall at a distance of 50 - 70 mm and align it horizontally using a socket wrench (SW 13).

2



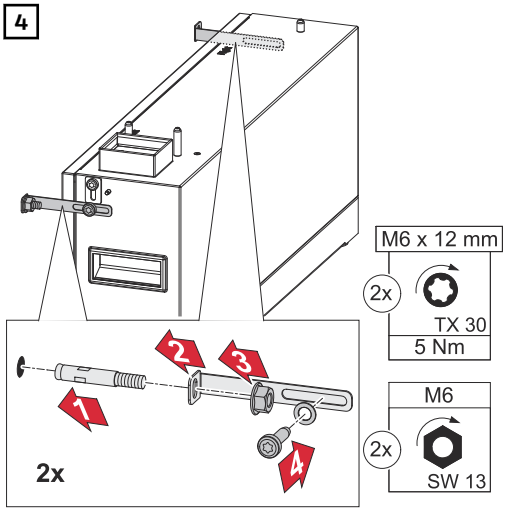
Place the Reserva module parallel to the base plate.

3



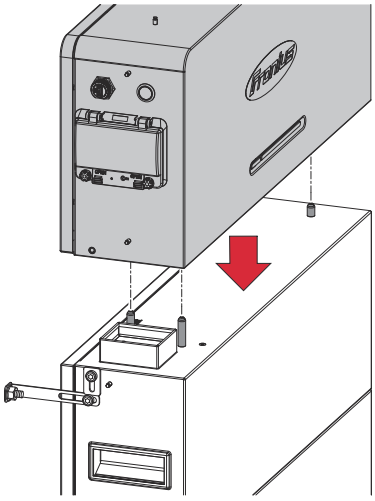
Fasten the 2 connecting brackets with the supplied screws (TX30) and a torque of 5 Nm.

4



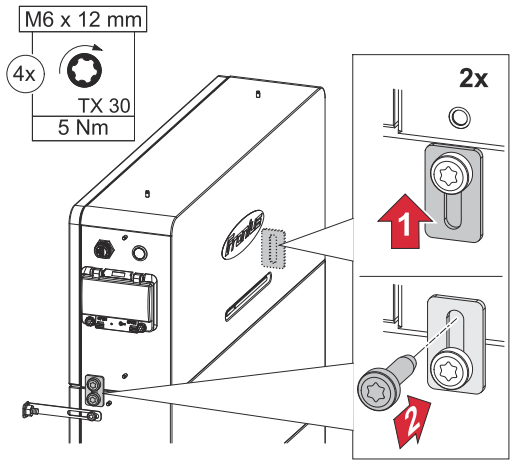
Fasten the L-shaped mounting brackets with the supplied screws (TX30), washers and a torque of 5 Nm. Insert the bolt anchors into the wall and fasten with a socket wrench (SW13).

5



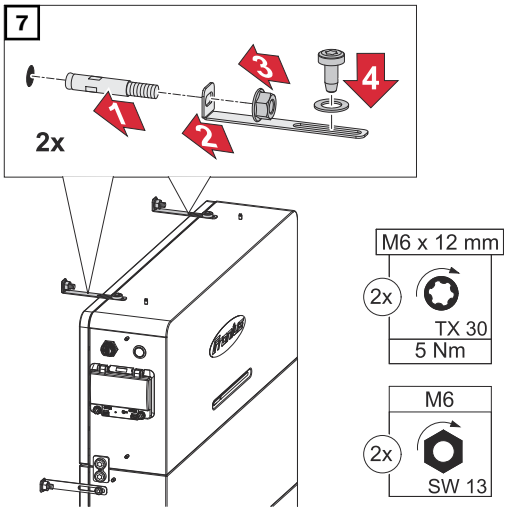
Place the Reserva BMS in parallel on the last Reserva module.

6



Fasten the 2 connecting brackets with the supplied screws (TX30) and a torque of 5 Nm.

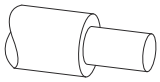
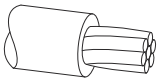
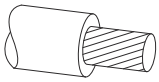
7



Fasten the L-shaped mounting brackets with the supplied screws (TX30), washers and a torque of 5 Nm. Insert the bolt anchors into the wall and fasten with a socket wrench (SW13).

Requirements for the connection

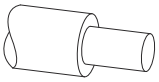
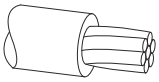
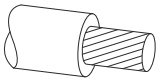
Different cable types

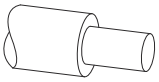
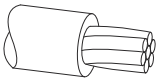
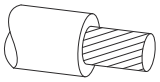
Single-wire	Stranded	Fine stranded
		

Permitted cables for the electrical connection

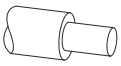
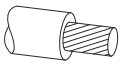
IMPORTANT!
The cables used must comply with nationally applicable standards and directives.

Round copper conductors can be connected to the terminals as described below.

DC connections					
Manufacturer	max. Ø Insulation layer	Stripping length			
Amphenol	7.8 mm	7 mm	6 mm²	6 mm²	6 mm²

PE Protective conductor connection (ring cable lug)					
Material	Ø Bore	Torque			
Copper with tin coating	6 mm	5 Nm	10 mm²	10 mm²	10 mm²

Permitted cables for the data communication connection

RJ45 connection			
Cable recommendation	max. cable length		
min. CAT 5 STP (Shielded Twisted Pair)	30 m	0.14 - 1.5 mm²	0.14 - 1.5 mm²

Electrical connection

Safety

⚠ WARNING!

Danger due to incorrect operation and incorrectly performed work.
This can result in serious personal injury and damage to property.

- ▶ Commissioning, maintenance and service work on the inverter and battery may only be carried out by service personnel trained by the respective inverter or battery manufacturer and only within the scope of the technical regulations.
- ▶ Read the installation and operating instructions of the respective manufacturer before installation and commissioning.

⚠ WARNING!

Danger from mains voltage and DC voltage from solar modules exposed to light and batteries.
Serious personal injury and damage to property may result.

- ▶ All connection, maintenance and service work may only be carried out when the AC and DC sides of the inverter and battery are de-energized.
- ▶ The fixed connection to the public power grid may only be established by a licensed electrician.

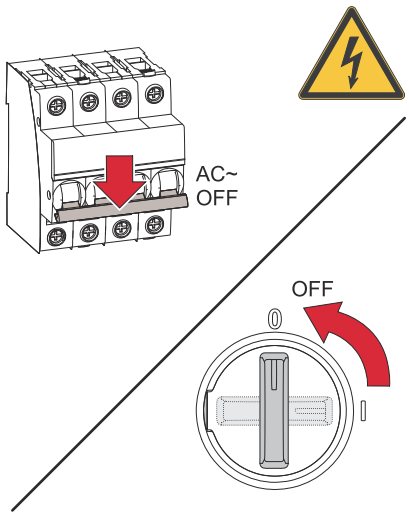
⚠ WARNING!

Danger due to damaged and/or contaminated connection terminals.
This can result in serious personal injury and damage to property.

- ▶ Before making connections, check the terminals for damage and contamination.
- ▶ Remove any impurities in a de-energized state.
- ▶ Have defective connection terminals repaired by an authorized specialist company.

De-energize the photovoltaic system

1



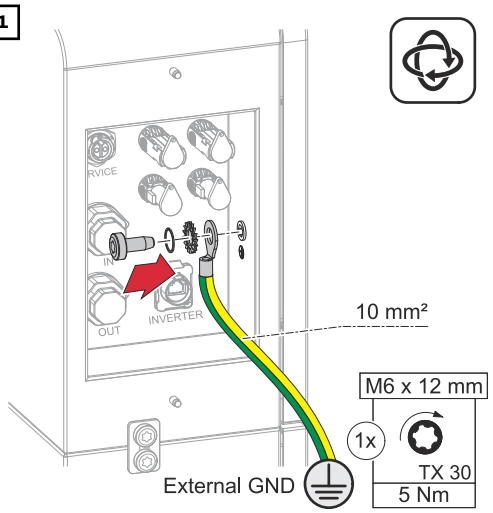
Switch off the miniature circuit breaker. Set the DC isolator of the inverter to the "Off" switch position.

IMPORTANT!
Wait for the capacitors of the inverter to discharge!

Connecting the protective earth conductor (PE)

IMPORTANT!
The protective earth conductor (PE) of the battery must be connected externally (e.g. switch cabinet). The technical specialist is responsible for selecting the ring cable lug and the screw lock

1



Fasten the protective earth conductor (PE) to the protective earth conductor connection using the supplied screws (TX30) and a torque of 5 Nm.

Connecting DC cables

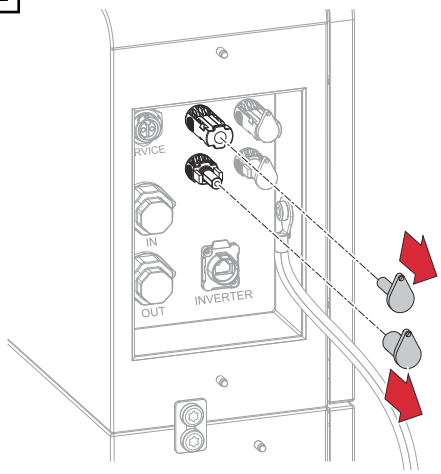
⚠ WARNING!

Danger due to loose and/or improperly clamped individual conductors in the Amphenol plug.
This can result in serious personal injury and damage to property.

- ▶ Check that the individual conductors are firmly secured in the crimp contact.
- ▶ Ensure that the individual conductors are fully inserted into the crimp contact and that no individual strands are protruding.

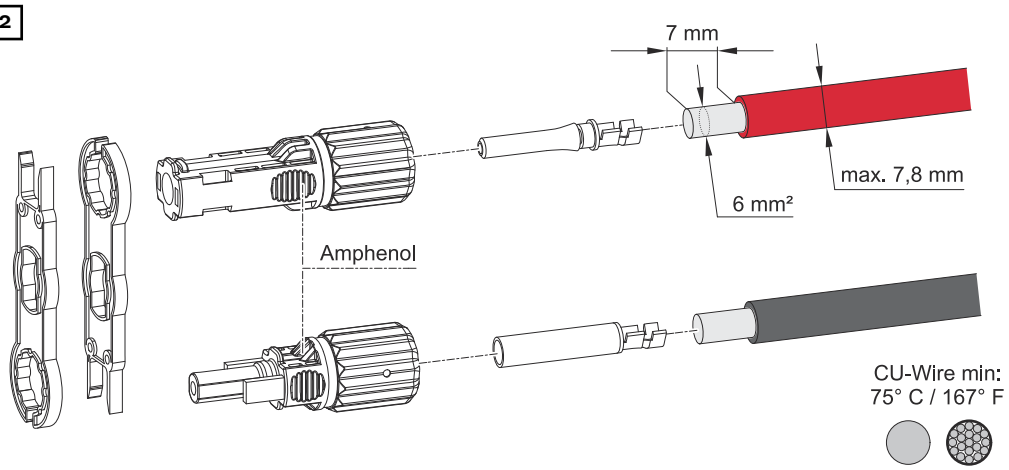
IMPORTANT!
The maximum cable length between the inverter and battery is 30 m.

1



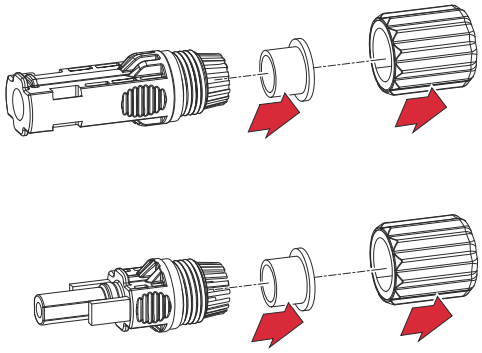
Remove the sealing caps.

2



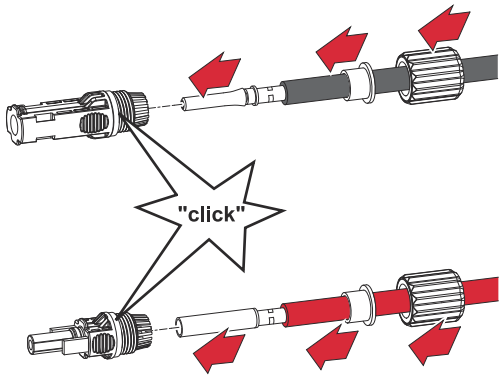
Cable cross-section according to the specifications in **Permitted cables for the electrical connection** on page **34** Strip 7 mm / 0.27 inch of insulation from the individual conductors.

3



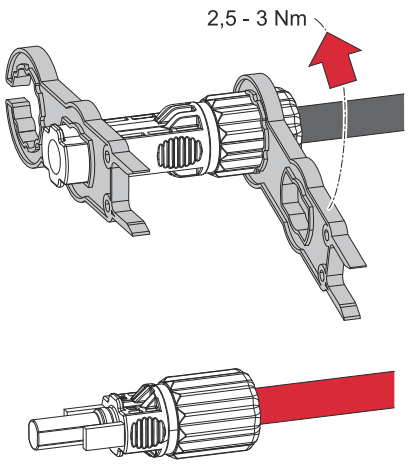
Disassemble the Amphenol connectors.

4



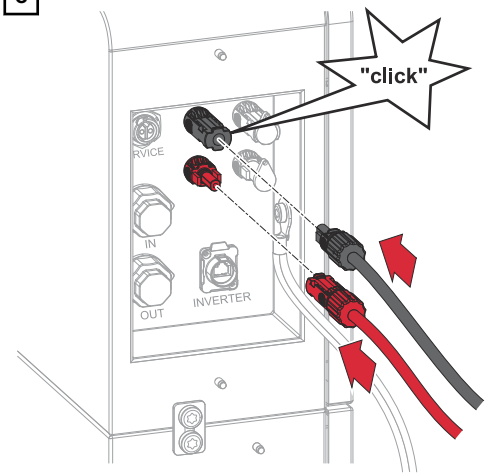
Feed the DC cable through the cable gland and sealing ring. Crimp the crimp contact onto the stripped DC cable using a suitable Amphenol crimping tool. Insert the crimp contact into the Amphenol plug with an audible click.

5



Tighten the cable gland using the Amphenol plug tool supplied and a torque of 2.5 Nm - 3 Nm.

6



Insert the Amphenol plug (+/-) into the respective slot until it clicks into place.

Connecting DC cables for battery parallel operation

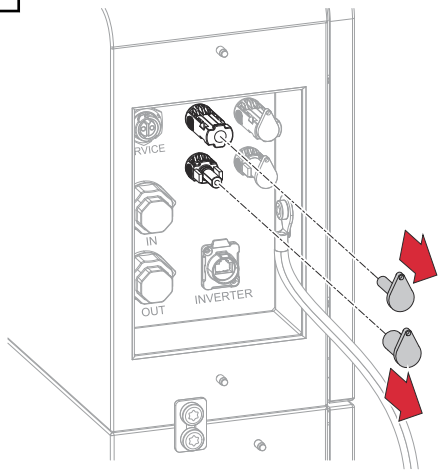
⚠ WARNING!

Danger due to loose and/or improperly clamped individual conductors in the Amphenol plug.
This can result in serious personal injury and damage to property.

- ▶ Check that the individual conductors are firmly secured in the crimp contact.
- ▶ Ensure that the individual conductors are fully inserted into the crimp contact and that no individual strands are protruding.

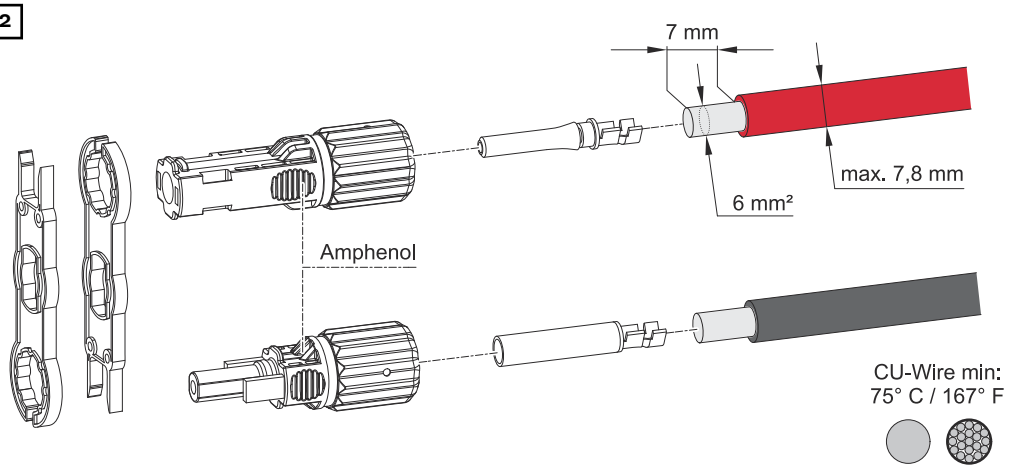
IMPORTANT!
The maximum cable length between the inverter and battery is 30 m, the maximum cable length between the battery systems is 10 m. The cable lengths between the battery systems should be identical in order to avoid a voltage drop due to different cable lengths.

1



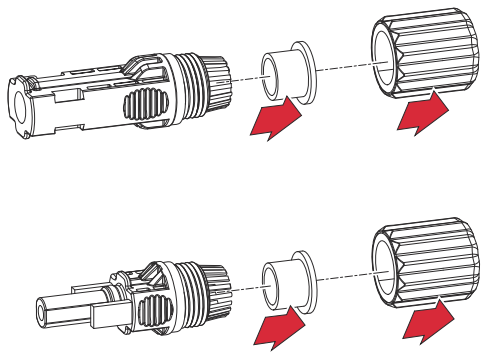
Remove the sealing caps.

2



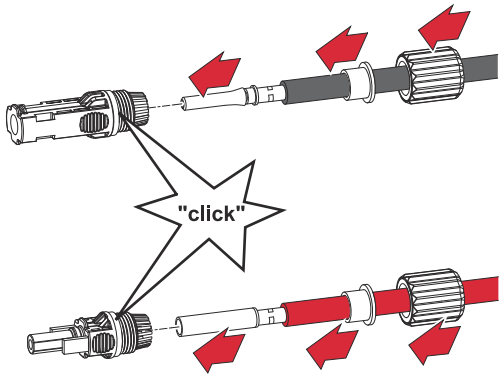
Cable cross-section according to the specifications in **Permitted cables for the electrical connection** on page **34** Strip 7 mm / 0.27 inch of insulation from the individual conductors.

3



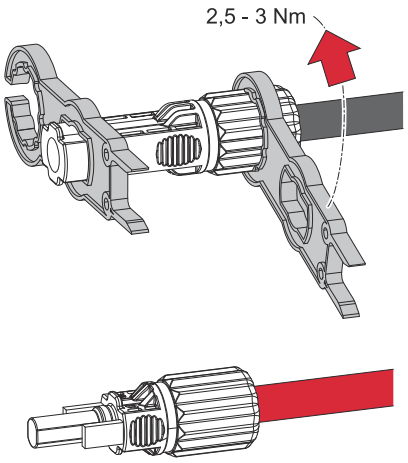
Disassemble the Amphenol connectors.

4



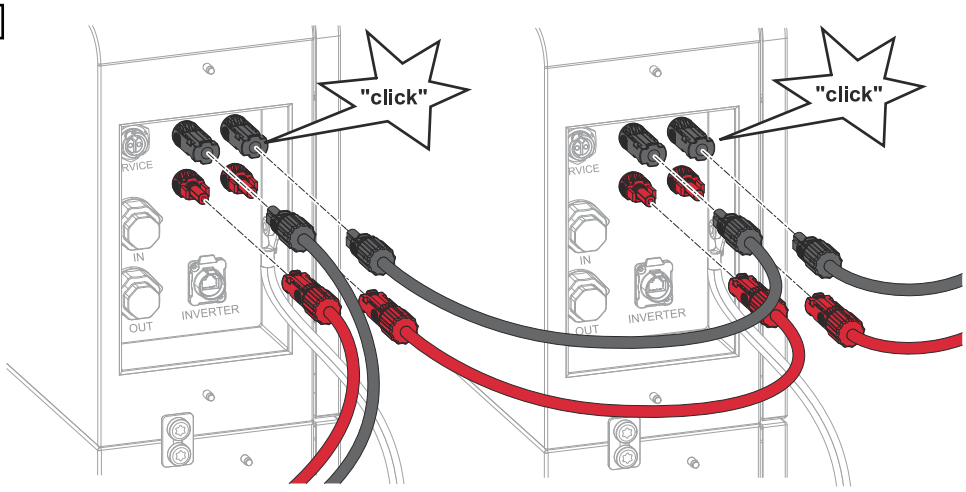
Feed the DC cable through the cable gland and sealing ring. Crimp the crimp contact onto the stripped DC cable using a suitable Amphenol crimping tool. Insert the crimp contact into the Amphenol plug with an audible click.

5



Tighten the cable gland using the Amphenol plug tool supplied and a torque of 2.5 Nm - 3 Nm.

6



Insert the Amphenol plug (+/-) into the respective slot until it clicks into place.

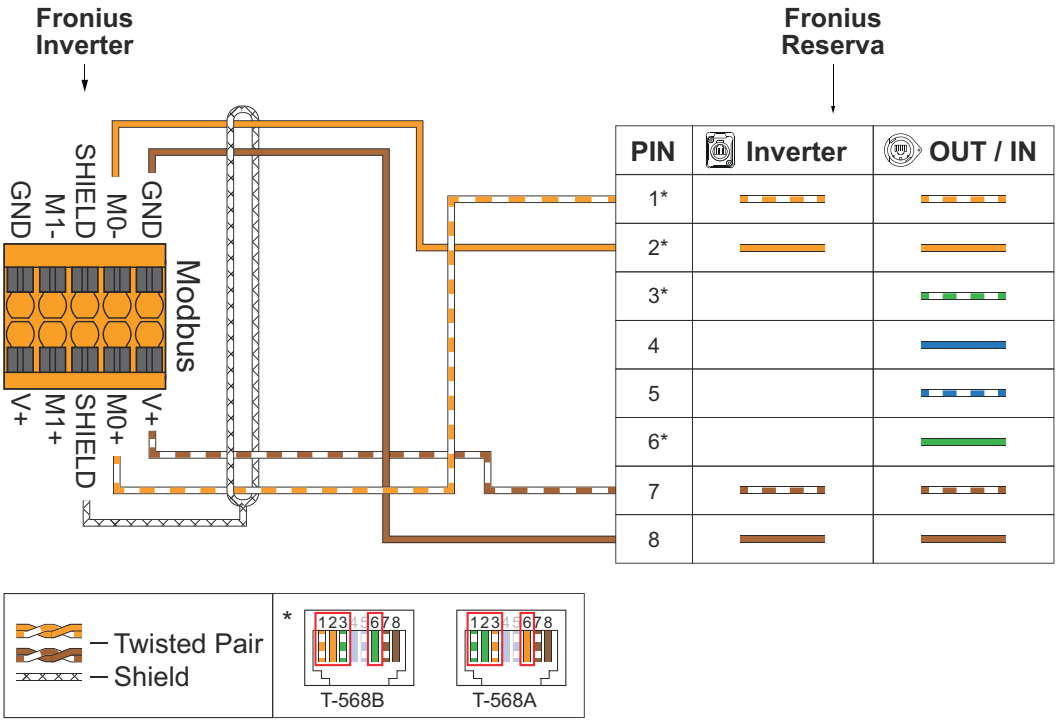
Connecting the data communication cable

PIN assignment

⚠ WARNING!

Danger due to short circuit between individual conductors of the shielding and live components.
This can result in serious personal injury and damage to property.
▶ Insulate unused individual conductors of the shielding with heat-shrink tubing.

Observe the following points when connecting the data communication cable.
- Use network cables of type CAT5 STP or higher.
- Use a twisted pair of cables for data lines that belong together.
- Use double-insulated or sheathed data lines if they are located near bare conductors.
- Use shielded twisted pair cables to avoid interference.

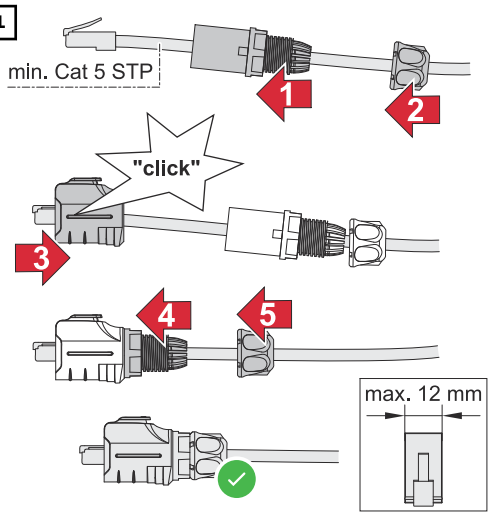


Connect the data communication cable to the inverter

IMPORTANT!
The maximum cable length between the inverter and battery is 30 m.

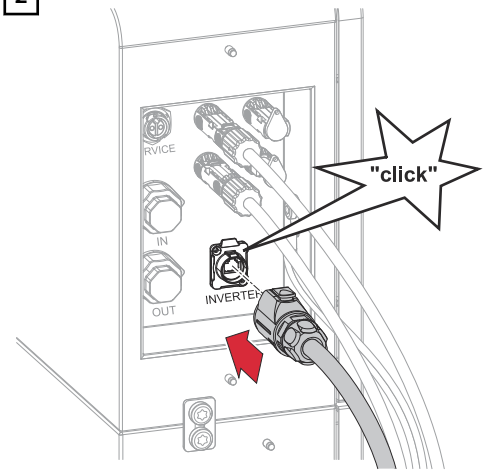
IMPORTANT!
If connected incorrectly, strain relief and protection class IP65 for the data communication connection cannot be guaranteed. The maximum possible width of the RJ45 plug is 12 mm. Only RJ45 plugs without locking and kink protection are possible in combination with the LP-16-C/RJ 45 plug.

1



First feed the data cable through the union nut and then through the cable gland. Insert the plug insert with an audible click. Fasten the union nut to the cable gland.

2



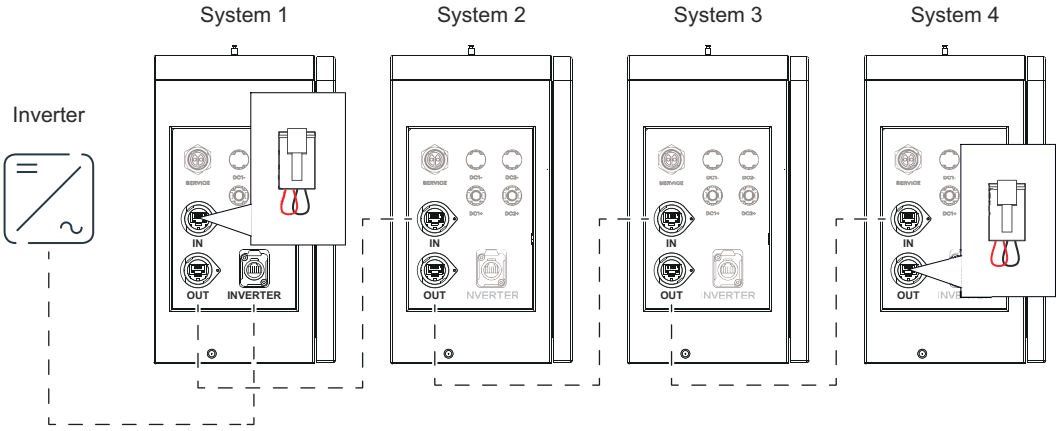
Connect the data cable to the "INVERTER" data communication connection with an audible click.

Connecting the data communication cable for battery parallel operation

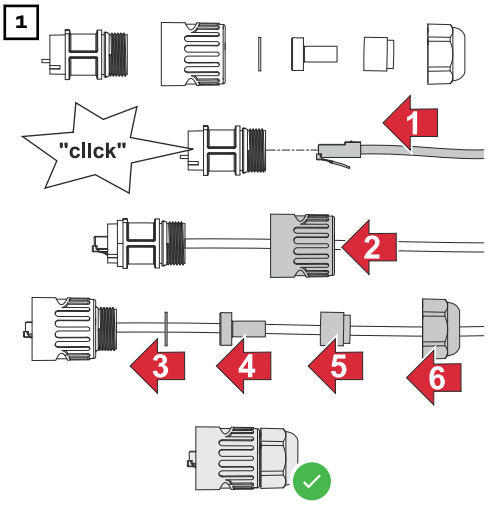
IMPORTANT!
The maximum cable length between the inverter and battery is 30 m, the maximum cable length between the battery systems is 10 m.

IMPORTANT!
If the connection is not made correctly, strain relief and protection class IP65 for the data communication connection cannot be guaranteed. The maximum possible width of the RJ45 plug is 12 mm. Only RJ45 plugs without locking and kink protection are possible in combination with the cable gland.

Overview
The terminating resistors must be installed as shown below.

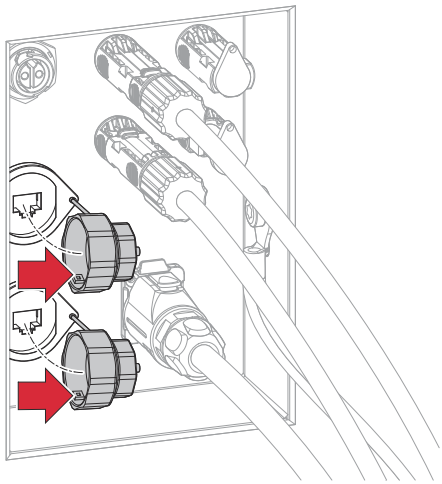


1



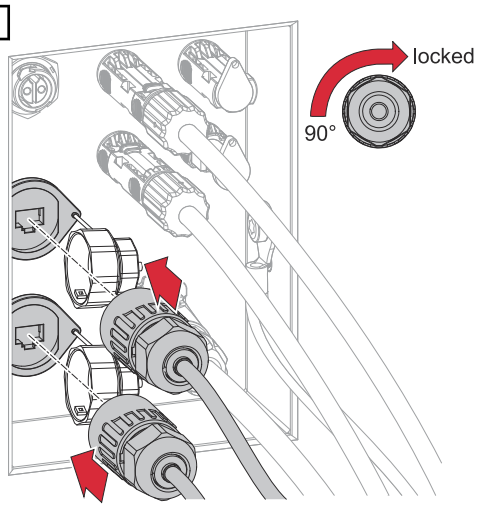
First feed the data cable through the union nut, seal and then through the cable gland. Fasten the union nut to the cable gland.

2



Remove the sealing caps from the data communication connections "IN" (data input) and "OUT" (data output) by turning them 90° to the left.

3



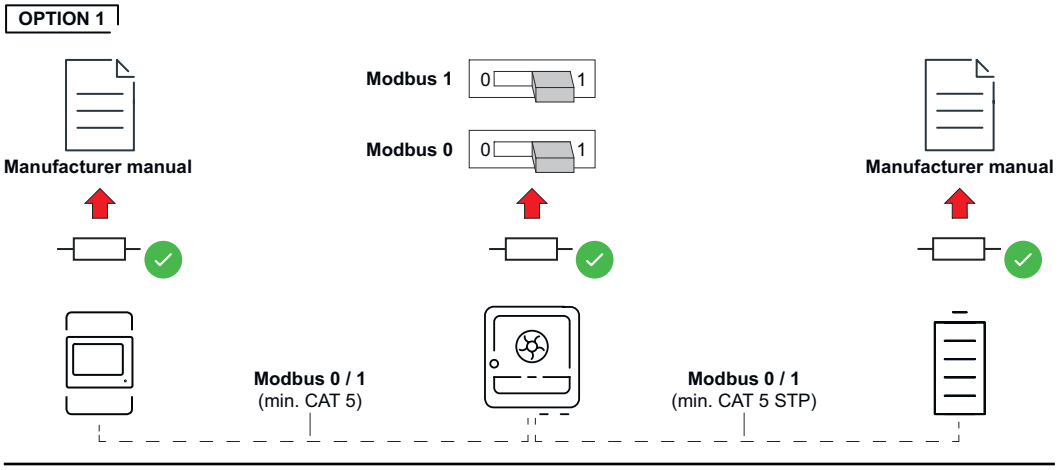
Connect the data cable to the data communication connection "IN" (data input) or "OUT" (data output) and turn 90° to the right.

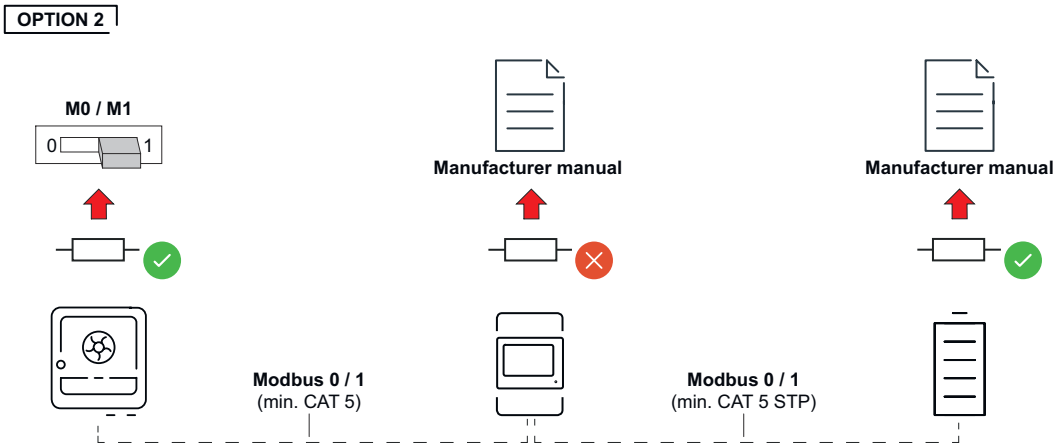
Terminating resistors

The system may function without terminating resistors. However, due to interference, the use of terminating resistors in accordance with the following overview is recommended for proper functioning.

For permitted cables and maximum distances for data communication area, see chapter **Permitted cables for the data communication connection** on page **34**.

IMPORTANT**!**
Terminating resistors that are not set as shown can cause interference in data communication. The terminating resistors are installed at the factory. When operating several batteries in parallel, the terminating resistors must be set as shown in the chapter **Connecting the data communication cable for battery parallel operation** on page **42** must be installed.

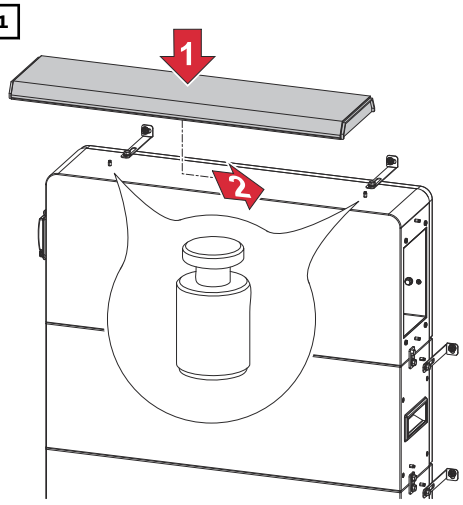



OPTION 2
M0 / M1
0
1
Manufacturer manual
Manufacturer manual
Modbus 0 / 1
(min. CAT 5)
Modbus 0 / 1
(min. CAT 5 STP)

Final activities

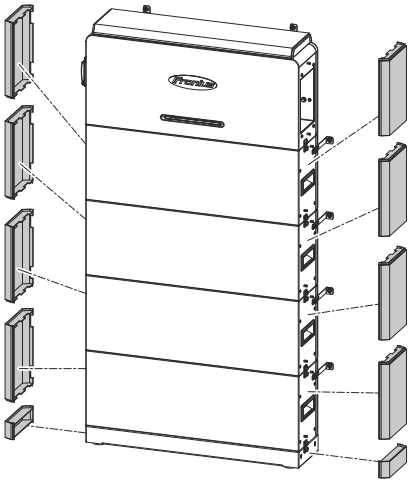
Fitting the covers to the battery

1



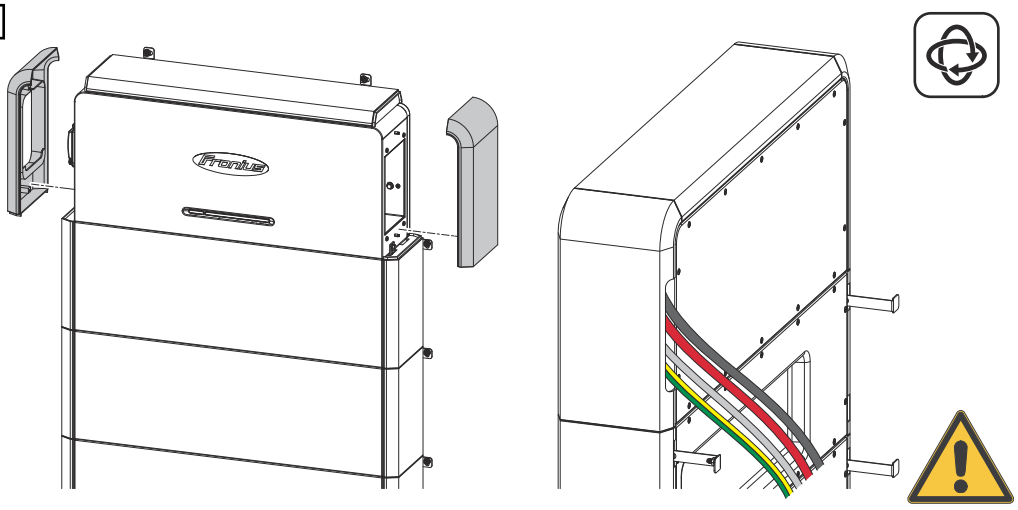
Place the cover (top) on the Reserva BMS and slide it to the right until it clicks into place.

2



Slide in the side covers from the top, starting at the base plate, until they click into place.

3



Push in the side covers of the Reserva BMS from above until they click into place. Guide the cables through the side recess in the cover.

Add/replace Reserva module to the battery system

Safety

⚠ WARNING!

Risk of electric shock from live HVB plug connectors.
This can result in serious personal injury and damage to property.
- ▶ Use the integrated carrying handles for lifting and setting down.
- ▶ Wear personal protective equipment.
- ▶ Remove conductive objects such as watches, bracelets and rings.

⚠ WARNING!

Danger from contaminated battery connections.
This can result in serious personal injury and damage to property.
- ▶ Protect battery connections from contamination.
- ▶ Check battery connections for contamination.
- ▶ Only clean contaminated battery connections with personal protective equipment (insulated gloves, safety goggles, protective clothing) and a lint-free cloth without using cleaning agents.

⚠ CAUTION!

Danger due to improper handling during transportation or installation of the battery.
Injuries may result.
- ▶ Use the integrated carrying handles to lift and set down the battery.
- ▶ When setting down the battery, ensure that there are no limbs between the battery and attachments.
- ▶ Wear personal protective equipment.
- ▶ Ensure that there are sufficient fastening points to prevent the battery from tipping over.

Requirements for expanding the battery system

The following points must be observed when expanding the battery system in order to be able to use the full capacity:
- The State of Charge (SOC) must be 30 % (to activate Service Mode, see chapter **Setting the State of Charge (SOC) with Service Mode** on page **48**).
- Carry out the extension within the first 2 years of initial commissioning.
- Number of charge/discharge cycles <300

Extensions after 2 years are possible, but with the restriction that the added battery module is operated with the lowest State of Health (SOH) in the battery system.

Example	
SOH new Reserva module	100 %
SOH installed Reserva modules	96 %
SOH total battery system	**96 %**

Setting the State of Charge (SOC) with Service Mode

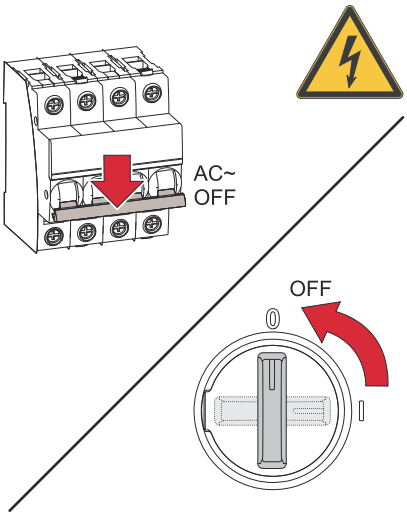
☐ To activate **service mode**, a connection to the user interface of the inverter is required, see chapter **Commissioning with the app** on page **60** or **Commissioning with the browser** on page **60**.

1. Call up the user interface of the inverter.
2. Log in to the login area with the user **Customer** or **Technician** and the respective password.
3. Call up the menu area **Energy management** > **Battery management** > **Service mode**.
4. Activate the **service mode**.
5. Click on the **Save** button to save the settings.

✓ *Service mode is activated and the battery is charged/discharged to 30 % SOC.*

De-energize the photovoltaic system and battery

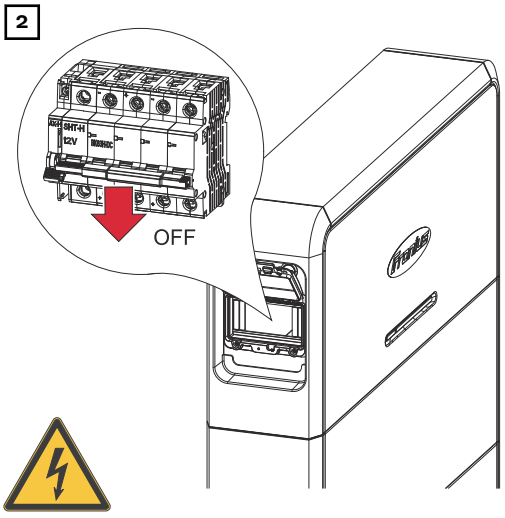
1



Switch off the miniature circuit breaker. Set the DC isolator of the inverter to the "Off" switch position.

IMPORTANT**!**
Wait for the capacitors of the inverter to discharge!

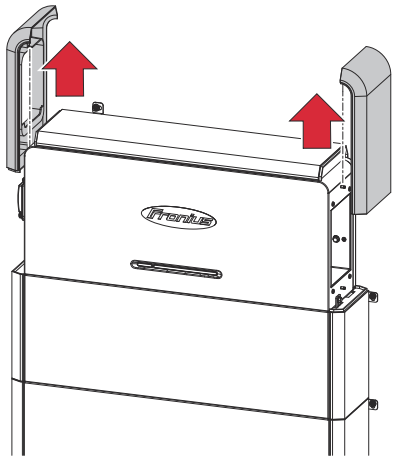
2



Set the DC isolator of the Reserva to the "Off" switch position.

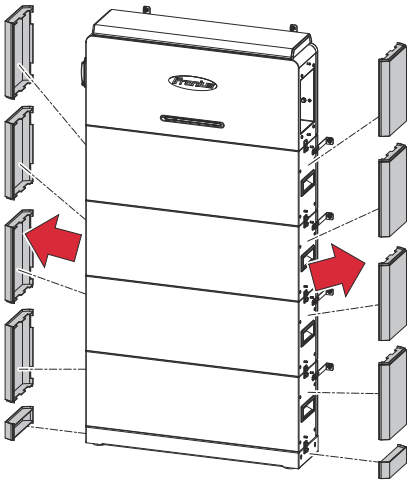
Removing the covers on the battery

1



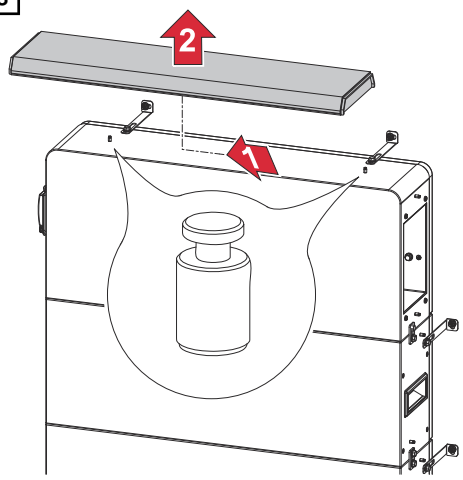
Slide the left and right covers on the Reserva BMS upwards and lift them off.

2



Slide the left and right covers on the Reserva module upwards and lift them off.

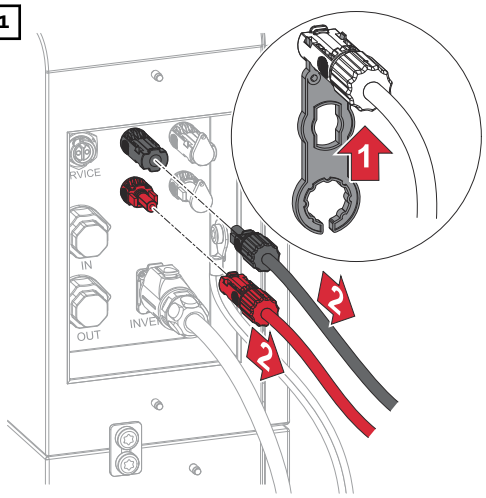
3



Slide the top cover on the Reserva BMS to the left and lift it off.

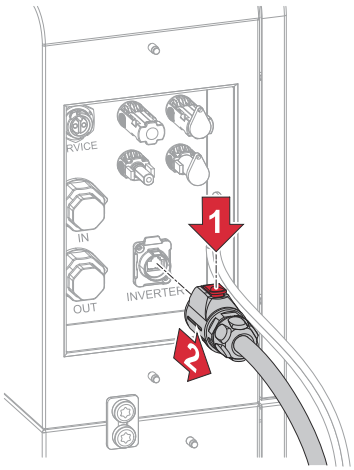
Terminate and dismantle the Reserva BMS

1



Disconnect the Amphenol connectors (+/-) using the Amphenol connector tool.

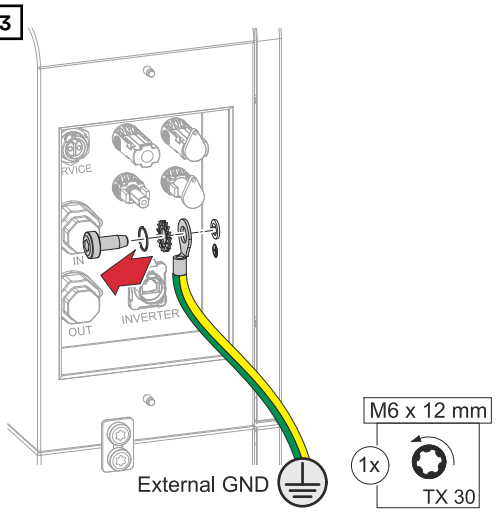
2



Press the latch on the "INVERTER" data cable plug and remove the plug.

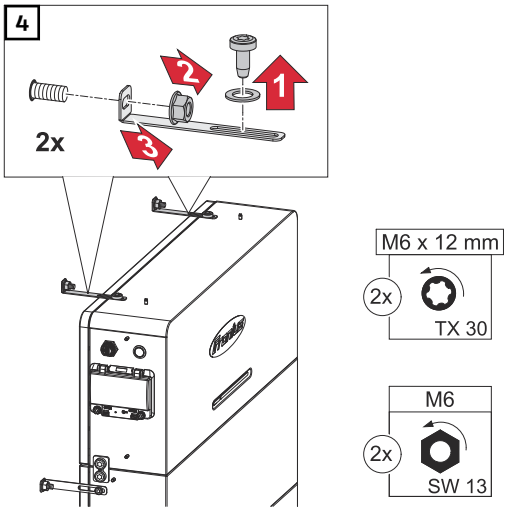
For batteries in parallel operation, also disconnect the "IN" and "OUT" data cables.

3



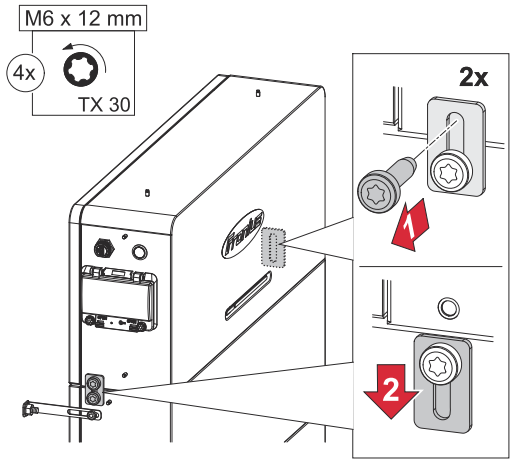
Disconnect the protective earth conductor (PE) with a screwdriver (TX30).

4



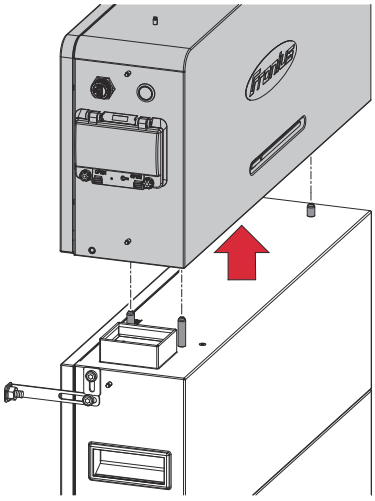
Loosen the L-shaped mounting brackets.

5



Loosen the 2 connecting lugs.

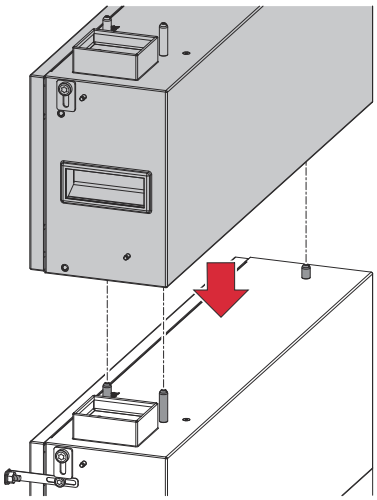
6



Lift the Reserva BMS in parallel from the last Reserva module.

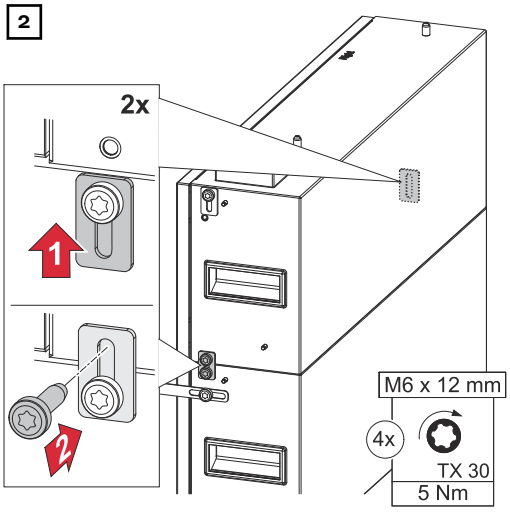
Installing a new Reserva module

1



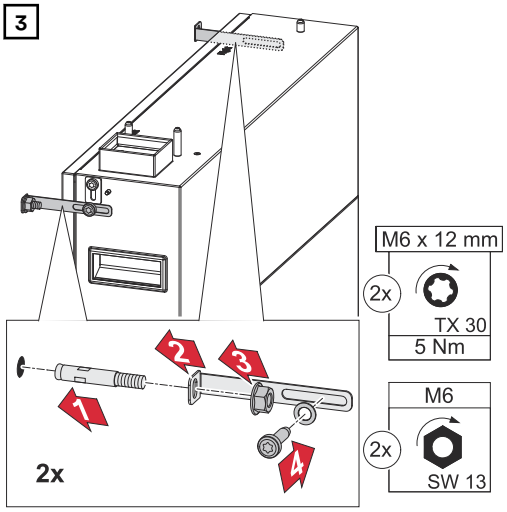
Fit the new Reserva module in parallel.

2



Fasten the 2 connecting brackets with the supplied screws (TX30) and a torque of 5 Nm.

3

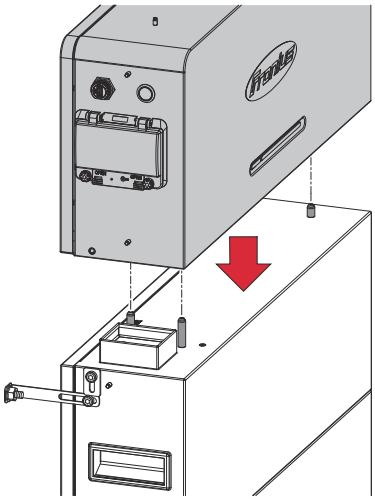


Fasten the L-shaped mounting brackets with the supplied screws (TX30), washers and a torque of 5 Nm. Insert the bolt anchors into the wall and fasten with a socket wrench (SW13).

IMPORTANT**!**
Ensure sufficient fastening points, see chapter **Wall mounting** on page **29**.

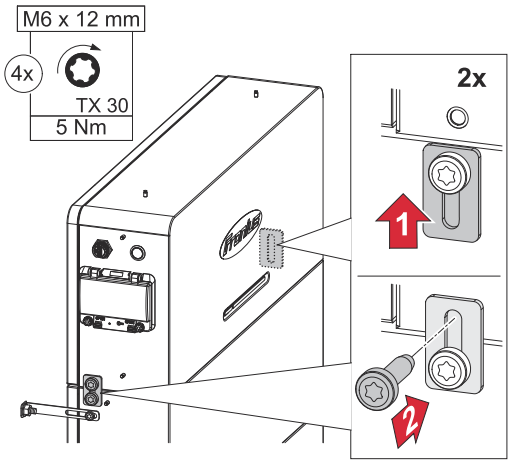
Fitting the Reserva BMS

1



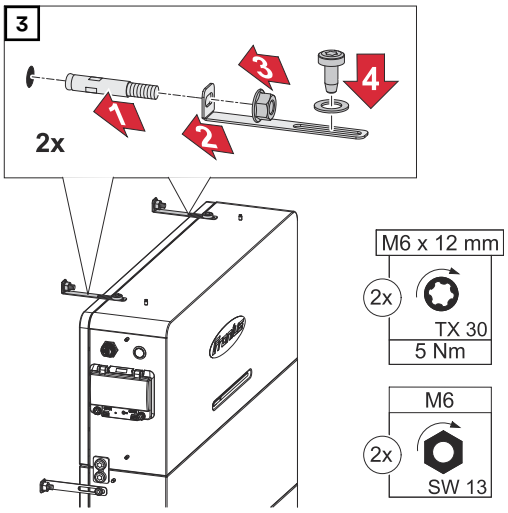
Place the Reserva BMS in parallel on the last Reserva module.

2



Fasten the 2 connecting brackets with the supplied screws (TX30) and a torque of 5 Nm.

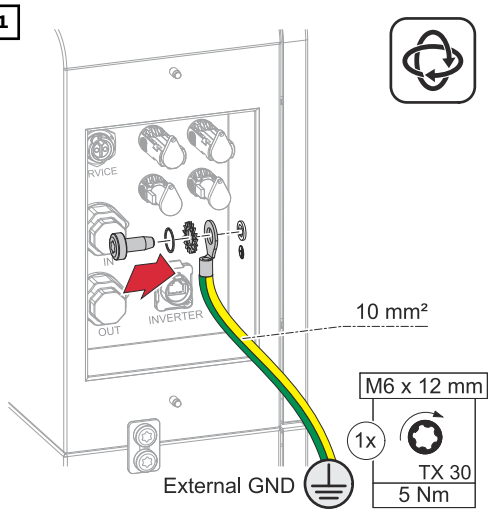
3



Fasten the L-shaped mounting brackets with the supplied screws (TX30), washers and a torque of 5 Nm. Insert the bolt anchors into the wall and fasten with a socket wrench (SW13).

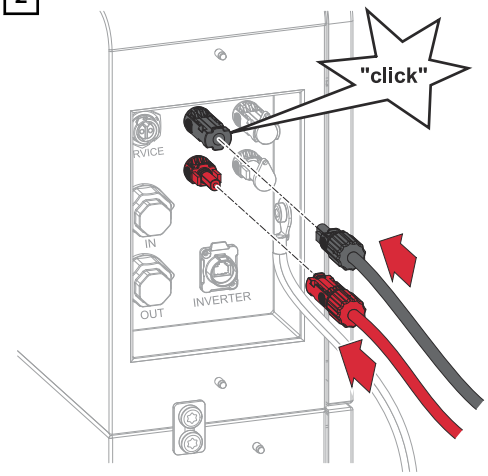
Connecting the Reserva BMS

1



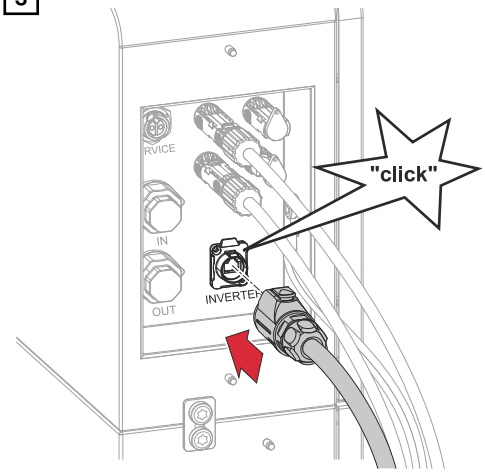
Fasten the protective earth conductor (PE) to the protective earth conductor connection using the supplied screws (TX30) and a torque of 5 Nm.

2



Insert the Amphenol plugs (+/-) into the respective slots until they click into place.

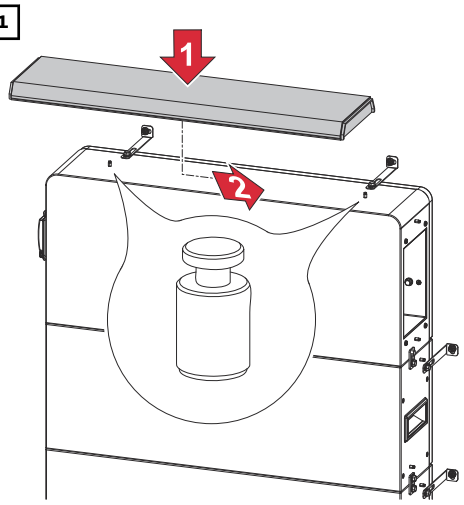
3



Connect the data cable to the "INVERTER" data communication connection with an audible click.

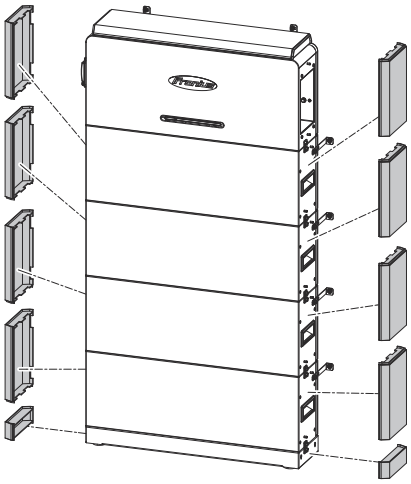
Fitting the covers to the battery

1



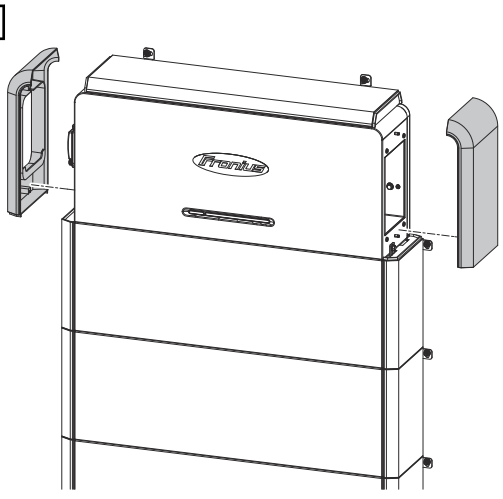
Place the cover (top) on the Reserva BMS and slide it to the right until it clicks into place.

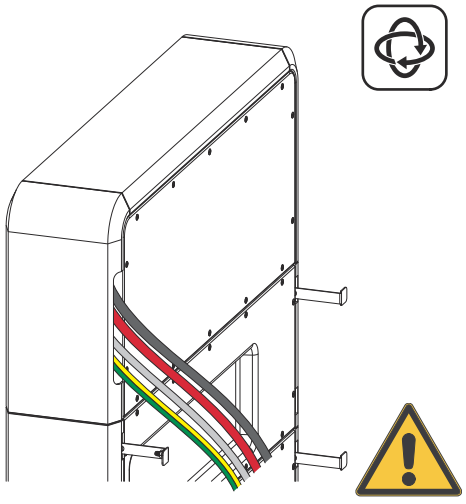
2



Slide in the side covers from the top, starting at the base plate, until they click into place.

3

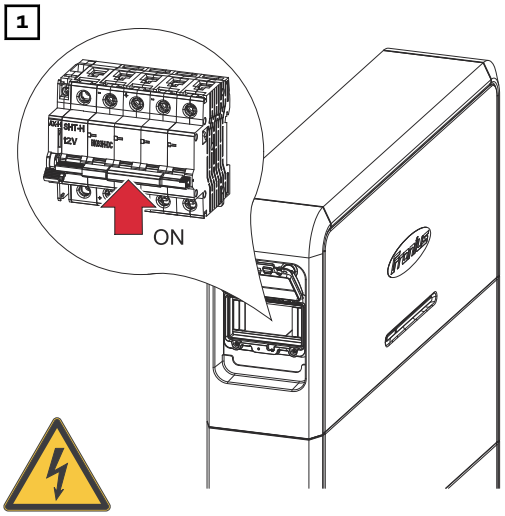




Push in the side covers of the Reserva BMS from above until they click into place. Guide the cables through the side recess in the cover.

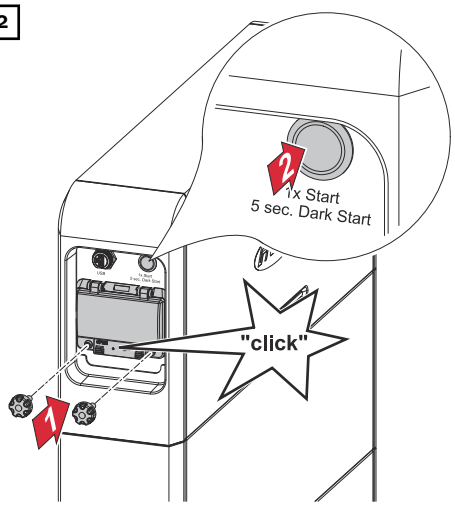
Switch on the photovoltaic system

1



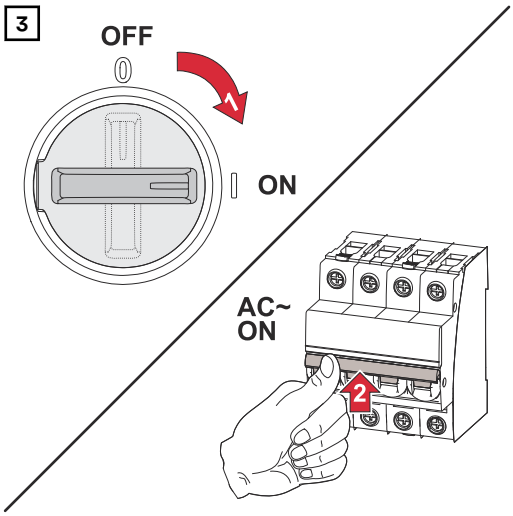
Switch the DC isolator of the battery to the "On" switch position.

2



Close the cover of the DC isolator with an audible click and secure it with the screws to prevent unauthorized opening. Press the start button once to start the battery.

3



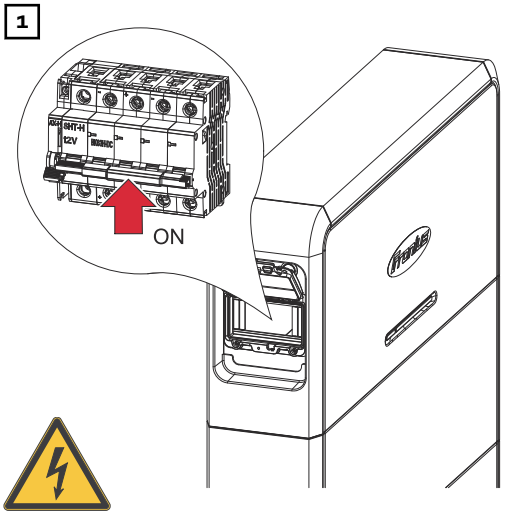
Switch the DC isolator of the inverter to the "On" switch position. Switch on the miniature circuit breaker.

Commissioning

Switch on the photovoltaic system

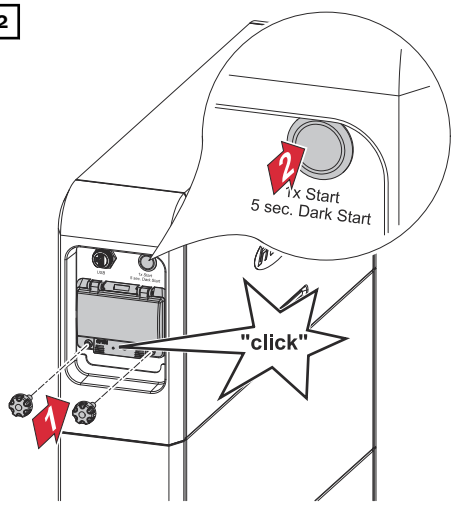
Switch on the photovoltaic system

1



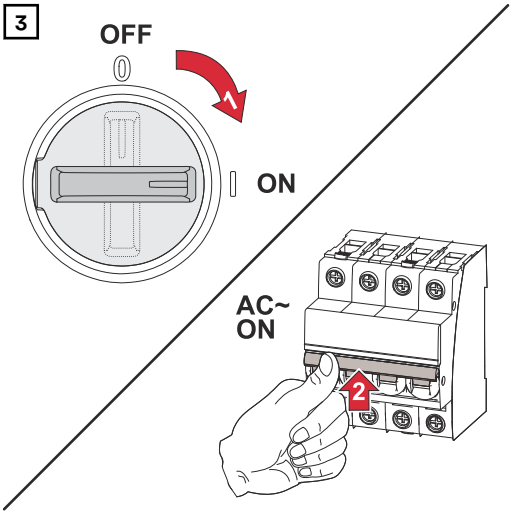
Switch the DC isolator of the battery to the "On" switch position.

2



Close the cover of the DC isolator with an audible click and secure it with the screws to prevent unauthorized opening. Press the start button once to start the battery.

3



Switch the DC isolator of the inverter to the "On" switch position. Switch on the miniature circuit breaker.

Settings - User interface of the inverter

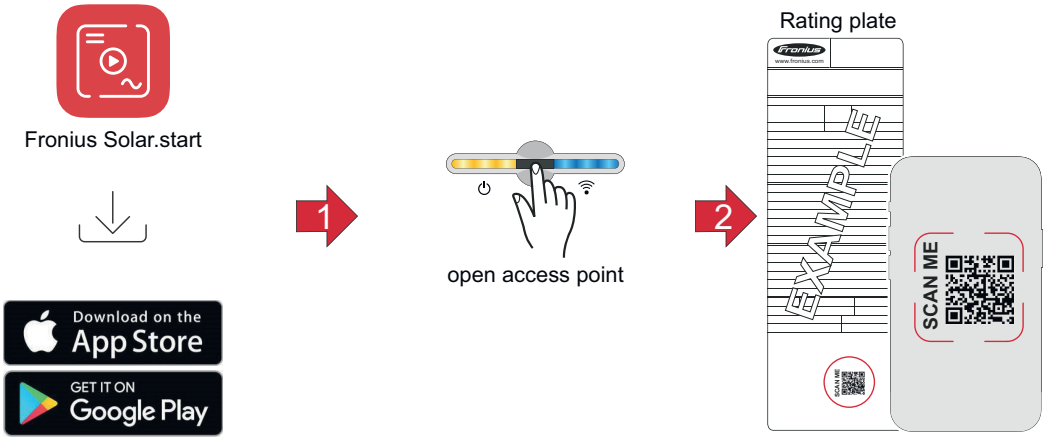
General information

IMPORTANT: Settings in the **"Device configuration"** menu item may only be made by trained specialist personnel!

The technician password must be entered for the **"Device configuration** " menu item.

Commissioning with the app

The Fronius Solar.start app is required for commissioning. Depending on the end device used for installation, the app is available on the respective platform.



1 Download and install the Fronius Solar.start app.

2 Open the Access Point on the inverter by touching the sensor.

✓ *Communication LED flashes blue.*

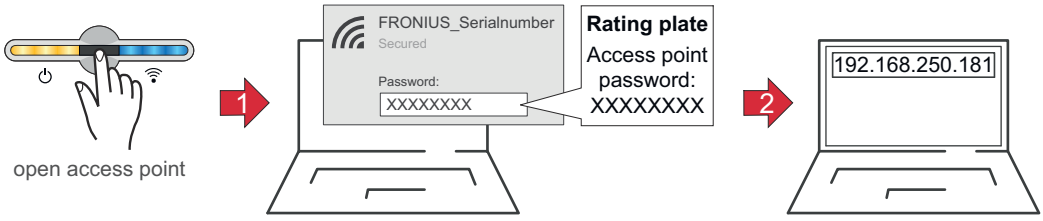
3 Open the Fronius Solar.start app and scan the QR code on the rating plate of the inverter with a smartphone or tablet to connect to the inverter.

4 Charge the battery as described in chapter **Add battery in the user interface of the inverter** on page **61** add the battery.

The network wizard and the product setup can be carried out independently of each other. A network connection is required for the Fronius Solar.web installation wizard.

Commissioning with the browser

WLAN:



1 Open the access point on the inverter by touching the sensor

✓ *Communication LED flashes blue.*

2 Establish the connection to the inverter in the network settings (the inverter is displayed with the name "FRONIUS_" and the serial number of the device).

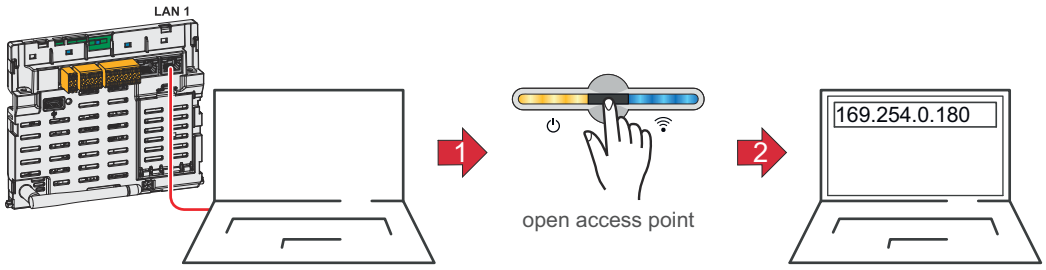
3 Enter and confirm the password from the rating plate of the inverter.
IMPORTANT!
To enter the password under Windows 10, the link **Connection instead using a network security key** must first be activated in order to be able to establish the connection with the password.

4 Enter the IP address 192.168.250.181 in the address bar of the browser and confirm to connect to the inverter.

5 Connect the battery as described in chapter **Add battery in the user interface of the inverter** on page **61** add the battery.

The network wizard and the product setup can be carried out independently of each other. A network connection is required for the Fronius Solar.web installation wizard.

Ethernet:



1 Establish the connection to the inverter (LAN1) with a network cable (CAT5 STP or higher).

2 Open the Access Point on the inverter by touching the sensor 1x

✓ *Communication LED flashes blue.*

3 Enter the IP address 169.254.0.180 in the address bar of the browser and confirm to connect to the inverter.

4 Connect the battery as described in chapter **Add battery in the user interface of the inverter** on page **61** add the battery.

The network wizard and the product setup can be carried out independently of each other. A network connection is required for the Fronius Solar.web installation wizard.

Add battery in the user interface of the inverter

1 Log in with user name and password in the **Login** menu area or in the **User** > **User login** menu area.

2 Call up the menu area **Device configuration** > **Components**.

3 Click on the **Add components+** button.

4 Select the **Fronius Reserva** battery from the **Type** drop-down list.

5 Click on the **Add** button.

6 Click on the **Save** button to save the settings.

✓ *The battery has been added to the PV system.*

Firmware update

Outdated firmware/software versions can lead to incompatibilities between the inverter and battery. In this case, the following steps must be carried out:

1 Call up the user interface of the inverter.

2 Log in with user name and password in the **Login** menu area or in the **User** > **User login** menu area.

3 Call up the **System** > **Update** menu area.

4 Drag the firmware file into the **Drop file here** field or select it via **Select file**.

✓ *The update is started.*

All available updates are provided on the product page and in the "Fronius download search" area at **www.fronius.com**.

Appendix

Care, maintenance and disposal

Cleaning

If necessary, wipe the battery with a damp cloth.
Do not use cleaning agents, abrasive cleaners, solvents or similar for cleaning.

Maintenance

Maintenance and service work may only be carried out by Fronius-trained service personnel.

Recharging in the event of undervoltage

NOTE!

Danger of undervoltage in battery modules.
Irreparable damage to the battery modules may result. The manufacturer is not liable for any resulting damage.

▶ If the undervoltage limit value is reached or undershot, the battery module must be recharged within 7 days.

1 Set the charging parameters to "CV = 113.6 V, CC = 5 A".

2 Charge the battery modules for 2 hours until a voltage of 105.6 V - 108.8 V is measured at the battery module terminals.

Disposal

Waste electrical and electronic equipment must be collected separately and recycled in an environmentally friendly manner in accordance with the EU Directive and national law. Return used appliances to the retailer or via a local, authorized collection and disposal system. Proper disposal of the old appliance promotes the sustainable recycling of resources and prevents negative effects on health and the environment.

Packaging materials
- Collect separately
- Observe locally applicable regulations
- Reduce the volume of the carton

Warranty conditions

Fronius factory warranty

Detailed, country-specific warranty conditionscan be found at **www.fronius.com/solar/garantie** .

To receive the full warranty period for your newly installed Fronius product, please register at **www.solarweb.com.**

Technical data

Fronius Reserva

General data	
Nominal capacity	32.65 Ah
Nominal capacity [1)]	30.85 Ah
Max. Charging current - 20 °C to -10 °C - 10 °C to 5 °C 5 °C to 15 °C 15 °C to 45 °C 45 °C to 50 °C 50 °C to 55 °C	 2.5 A 8 A 16 A 32 A 21.5 A 8 A
Max. Discharge current -20 °C to 0 °C 0 °C to 45 °C 45 °C to 50 °C 50 °C to 55 °C	 16 A 32 A 21.5 A 8 A
Peak value of the charge/discharge current (25 °C, 5s)	37,76 A
Calendar service life (25 °C)	10 years
Cycle life (SOH ≥ 60 %)	6000 cycles
Permissible ambient temperature	-20 °C ~ 55 °C
Optimum operating temperature	15 °C ~ 30 °C
Permissible humidity	5 % ~ 95 %
Cooling	Convection cooling
Altitude	≤ 2000 m
Discharge rate of the Reserva module (25 °C)	≤ 1.5 %/month
Reserva modules in series connection	2 - 5 modules
Max. Battery systems in parallel operation	4
Data communication between inverter and battery	RS485
Certifications	IEC62619:2022 CE VDE 2510-50 IEC62477
EMC standard	EN61000-6-1 EN61000-6-3
UN transport test standard	UN38.3+PI965
Certifications for environmental protection	RoHS REACH
Protection class (when mounted)	IP 65

Electrical data				
Number of modules	**2**	**3**	**4**	**5**
Nominal energy (kWh)	6,68	10,03	13,37	16,71
Nominal energy (kWh)	6,31	9,47	12,63	15,79
Nominal voltage (V)	204,8	307,2	409,6	512
Output voltage range (V)	179.2 ~ 230.4	268.8 ~ 345.6	358.4 ~ 460.8	448 ~ 576
Operating voltage range (V)	185.6 ~ 227.2	278.4 ~ 340.8	371.2 ~ 454.4	464 ~ 568
Charging/discharging capacity (kW)	5,94	8,91	11,88	14,85
Peak charging/discharging power (kW) (25 °C, 5s)	8,45	12,68	16,91	21,14
Dimensions (mm) incl. covers H: W: D:	 860 780 176	 1110 780 176	 1360 780 176	 1610 780 176
Weight (kg)	86,5	120	153,5	187

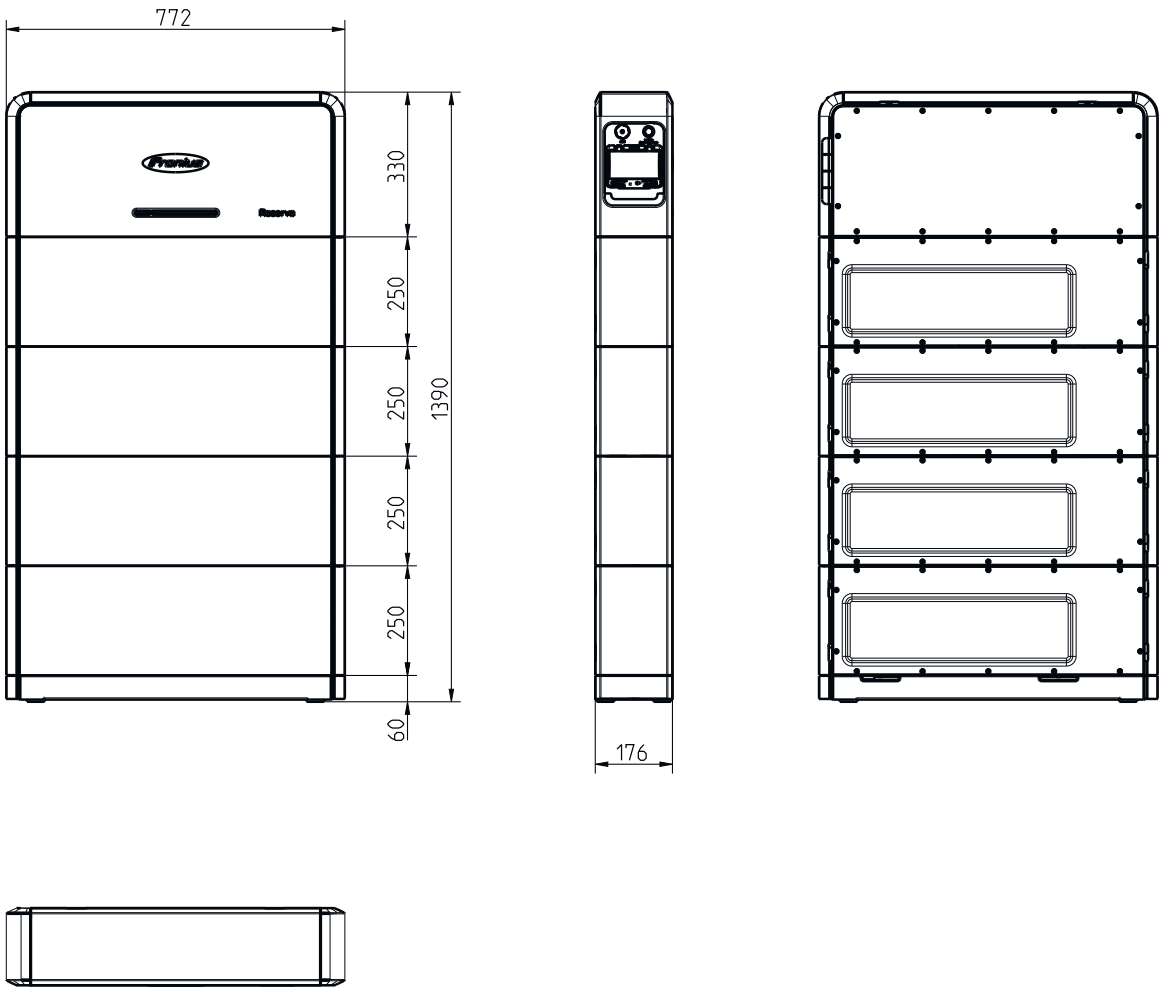
Explanation of the footnotes

1) Measurement method: 0.2C CC (C=rated capacity, 0.2C = 6.17 A, constant current) charge to 3.55 V as cell (max.), then charge CV 3.55 V until the charge current drops to 2 A or SOC = 100 %, and rest for 4h, then 0.2C discharge to 2.9 V as cell cut-off.

Dimensions

Fronius Reserva







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At www.fronius.com/contact you will find the contact details of all Fronius subsidiaries and Sales & Service Partners.