batterX®

HOME 2.0

INSTALLATION MANUAL

V23.1

h10R-7
h10R-10
h10R-14
h10R-28
h10R-42
h10R-56

h10W-7
h10W-10
h10W-14

www.batterx.io

SAFETY INSTRUCTIONS

H10 INVERTER

Before using the system, read all instructions and safety information on the h10 inverter as well as listed in this manual.
Keep this manual easily accessible in the vicinity of the h10 inverter.
This manual is intended for qualified specialist personnel. The tasks described here should only be carried out by such specialist personnel.

WARNING! Before installation of the h10 inverter, read all instructions and safety information.

WARNING! The device must be earthed correctly (and in compliance with local legislations) as the enclosure may be live in event of a malfunction.

WARNING! The h10 inverter is heavy and should be carried by 2 persons.

CAUTION! To avoid the risk of an electric shock, the service technician should disconnect all energy sources on the AC and DC side of the system and measure potential dangerous voltages before carrying out any type of work on the system. Just switching off the device does not reduce the risk! The internal capacitors can take up to 5 minutes to discharge after switching off the energy sources.

CAUTION! Do not dismantle the h10 inverter by yourself. It does not contain any parts that are permitted to be maintained or replaced by the user. Maintaining the h10 inverter by yourself poses the risk of an electric shock or burns. Moreover, the guarantee of the manufacturer is exempted in event of unauthorised opening.

CAUTION! To avoid the risk of an electric shock, one should ensure that the wiring around the system is in proper condition and not undersized. **Never** operate the h10 inverter with damaged or undersized wiring.

CAUTION! At higher ambient temperatures, the surface of the h10 inverter can become so warm that it may cause burns to skin if touched accidentally. The h10 inverter should therefore not be installed in a highly frequented environment.

CAUTION! Use only suitable material and tools! Other unsuitable materials or tools may cause fire, electric shock, or injury to persons.

CAUTION! To reduce the risk of fire, the air circulation including fans of the h10 inverter must not be obstructed or blocked.

CAUTION! Do not use the h10 inverter if it has been subject to an impact, dropped or damaged in any other manner. If the h10 inverter has been damaged, contact your supplier.

CAUTION! All AC, DC and battery fuses/breakers are used to switch off energy sources and should therefore be and remain easily accessible.

SYMBOL LEGEND

	Refers to the installation instructions
	Hazard risk
	Risk of electric shock
	Risk of electric shock. Discharge time of the internal residual charge, 5 min.
	Hot surface

BATTERY MODULE

ARRANGEMENTS

- It is important and necessary to carefully read the user manual of the lithium battery modules before they are installed and used. Disregarding the warning and safety instructions may result in electric shocks, serious injury or death. Handling the battery modules not in compliance with the regulations may also damage or render them unusable.
- After being discharged completely, we recommend recharging the batteries within 12 hours.
- The battery modules comply with protection class IP20.
- Expose the battery modules only to temperatures of 0-45°C.
- Never use a battery module that shows any kind of damage.
- All battery connections must be disconnected before performing maintenance work.
- It is forbidden to connect AC lines directly with the battery module.
- The battery module system has been designed for 48 V systems. Never connect these battery modules in series.
- If anything unusual happens, contact your supplier within 24 hours.
- Never use solvent to clean the battery.
- Never expose the battery module to flames, aggressive chemicals, water, or vapour.
- Never apply a coat of lacquer or paint to the battery module. Neither on parts located on the inside nor the outside.
- Never connect a PV cable directly to the battery module.
- Make sure that the electronic parameters of the battery modules are compatible with the remaining equipment of the system.
- Never open the battery modules.
- It is not permitted to use the batteries with faulty or incompatible h10 inverters.
- It is forbidden to use these battery modules in combination with other battery types.
- Guarantee claims exclude damage that has been caused directly or indirectly by the points listed above.
- It is forbidden to insert any type of foreign parts in the openings of the battery module.

BEFORE CONNECTING

- When unpacking, make sure that the product is intact and that all parts have been supplied. If this is not the case, contact your supplier.
- Make sure that all cables to be connected are not live and the battery modules are switched off.
- All cables must be connected correctly. Do not interchange the cables of the positive and negative pole. This may cause a short-circuit in the battery module and / or external devices.
- All battery modules must be earthed, with a resistance of less than 1 Ω.

DURING USE

- In case the battery module has to be removed, it must be completely separated from the system and switched off.
- In case of a fire, use only fire extinguishers with dry powder. Fire extinguishers with liquid extinguishing agent are forbidden.
- Opening, repairing, and dismantling the battery modules is strictly forbidden. We assume no responsibility whatsoever for the consequences that result from disregarding the safety instructions or through manipulation or modifications to the battery modules.

MISCELLANEOUS

Conversions or modifications to the system may only be carried out by trained specialist personnel. Unauthorised changes may have the following impacts:

- Electric shock
- Injury
- Malfunctions of the system
- System failure
- Loss of guarantee

If a circuit breaker or other fuses are tripped, one should first find the cause of the tripping before switching it back on.
The rack cabinet of the system should be setup on a level surface. The brakes of the cabinet should also be applied to avoid unintentional movement.

TABLE OF CONTENTS

1. SCOPE OF DELIVERY

19" rack (22U or 39U)
- 2x shelfes (pre-installed)
- strain relief (pre-installed)
- cliX-module (pre-installed)
- Inverter plate (pre-installed)
- Cable cover (only for 39U)
- batterX bag
  (cabinet earthing, keys and retaining screws)

2-4x LFP3500-C
- 4x Cage nut
- 4x Retaining screw
- Earth cable
- Safety instructions

h10
- Holder
- Fastening material
- Modbus card
- cliX-com cable

Accessory kit
- RS232/USB converter
- 4x Bolt clamp
- 4x Counter trough
- 2x PV connector [M]
- 2x PV connector [F]
- Connector for UPS mode
- Connector for backup mode
- "Self-provider" Sticker
  [DE&EN]
- 16x "X" Sticker
- Safety instructions

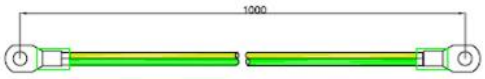
Energy Meter
Cable set (2-4pc)
Blanking plate (1-2pc)

22U rack → Art. K800142-1
39U rack → Art. K800048-1

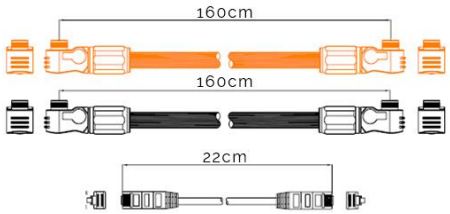
LFP3500 → Art. K800051

h10 → Art. K010000
Accessory kit → Art. K200999
Energy meter → Art. K800003
Cable set → Art. K800055
Blanking plate → Art. K800040

BATTERY MODULE EARTHING CABLE



BATTERY POWER AND COMMUNICATION CABLE



CLIX-COM CABLE TYPE-C (Art. K800052)

h10- Inverter	LFP3500 Battery module	Colour
Pin 1,2,3,6,7	Pin 1-5	Not used
Pin 4	Pin 8	Red
Pin 5	Pin 7	White
Pin 8	Pin 6	Black

The cliX-Com cable is not a normal patch cable and cannot be replaced by those.

USB/RS232 ADAPTER

CONNECTOR OPERATING MODE

UPS mode

Backup mode

2. INSTALLATION INSTRUCTIONS

I. INSTALLATION LOCATION

Make sure that the installation location fulfils the following conditions:

- There are no flammable or explosive substances.
- Assembly on a stable surface.
- The floor is flat and level.
- Not installed in an inhabited room as the h10 inverter may be loud.
- It should preferably be installed in a utility or electric room.
- The display should be situated at eye level to enable it to be read-off at any time.
- Installation in a clean environment, only with minimum dust / dirt. Dust can impair the performance of the system or reduce its service life.
- The ambient temperature should be between 5°C and 40°C and the relative humidity between 5% and 85%.

  If the ambient temperature is outside the operating range, the battery module stops to protect the device. Being frequently exposed to harsh temperatures may impair the performance and service life of the battery module.

- Constant temperature and humidity.
- The inverter must be installed upright.
- The cable used should comply with the regulations.
- The level of contamination of the h10 inverter is PD2. The installation environment should therefore be dry, ventilated, and free from intensive dust. Do not operate the device if the temperature and humidity exceed the limits specified.
- The installation should not block access to other devices.
- The inverter has protection class IP20 and is only suitable for indoor applications.
- The fans should be cleaned at regular intervals.
- The area must be completely protected against wetness.

II. EQUIPMENT

Use correctly insulated tools to prevent unintentional electric shock or short-circuits.

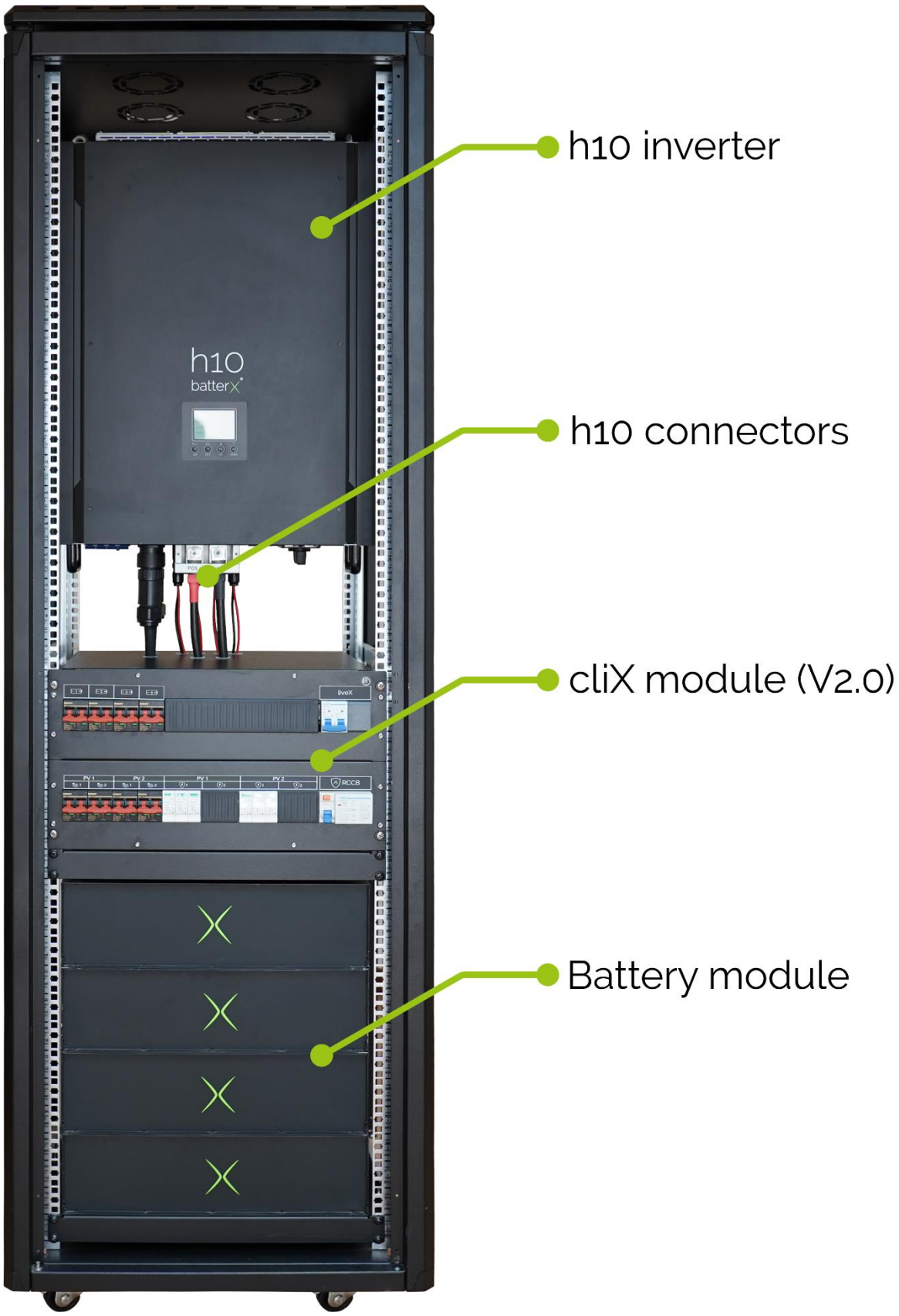
When handling the battery module, we recommend that you wear the following protective equipment:

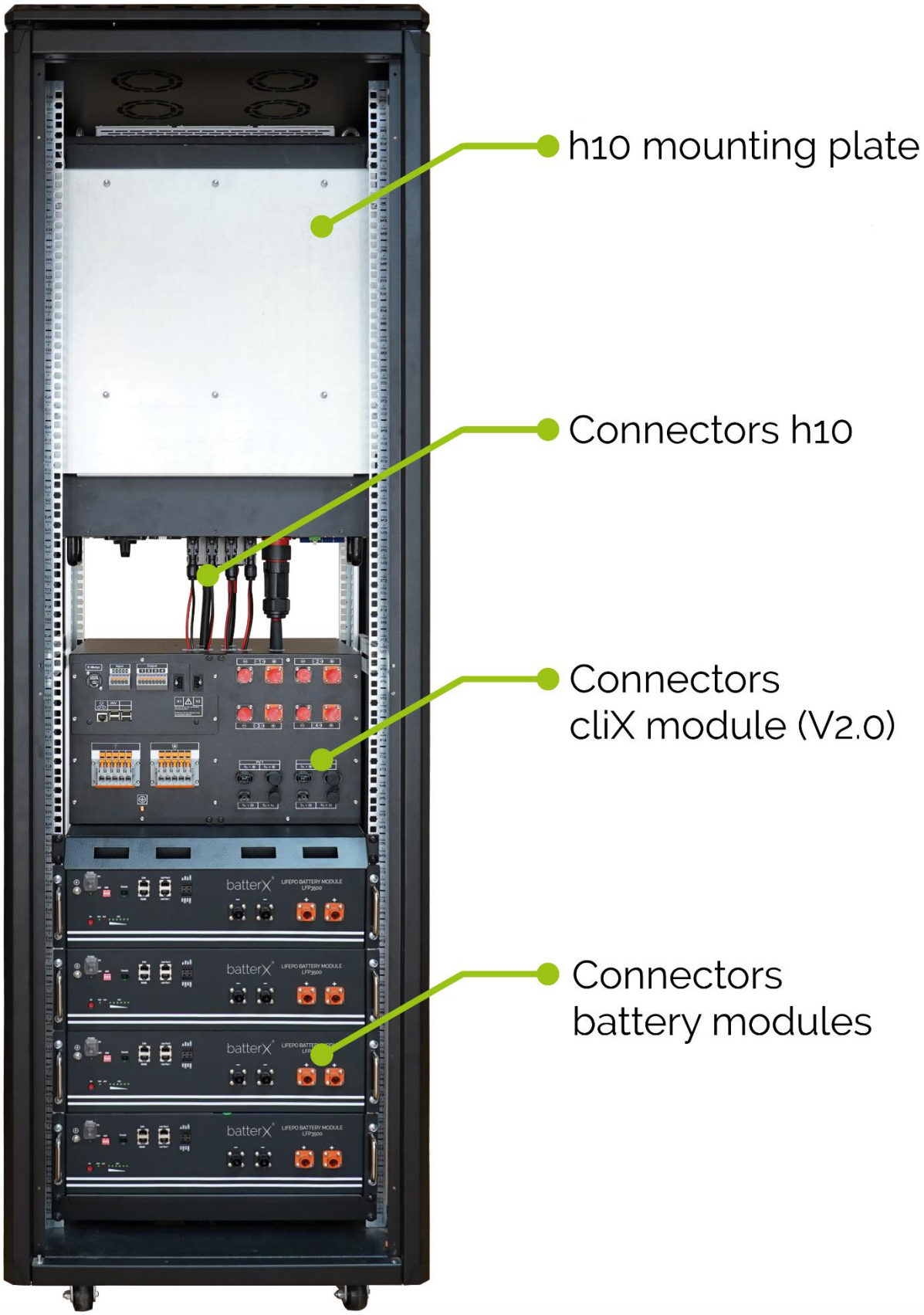
Insulated gloves

Safety glasses

Safety shoes

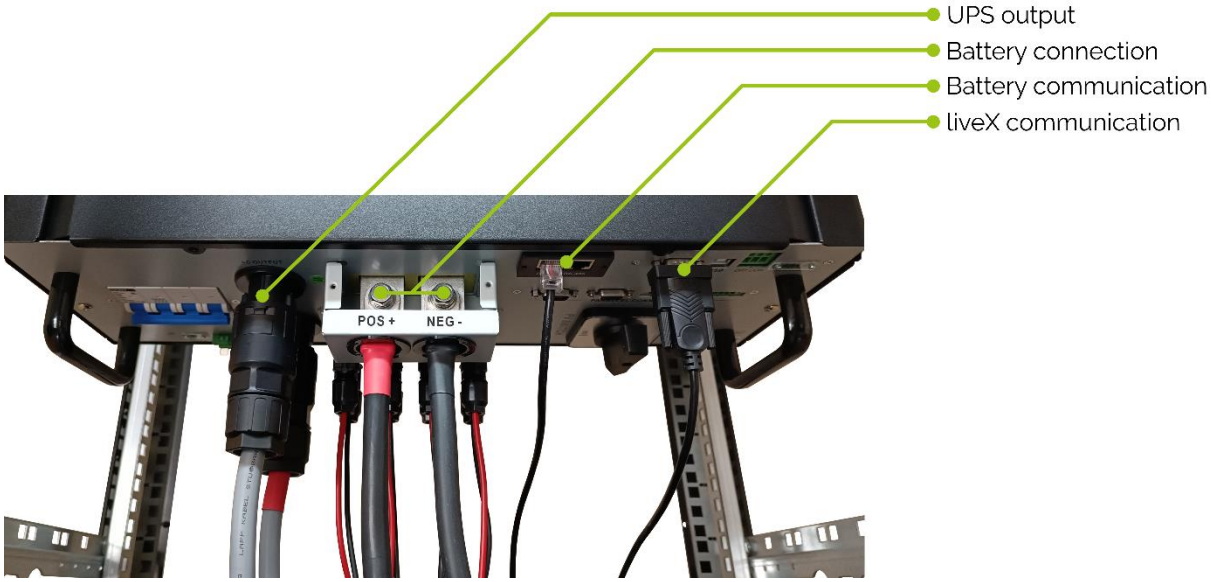
3. OVERVIEW


h10 inverter
h10 connectors
cliX module (V2.0)
Battery module
h10
batterX
liveX
RCCB

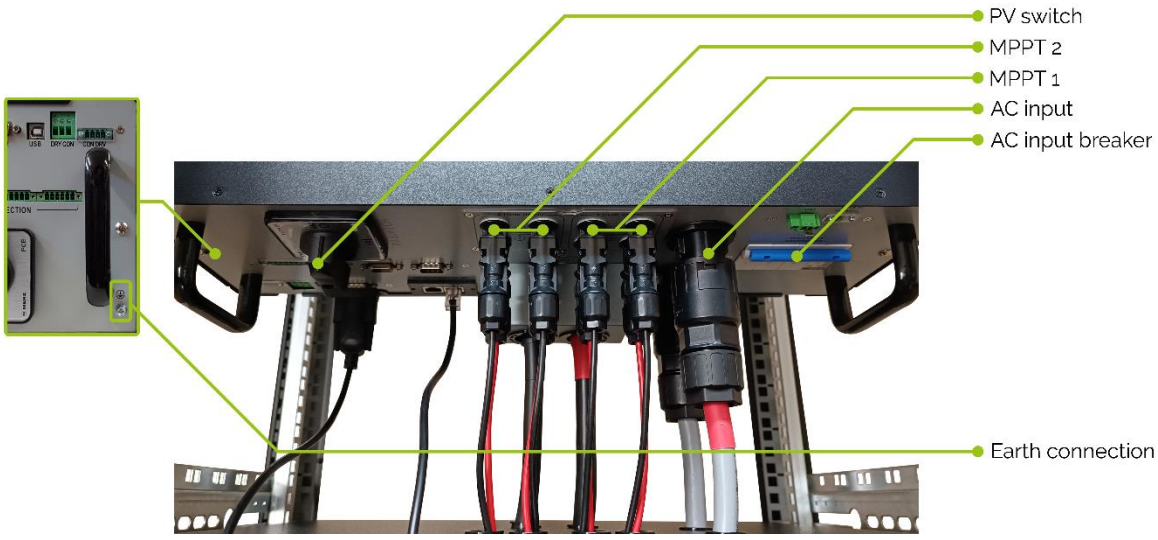

h10 mounting plate
Connectors h10
Connectors
cliX module (V2.0)
Connectors
battery modules

I. H10 INVERTER CONNECTION

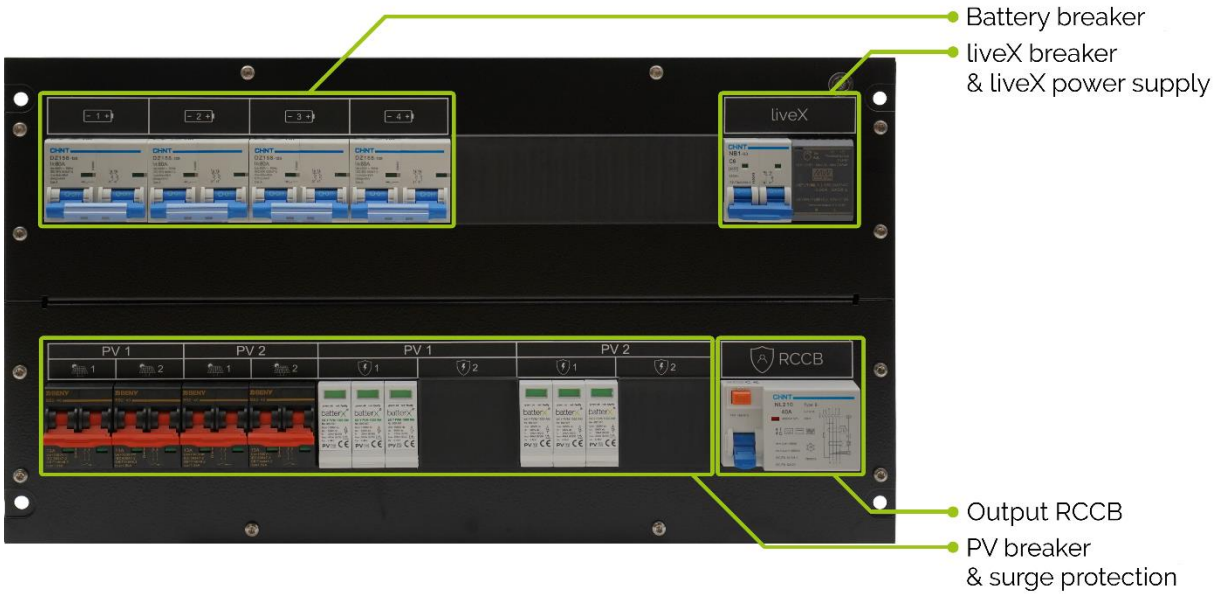
FRONT VIEW

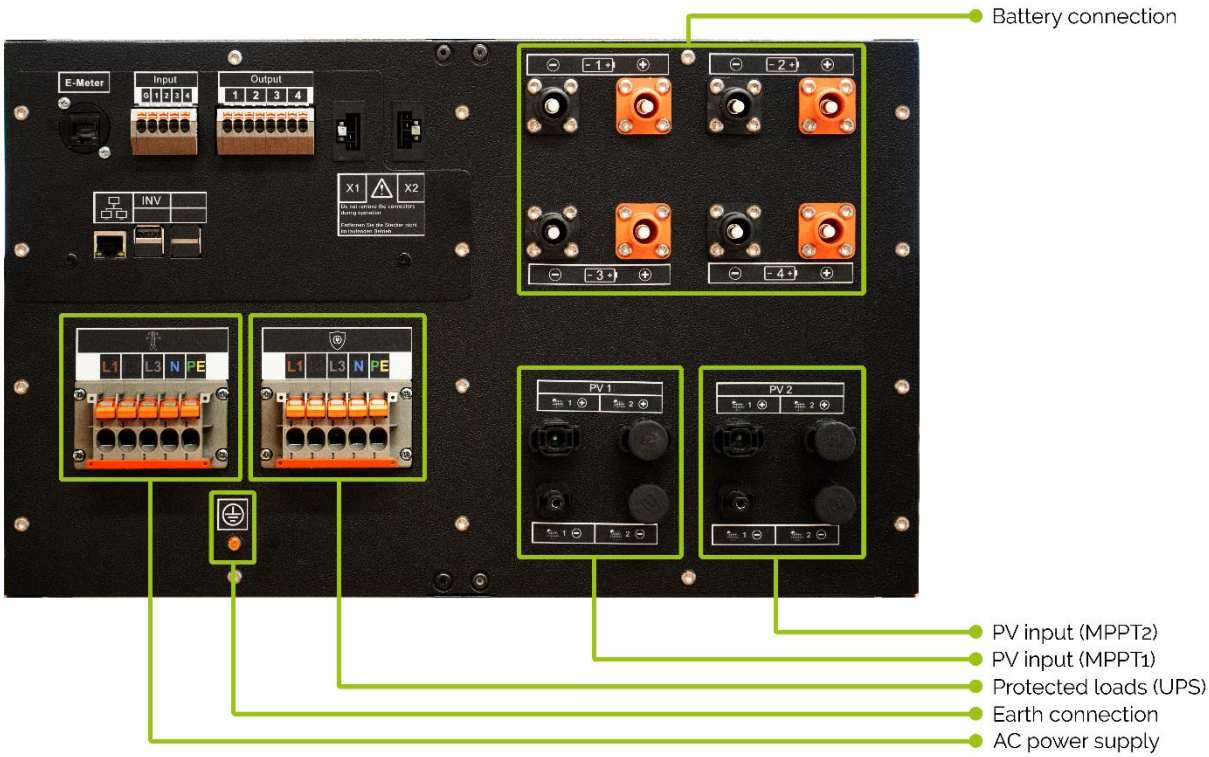


REAR VIEW

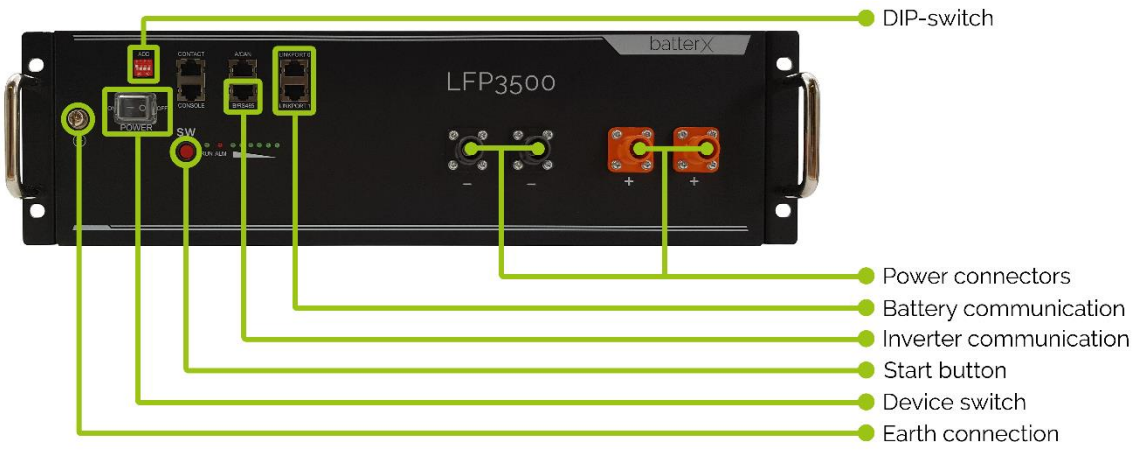


II. CLIX MODULE

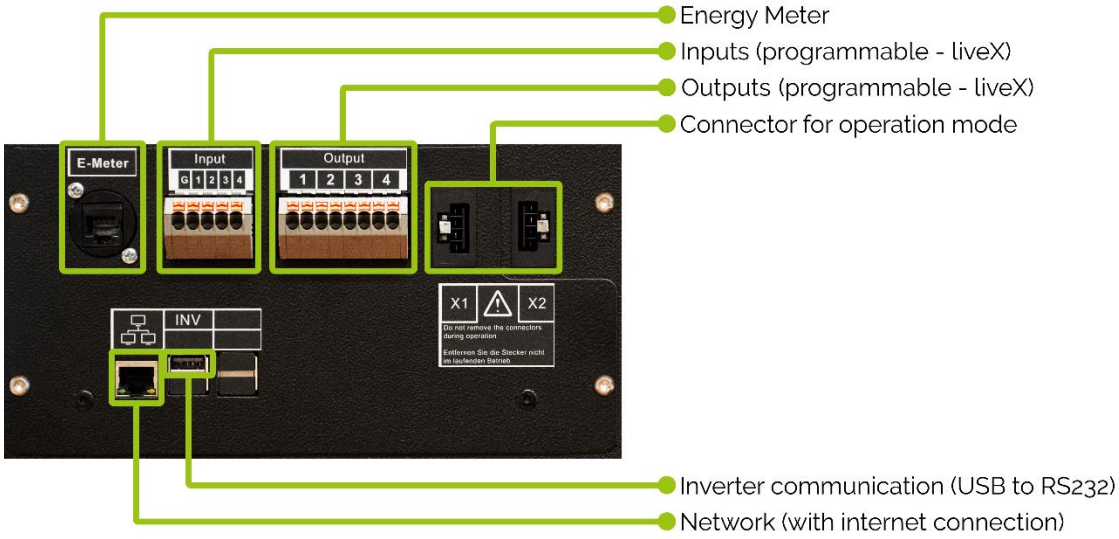




III. BATTERY MODULE



IV. LIVEX



4. PREPARATION - 19" RACK

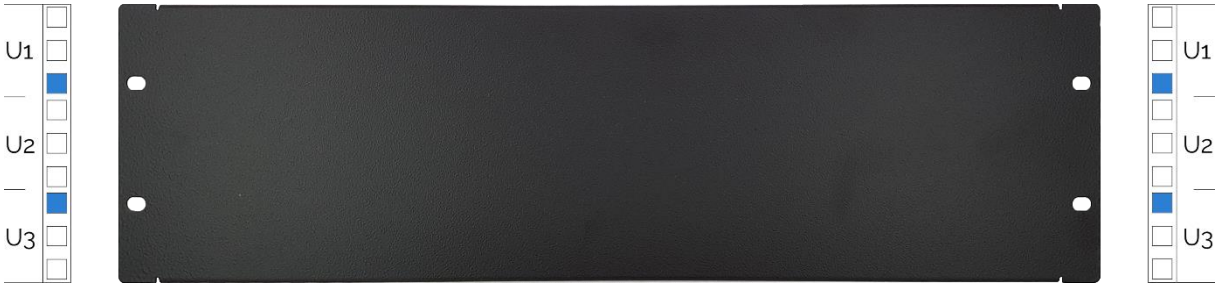
Both side panels as well as the doors should be removed before installation.
To remove the doors, open them at a 90° angle and then pull the pin that is located on the inside of the door downwards. Then fold the door to the rear and lift it out of the swivel joint.
With the side panels, first the lock at the top in the middle must be unlocked using the enclosed key. Then both plastic latches in the middle must be pulled down to unlock them, before lifting the panel out of the groove.

Before installing the various system components, check that all required cage nuts are in position. Depending on the composition of the system, 4-16 battery modules are installed. All free slots on the front side are covered by blank covers.

The cage nuts of the battery modules must be inserted on the rear side of the cabinet.

COVER ANGLE

BLIND PANEL



BATTERY MODULE

5. INSTALLATION

I. BATTERY MODULES

Starting from the bottom, the battery modules are pushed in on the **rear side of the 19" rack.** The number of battery modules varies depending on the system. If not used, the other battery slots remain empty and are covered later with blank covers.

Deliver state

Delivery state, battery rack (starting from 14kWh)

h10R-7

h10R-10,5

h10R-14

h10R-28


LFP3500
LFP3500
LFP 3500-C
LFP 3500-C
LFP 3500-C
LFP 3500-C
LFP 3500-C
LFP 3500-C

h10R-42


LFP3500
LFP3500
LFP3500
LFP 3500-C
LFP 3500-C
LFP 3500-C
LFP 3500-C
LFP 3500-C
LFP 3500-C
LFP 3500-C
LFP 3500-C
LFP 3500-C

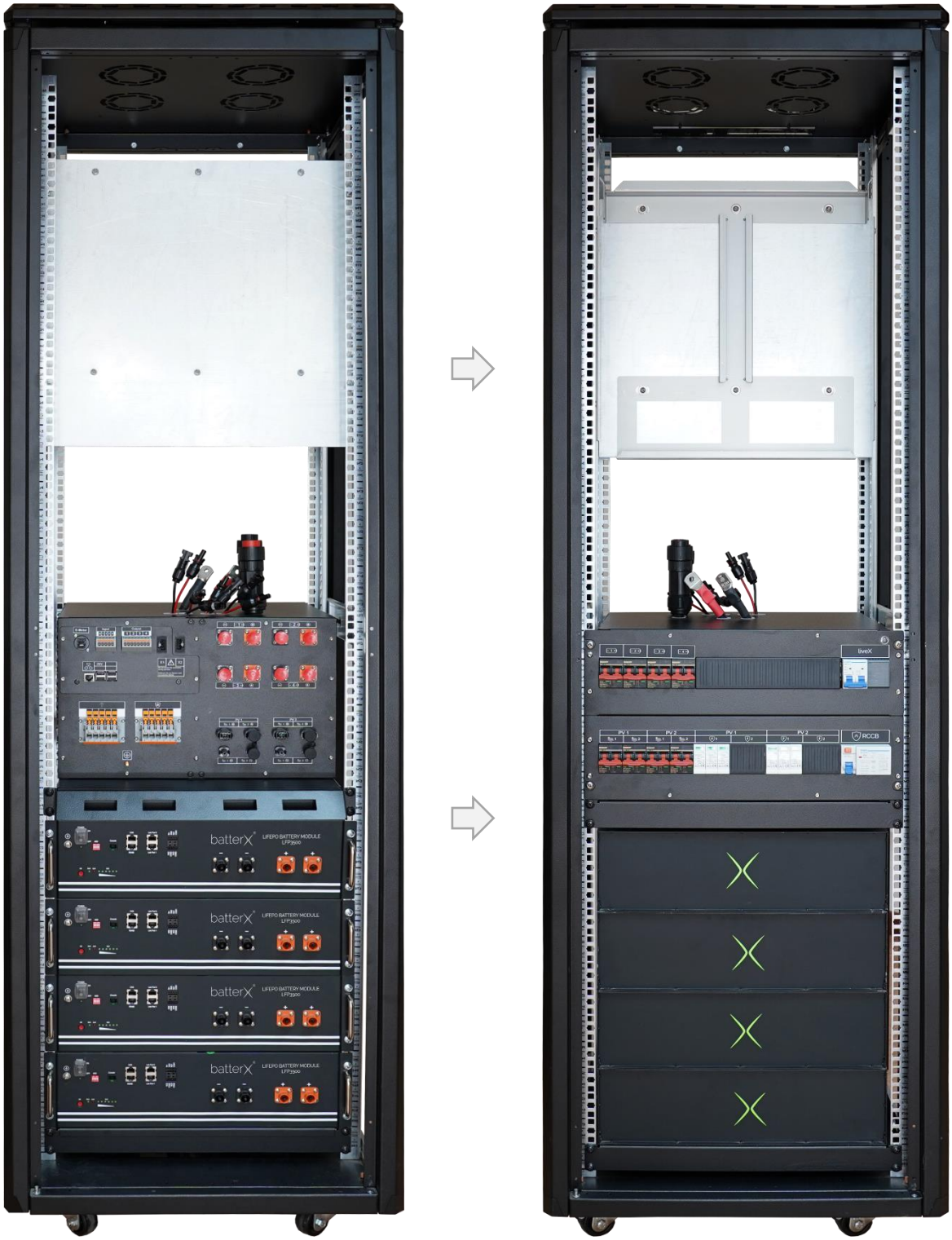
h10R-56

Once all battery modules have been inserted in the rack, they can be secured with 4 screws and the previously installed cage nuts.

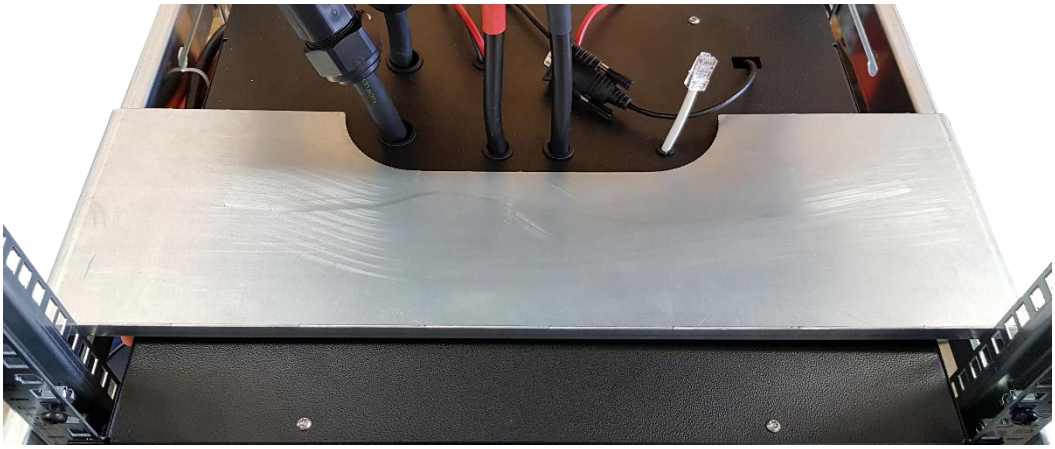
II. H10 INVERTER

First the device holder that can be found in the box of the h10 inverter is installed in the cabinet. The matching screws and washers can be found in the enclosed batterX bag.

- 6 pcs M6 x 16 mm
- 6 pcs washers with threefold outer diameter



To install the h10 inverter, the mounting plate is required as installation aid. It is placed on the metal rails on the side to stop it from slipping.



For the next step, 2 persons are required as the inverter weighs 45 kg. If you want to prevent scratches on the device, the mounting aid can also be lined with a soft non-slip material.

- Viewing from the front, the h10 inverter must be placed on the right outer edge of the mounting aid with the left bar.
- Now push the h10 inverter into the cabinet along the mounting aid.
- Then lift the h10 inverter from the both sides into the mounted holder.
- Now the mounting aid can be removed from the cabinet so that it can be used for the next installation.

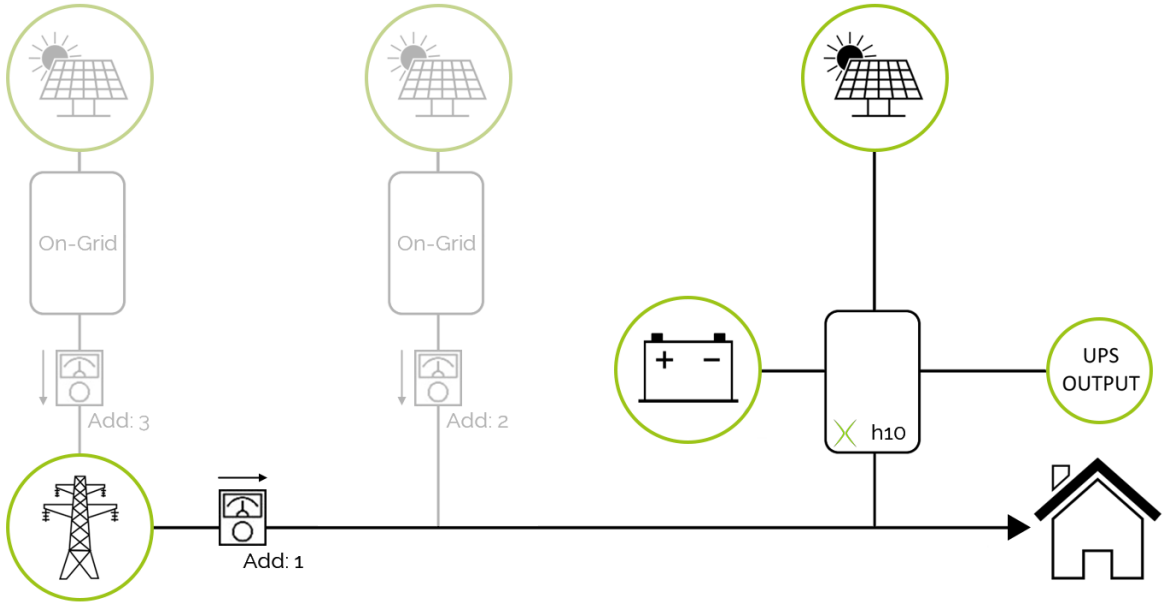

h10
batterX
liveX
RCCB

III. ENERGY METER

The energy meter is installed at the supply point of the electric installation, usually directly after the meter of the energy supplier.
In case an external on-grid inverter should also be integrated in the portal, this can be recorded using an additional energy meter. For this purpose, this must be provided with the correct address.

- Supply point → Address 1
- On-grid inverter, excess feeder → Address 2
- On-grid inverter, full feeder → Address 3

External inverters cannot be limited by our portal. Only the excess energy of an excess feeder can be used for charging batteries.



There are 2 different types of energy meter, direct (default) or indirect measurement, which can be installed in different manners.

DIRECT MEASUREMENT (DEFAULT)

With the direct measurement, the current to be measured flows through the energy meter. The maximum value is 100 A at a maximum cross-section of 25 mm^2.
All three phases are routed in at the top side and out at the bottom side. In doing so, the neutral conductor does not necessarily have to be interrupted and can only be connected to the top side.
This energy meter is equipped with a communication socket which is connected directly to the cliX module later on. This is carried out via a patch cable.

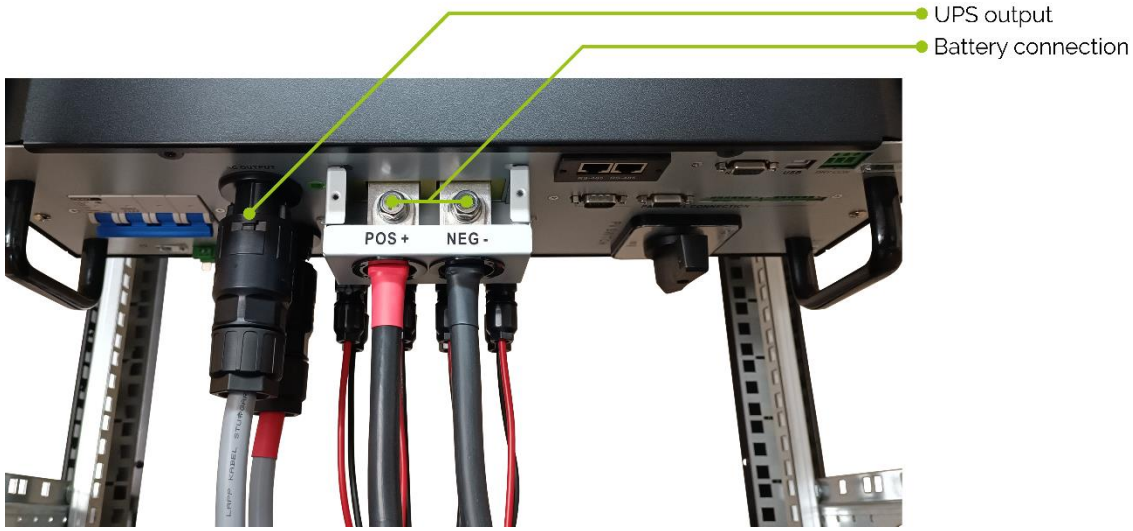
INDIRECT MEASUREMENT

With the indirect measurement, the current to be measured flows through a transducer which is connected to the energy meter. The transducers have a divided core so that the cables that are supposed to be metered do not need to be disconnected for the installation of the transducers. The energy meter must also be connected to a reference voltage and power supply.
This model is not equipped with a communication socket, thus the communication must be implemented via 3 wires (A+B and GND).
If this version has to be used, this must be specified explicitly when ordering. Additionally, the size and strength of the transducer must be defined, including diameter of the cable bushing and maximum amperage.

6. CABLING

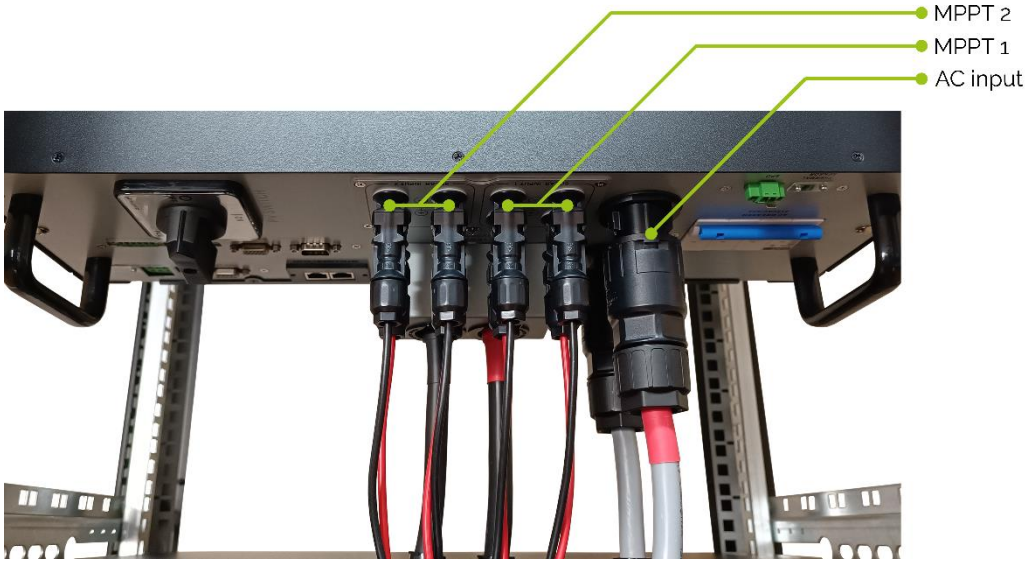
I. H10 INVERTER

After inserting the h10 inverter, it can be connected to the cliX module. The respective connections are placed precisely.



UPS output: Connect the male connector to the corresponding socket of the h10 inverter until you hear the lock mechanism clicking in.

Battery connection: Guide the M8 cable lug through the holes of the h10 inverter battery connection. Then screw the red cable to + and the black cable to -. The recommended tightening torque is 3.5 Nm.



PV connection: The MC4 connector of the module must be inserted in the respective PV inputs of the h10 inverter located above them, where plus and minus are marked on the h10 inverter. When inserting, you should hear them clicking in place.

AC input: Connect the female socket to the corresponding connector of the h10 inverter until you hear the lock mechanism clicking in.

II. BATTERY CABLING

COMMUNICATION

The internal communication of the batteries is realised by connecting link port 0 of one battery with link port 1 of the next battery module. This is done until all battery modules are connected to each other so that link port 0 of the topmost module and link port 1 of the lowest module are not occupied. The supplied communication cables[1] are used (18cm patch cables; storage units over 14kWh contain a long 5m patch cable to continue the communication between both cabinets).

The top battery module is the master module[2] which communicates with the h10 via an RS485 connection. The cliX-COM cable is used for the connection, a normal network cable will **not** work here. Plug the cliX-COM cable into the RS485 interface of the h10 and the master module. Connect the side marked "BAT" to the battery module.

In addition, the address switch[3] (dip switch) must be set on the master module.

On the next page you will find an illustration of the communication wiring.

[1] This is a normal patch cable.
[2] The master module is only defined by a free link port 0. In case of any change in communication, wiring and/or setting, all battery modules must be restarted.
[3] The address switches define the transmission speed of the h10 inverter communication. Caution: The address switches are mounted upside down!


LFP3500-C
LFP3500-C
LFP3500-C
LFP3500-C
LFP 3500-C
LFP 3500-C
LFP 3500-C
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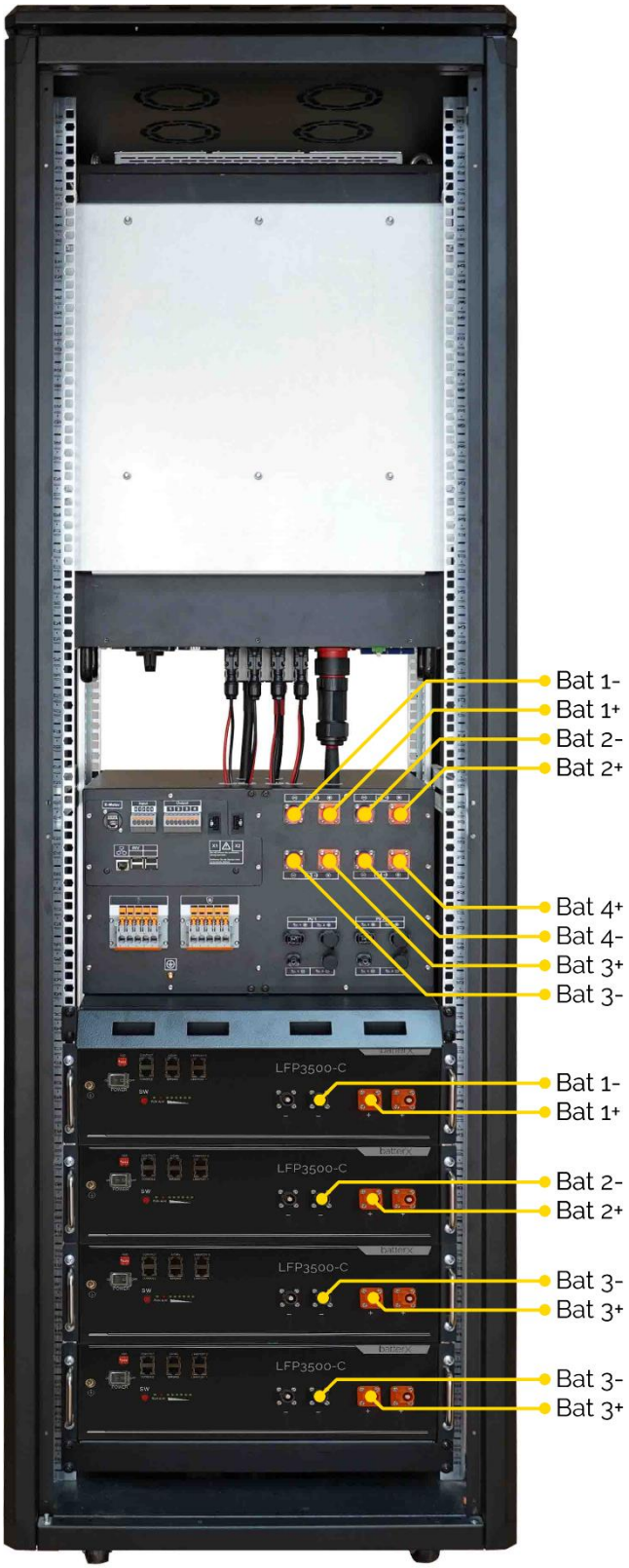
LFP 3500-C

SETUP A (STORAGE SIZES 7 kWh, 10.5 kWh, 14 kWh)

The cables of the respective battery modules are plugged into the correspondingly marked battery sockets of the cliX module. Here, the colour code (orange, black) must be followed. Reversing the polarity of the battery cables can lead to permanent damage of the system. On the battery side, it does not matter which of the same-coloured sockets is used.



SETUP B (STORAGE SIZES FROM 28 KWH, 42 KWH, 56 KWH)

For larger storage units, over 14kWh, the cabling of the battery storage unit is divided into 4 blocks.
The individual battery blocks are distributed as follows:

- **28kWh** → 8 modules
  - Block 1: Battery modules 1-2 (rack h10)
  - Block 2: Battery modules 3-4 (battery rack)
  - Block 3: Battery modules 5-6 (battery rack)
  - Block 4: Battery modules 7-8 (battery rack)

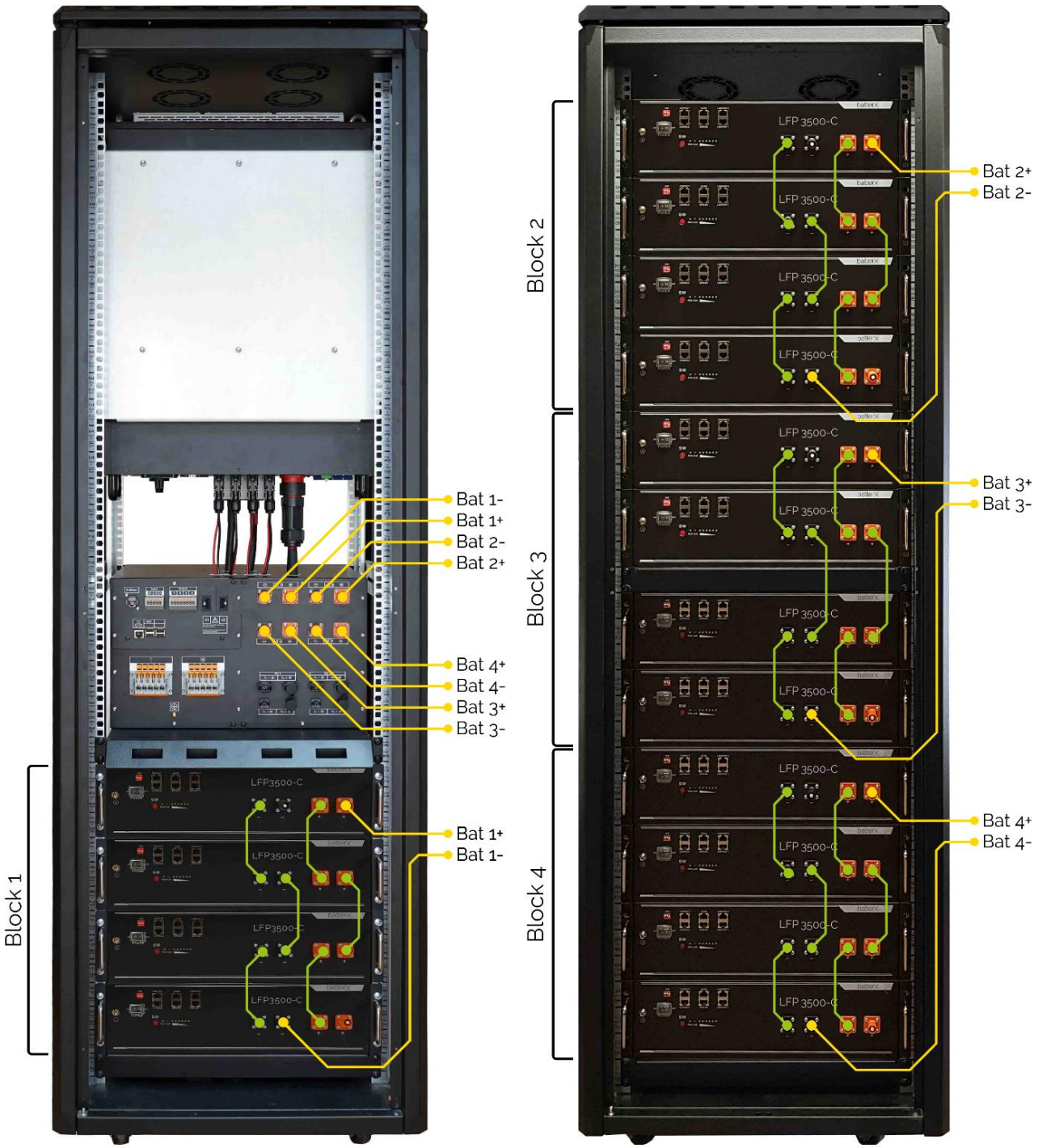
- **42kWh** → 12 modules
  - Block 1: Battery modules 1-3 (rack h10)
  - Block 2: Battery modules 4-6 (battery rack)
  - Block 3: Battery modules 7-9 (battery rack)
  - Block 4: Battery modules 10-12 (battery rack)

- **56kWh** → 16 modules
  - Block 1: Battery modules 1-4 (rack h10)
  - Block 2: Battery modules 5-8 (battery rack)
  - Block 3: Battery modules 9-12 (battery rack)
  - Block 4: Battery modules 13-16 (battery rack)

All battery modules of a block must be connected to each other. The positive pole (orange) of the upper module is connected to the positive pole (orange) of the lower module of a battery block using a power cable (18cm, 25mm²) supplied. The same can be repeated for the negative pole (black).[4]
→ Shown in green on the following page.

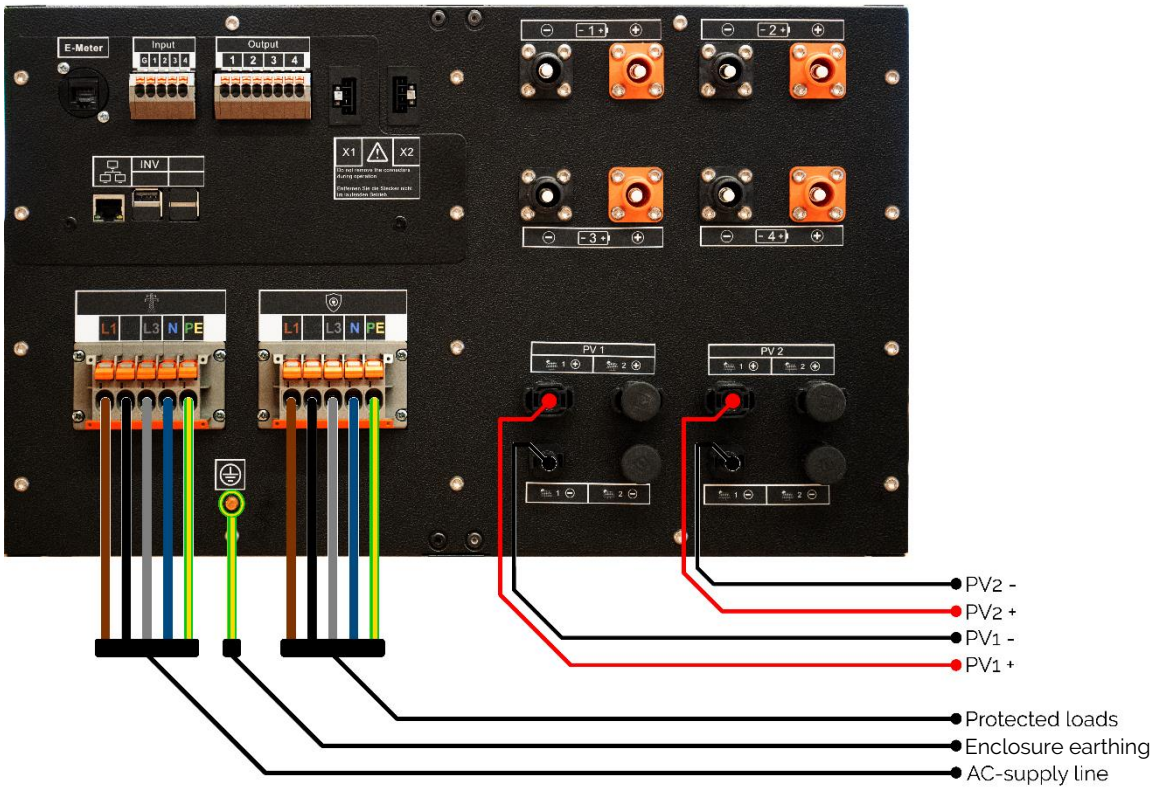
Then all the plus and minus poles of the battery blocks must be connected to the cliX module. Always use the positive pole of the first/top module and the negative pole of the last/bottom module of a battery block. This ensures that the current flow within a battery block is balanced.
→ Shown in yellow on the following page.

[4] *The two poles of the same colour are each bridged internally, so technically it makes no difference which of the two is used.*


Block 1
Block 2
Block 3
Block 4
Bat 1-
Bat 1+
Bat 2-
Bat 2+
Bat 4+
Bat 4-
Bat 3+
Bat 3-
Bat 1+
Bat 1-
Bat 2+
Bat 2-
Bat 3+
Bat 3-
Bat 4+
Bat 4-
LFP3500-C
LFP 3500-C

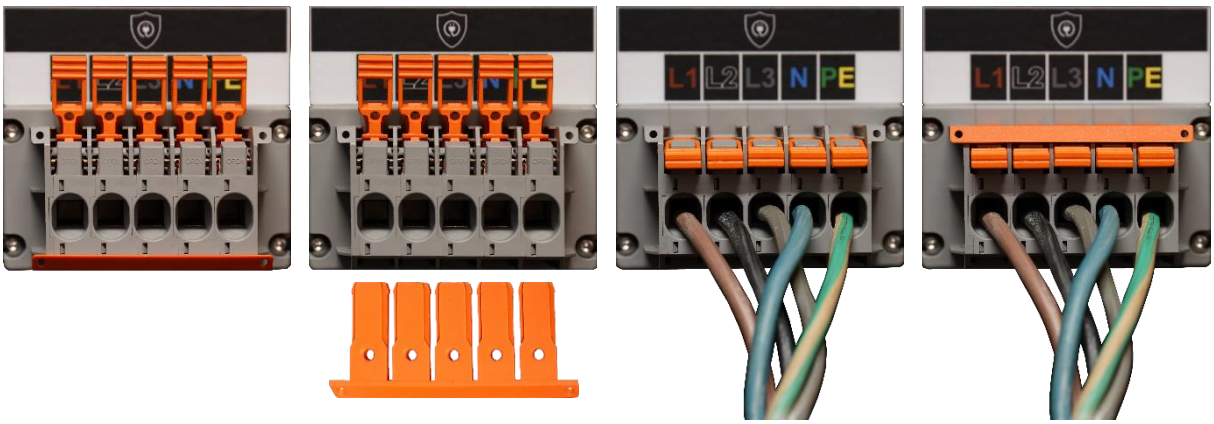
III. EXTERNAL CABLING

Before connecting, all fuses and switches must be switched off.
All external connections such as PV and supply line are connected to the rear side as follows:



PV: The PV connectors are type "Sunclix" of the brand Phoenix Contact. After removing the rubber cover, the connectors can be simply plugged into the respective socket. When inserting, you should hear them clicking in place. The two connectors are fused (by default), but not provided with a surge protector as standard. This must be ordered separately.

AC connection: The AC supply line as well as connection of the protected consumers is carried out using quick connection terminals. When connecting, first the safety support ridge must be removed. Then the 5 wires can be striped and inserted into the cable opening one after another (with or without ferrules, cross-section ≥ 2.5 mm^2). After inserting each time, press the connecting lever down to the stop to fix the cable in the terminal. At the end, insert the safety support ridge above the terminal so that the terminal cannot be easily opened (the terminal can also be provided with a seal as an option).



IV. LIVE X

To ensure that the liveX functions correctly, it is essential that the following items are connected:

- Internet connection
- Energy meter
- Connector for operating mode
- h10 communication

Internet connection: The system is equipped with a network plug and a WI-FI connection. For commissioning, a LAN connection must be available which, where applicable, can be removed again after the configuration of the inverter and WI-FI.

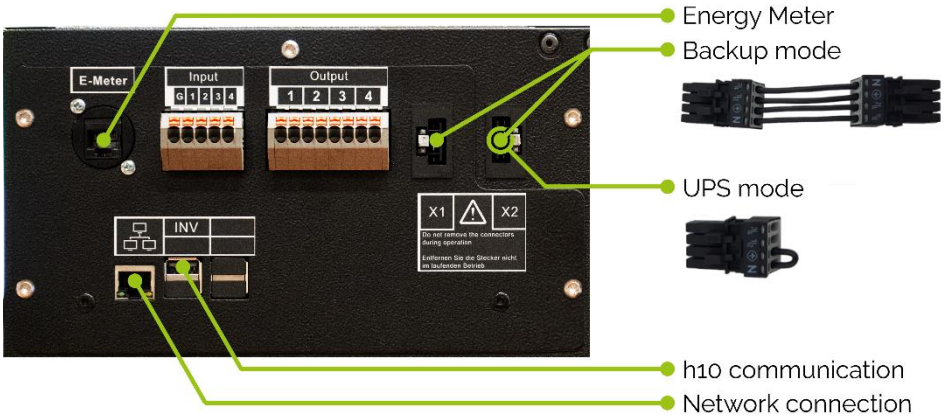
Energy meter: The connection to the energy meter is implemented using a standard patch cord which is inserted in the RJ45 socket of the cliX and energy meter. In doing so, the specifications of a network cabling (e.g. length ≤ 90 m) must be observed.

Connector, operating mode: The system is equipped with 2 different operating modes, backup and UPS. To ensure that the system functions correctly, we need 2 different connectors which are connected as follows:

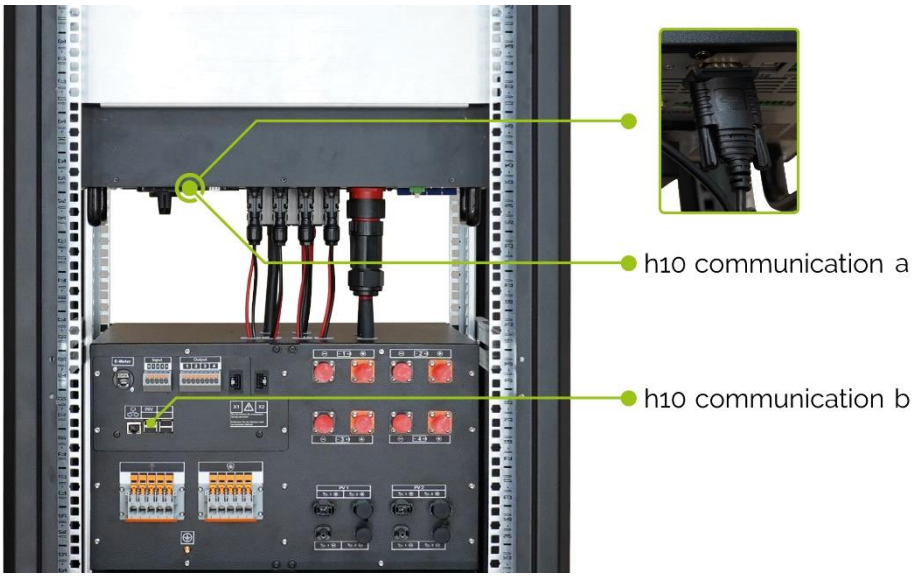
Backup mode → X1 -X2

UPS mode → X2

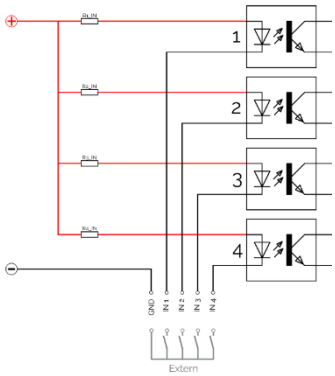
CAUTION! In backup mode, the outputs "Output 3" & "Output 4" can no longer be used. In this mode, **230 VAC** are each applied to the contacts of **"Output3" & "Output4".**



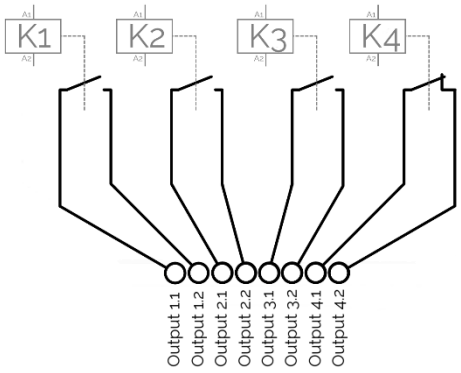
h10 communication: Communication of the h10 is implemented via an Rs232/USB adapter. The USB is inserted at the rear side of the cliX module, the DB9 connector of the RS232 to the communication interface of the H10.



Inputs: The system is equipped with 4 inputs which can be configured via the liveX portal. The activation of the inputs is carried out by connecting the respective contacts with the common earth.



Outputs: The liveX is also equipped with 4 potential free output contacts (only 2 in backup mode as the other two are used for internal purposes). These contacts are relay contacts where outputs 1-3 are configured as normally open and output 4 as normally closed[5]. In the same manner as the inputs, the outputs can be freely programmed via the liveX portal.



[5] *The relay contacts can also be reconfigured from normally open to normally closed, or vice versa, if required. For this purpose, the jumper position on the circuit board needs to be changed.*

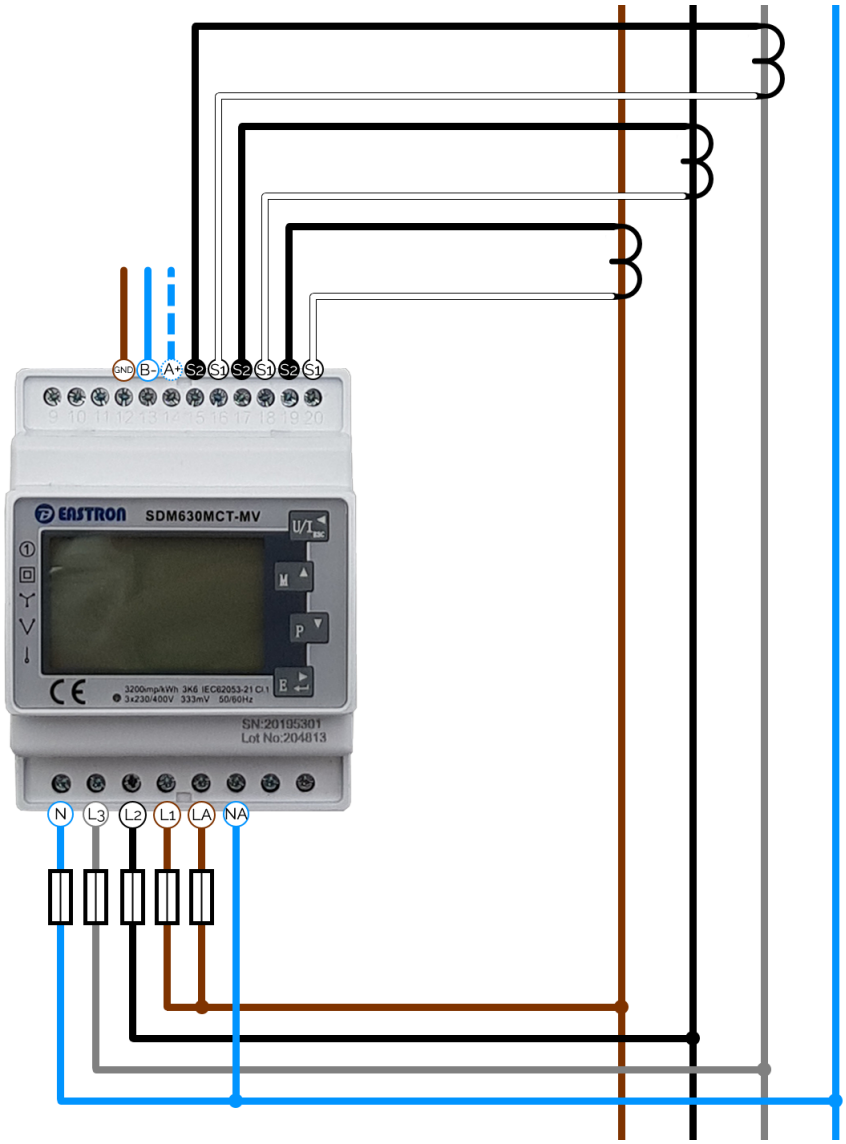
V. ENERGY METER

DIRECT MEASUREMENT (SDM630-MODBUS V2)

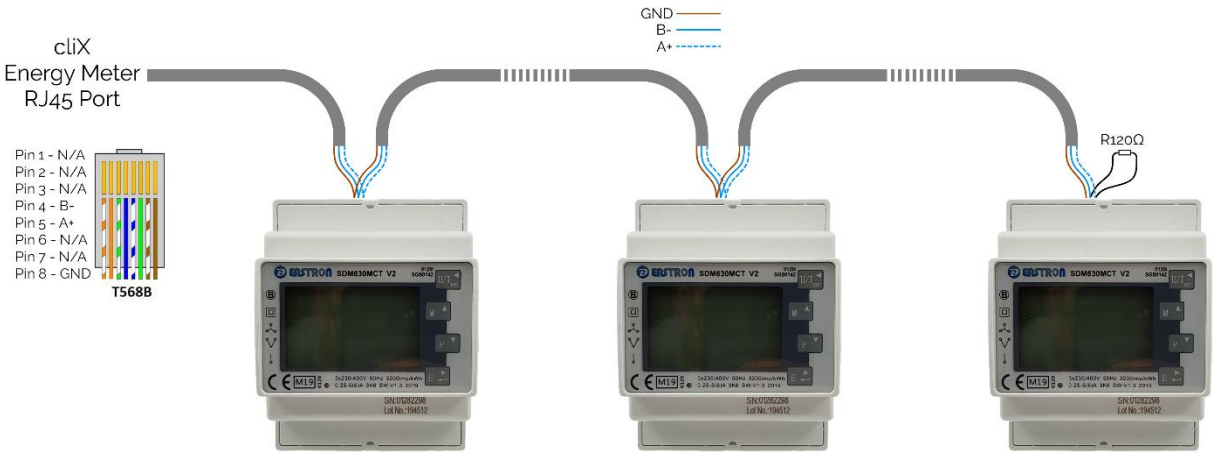
Guide the respective wires, L1-L2-L3-N, from the top into the energy meter. Continue the wiring from the bottom side off the energy meter. The neutral conductor does not necessarily have to be interrupted, meaning, it can only be connected to the top of the energy meter (as reference). The measuring direction must be observed to allow a trouble-free function.
Communication takes place via the RJ45 socket (see point "IV. LIVEX" – Energy meter)

INDIRECT MEASUREMENT (SDM630MCT-MV + CURRENT TRANSFORMER)

To ensure that the indirect measurement functions, the reference voltage of all 3 phases and the current transformers must be connected. The energy meter also requires a 230 VAC power supply, which can be tapped from the reference voltage (in schematic L1, can also be L2 or L3). As a small cross-section is usually used for tapping the reference voltage, this must also be protected with a fuse accordingly. The power supply of the energy meter should also be protected with a fuse. Here the manufacturer specifies 1 A (fast-blow).
The current transformers have a divided core and can therefore simply be placed around the cable without having to disconnect it. In doing so, the direction that is marked on the current transformer must be observed.
The current transformer and reference voltage must also be installed at the same connecting point.



All energy meters installed are read out from the same modbus. For this purpose, it must be observed that each participant of the bus is given another address and that the bus is wired lineal and not star-shaped. The last energy meter must also be provided with a terminal resistance which is located between A+ and B-.



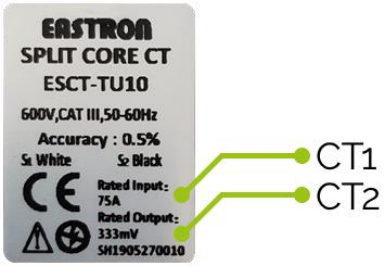
CONFIGURATION

After successful installation, the energy meter should be started, and all parameters correctly configured.

- Address: 1 – Supply point
  2 – External inverter, surplus injection
  3 – External inverter, full injection
- Baud rate: 9.6 k
- Parity: EVEN
- Stop bits: 1

Energy meter *SDM630MCT-MV* with *ESCT-TU*[6] Series coils

- CT2: 0333
- CT1: 0075 (varies depending on the type of the current transformer)



- As an option, the direction of the current measurement on the energy meter can be relocated. Carry out the following for this purpose:
  - In the menu, select the option "SET SYS CONT".
  - With 1A, 1B, 1C, select the respective phase where "A" corresponds with phase 1, "B" with phase 2 and "C" with phase 3.
  - Change the measuring direction. In doing so, "Frd" stands for forwards and "rEV" for reverse.

PROCEDURE:

- Press the enter button for several seconds
- A password is requested
- Enter the password 1000 (using the arrow and enter button) and confirm by keeping the enter button pressed.
- Now the set-up menu is opened.
- Using the arrow buttons, scroll through the menu and select the desired parameters.
- To edit, press the enter button for several seconds until the parameter begins to flash. Now it can be adjusted using the arrow buttons. Confirm by keeping the enter button pressed again. The display indicates “good” if the parameter has been accepted.
- You can exit the set-up menu using the escape button.

[6] *The number after the ESCT-TU defines the size of the hole of the cable gland (ESCT-TU10 → Ø 10mm, ESCT-TU24 → Ø 24mm)*

VI. EARTHING

Every ground terminal (cliX, battery module, inverter, and battery rack) must be connected to the potential equalization. Here, the rules of local legislation must be followed.

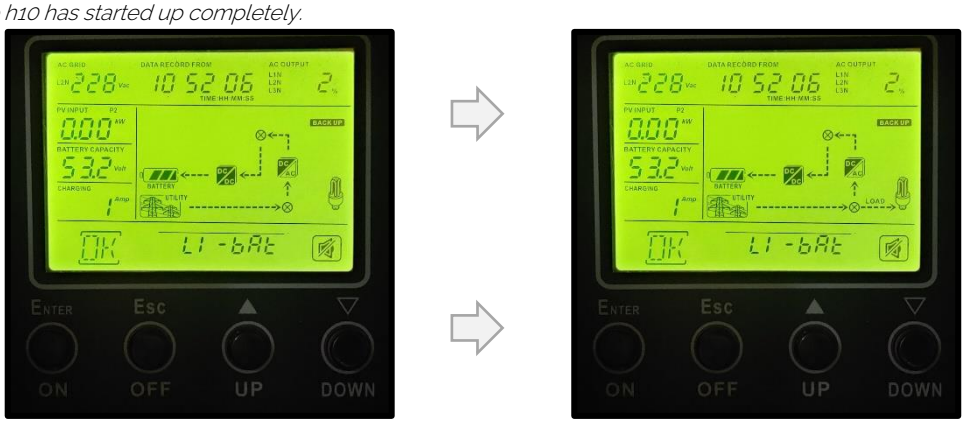
7. COMMISSIONING

SWITCHING ON THE SYSTEM

1. Switch on the AC supply line of the system
   The automatic bypass switches on, the bypass LED illuminates.
2. Switch on the input switch of the h10 inverter.
   The h10 inverter starts, warnings can be disregarded at this time.
3. Switch on the battery fuses/breakers.
   The battery cables are now connected through to the battery modules.
4. Using the device switch, switch on the battery modules one after another from the top to the bottom.
5. Keep the on button of every master module (7-14kWh 1 master module; 28-56kWh 4 master modules) pressed for 2-3 seconds.
   The power of the battery modules is unlocked. The status LEDs of the battery modules start to illuminate one after another from the top to the bottom. If this is not the case, the cabling of the battery communication must be checked.

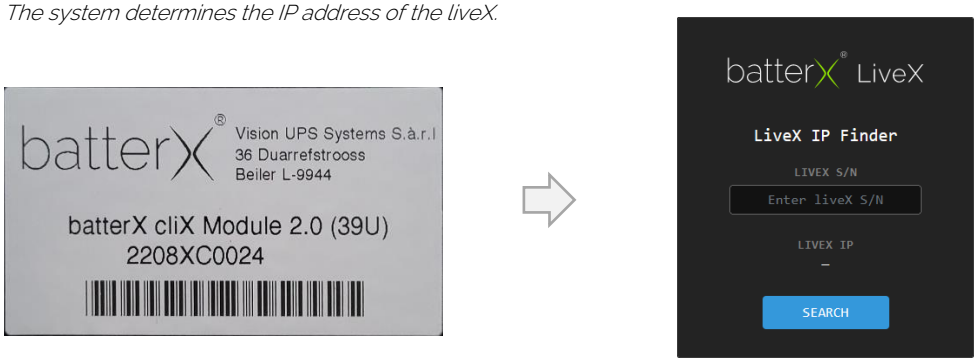
6. Wait until "Li-Bat" appears on the display of the h10 inverter.
   Communication between h10 and the battery modules has been successfully established. Now the battery modules are completely connected (communication and power).

7. Press the "ON" button for 2-3 seconds so that a small bulb appears at the bottom right on the display and wait until the UPS output synchronises with the system (±60 seconds).
   Now the h10 has started up completely.



8. Switch on the PV switch of the h10 inverter and the respective PV breaker(s) of the cliX module.
   Now, at least 1 PV array should appear on the display and start with the production.
   The h10 has started up completely.

9. Switch on the liveX breaker.
   The blue LED of the power supply lights up.
10. Switch on the RCD (marked with "RCCB").
    The loads of the protected outputs are now supplied with energy.
11. Open a browser[7] on a computer/laptop and enter http://batterx or batterx/ in the address bar. If the liveX cannot be reached in this way, it can be found using *"liveX IP finder"*. Simply enter https://batterx.app/ipfinder.php in the address bar[8] and enter the serial number of the cliX module.
    The system determines the IP address of the liveX.



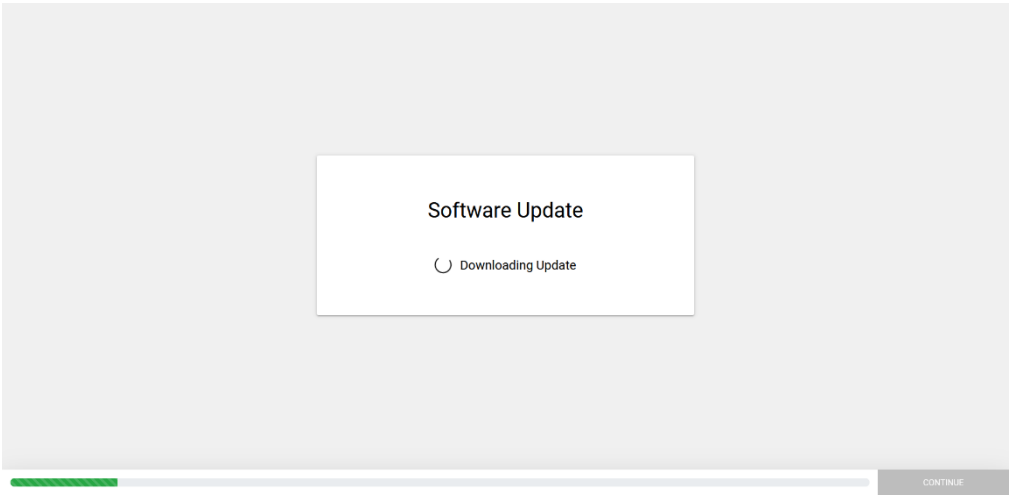
12. Enter the determined IP address in the browser.
    The installation routine will be opened.

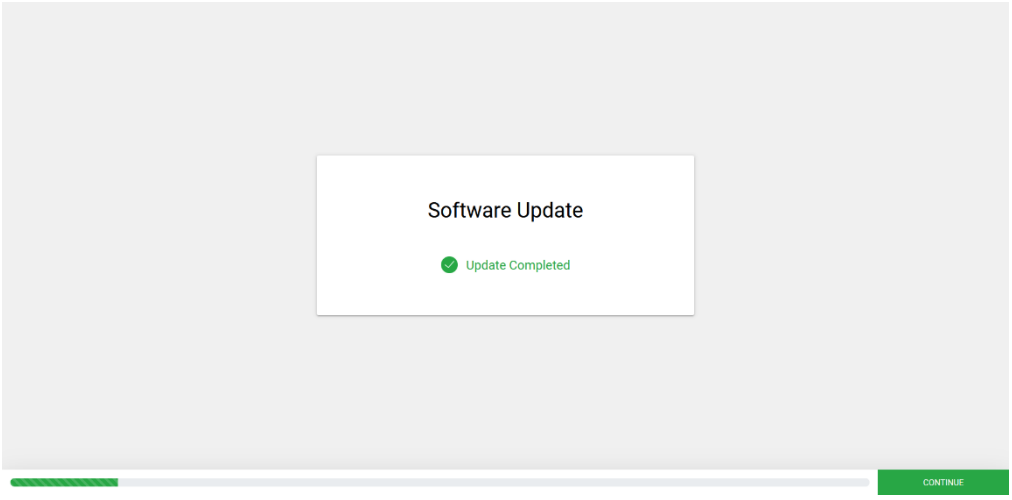
[7] *Internet Explorer is not supported.*
[8] *The computer / laptop must be in the same network as the batterX system.*

8. INSTALLATION ROUTINE

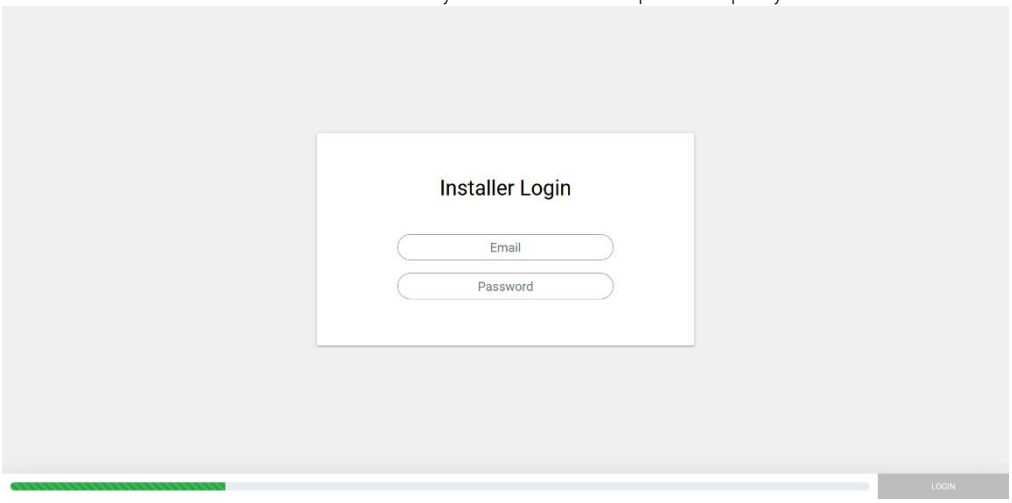
Language: The preferred language can be selected.

Software update: A search is carried out for software updates. In case a new version is available, it will be downloaded and installed. This can take several minutes.

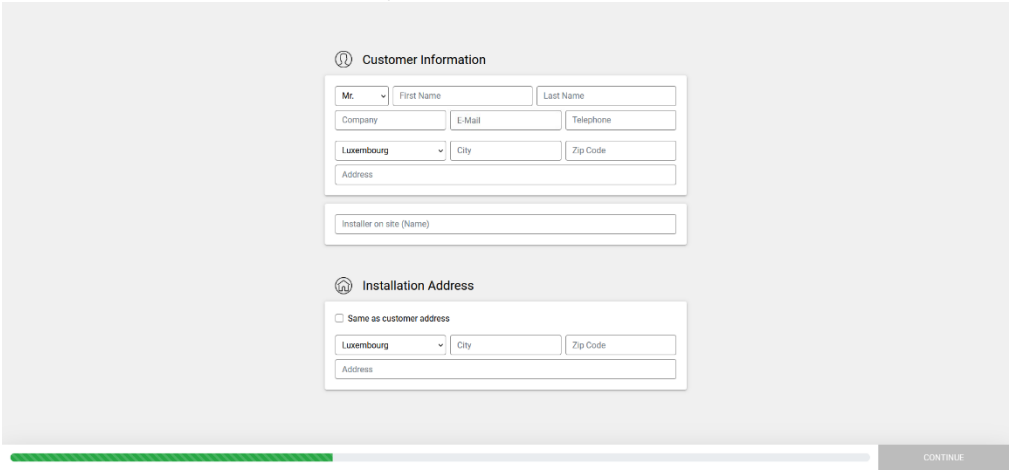


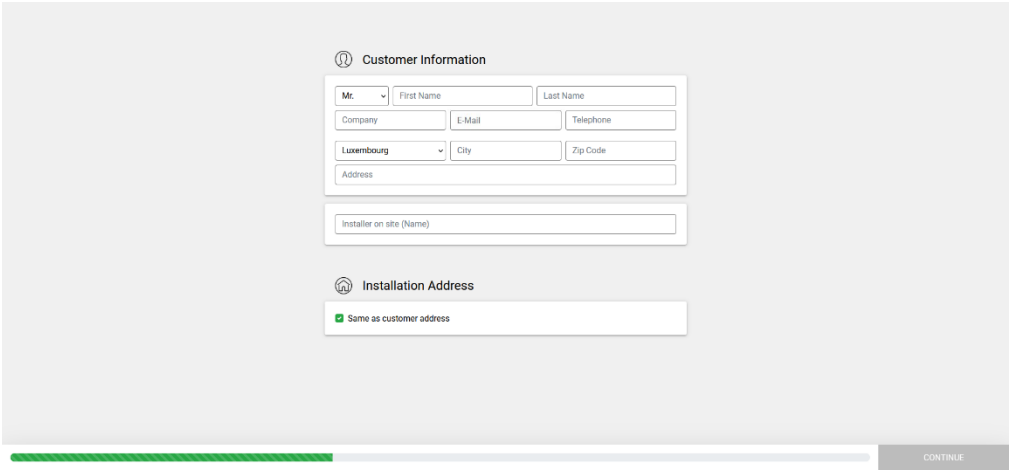


Installer login: The installer must login with their own account. As a result, this system is automatically allocated to this account.[9] There can only be one account per company.



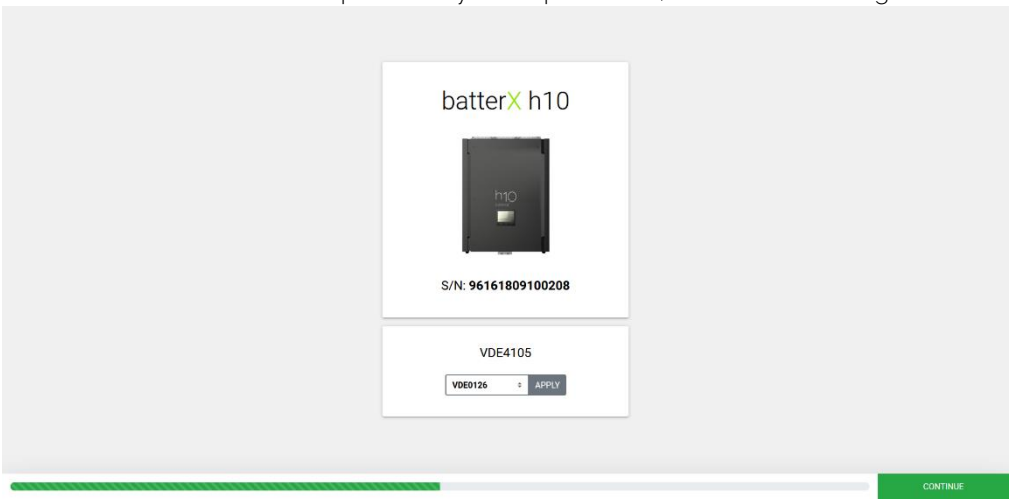
Customer information: Enter the customer information, installation address and installer.[10] If the installation address is the customer's address, please tick the "same as customer address" box.



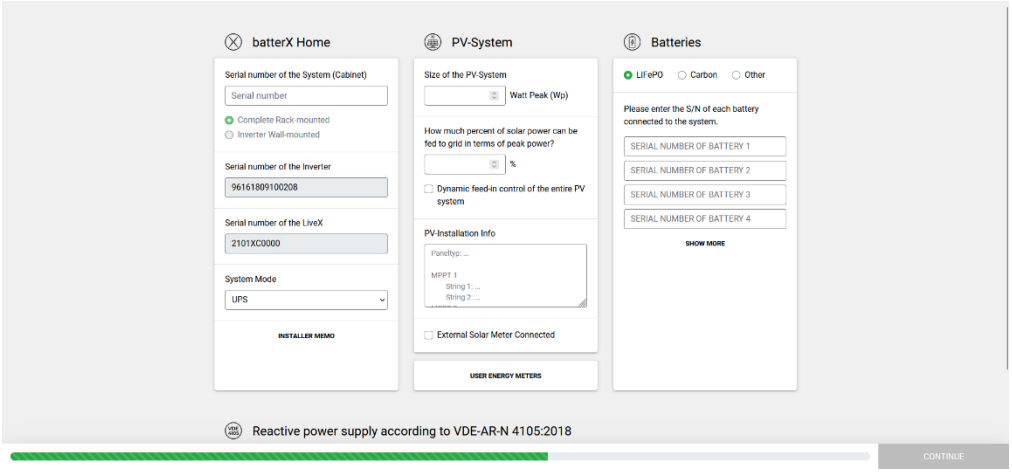


[9] *This account will be created by batterX after the certification training.*
[10] *This field offers the possibility to distinguish between different installers of a company, as they use the same account of the company.*

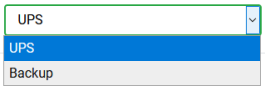
Device type: Inverter type, serial number and standard norm are detected by liveX automatically. In case the standard norm does not correspond with your requirements, it can also be changed here.



System information: Inverter, PV and battery information must be entered here.



- ***Serial number of the system:*** It is located on the inside of the cabinet. Example: 390200EP210001
- ***Serial number of the inverter:*** This serial number is located on the side of the inverter, is however, read by the system automatically,
- ***Serial number of the liveX:*** The serial number of the of the liveX is read out by the system automatically.
- ***System mode:*** The system mode decides if the system runs in UPS or backup mode. This setting must correspond with connector used on the rear side of the cliX module.

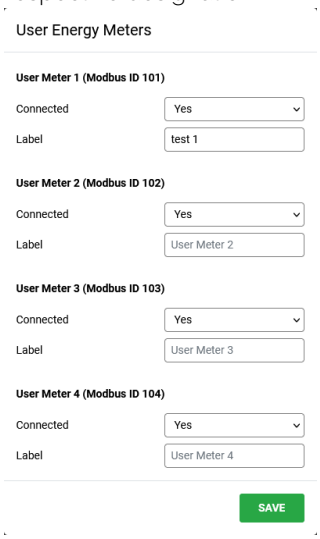


- ***Installer memo:*** Optional information for the installer.
- ***Size of the PV system:*** Total output of the PV system installed (in Watt)
- **Feed in limitation**: A factor which specifies how much of the installed PV output can be supplied to the network.
- ***Dynamic feed-in control of the entire PV system[11]:*** This function allows the system to take over the control of the entire PV plant. For this purpose, the h10 can reduce the PV production to 0% instead of 70%. A prerequisite for this is that at least the generating power to be limited is connected to the h10.

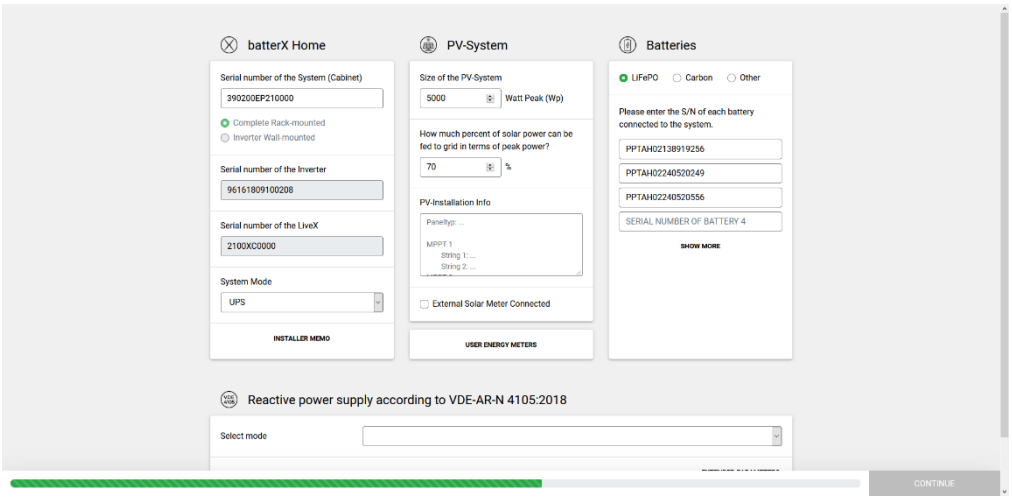
Total PV	*30kW*
Regulation	*70%*
PV h10	*≥ 9kW (30%)*
PV extern	*≤ 21kW (70%)*

[11] *This option is only relevant if external grid connected generators are included in this system (e.g. PV plant).*

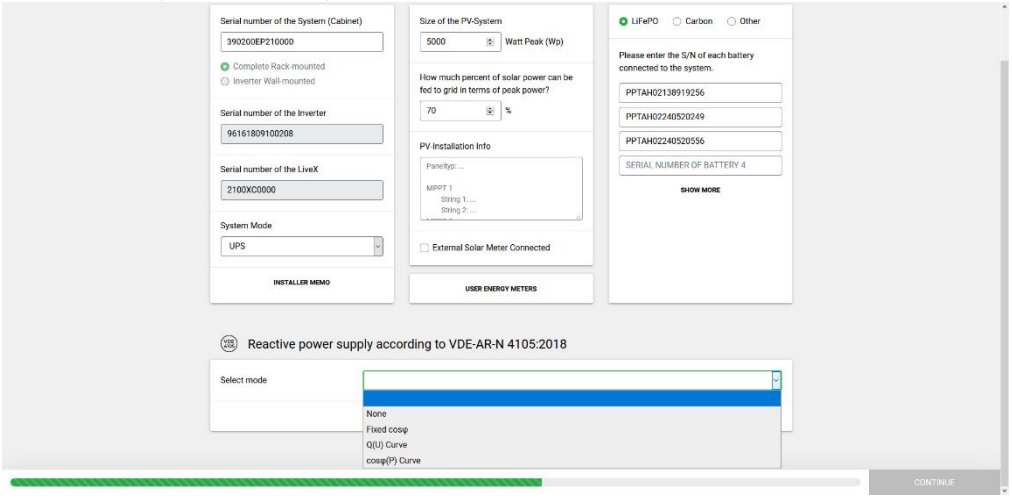
- ***PV installation info:*** Optional information regarding the PV system.
- ***User energy meters:*** The user energy meters allow specific loads (& generators) to be recorded and displayed separately in the portal. It is important to note that this data is only displayed in the portal and has no influence on the calculations of the energy flow.
  Up to 4 consumption meters can be installed per system, each with a fixed Modbus address, which must be set accordingly. During commissioning, it should be specified which of these meters is active with a respective designation.



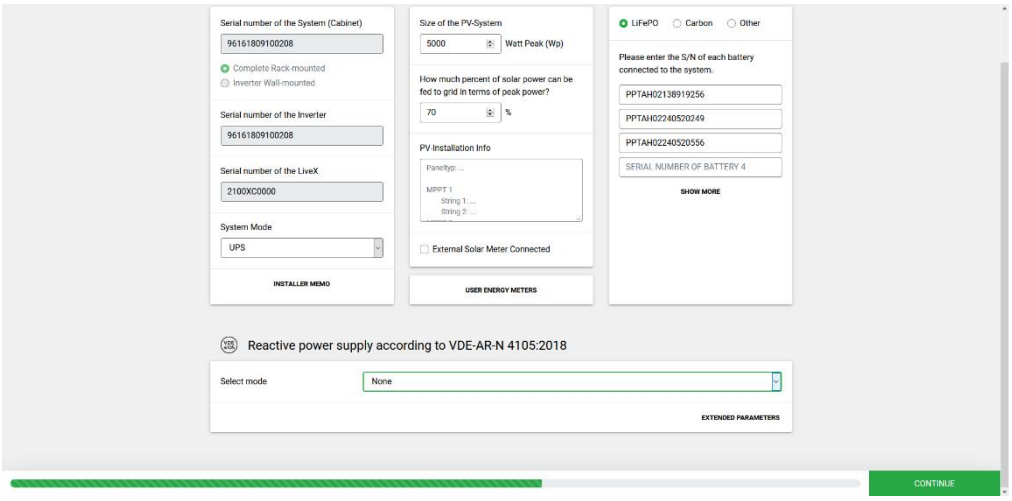
- ***Batteries:*** Specify the connected battery type.
  - LiFePo: The serial numbers of each individual module must be entered
  - Carbon: Type, quantity and total capacity must be specified. In doing so, the settings apply for in-house batteries.
  - Miscellaneous: With third party batteries, the voltages and currents must be entered manually. This is carried out at your own responsibility.



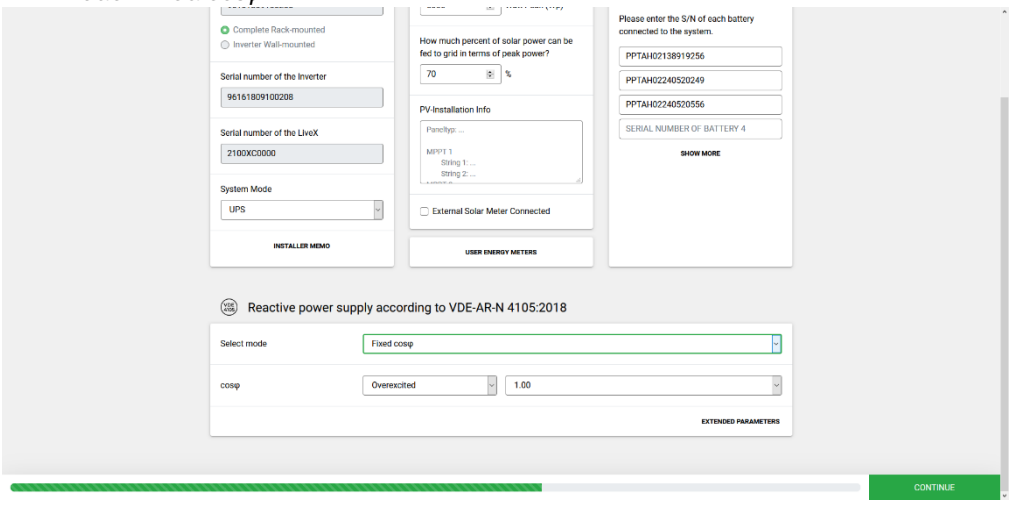
Setting the reactive power behaviour [12]: The mode prescribed by the power supplier must be set. Some modes still require additional parameters.



- ***Mode: "None"***

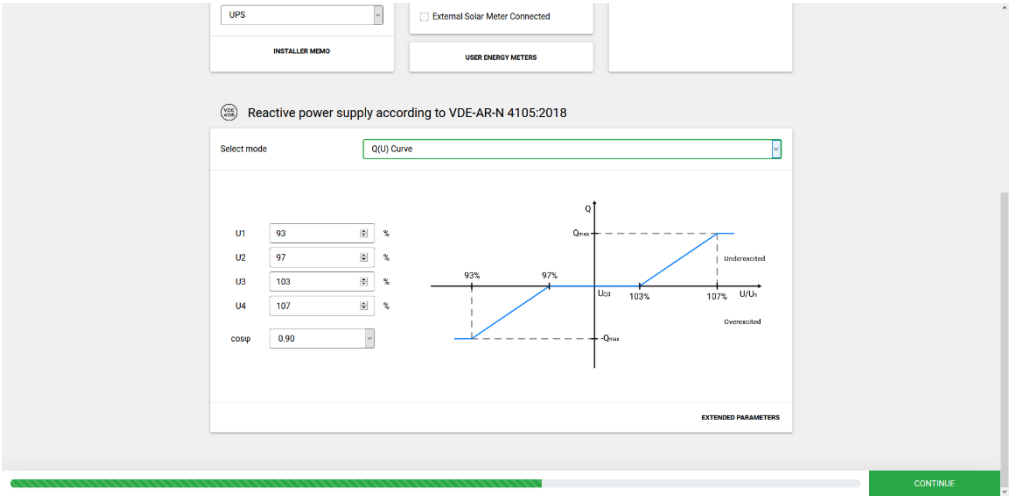


- ***Mode "Fixed cosφ"***

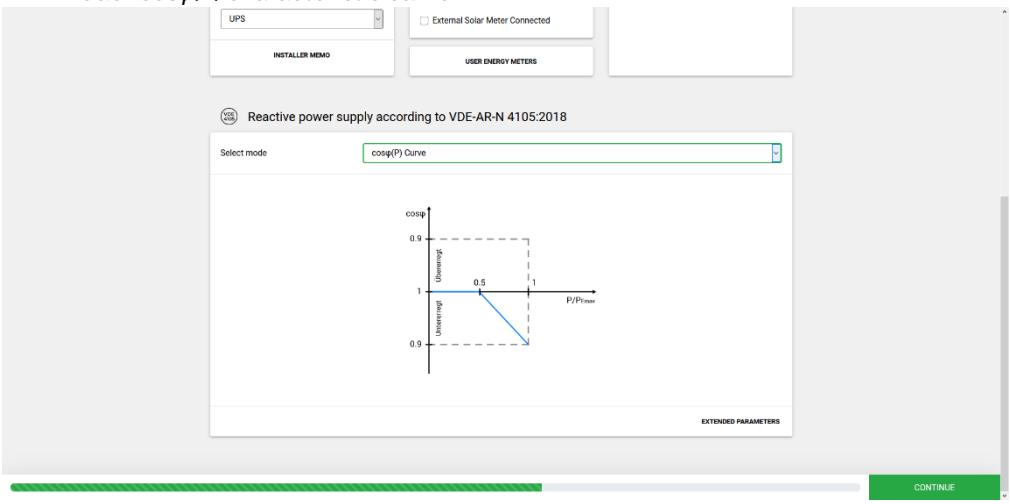


[12] *Only available for the standards "VDE4105", "TOR" and "Estonia".*

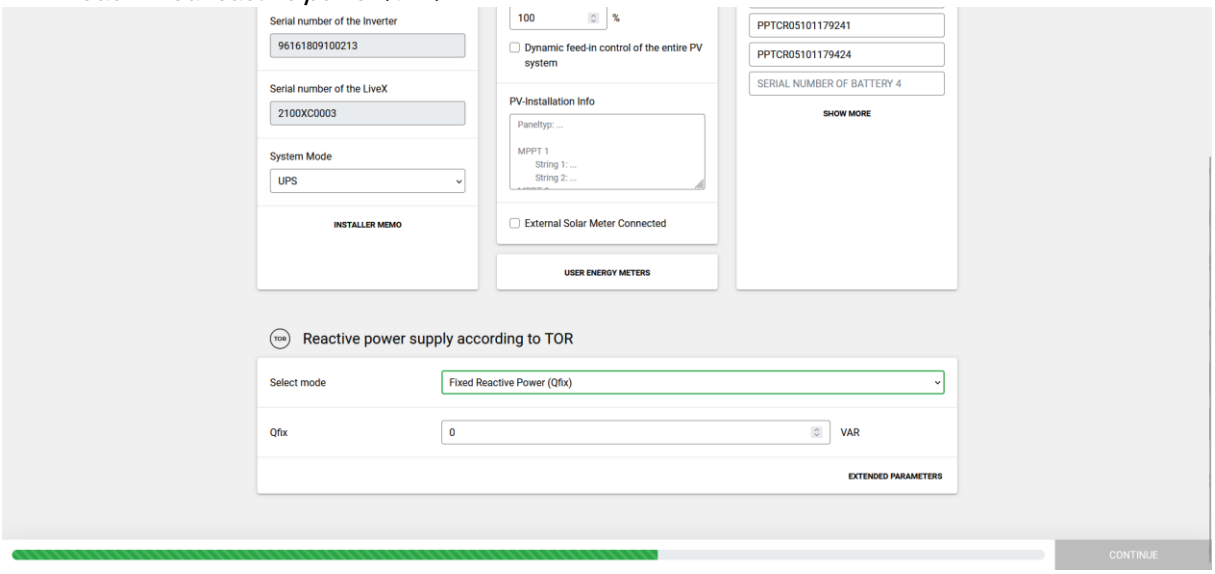
- *Mode "Q(U) characteristic curve"*



- *Mode "cosϕ(P) characteristic curve"*

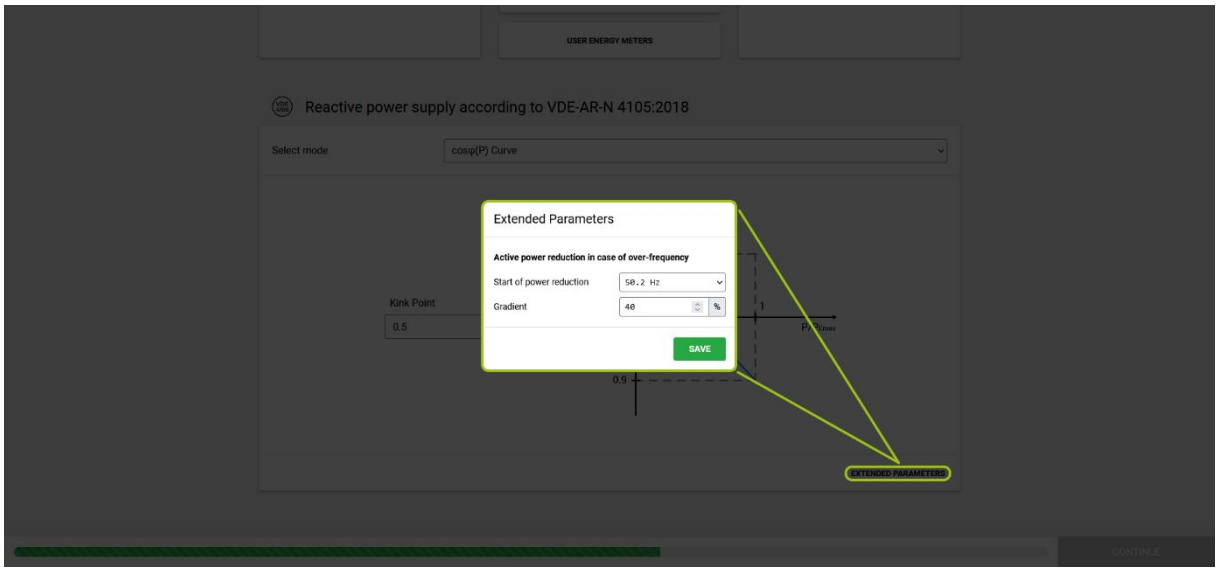


- *Mode "Fixed reactive power (Qfix)"* [13]

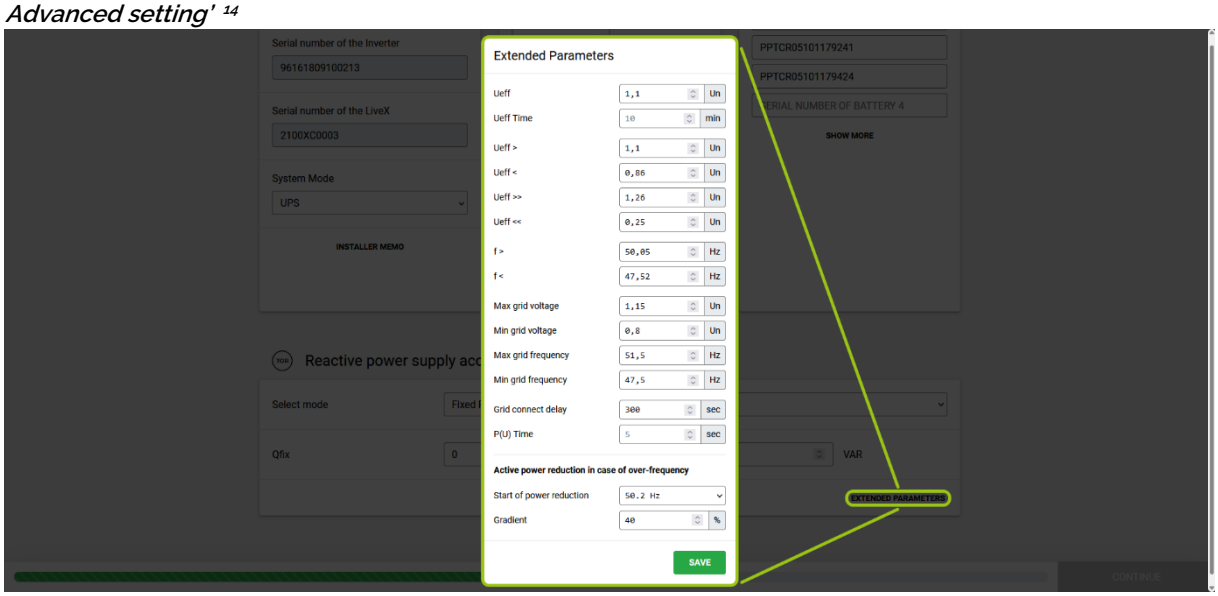


- *Advanced setting*

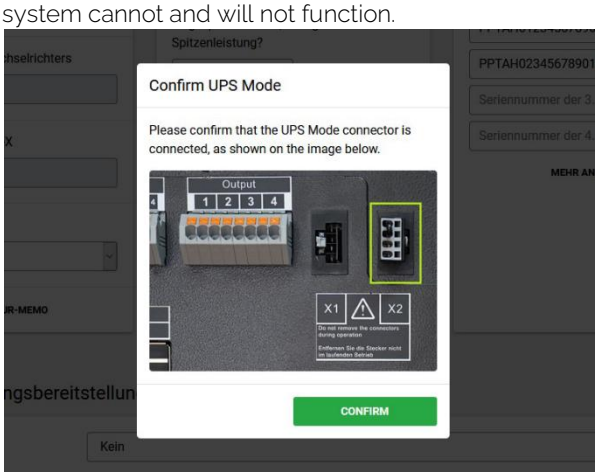
[13] *Only available for the „TOR" standard.*

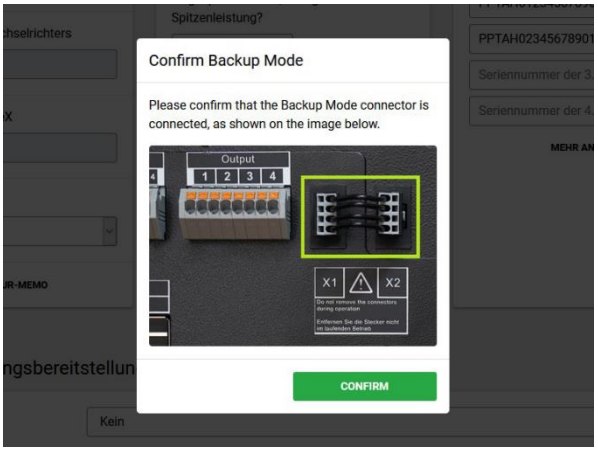


- *Advanced setting'* [14]



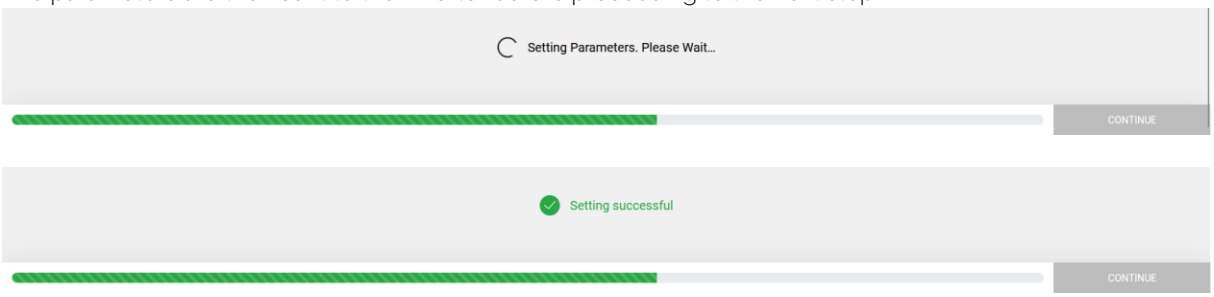
Finalizing the configuration: Once all system and reactive power settings have been made, one only has to confirm that the operating mode set corresponds with the connector installed. If this is not the case, the system cannot and will not function.





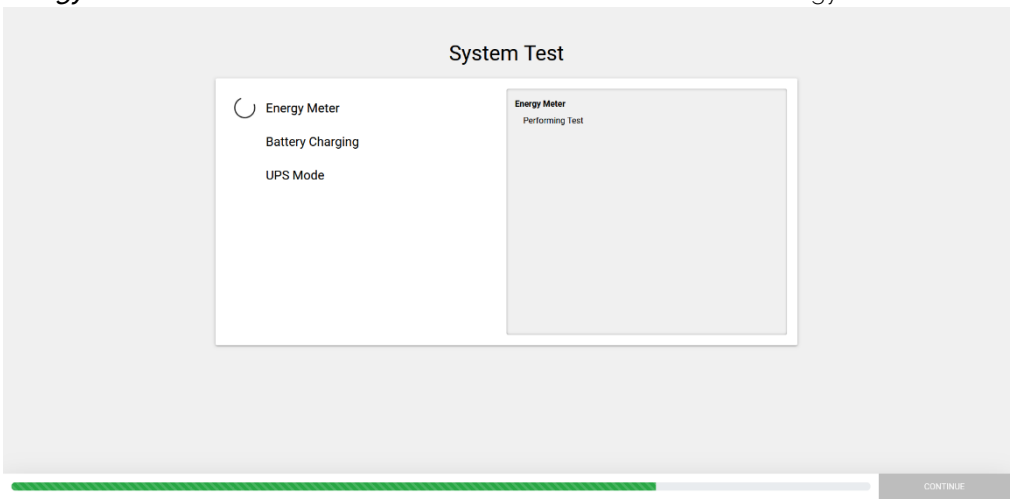
[14] *Only available for the „TOR" standard.*

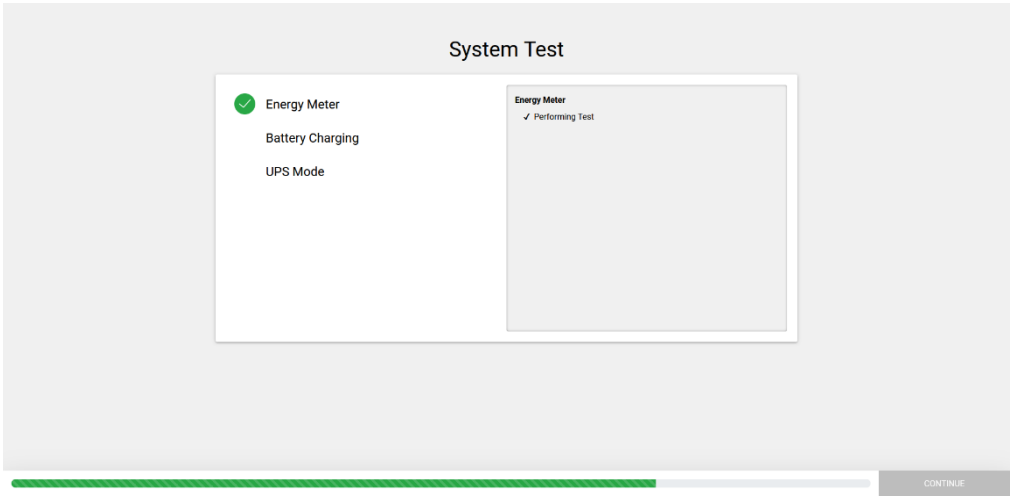
The parameters are then sent to the inverter before proceeding to the next step.



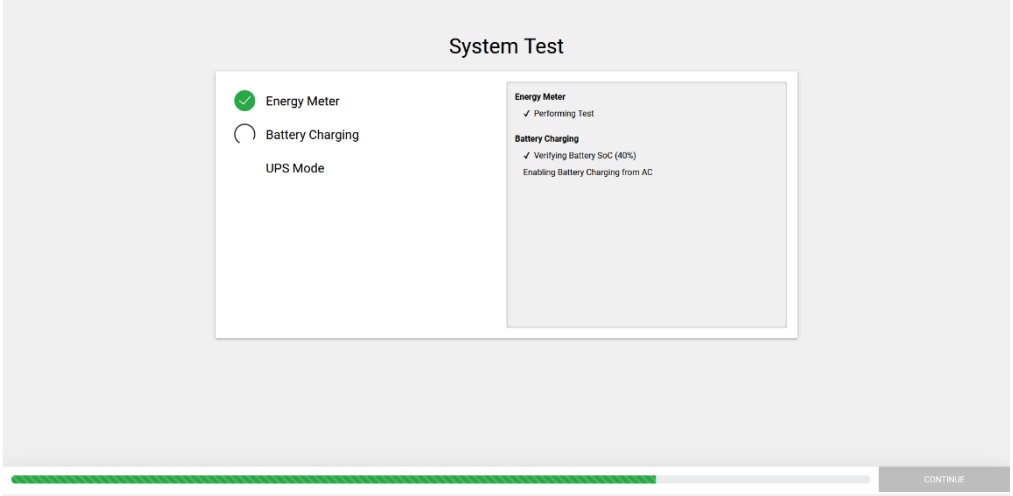
System test: A system test is carried out which checks the individual functions of the system in sequence to allow the installation to be concluded thereafter.

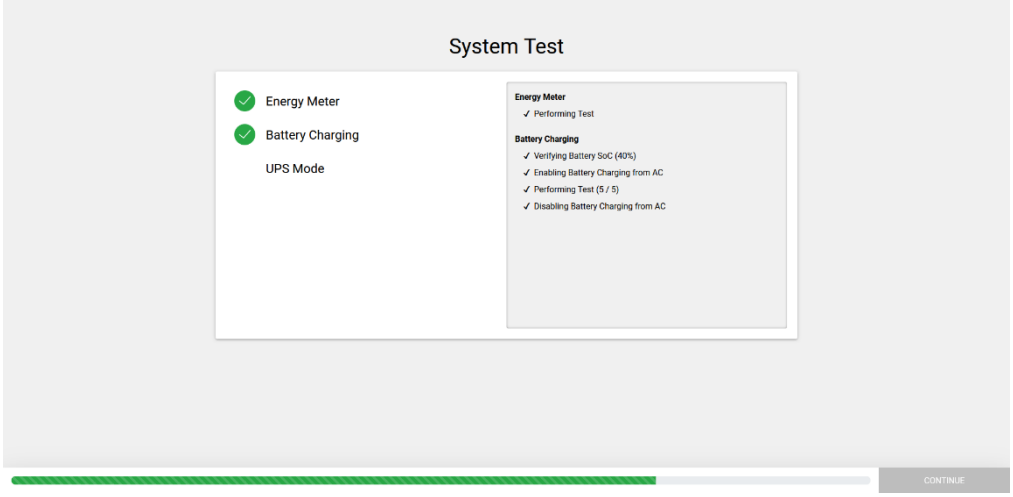
- ***Energy Meter:*** Checks if communication has been established to the energy meter.



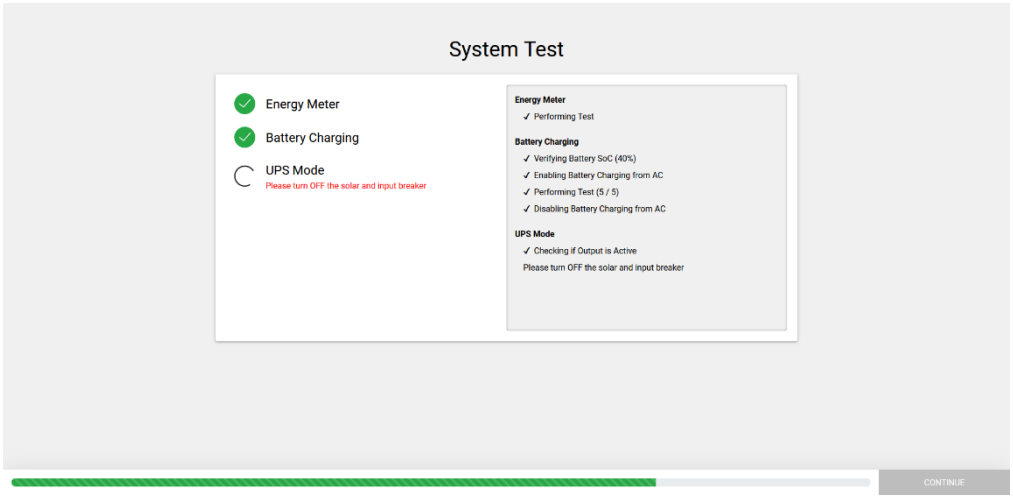


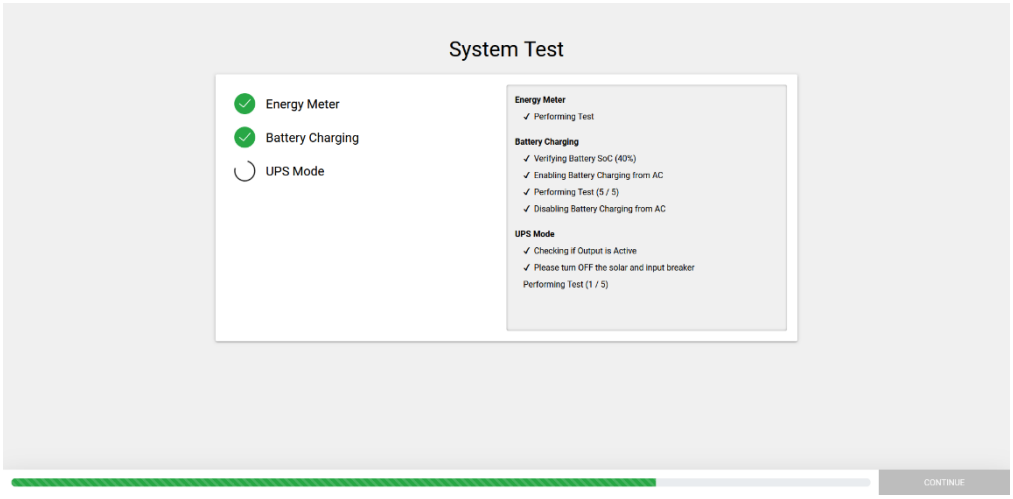
- **Battery Charging:** During the test of battery charging, the SoC is always checked first. If it is below 20%, the battery is charged until then, to ensure that sufficient reserve capacity is available for the discharge process of the tests. At a value higher than 90%, the battery is discharged until then, to provide reserve capacity for the charge process of the tests.

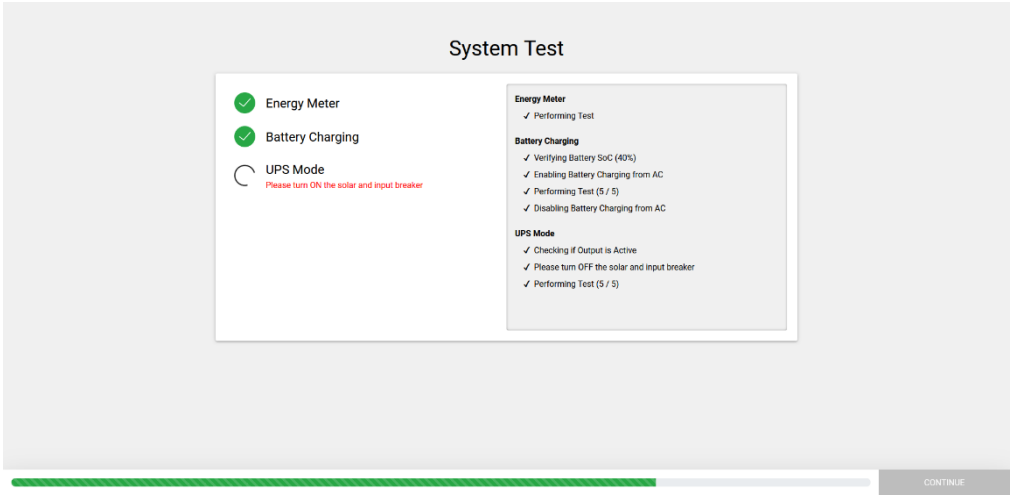


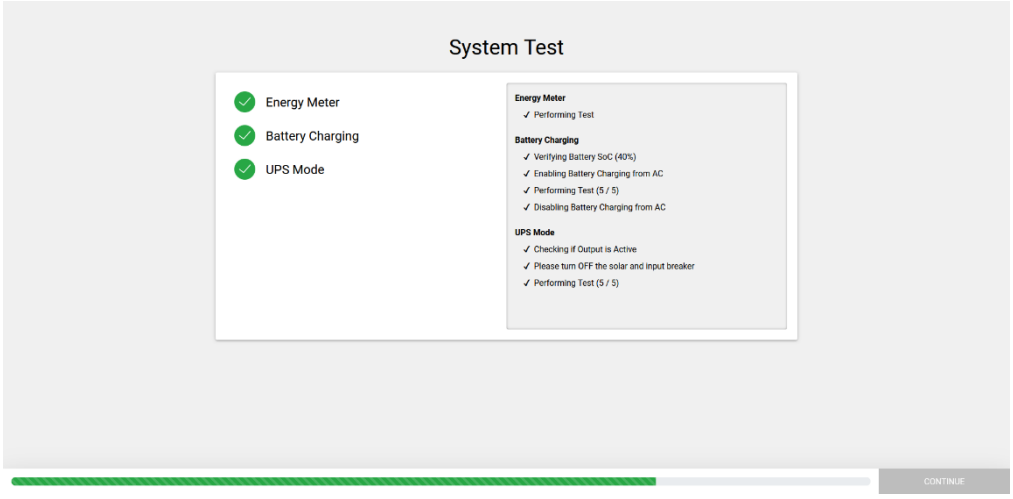


- ***UPS mode:*** To provide a real test of the UPS / backup electricity, first the supply line must be switched off and then switched back on again. This should only be carried out if prompted to do so by the installation routine.

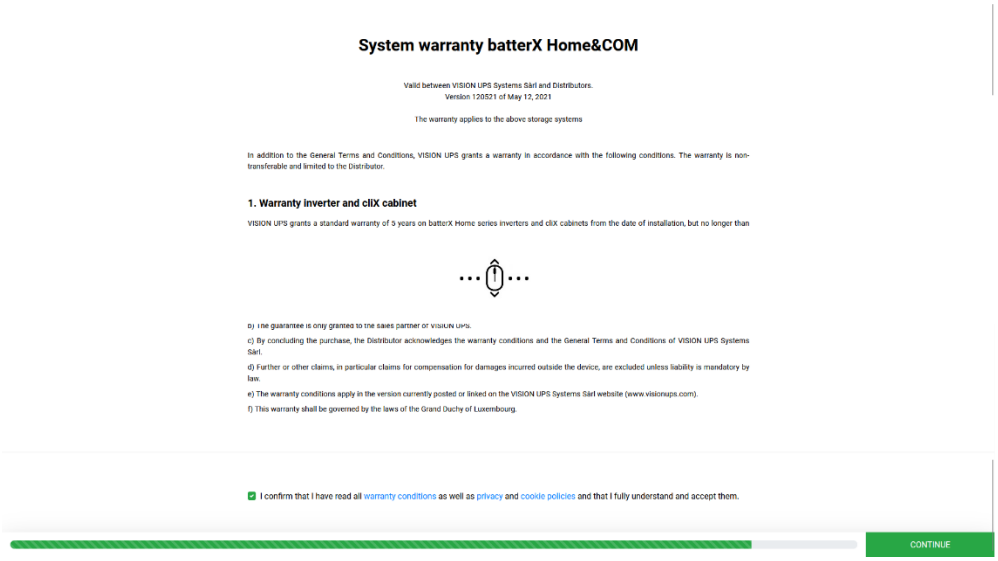



System Test
Energy Meter
Battery Charging
UPS Mode
Energy Meter
✓ Performing Test
Battery Charging
✓ Verifying Battery SoC (40%)
✓ Enabling Battery Charging from AC
✓ Performing Test (5 / 5)
✓ Disabling Battery Charging from AC
UPS Mode
✓ Checking if Output is Active
✓ Please turn OFF the solar and input breaker
Performing Test (1 / 5)
CONTINUE

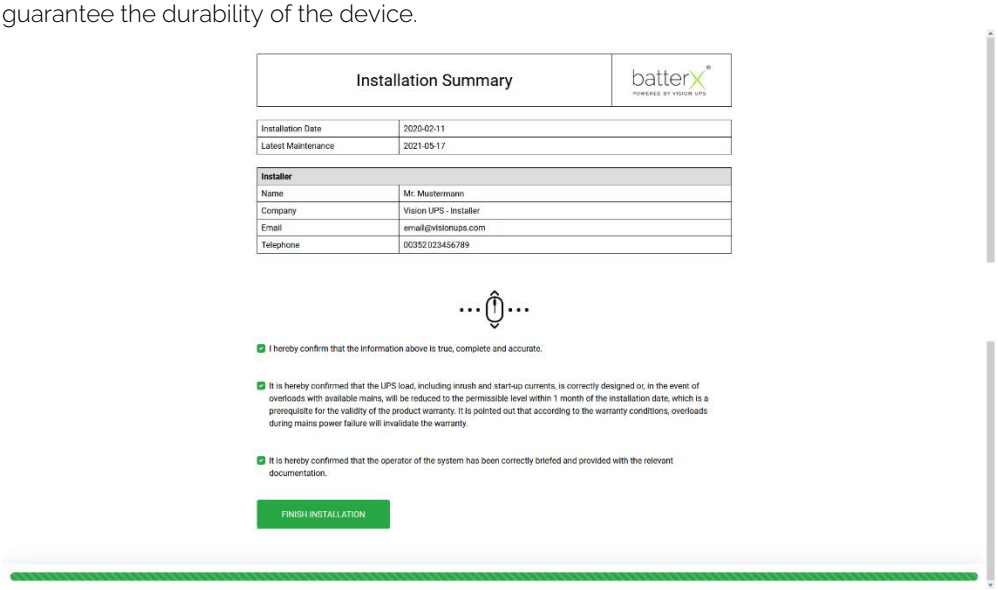

System Test
Energy Meter
Battery Charging
UPS Mode
Please turn ON the solar and input breaker
Energy Meter
✓ Performing Test
Battery Charging
✓ Verifying Battery SoC (40%)
✓ Enabling Battery Charging from AC
✓ Performing Test (5 / 5)
✓ Disabling Battery Charging from AC
UPS Mode
✓ Checking if Output is Active
✓ Please turn OFF the solar and input breaker
✓ Performing Test (5 / 5)
CONTINUE


System Test
Energy Meter
Battery Charging
UPS Mode
Energy Meter
✓ Performing Test
Battery Charging
✓ Verifying Battery SoC (40%)
✓ Enabling Battery Charging from AC
✓ Performing Test (5 / 5)
✓ Disabling Battery Charging from AC
UPS Mode
✓ Checking if Output is Active
✓ Please turn OFF the solar and input breaker
✓ Performing Test (5 / 5)
CONTINUE

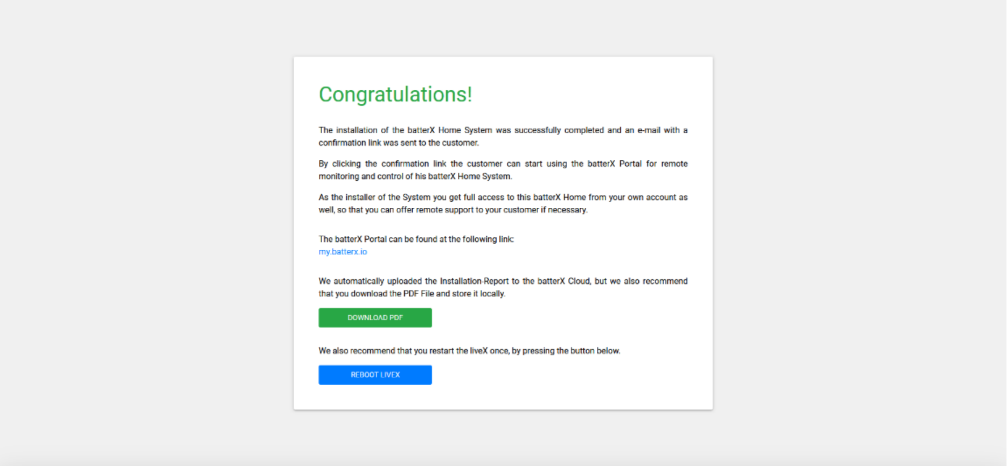
System guarantee: On the screen of the system guarantee, you will find all useful information about guarantees. This must be confirmed before you can continue with the next step.



Installation report: Afterwards, there is a summary of the specified data. These must be confirmed again. Additionally, you must agree to free the system from overloads if they occur regularly. This must be done to guarantee the durability of the device.



Conclusion of the installation routine: Upon completion, an email with the login data will be sent to the customer. It is also recommended to restart the liveX monitoring by pressing the blue button.



- ***E-mail of the customer***

From: batterX <batterx.noreply@gmail.com>
Sent: Thursday, February 16, 2023 8:26 AM
To: Gavrilov, Ivan - VisionUPS <ivan.gavrilov@visionups.com>
Subject: [batterX] Please verify your account!

Congratulations!

Your new batterX Home System has been successfully installed!
To start using your system, please activate your account by clicking on the following link:

https://batterx.app/accountverify.php?lang=en&v=914c60fb1aaaa3e4065d33d8ae321efdcfb6c78044d195713a72117974df9

Your email address is: **info@visionups.com**
Your password is: **batterx**

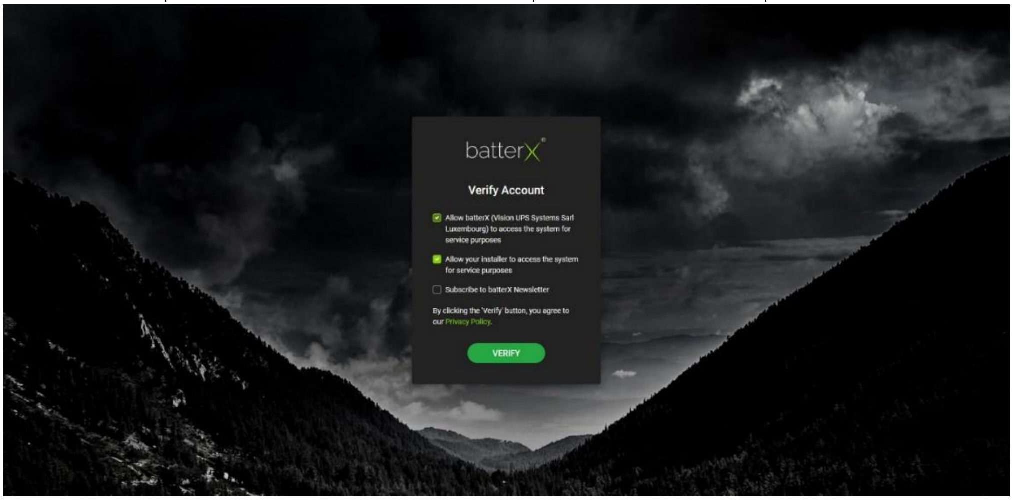
We recommend that you change your password to a password of your choice.
Please also note our Privacy Policy.

If you have any questions, please do not hesitate to contact us at info@batterx.de

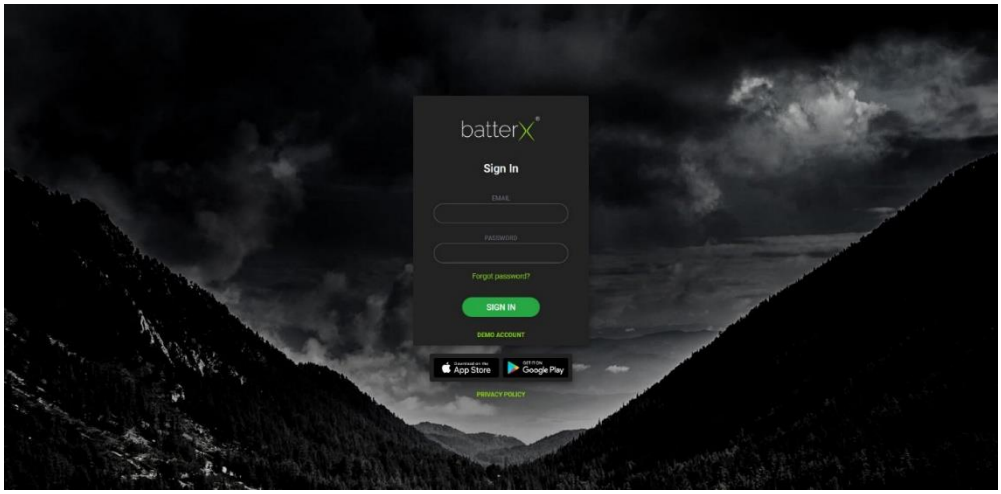
Yours sincerely
batterX Service Team

VISION UPS Systems Sarl
Duarrefstrooss 36, 9944 Beiler, Luxembourg
info@visionups.com
batterx.de – batterx.app

- ***Verification:*** Before verifying the customer account, it must be specified who will have access to their data. This data is required in service cases to allow a quicker and better response.



- **Logging in:** Then the customer can login via the app or at https://my.batterx.io. Now the system should also be visible for the installer in their account.



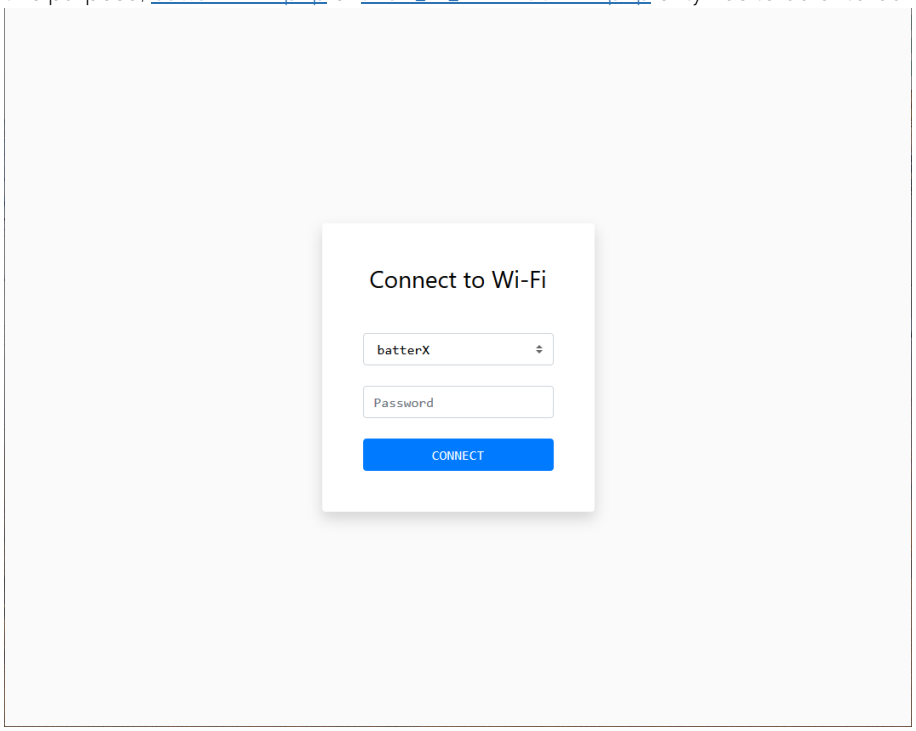
9. FINAL INSTALLATION

1. The supplied cover angle can be attached to cover the connected cable.
2. The excess of the battery cable can be stowed away on the 19" rack and secured with cable ties before subsequently remounting the side panels.
3. Cover all unoccupied slots on the front side with blank covers.
4. Mount the door back on the rear side of the 19" rack.
5. Mount the glass door back on the front side.

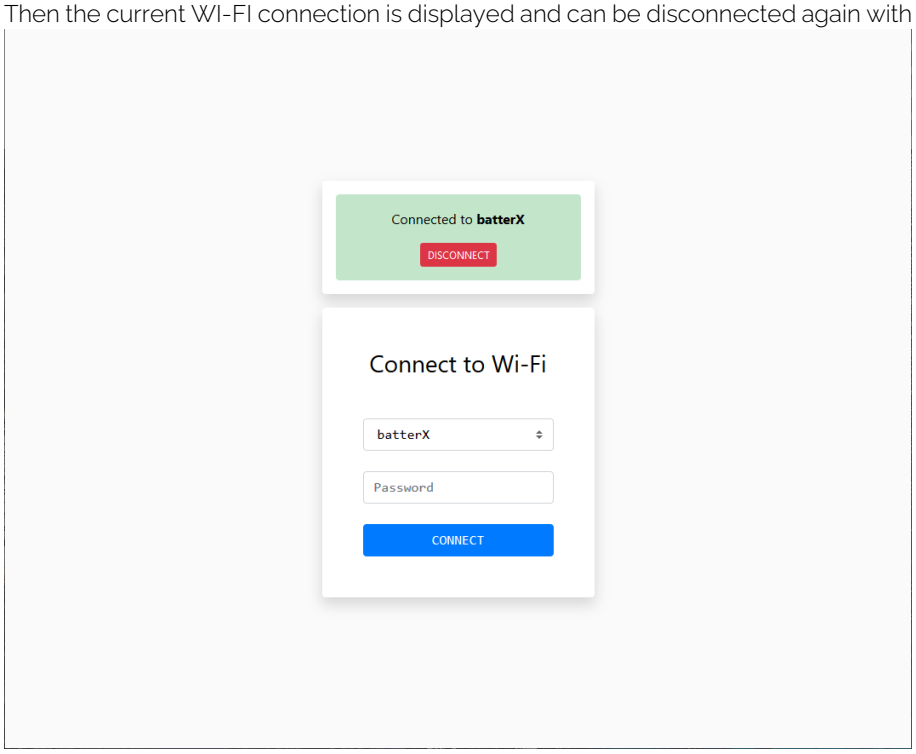
Congratulations, you have successfully completed the installation!

10. WI-FI (OPTIONAL)

The internet connection of the liveX can be changed to WI-FI after the installation has been completed. For this purpose, batterx/wifi.php or liveX_IP_ADRESS/wifi.php only has to be entered in the address list.



Select the desired WI-FI network and enter the respective network code.
Then the current WI-FI connection is displayed and can be disconnected again with the “disconnect” button.



11. BATTERY EXTENSION

If a system with battery modules of type B, should be extended with battery modules of type C, the following points must be considered:

- Please contact us if your system already contains 8 or more type B battery modules. In this case, the battery communication must be adjusted.
- The master module must be a type-C module.
- The cliX-COM type-B cable must be replaced by a cliX-COM cable type-C.
- The compatibility of the Modbus-BMS-Card must be checked before placing an order. Therefore, check the serial number of the inverter. If the 5th and 6th digit are equal to or greater than **21**, the die Modbus-BMS-Card is compatible. In the example shown below, the Modbus-BMS-Card is not compatible.

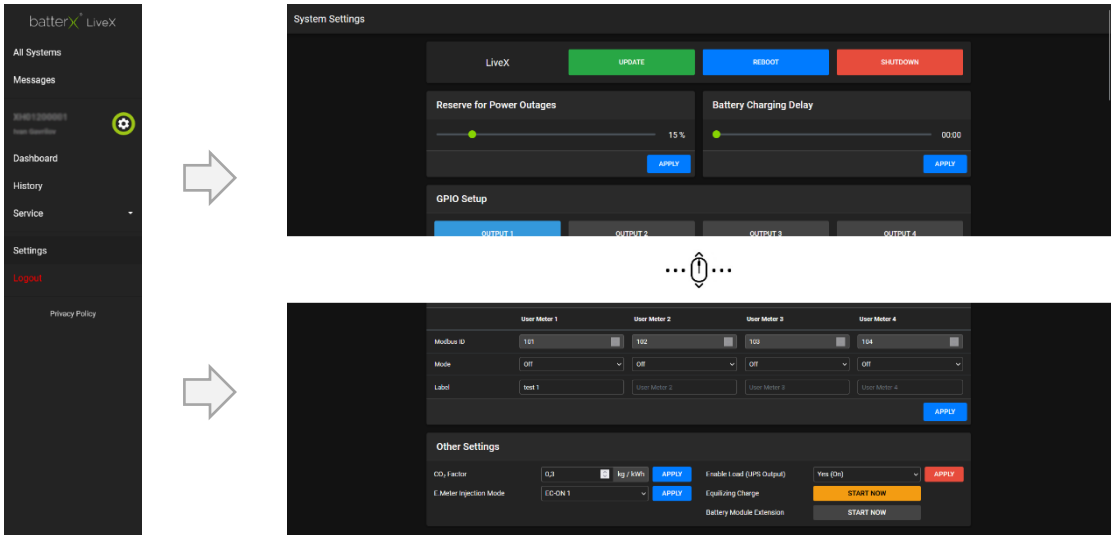
  961618**09**100208

  If the Modbus-BMS-Card is not compatible, it must be replaced by the latest version. It must be ordered separately.

PROCEDURE

To extend the battery storage, some things must be considered. Please read all instructions carefully *before* starting the capacity expansion.

1. **Bringing installed battery modules to a defined state of charge:** To get the existing and new battery modules to work together, they must be brought to a state of charge as equal as possible. Depending on their condition, this can take a while.



2'. **Replacing the Modbus-BMS-Card[15]:** The Modbus BMS card is located on the bottom of the h10 inverter and fixed with two small screws. After these have been removed, the card can be pulled out downwards during operation. The new card must then be placed in the guide rails provided and pushed in with light pressure. You should feel the card snap into place with a clicking noise at the last centimeter.

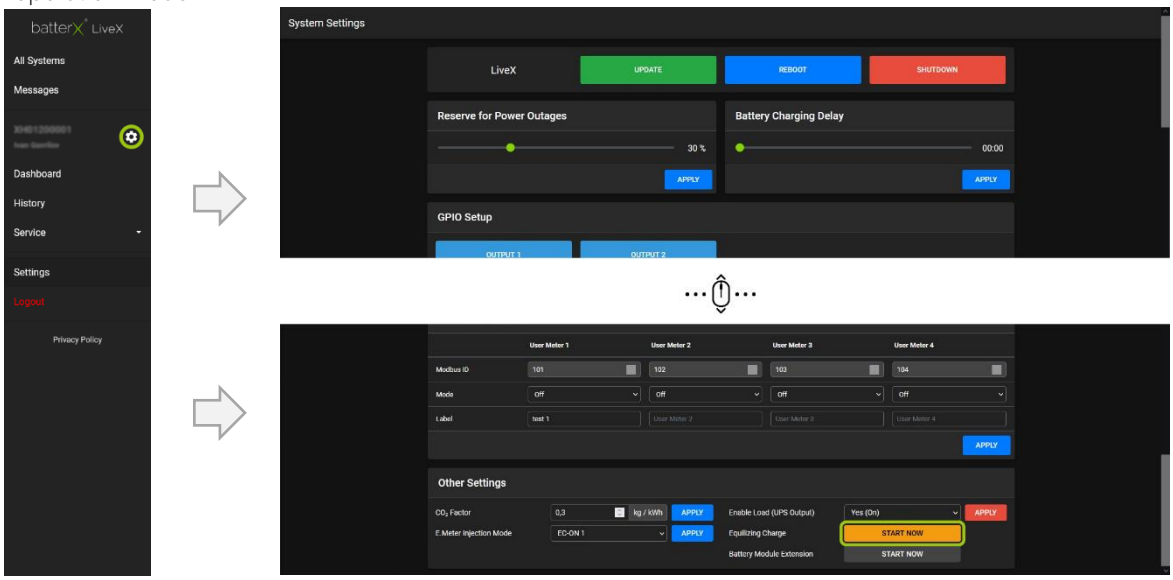
[15] *Only if Modubus-BMS-Card is not compatible.*

2. **Install new battery modules and reconnect:** After charging, the new battery modules can now be installed and connected as described in the installation manual. It is important that all battery modules must be restarted after changing the communication cabling or address switch configuration.

3. **Switch on the battery modules:** To switch on again, carry out point 3-5 of chapter "7. Commissioning".

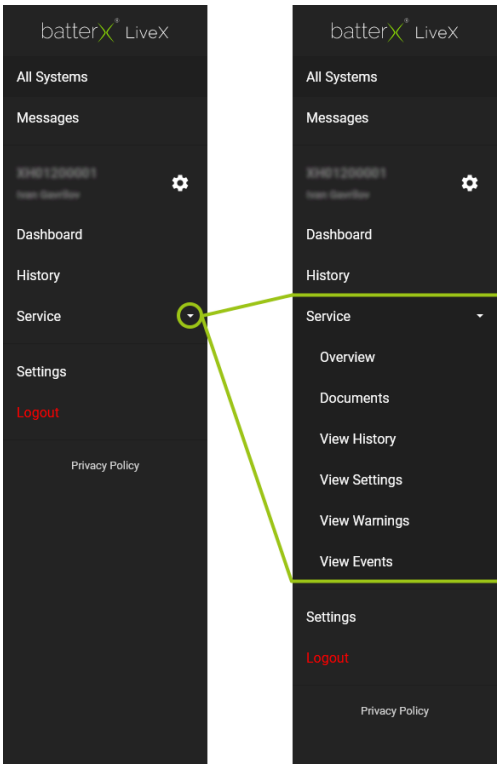
4. **Installation routine:** To test the system and to be able to include the necessary information in our portal, you have to repass the installation routine. Here, a new installation report is generated, which captures the capacity extension.

5. **Equalizing Charge:** The equalizing charge balances the cells of all battery modules by charging them to 100% capacity. The cell balancing can last several days. The system then switches automatically to a normal operation mode.

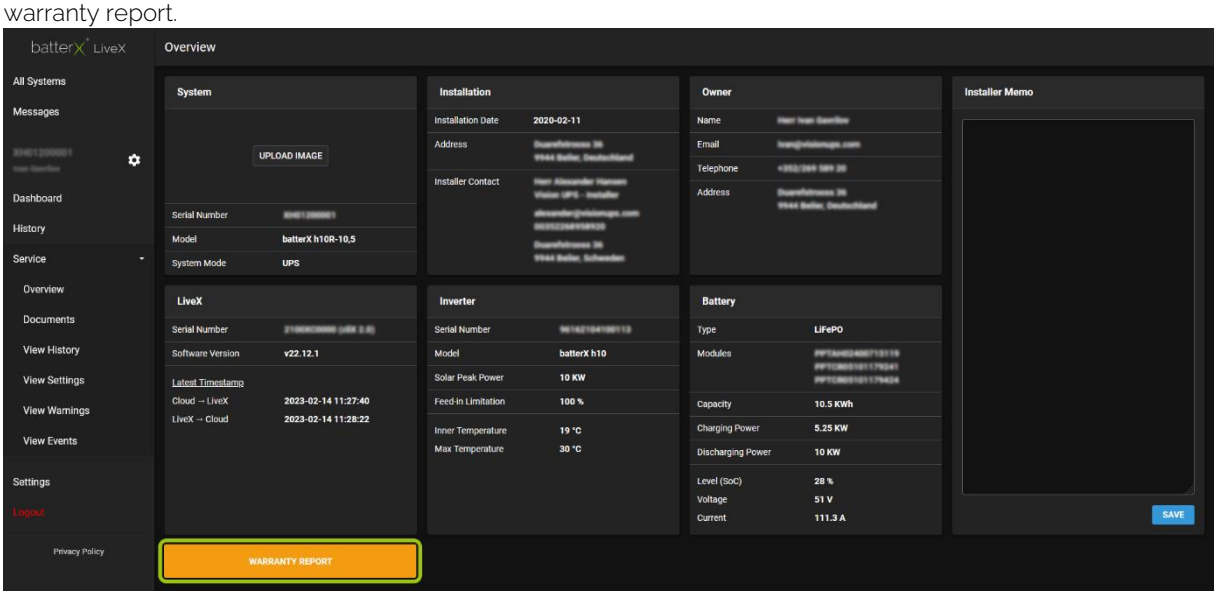


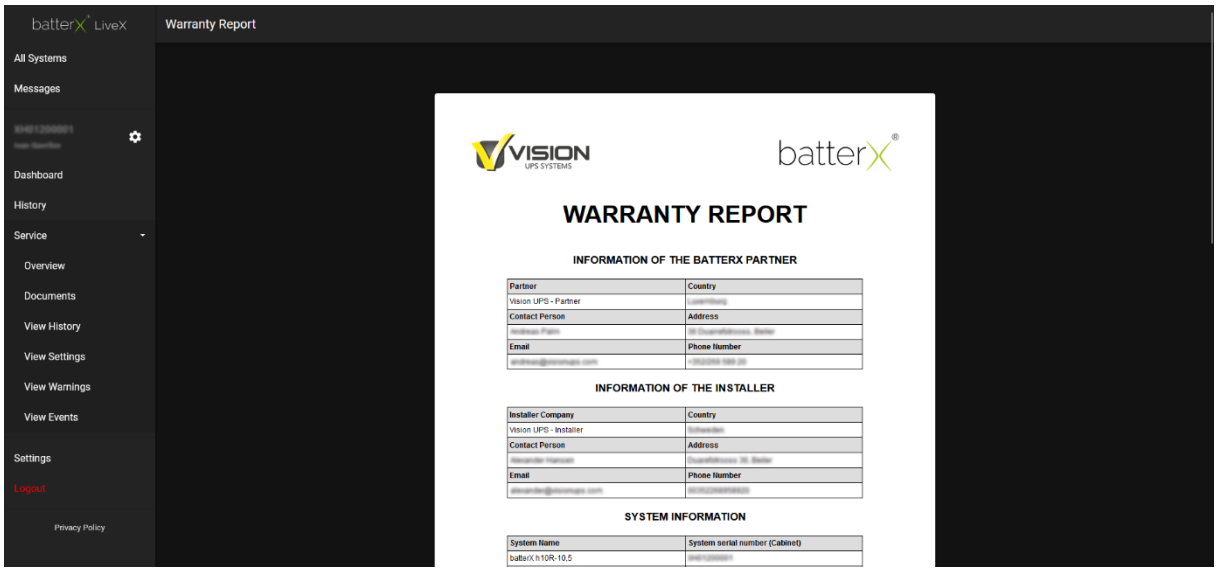
12. WARRANTY PROCESSING

If a defect has been detected on a unit, an automatic warranty report can be created via the portal. To do this, open the "Overview" menu in the installer's account, which is in the "Service" area.



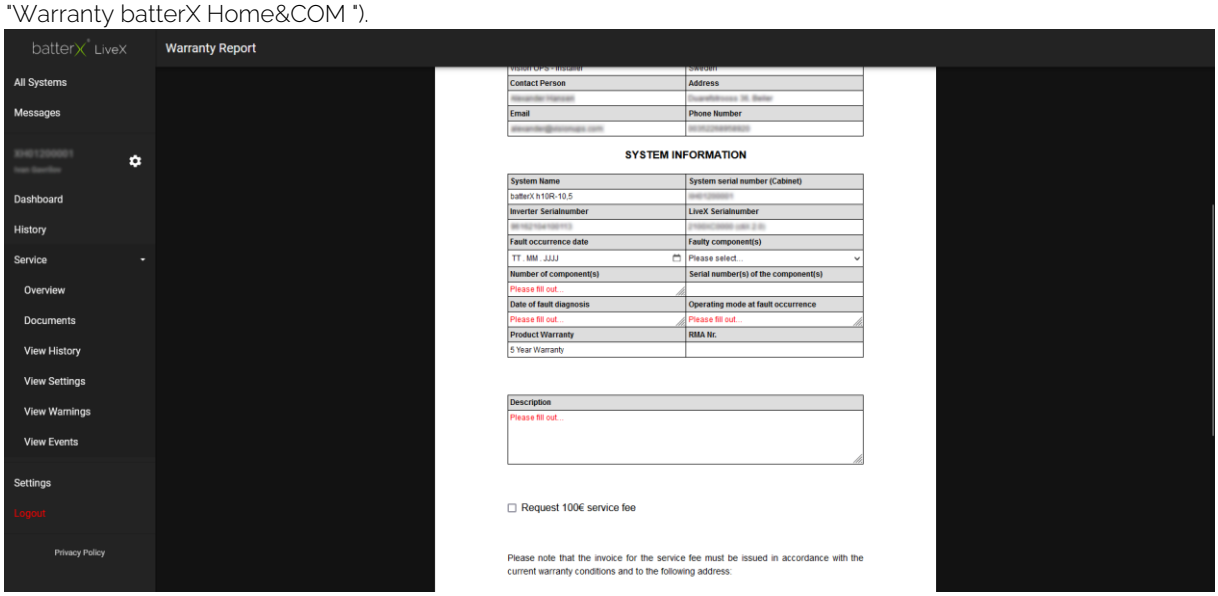
1. **Create a warranty report**: Press the orange button at the bottom left of the overview to open the warranty report.



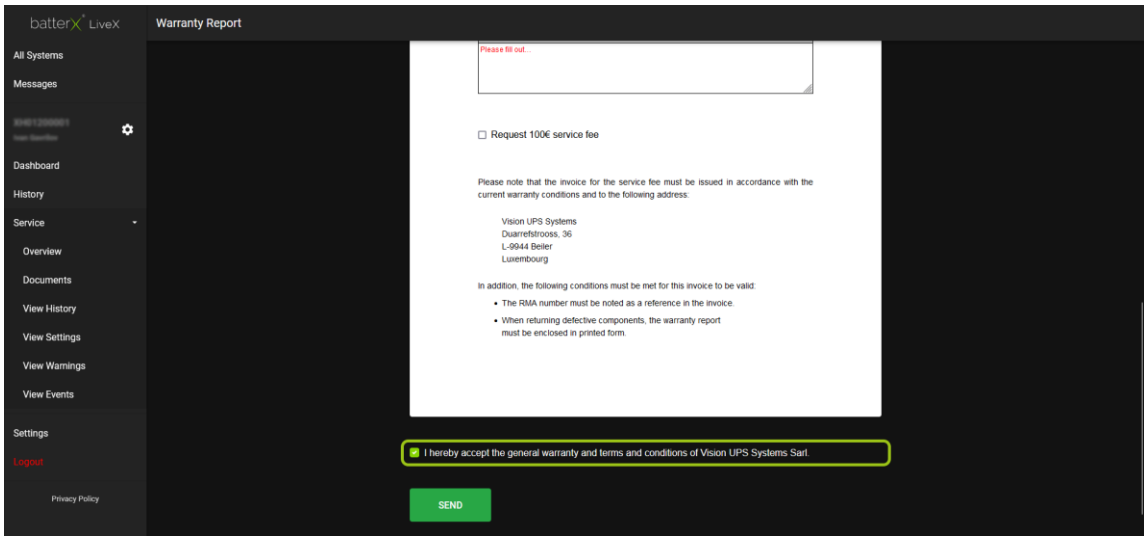


2. **Fill in the warranty report:** Fill in the warranty report: A large part of the data in the warranty report is already filled in automatically. However, the following information must be entered manually:

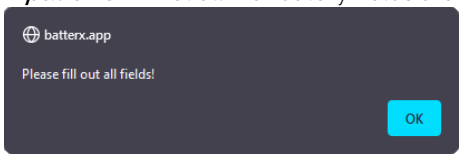
- ***Fault occurrence date:*** Date on which the fault occurred. If the exact date cannot be determined, it is sufficient to enter an estimate here.
- ***Faulty component(s):*** Component(s) of the system which is/are faulty.
- ***Number of components:*** Indication of how many of the above components are defective.
- ***Serial number(s) of the component(s):*** Serial number(s) of the defective component(s). The number of serial numbers should correspond to the "Number of component(s)".
- ***Date of fault diagnosis:*** Date on which the installer examined the installation on site.
- ***Operating mode at fault occurrence:*** State of the system at fault occurrence. For example, in the event of a mains failure.
- ***Description:*** Description of the error. Here, the more detailed the description, the faster and easier it is to process this request. Error and warning codes of the h10 inverter are also important here.
- ***Request service flat rate:*** A flat rate can be requested which compensates the installer for the service call in the event of a fault. The applicable warranty conditions must be observed (see document "Warranty batterX Home&COM ").



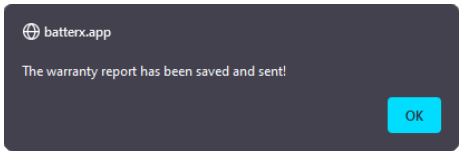
3. **Complete the warranty report:** Finally, the Terms and Conditions must be accepted before the report can be submitted.



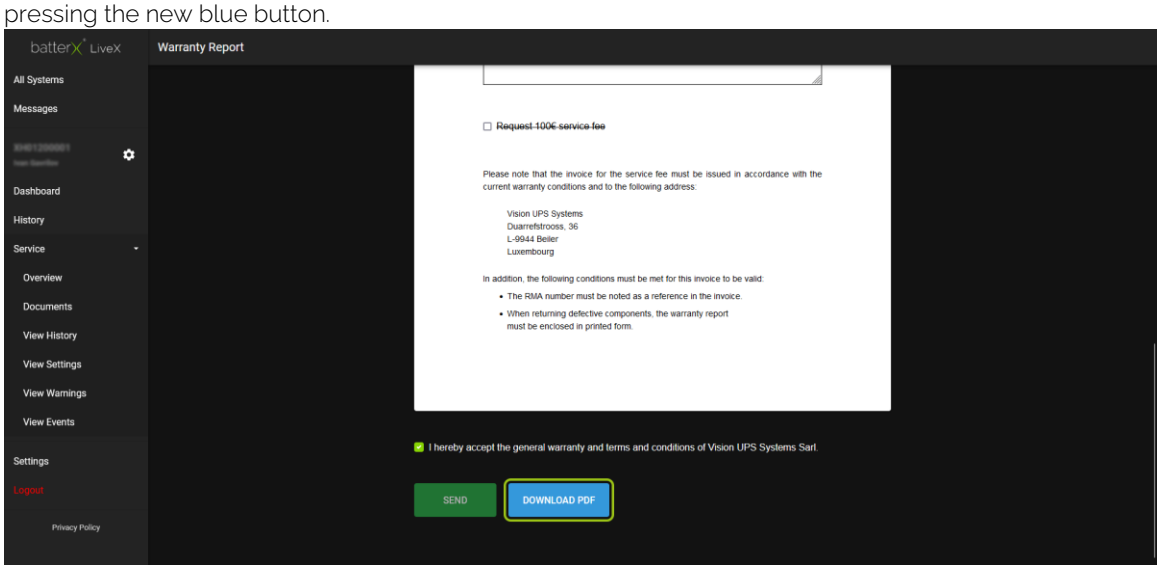
- ***Input error:*** If not all mandatory fields are filled in correctly.



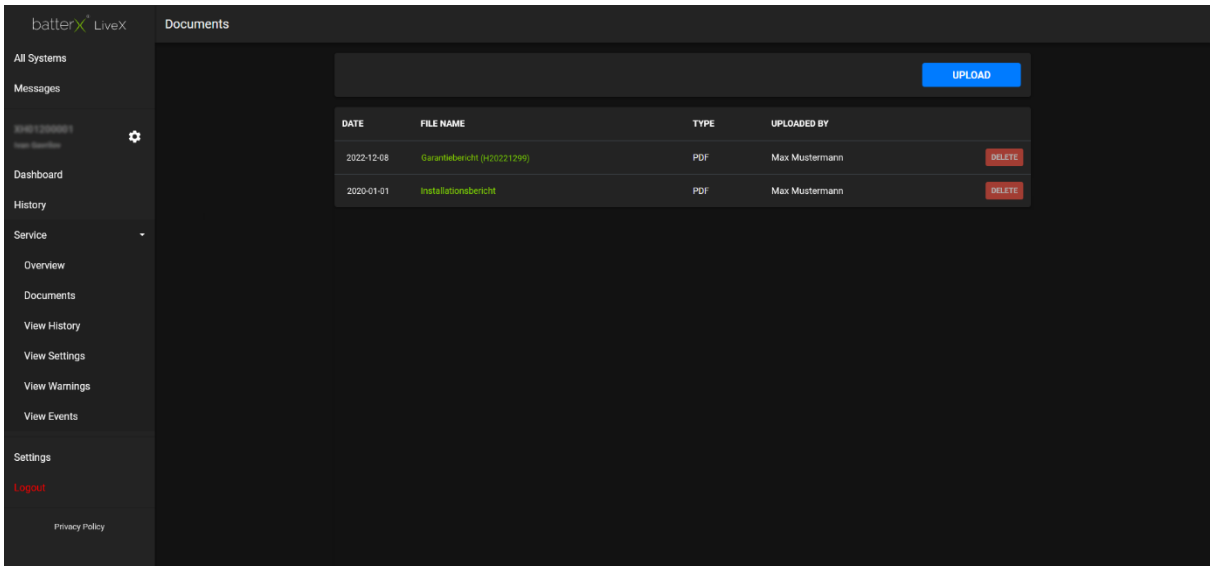
- ***Successful completion:*** This field signals that the report has been sent successfully. No further steps need to be taken.



4. **Download warranty report (optional):** After sending the report, it can be downloaded as a PDF file by pressing the new blue button.



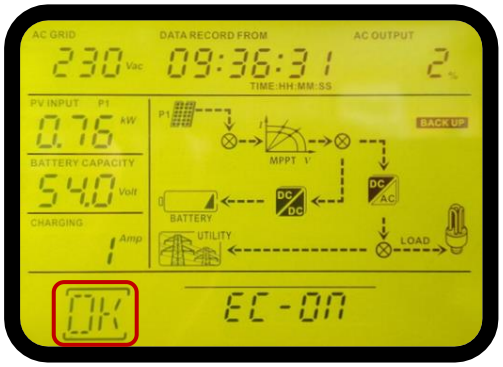
The warranty report can be viewed at any time in the portal under the menu "Documents".



After these steps have been carried out and the warranty claim has been processed, you will receive a replacement for the defective component(s). Once the corresponding device has been replaced and the **installation routine has been successfully carried out,** we will arrange for the defective component to be collected from your branch, meaning. the device must not remain with the end customer. To do this, please send an e-mail with the following information to *"info@visionups.com":*

- RMA-number
- Package/Pallet
- Dimensions (L x W x H)
- Weight
- Pick-up period (day and time or opening hours)

13. SYSTEM CODES



- Status code: ⚠

- Error code: ⚠ ERROR

STATUS CODES

Code	Event	Description
01	Grid voltage high	Grid voltage too high
02	Grid voltage low	Grid voltage too low
03	Grid frequency high	Grid frequency too high
04	Grid frequency low	Grid frequency too low
05	Grid voltage failure (long time)	Mains voltage is higher than 253V
06	Ground loss	Ground conductor was not recognized by the system
07	Island system detected	Island operation was detected
08	Line waveform	Waveform of grid and inverter incompatible
09	Line phase failure	Phases missing or not in the right order
10	EPO detected	EPO contact open
11	Overload	Load exceeds specifications
12	Over temperature	Temperature in the device too high
13	Battery voltage low	Battery discharges to alarm point
14	Battery undervoltage (power failure)	Battery discharged to shutdown value
15	No battery	Batteries disconnected or voltage too low
16	Battery undervoltage (mains OK)	Battery discharged to shutdown value
17	PV overvoltage	PV input voltage is too high
b0	BMS command to h10 (inverter)	Request to the h10 to stop discharging
b1	BMS command to h10 (inverter)	Request to the h10 to stop loading
b2	BMS command to h10 (inverter)	Request to the h10 to charge the batteries

Der Buchstabe "b" und die Zahl "6" sehen sich auf dem Display sehr ähnlich, hier ein Beispiel:

61 → 

b1 → 

ERROR CODES

Code	Event	Reason	Solution
01	BUS Overvoltage	Lightning strike/overcurrent	*1. restart inverter* *2. contact the installer if the fault persists*
02	BUS Undervoltage	Sudden disconnection of PV or battery	*1. restart inverter* *2. contact the installer if the fault persists*
03	BUS Softstart Time-out	Internal components failed	*1. restart inverter* *2. contact the installer if the fault persists*
04	Inverter Softstart Time-out	Internal components failed	*Contact the installer*
05	Inverter Overcurrent	Lightning strike/overcurrent	*1. restart inverter* *2. contact the installer if the fault persists*
06	Over temperature	Internal temperature too high	*1. check temperature and fans* *2. contact the installer if the fault persists*
07	Relay fault	Internal components failed	*Contact the installer*
08	CT sensor error	Internal components failed	*Contact the installer*
09	PV input power abnormal	MPPT damaged, PV power/voltage too high	*1. check PV voltage (<850VDC)* *2. contact the installer*
11	PV overcurrent	Lightning strike/overcurrent	*1. restart inverter* *2. contact the installer if the fault persists*
12	GFCI error	Residual current too high	*1. check wiring and panels for fault current* *2. contact the installer if the fault persists*
13	PV ISO error	Leakage resistance between PV and earth is too high	*1. check wiring and panels for fault current* *2. contact the installer if the fault persists*
14	Inverter DC overcurrent	mains fluctuations	*1. restart inverter* *2. contact the installer if the fault persists*
16	GFCI sensor error	GCFI Sensor error	*Contact the installer*
22	Battery overvoltage	Battery voltage too high, exceeds the limit	*1. check battery voltage* *2. contact the installer if the fault persists*
23	Overload	Inverter output overloaded	*Reduce output load*
26	Inverter short circuit	Output short-circuit	*Check wiring and remove abnormal load*
27	Fans blocked	Fans blocked or failed	*Contact the installer*
32	Inverter DC overvoltage	Load fluctuations	*1. restart inverter* *2. contact the installer if the fault persists*
33	Inverter Undervoltage	Internal components failed	*Contact the installer*
34	Inverter Overvoltage	Internal components failed	*Contact the installer*
35	Wiring fault	Internal wiring loose	*Contact the installer*
36	Output Voltage error	Grid connected to output	*Do not connect grid to the output.*
37	Short circuit on PV input	Short circuit on at least one PV input	*1. check PV input* *2. contact the installer if the fault persists*
50	Incompatible firmware	Inverter hardware does not match the inverter firmware	*Contact the installer*

14. INVERTER SPECIFICATIONS

PV INPUT

Maximum DC power	14850Wp
DC nominal voltage	720VDC
Maximum DC voltage	900VDC
Working range DC voltage	300VDC – 900VDC
Start-up Voltage/beginning of feed-in	320VDC/350VDC
MPP working range	350VDC – 850VDC
Maximum input current	2 x 18,6A
Isc PV (absolute maximum)	25A
Max. feedback current to the PV strings	0A

AC INPUT

Start-up voltage	120-140VAC (/Phase)
Auto restart Voltage	180VAC (/Phase)
Permissible voltage range	170VAC - 280VAC (/Phase)
Nominal frequency	50Hz/60Hz
Input power	10000VA / 10000W
Maximum input current	25A
Inrush current / duration	25A/1ms

UPS OUTPUT (MAINS OPERATION)

Nominal voltage	230VAC (P-N) / 400VAC (P-P)
Voltage range	184-265VAC (/Phase)
Frequency range	47,5 – 51,5Hz resp. 59,3 – 60,5Hz
Rated current	14,5A (/Phase)
Inrush current / duration	17A (/Phase) /20ms
Maximum fault current / duration	51A (/Phase) / 1ms
Maximum overcurrent protection	51A (/Phase)
Displacement factor (cos φ)	+0,9/-0,9

UPS OUTPUT (BATTERY OPERATION)

Nominal voltage	230VAC (P-N) / 400VAC (P-P)
Frequency	50Hz / 60 Hz
Waveform	Pure sine wave
Power	10000VA / 10000W
Stream	13A (/Phase)
Efficiency (DC to AC)	91%

BATTERY & CHARGER

Voltage range	40-60VDC
Nominal voltage	48VDC
Maximum discharge current	275A
Maximum charge current	200A

PHYSICAL SIZES

Dimension - L x W x H	622 x 500 x 167,2 mm
Weight	45 kg

PORTS

Communication	RS232 - USB
Intelligent Port (optional)	Relay Board/SNMP/Modbus

ENVIRONMENT

Protection type	I
IP protection class	IP 20
Humidity	0 – 90% (non-condensing)
Temperature range	5˚C – 30˚C*
Altitude	< 2000m**

*Power reduction above 50˚C
**Power reduction of 1%/100m when altitude is over 1000m.