

xStorage Home Installation manual

For 4.2 kWh, 6 kWh and 10 kWh systems capacity



This document is intended for Eaton certified installers

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1. Introduction

Thank you for installing the xStorage Home system

Before you start

This manual contains important instructions that must be followed during the installation, operation and maintenance of the xStorage Home system. All instructions must be read before installing and operating the equipment. This manual should be retained for future reference. Please note that the xStorage Home system must only be installed by Eaton certified personnel, i.e. an Eaton technical support representative or an Eaton certified installer. There are no user serviceable parts inside the xStorage Home system. Failure to observe the above will void the warranty provided and Eaton cannot be held legally accountable.

This product is intended for residential application only. The contents of this manual are the copyright of the publisher and may not be reproduced (even in extracts) without the prior written approval of Eaton Corporation. While every care has been taken to ensure the accuracy of the information contained in this manual, Eaton assumes no liability for any error or omission. Eaton reserves the right to modify the designs of its products. The unauthorized copying and lending of this manual is prohibited.

Technical disclaimer

In line with our goal to continuously improve the products and the customer service we provide, all specifications contained in this document are subject to change with due notice. All drawings, descriptions or illustrations contained in this document serve to provide a clear overview and/or technical explanation of the present product and its various components and accessories.

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2. Good to know

To download the latest technical documentation, such as the user manual, the safety documentation and other relevant updates, visit our website www.eaton.com/xstorage. Please note that in order to improve our customer experience we are constantly updating and enhancing the relevant technical and marketing materials.

2.1 System Overview

The following images in Figure 1 and Figure 2 provide an external overview of the xStorage Home system.



Figure 1: xStorage Home 3D casing model

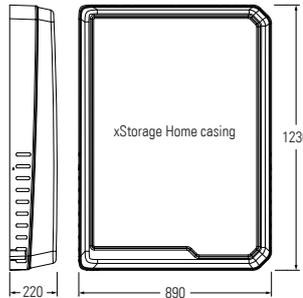


Figure 2: xStorage Home casing dimensions

2.2 System product list

This installation manual applies to the listed product system, which is a single-phase system with a total of nine power-charging and energy-capacity combinations:

Table 1 xStorage Home system combinations overview

xStorage Home systems			
Charging power	Battery capacity	Product Description	Part Number
3.6 kW	4.2 kWh	XST 1Ph 3.6 kW 4.2 kWh Blue	XSTH1P0361UBUEV2
4.6 kW	4.2 kWh	XST 1Ph 4.6 kW 4.2 kWh Blue	XSTH1P0461UBUEV2
6.0 kW	4.2 kWh	XST 1Ph 6.0 kW 4.2 kWh Blue	XSTH1P0601UBUEV2
3.6 kW	6.0 kWh	XST 1Ph 3.6 kW 6 kWh Blue	XSTH1P0362NBUEV2
4.6 kW	6.0 kWh	XST 1Ph 4.6 kW 6 kWh Blue	XSTH1P0462NBUEV2
6.0 kW	6.0 kWh	XST 1Ph 6.0 kW 6 kWh Blue	XSTH1P0602NBUEV2
3.6 kW	10.08 kWh	XST 1Ph 3.6 kW 10.08 kWh Blue	XSTH1P0364NBUEV2
4.6 kW	10.08 kWh	XST 1Ph 4.6 kW 10.08 kWh Blue	XSTH1P0464NBUEV2
6.0 kW	10.08 kWh	XST 1Ph 6.0 kW 10.08 kWh Blue	XSTH1P0604NBUEV2

Some of the combinations might be not available in your country due to local regulations.

xStorage Home is based on three components: the hybrid inverter, the battery pack and the cover. The table 2 provides details about the structure of each part number.

Table 2 xStorage Home part number composition

Part number	Components	
	Part number	Product description
XSTH1P0361UBUEV2	XSTH1P036P060V11	XST Home Inverter 1Ph 3.6 kW PV 6
	XSTH1U12EV2	XST Home Batt GEN1 2nd life 4.2 kWh
	XSTH1P1CKBU	XST Ext. cover
XSTH1P0461UBUEV2	XSTH1P046P060V11	XST Home Inverter 1Ph 4.6 kW PV 6
	XSTH1U12EV2	XST Home Batt GEN1 2nd life 4.2 kWh
	XSTH1P1CKBU	XST Ext. cover
XSTH1P0601UBUEV2	XSTH1P060P060V11	XST Home Inverter 1Ph 6 kW PV 6
	XSTH1U12EV2	XST Home Batt GEN1 2nd life 4.2 kWh
	XSTH1P1CKBU	XST Ext. cover
XSTH1P0362NBUEV2	XSTH1P036P060V11	XST Home Inverter 1Ph 3.6 kW PV 6
	XSTH2N12EV2	XST Home Batt GEN2 New 6 kWh
	XSTH1P1CKBU	XST Ext. cover
XSTH1P0462NBUEV2	XSTH1P046P060V11	XST Home Inverter 1Ph 4.6 kW PV 6
	XSTH2N12EV2	XST Home Batt GEN2 New 6 kWh
	XSTH1P1CKBU	XST Ext. cover
XSTH1P0602NBUEV2	XSTH1P060P060V11	XST Home Inverter 1Ph 6 kW PV 6
	XSTH2N12EV2	XST Home Batt GEN2 New 6 kWh
	XSTH1P1CKBU	XST Ext. cover
XSTH1P0364NBUEV2	XSTH1P036P060V11	XST Home Inverter 1Ph 3.6 kW PV 6
	XSTH4N6EV2	XST Home Batt GEN4 New 10 kWh
	XSTH1P1CKBU	XST Ext. cover
XSTH1P0464NBUEV2	XSTH1P046P060V11	XST Home Inverter 1Ph 4.6 kW PV 6
	XSTH4N6EV2	XST Home Batt GEN4 New 10 kWh
	XSTH1P1CKBU	XST Ext. cover
XSTH1P0604NBUEV2	XSTH1P060P060V11	XST Home Inverter 1Ph 6 kW PV 6
	XSTH4N6EV2	XST Home Batt GEN4 New 10 kWh
	XSTH1P1CKBU	XST Ext. cover

2.3 On line product registration

Please note that the xStorage Home guarantee is only valid for xStorage Home systems that have been registered online or via the Eaton certified installer portal, the date of the online product registration being the start date of the guarantee period. The residential user must therefore ensure that an Eaton certified installer has properly registered the product.

2.4 Before installing

This manual must be read and understood prior to installing the xStorage Home system. Failure to do so may result in damage due to misuse or incorrect installation of the product, which would also violate the terms of guarantee. This could also lead to unnecessary hazards, potentially exposing the installer and/or the residential user to electrical shocks, injuries or death.

3. Symbols and glossary overview

The following pages provide a comprehensive overview of all symbols used in this manual, on the xStorage system itself and on its accessories in order to alert you to important information that must be understood and applied at all times when handling the xStorage Home system.

3.1 Safety related notices

DANGER	DANGER indicates a hazard with a high level of risk which, if not avoided, will result in serious injury or death.
WARNING	WARNING indicates a hazard with a medium level of risk which, if not avoided, could result in serious injury or death, or damage to you or your equipment.
CAUTION	CAUTION indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury, or damage to you or your equipment.

3.2 Hazard symbols

GENERAL WARNING SIGN	
ELECTRICAL HAZARD	
EXPLOSION AND FIRE HAZARD	
CORROSIVE HAZARD	
BATTERY HAZARD	
ELECTRICAL HAZARD ENERGY STORAGE TIMED DISCHARGE	
HOT SURFACE	

3.3 Prohibited action symbols

GENERAL SYMBOL FOR PROHIBITED ACTION	
LIMITED OR RESTRICTED ACCESS	
NO SMOKING	

3.4 Mandatory action symbols

Mandatory action symbols are used to indicate an action that must be taken:

GENERAL SYMBOL FOR MANDATORY ACTION	
READ MANUAL	
DISCONNECT FROM POWER SOURCE	
PROTECTION ACTION	
MEDICAL ACTION	

3.5 Product labels

The following are examples of symbols used on the xStorage Home system or accessories to alert the installer and the end user to important information:

RISK OF ELECTRICAL SHOCK	
CAUTION - REFER TO INSTALLATION OR USER MANUAL Refer to your manual for additional information, such as important operating and maintenance instructions.	
This symbol indicates that the battery pack of the xStorage Home system must not be discarded with domestic waste. This product involves sealed, Lithium-ion batteries which must be properly discarded. For more information, contact your local recycling or hazardous waste facility.	
This symbol indicates that waste electrical or electronic equipment (WEEE) as well as the Lithium-ion battery pack of the xStorage Home system may not be disposed of together with unseparated household waste. By separating waste electrical and electronic equipment and batteries, you will help reduce the volume of waste sent for incineration or land-fills and minimize any potential negative impact on human health and environment. For proper disposal, contact your local recycling or hazardous waste facility.	
ELECTRICAL HAZARD ENERGY STORAGE TIMED DISCHARGE	
HOT SURFACE	
READ MANUAL	
CAUTION FOR LITHIUM-ION BATTERY TRANSPORTATION	
MULTIPLE SUPPLIERS	
DO NOT OPEN THE METAL CASINGS	

3.6 Conventions used in this document

This manual adopts the following type conventions and acronyms to refer to Eaton xStorage Home system or its parts:

- Screen type represents information that appears on the screen or LCD display (used to indicate screen content inside the text).
- ALL CAPITALS highlights critical points that require careful attention.

All abbreviations used in this document are listed in the Table 3 Glossary.

Table 3 Glossary

AC/DC	Alternating Current/Direct Current
ADSL	Asymmetric Digital Subscriber Line
API	Application Program Interface
BMS	Battery Management System
C/D	Charge/Discharge
DDNS	Dynamic Domain Name System
DG	Dangerous Goods
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name System
FW	Firmware
IP	Internet Protocol
IPv4	Internet Protocol Version 4
LAN	Local Area Network
MAC	Maximize Auto-Consumption
NTP	Network Time Protocol
OV	Over Voltage
PE	Protective Earth
PS	Peak Shaving
PV	Photovoltaic
RCD	Residual Current Device
SOC	State Of Charge
SSID	Service Set Identifier
SSL	Secure Sockets Layer
SW	Soft Ware
TB	Terminal Block
UI	User Interface
URL	Uniform Resource Locator

4. Safety instructions

SAVE THESE INSTRUCTIONS.

These safety guidelines contain essential information that must be followed during the installation of the xStorage Home system in accordance with the procedures outlined in the remaining sections of this installation manual. Instructions must be carefully read and understood before operating the equipment and be saved for future reference. The xStorage Home system is a product for residential application only and installation must be done in a dry, indoor environment within a temperature range of 0 °C to 30 °C that is free of conductive contaminants.

THE XSTORAGE HOME SYSTEM CAN ONLY BE INSTALLED BY EATON CERTIFIED PERSONNEL I.E. AN EATON CERTIFIED INSTALLER.

4.1 Product life usage

Please note that safety instructions are organized and mapped around:

- the use phases of the xStorage Home system (see Table 4);
- the users associated with each of these use phases;
- all potential dangerous actions a user might take.

These safety instructions are supplemented by a detailed explanation of potential hazards that may arise if a dangerous action is undertaken.

Preventive measures must be taken at all times in order to avoid potential hazards and to prevent injury and product damage.

Table 4 xStorage Home product life usage

USE PHASE	USER	ACTION
LOGISTICS	Forwarder	Loading, storing, delivery
INSTALLATION	Eaton certified installer	Unpacking, mounting, installation, commissioning
OPERATING PHASE	Residential user	Nominal operation via the User Interface (UI), malfunction notification, misuse
SERVICE AND MAINTENANCE	Eaton certified service provider	Standard check-up, replacement of the battery pack, the hybrid inverter or the electrical units, software upgrade
DEINSTALLATION	Eaton certified installer	Dismantling the installed xStorage Home system
PRODUCT DISPOSAL	Eaton certified installer	Recycling the xStorage Home system

4.2 Logistics

The following safety measures must be observed during the logistics phase.

WARNING

- Do not attempt to lift any of the packaged or unpacked units on your own without the assistance of a second person or the use of an adequate machine lifter. Failure to do so may result in severe injury.
- Do not stack the product pallets on top of one another. One pallet contains three rows of products, i.e. three packages on top of each other, distributed in two columns side by side. If the total number of packages per pallet exceeds this number, the products may be damaged or fall, which may result in irreversible product damage and potentially the injury or death of the handler.
- When loading, lifting, storing and delivering products, uncontrolled movements should be avoided, as these could harm both the product and the handler.
- The battery pack and the hybrid inverter must be transported in their original packaging, in an upright position with the terminals at the top. Compliant, non-flammable material must be used to protect the battery pack from impact damage. Never lift the battery pack or the hybrid inverter by the terminals.
- During delivery, the products must be carefully stacked to prevent any damage during transport due to excessive vehicle movements, which should therefore be avoided wherever possible.

CAUTION

- The packaged units (the battery pack and the hybrid inverter) are both heavy; safety shoes shall therefore be worn and a forklift could be used for all handling operations.
- All handling operations such as loading, lifting, moving packed units through the warehouse, delivery and unloading will require AT LEAST two persons working together.
- Always store packaged units in a dry and humidity-controlled environment with a storage temperature range between -10 °C and 40 °C, and at a safe distance from any running liquids.
- Never let a foreign body penetrate inside the packaging, i.e. neither inside the packaging of the battery pack nor inside the packaging of the hybrid inverter.
- If a packaged item should be dropped, this must be reported immediately to the responsible personnel who will then carry out a product quality check to ascertain that the fall or its impact did not cause any damage to the product. Packaged products must not be stored outside, as harsh weather conditions may cause severe product damage

4.3 Installation

The following safety measures must be observed during the product installation phase. The installation must be performed by Eaton authorized service personnel, i.e. an Eaton certified installer. THERE ARE NO USER SERVICEABLE PARTS inside the xStorage Home System. The following section applies only to Eaton certified installers.



DANGER

- The product installation guidelines, i.e. the instructions for mounting, connecting and operating the equipment described in this manual, must be followed at all times in the given order.
- The xStorage Home system must be installed in a temperature and humidity controlled, indoor environment that is free of conductive contaminants, in accordance with the recommendations set out in this manual. The xStorage Home system must NOT be installed in an airtight room, in the presence of flammable gases, or in an environment that does not meet the outlined specifications, such as outdoors. The system is not intended for outdoor use. Excessive amounts of dust in the operating environment of the xStorage Home system may cause damage or lead to malfunction.
- The permitted ambient temperature range is [0 °C, 30 °C] and must not exceed 30 °C for 10 consecutive days. Do not install and operate the xStorage Home system where water or excessive humidity (95 % maximum) are present.
- Prior to stating any installation or service work, all AC and DC power sources must be disconnected. In addition, the system grounding/PE continuity must also be ensured.
- Do not open or mutilate the battery pack or the hybrid inverter in any way.
- If either the battery pack or the hybrid inverter should be accidentally dropped, immediately move back beyond the five metres safety perimeter and make sure to have foam fire extinguishers at hand, as the impact may cause the battery pack cells to ignite. Next, inform your Eaton technical support representative of the incident. In case of fire, immediately alert the fire brigade and maintain safe distance from the hazard area to avoid exposure to potentially toxic fumes or smoke. Instruct all people in the immediate vicinity not to enter the hazard area.
- In case of spillage incidents, i.e. battery pack leakage, move away at least five metres from the leak point and inform the fire brigade as well as your Eaton technical support representative. Keep away from the hazard area. Disposal of the battery must be handled by certified personnel.
- In the event of electrolyte contamination (i.e. exposure to uncovered battery components such as the electrolyte, powder, etc.), immediately rinse the skin and eyes with running water and remove any contaminated clothing.
- The affected individual should then seek medical assistance.



DISREGARD OF THE DANGERS OUTLINED IN THIS MANUAL MAY RESULT IN SEVERE PRODUCT DAMAGE, ELECTRICAL SHOCK AND POTENTIALLY THE DEATH OF THE INSTALLER.



WARNING

- Prior to energizing the installed xStorage Home system, determine if the hybrid inverter and/or the battery pack are inadvertently grounded. Should the system be inadvertently grounded, remove the source from the ground. Contact with any part of a grounded battery pack or hybrid inverter may result in an electrical shock. The likelihood of a shock can be reduced if all grounds are removed during installation and maintenance (applicable to equipment and remote battery supplies not having a grounded supply circuit).
- To comply with warranty and safety requirements, a minimum clearance distance of at least 15 cm should be maintained around all sides of the xStorage Home casing.
- Prior to energizing the installed xStorage Home system make sure to connect, physically, all elements as it is instructed in the manual and to close the hybrid inverter with the xStorage Home casing in order to prevent potential contact with the operating system once it has been energized.
- If the xStorage Home system application includes a connection to a Photovoltaic (PV) solar power system and/or the grid, make sure to deenergize the PV connection, and/or the battery connection, and/or the grid terminals prior to carrying out any work. Please note that the xStorage Home system can be powered either by a PV solar system, by the electricity grid, or by its own energy sources (batteries), making it essential to deenergize each connecting terminal. Always make sure to protect the xStorage Home unit against the ingress of solid foreign objects.
- Make sure never to block the natural air flow around the system, and not to place any objects on top of or near the sides of the xStorage Home system after installation.
- Never expose the system to direct sunlight or a source of heat.
- If the xStorage Home system is to be stored prior to installation, this must be done in a dry place away from any exposure to sunlight or rain.
- When installing the hybrid inverter, please note that both AC and DC sources are terminated within this device. To prevent the risk of an electrical shock during installation, please ensure that all AC and DC terminals are disconnected from the power source.
- Make sure to secure the Ground line to the Grid's Ground, and to double check that the Line and Neutral are not confused with Ground.
- The hybrid inverter is designed to feed AC power directly into the public utility power grid only. Do not connect the AC output feed of the hybrid inverter to a private AC equipment. If the equipment is used in a manner not specified by the manufacturer, the functioning of the integrated protective features may be impaired.
- Do not attempt to alter the battery pack wiring or connectors, especially those to the hybrid inverter. Any attempt to alter the wiring may cause injury.



CAUTION

- The packed units (the battery pack and the hybrid inverter) are both heavy: wear safety shoes and preferentially use a vacuum lifter for handling operations.
- All handling operations will require at least two people (for unpacking, lifting and mounting the system on an indoor wall).
- Carefully unpack both units (the battery pack and the hybrid inverter) while paying special attention to the sharp edges on the housing and cooling fins. Excessive movements should also be avoided, as these may lead to product damage and/or severe injury.
- When unpacking, all accessories listed in the manual must be identified. Should the identification of all accessories not be possible, the installation must be aborted due to the missing components. Do not try to replace any on your own.
- Handling precautions must be taken, i.e. rubber gloves and safety boots must be worn and adequate installation tools must be used.
- Do not place tools, metal parts or any other objects on top of the unpackaged or mounted battery pack or hybrid inverter. Allocate a minimum wall surface area of 1,530 mm x 1,190 mm that is free from electrical wiring, pipework or any other obstructions, either on the wall surface or embedded within it.
- Suitable eye protection should be worn when working with or near the Lithium-ion batteries.



4.4 Operating phase

These are the safety measures that must be observed during the system use and the product's operating life cycle. These measures are intended for the residential users of the xStorage Home system. Upon installing the xStorage Home system, the installer should go through these safety measures with the end user.

THERE ARE NO USER SERVICEABLE PARTS INSIDE THE XSTORAGE HOME SYSTEM.



DANGER

- Once installed and energized, the xStorage Home system contains components that carry **HIGH HAZARDOUS CURRENTS AND VOLTAGES**. Residential users **MUST NOT REMOVE THE COVER and MUST NOT OPEN IT** at any time. All repairs and service work should be performed by **EATON AUTHORIZED SERVICE PERSONNEL ONLY**. There are **NO USER SERVICEABLE PARTS** inside the xStorage Home system.
- Do not try to remove the screws from the hybrid inverter and the battery pack at any time. Failure to comply may cause electrical hazards that may prove fatal for both the residential user and/or the system.
- Never block the natural air flow around the installed system, and do not place any objects on top of or near the sides of the system after installation. Allow for a minimum distance of 15 cm between the xStorage Home system and any surrounding objects. Otherwise, the system may overheat, which may lead to malfunctions and electrical hazards that may potentially cause fire and/or an electrolyte contamination event.
- While designed to meet the requirements of international safety standards, the hybrid inverter and the battery pack may become hot while in operating mode. Do not touch the heat sink or peripheral surfaces of the hybrid inverter during or shortly after its operation.



WARNING

- The xStorage Home system may only be operated through the system's official UI application, and in the manner instructed by the Eaton certified installer, to ensure that the system is in the nominal operation mode. Any failure to comply may lead to product misuse, damage, or malfunction and potentially to personal injury.
- Please note that a deep cycle charge and discharge may damage the battery cells inside the battery pack and can be dangerous if not performed correctly. The battery must be cycled in accordance with the manufacturer's instructions. If the battery has been over discharged it must be returned to the distributor for disposal. The battery must not be charged and discharged outside of the voltage levels detailed in this manual. If the battery pack is misused (typically over/ under charged), harmful gases may be released.
- Before charging the battery from the grid, check with your Eaton certified installer that this option is available. Otherwise, you may incur the risk of product damage, personal hazard and product misuse.

4.5 Service and maintenance

Only Eaton authorized personnel are allowed to open the xStorage Home system and to carry out replacement and maintenance work on the hybrid inverter and the battery pack. THERE ARE NO USER SERVICEABLE PARTS inside the xStorage Home system. In case of system failure always contact your Eaton technical support representative responsible for the xStorage Home system maintenance i.e. the Eaton certified installer.



- To prevent the risk of electrical shock during service and maintenance work, please ensure that all AC and DC terminals are disconnected from their power sources prior to removing the casing of the xStorage Home system. Please note that the xStorage Home system can be powered by a PV solar system, by the grid or by its own energy sources (batteries), and that both AC/DC sources are terminated within the hybrid inverter, while DC sources are terminated within the battery pack. The output terminals may therefore still be energized even after the xStorage Home system has been disconnected from an AC or a DC source. After disconnecting all sources of supply, wait for five minutes before removing the cover.
- Make sure to secure the Ground line to the ground according to local regulations.
- When replacing the battery pack be aware that HIGH VOLTAGES, CORROSIVE, TOXIC and EXPLOSIVE substances are present in it. Given the set-up of the battery string, the output terminal may carry high voltages even when the AC supply is not connected to the xStorage Home system. The battery pack terminals should therefore not be touched before it has been definitely ascertained that they are deenergized. The shutdown instructions should be carefully followed.
- When replacing the hybrid inverter, please note that both AC and DC sources are terminated within this device. To prevent the risk of electrical shock during service and maintenance, please ensure that all AC and DC terminals are disconnected from the power source and deenergized.
- When servicing/replacing any other electrical items listed in the xStorage Home accessory list, please make sure that they are also disconnected from any AC/DC source and deenergized.
- The hybrid inverter is connected to more than one source of supply, i.e. the grid and a PV solar system. Make sure to disconnect all the power sources prior to servicing and maintenance, especially the DC switch and the breaker between the hybrid inverter and the PV panel, which starts to supply high DC voltage when exposed to sunlight. Avoid touching any live parts. Prior to reconnecting the hybrid inverter to the utility, please ensure that an earthing connection is present to prevent potential high-leakage currents.

4.6 Deinstallation

Only Eaton authorized personnel are allowed to open the xStorage Home system, carry out its deinstallation and the disconnection of all power sources, remove any electric units, and demount the hybrid inverter and/or the battery pack. There are NO USER SERVICEABLE PARTS inside the xStorage Home system.



- Prior to starting the dismantling process, the battery pack must be fully discharged to prevent potential electrical shocks.
- To further prevent the risk of electrical shock during the deinstallation phase, please ensure that all AC/DC terminals are disconnected from all power sources (PV and grid) prior to removing the casing of the xStorage Home system.
- Please note that the xStorage Home system can be powered by a PV solar system, by the grid or by its own energy sources (batteries), and that both AC/DC sources are terminated within the hybrid inverter, while DC sources are terminated within the battery pack. The output terminals may therefore still be energized even after the xStorage Home system has been disconnected from an AC or a DC source. Allow five minutes to pass before moving forward with the deinstallation.
- When demounting the battery pack from the wall, please take every precaution to prevent the product from falling and to avoid any potential electrical and chemical hazard, as the battery pack may contain residual HIGH VOLTAGES as well as CORROSIVE, TOXIC or EXPLOSIVE substances.
- The battery pack terminals should not be touched before it has been definitely ascertained that they are deenergized.



- Please note that both the xStorage Home hybrid inverter and the battery pack are heavy. Safety shoes should therefore be worn and all handling operations during the deinstallation, such as the demounting, repacking or moving of units from the original installation site to the transportation vehicle, as well as the loading and unloading of units at the waste disposal facility, etc., will require AT LEAST two persons working together. While dismantling the product, special attention should be paid to the sharp edges on the housing and cooling fins.
- Suitable eye protection should be worn when working with or near Lithium-ion batteries.



4.7 Product disposal

At the end of the xStorage Home system's product life cycle, only Eaton authorized personnel are allowed to carry out a full system disposal (including the hybrid inverter, the battery pack, the casing and the supporting electrical elements), in line with the applicable local regulations for waste disposal. Contact the local recycling or hazardous waste facility for information regarding the proper disposal of the used equipment.



CAUTION

- The product is made up of recyclable materials. Dismantling and destruction must take place in compliance with all local regulations concerning waste. At the end of its service life, the product must be transported to a dedicated processing facility for electrical and electronic waste.
- The battery pack must be disposed of in accordance with local disposal requirements. Do not attempt to dispose of any elements of the xStorage Home system by burning them, as the battery pack may explode when exposed to fire.
- The product contains Lithium-ion battery cells that must be processed in accordance with applicable local regulations concerning this type of batteries. The battery pack may be removed to comply with regulations and in view of correct disposal.
- Do not attempt to open or mutilate any elements of the xStorage Home system prior to its disposal. Released electrolyte from the battery pack is harmful to the skin and eyes. It may be toxic.
- Do not discard the xStorage Home system or any of its elements in the domestic waste. This product contains sealed, Lithium-ion battery cells and must be disposed of properly. For more information, contact your local recycling/ reuse or hazardous waste facility.
- Do not discard waste electrical or electronic equipment (WEEE) in the domestic waste. For proper disposal, contact your local recycling/reuse or hazardous waste facility.

5. Transport and storage environment

While handling, storing and transporting the xStorage Home system, the following guidelines must be observed at all times in order to ensure the best possible care of the equipment.

Please note that during the transport and storage phase, the xStorage Home system is disconnected from any power source, i.e. it is turned off and non-operational.

5.1 Transport - Battery pack

While transporting the xStorage Home battery pack, the following transportation guidelines apply:

- road transportation is authorized and must comply with the ADR 2017 regulatory specification, with particular emphasis on the local ADR regulations;
- sea transportation is authorized and must comply with the IMDG regulatory specification;
- the combination of road and sea transportation is also authorized;
- air transportation of the xStorage Home battery pack is not authorized, due to the high Lithium-ion weight per product.

The hazard classification of the xStorage Home battery packs is as follows:

- xStorage Home battery packs are classified as class 9 DG category, UN 3481 certified;
- xStorage Home battery packs have successfully passed UN 38.3 tests.

The following transportation constraints apply:

- When transporting a load of four or less battery packs a regular truck can be used to facilitate the load transport;
 - The only requirement is that the truck driver must have undergone the training stipulated in Chapter 1.3 of ADR;
- When transporting a load which is greater than the defined limit i.e. > 333 kg of products containing lithium-ion battery a Dangerous Goods (DG) truck must be booked. This entails the following:
 - additional transportation costs are incurred;
 - orange license plates must be used;
 - the truck must be equipped with the appropriate safety kits, and the driver requires a special permit;
 - this type of ADR transport can only stop at specially designated locations, and a speed limit that is 10 km/h lower than the nominal limit applies;
 - the list of applicable carrier rules is set out in the ADR documentation;
 - extra time is needed to request such a DG truck (one or two days).
- Other non-hazardous products may be transported in the same truck together with the xStorage Home battery packs.

Due to the hazardous nature of the product, leakage or spillage from the container must be prevented at all costs. The product should be loaded in a safe manner while taking every precaution to avoid damage. The product load should be secured in such a way that it cannot become unstable during transport, while avoiding direct exposure to adverse weather conditions such as rain. Excessive shock movement should be avoided, as this may result in damage to the battery cells.

Codes and classification are in accordance with:

- IATA-GDR special provision A88, A99, A154, A164;
- national regulations for transport on land GB12268-2005;
- the UN Classification number: Class 9 3481;
- packing instructions: PI 967 (Section I for Lithium-ion batteries);
- THIS PRODUCT COMPLIES WITH UN 38.3.

All supply chain participants (shipper, employee receiving or handling the batteries, drivers) must have undergone the training on Dangerous Goods. The xStorage Home battery pack is packaged in a safe carton suitable for the transport of products containing Lithium-ion batteries. Please note that the xStorage Home battery pack falls into the category of heavy products. Precautions must be therefore taken to avoid any injury due to the weight of the product.

5.2 Transport - Hybrid inverter

The hybrid inverter is classified as standard electrical equipment, there are no hazard elements associated with this product. During transport, all the necessary precautions must be taken to avoid damaging the hybrid inverter, which, like the battery pack, falls under the heavy product category.

5.3 Handling and storage

Store in a cool, indoor, dry place/warehouse at room temperature for best results:

- keep away from heat, sparks and flames;
- store within temperature range [-10 °C, 40 °C];
- do not exceed 10 consecutive days above 30 °C. It may impact battery life;
- keep above 0 °C for best performance;
- do not disassemble the battery pack or the hybrid inverter;
- do not attempt to puncture, crush or dispose of the xStorage Home system by fire. This also applies to the casing, the battery pack and the hybrid inverter;
- each product pallet should contain no more than two columns of three battery packs or three hybrid inverters side by side.

The xStorage Home system parts fall into the heavy product category. Appropriate precautions must therefore be taken while handling the battery pack and the hybrid inverter. Any behaviour/excessive movements that could cause damage, either to the handlers or the equipment itself, should be avoided.

5.4 After product delivery

Should any unexpected transport events raise doubts as to the integrity of the product:

- only Eaton authorized personnel can unpack the xStorage Home system parts and inspect them for any potential transport damage;
- due to the hazardous nature of the product, special precaution should be taken while unpacking and inspecting the xStorage Home battery pack.

In case of any damage, such as deformation of the casing or leakage:

- immediately inform your Eaton technical support representative;
- make sure that any damaged products are not used and remain disconnected.

6. Unpacking the xStorage Home system

- **EQUIPMENT INSPECTION NOTE:** If any equipment has been damaged during shipment, keep the shipping carton boxes and packing materials from the carrier or from the place of purchase and file a claim for shipping damage. If you discover damage after acceptance, file a claim for concealed damage. To file a claim for shipping damage or concealed damage, request a receipt of equipment delivery from the carrier and send a copy of the damage claim to your Eaton technical support representative within 15 days of delivery.

6.1 Pre-mounting phase

- Identify a suitably stable indoor mounting location, for example inside a private home or a garage; drywall or outdoor mounting are not permitted. The operational temperature range is [0 °C, 30 °C], at 5 % to 95 % relative humidity (non-condensing).
- Due to the variety of possible wall types, the best method for fixing the xStorage Home system will differ from case to case. Contact your Eaton technical support representative for recommendations.
- Should any accessories be missing, contact your Eaton technical support representative.
- The various parts of the xStorage Home system **MUST NOT** be energized during mounting and installation.
- Allocate a minimum wall area of 1,530 mm x 1,190 mm that is free from any electrical wiring, pipework or other obstructions, either on the surface of the wall or embedded within it.
- Use appropriate tools for installation.

6.2 Checking the accessory kit

The following section provides a list of the main parts of the xStorage Home system i.e. the hybrid inverter and battery pack as well as the supporting accessories that are necessary for the proper assembly, mounting and connection of the xStorage Home system in order to ensure optimal functionality. Specifically:

- The hybrid inverter packaging (Figure 3);
- The battery pack packaging (Figure 4);
- The casing cover packaging (Figure 5);
- All supporting documentation (Figure 6);
- The mounting bracket (Figure 7)
- The supporting accessory kit for mounting the hybrid inverter, the battery pack and then wiring and connecting them (Figure 8).

Figure 3: Unpacking the hybrid inverter - Exploded view

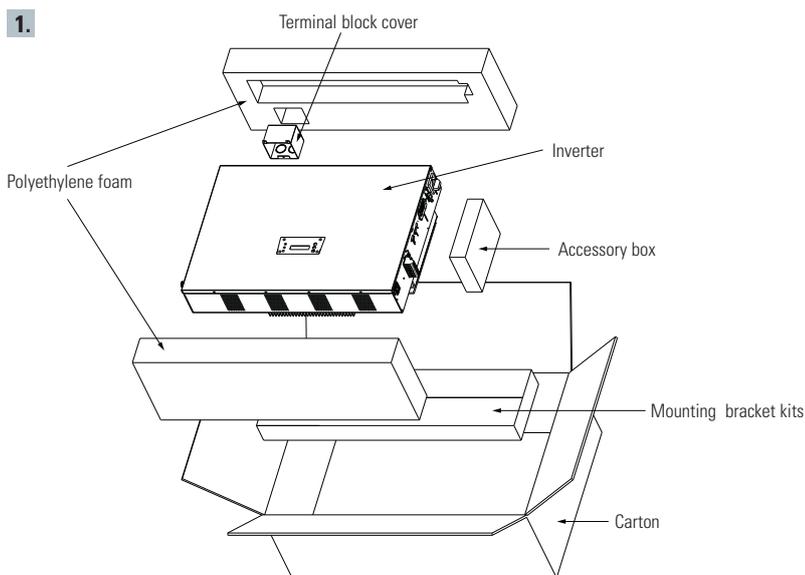


Figure 4: Unpacking the battery pack - Exploded view

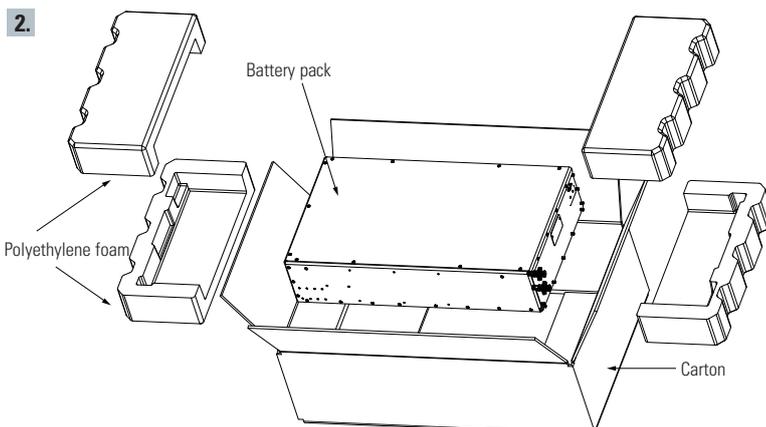


Figure 5: xStorage Home casing cover

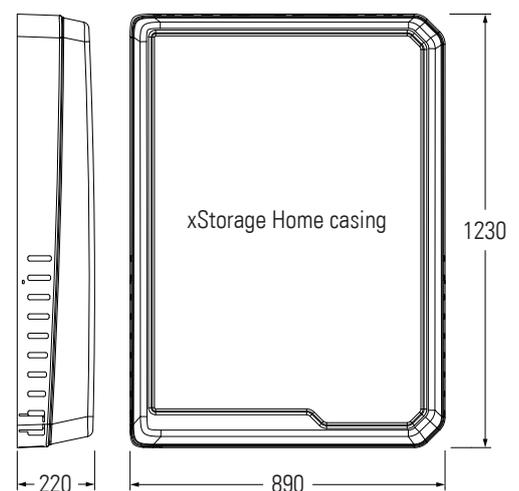


Figure 6: Quick Start Guide and Safety Guidelines

Eaton xStorage Home Quick Start Guide

⚠️ Never turn on any equipment when there is an evidence of fire, water or structural damage. ⚠️ xStorage Home must be installed only by a certified installer.

1. Preparation phase

Instructions

- Both the packed hybrid inverter and the battery pack are considerably heavy, wear safety shoes and preferentially use a vacuum lifter for handling operations.
- All handling operations will require at least two people (unpacking, lifting, installation i.e. mounting on the indoor wall).
- Select a suitable indoor mounting location such as the house or the garage, no drywall and no outdoor mounting allowed. The operational temperature range is [0°C, 30°C], 5% to 95% relative humidity (non condensing).
- Due to the various types of walls, fixing the xStorage Home system might differ from case to case. Contact your Eaton technical support representative for recommendations.
- In case of missing accessories, contact your Eaton technical support representative.
- xStorage Home parts MUST NOT be energized during mounting and installation.
- Allocate a minimum wall area of 1530 mm x 1190 mm that is clear of all electrical wiring, pipework or other obstructions either on or buried within the wall.
- Use appropriate tools and screws for the installation.

Packaging: xStorage Home & accessories

No.	Accessory
1	1x Hybrid inverter, dim: 796 mm x 515 mm x 182 mm (W x H x D)
2	1x Battery Pack
3	1x Mounting bracket
4	8x M5*40 mm round thick head wall mounting screws for BT type
5	8x plastic wall insert plug (MS) type
6	3x M4*15 mm truss cross
7	3x M3*8 mm round washer head screw, machine type
8	16x M4*6 mm flat cross
9	1x Terminal block cover for AC load output and input
10	1x Foot
11	7x M5*40 Round thick head
12	7x Plastic wall insert plug (MS)
13	1x M4*30 Round thick wall mount head
14	1x Plastic wall insert plug (M)

No.	Accessory
15	5x M5*10 Flat top screws
16	1x BP support bracket
17	1x EMC Core
18	1x 270 CAN adaptor
19	1x WiFi dongle
20	1x RS-485 connector
21	1x PV MC4 tool
22	1x RS232 Communication cable
23	1x M6*12 Hex Cross (BP grounding)
24	1x Grounding wire
25	2x PV MC4 connector
26	1x EPO connector

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Eaton xStorage Home Safety Guidelines

Prior to the installation it is required to download (www.eaton.com/xstorage), read, understand the step by step instructions from the latest xStorage Home installation manual.

Save these instructions. These safety guidelines contain essential information that must be followed during the installation of the xStorage Home system according to the procedure outlined in the xStorage Home installation manual. Instructions must be carefully read and understood before operating the equipment and be saved for future reference. The xStorage Home system is a product for residential application only and installation must be done in a dry, indoor environment within 0 °C to 30 °C, free of conductive contaminant. **NOTE: The xStorage Home system can only be installed by Eaton certified personnel i.e. an Eaton certified installer who needs to fully understand and apply provided safety instructions in order to avoid electrical hazard shock, potential death and severe product damage.**

These safety guidelines apply to the following xStorage Home systems and product life use phases:

xStorage Home systems			
Charging power	Battery capacity	Product description	Part number
3.6 kW	4.2 kWh	XST 1Ph 3.6 kW 4.2 kWh Blue	XSTHP19361UBUEV2
4.6 kW	4.2 kWh	XST 1Ph 4.6 kW 4.2 kWh Blue	XSTHP19461UBUEV2
6.0 kW	4.2 kWh	XST 1Ph 6.0 kW 4.2 kWh Blue	XSTHP19601UBUEV2
3.6 kW	6.0 kWh	XST 1Ph 3.6 kW 6 kWh Blue	XSTHP30362NBUEV2
4.6 kW	6.0 kWh	XST 1Ph 4.6 kW 6 kWh Blue	XSTHP30462NBUEV2
6.0 kW	6.0 kWh	XST 1Ph 6.0 kW 6 kWh Blue	XSTHP30602NBUEV2
3.6 kW	10.08 kWh	XST 1Ph 3.6 kW 10.08 kWh Blue	XSTHP30364NBUEV2
4.6 kW	10.08 kWh	XST 1Ph 4.6 kW 10.08 kWh Blue	XSTHP30464NBUEV2
6.0 kW	10.08 kWh	XST 1Ph 6.0 kW 10.08 kWh Blue	XSTHP30604NBUEV2

Use phase	User	Action
Logistics	Forwarder	Loading, storing, delivery
Installation	Eaton certified installer	Unpacking, mounting, installation, commissioning
Operating phase	Residential user	Nominal operation via the User Interface (UI), malfunction notification, misuse
Service and maintenance	Eaton certified service provider	Standard check-up, replacement of the battery pack, the hybrid inverter or the electrical units, software upgrade
Deinstallation	Eaton certified installer	Dismantling the installed xStorage Home system
Product disposal	Eaton certified installer	Recycling the xStorage Home system

⚠️ ⚠️ ⚠️ ⚠️ DANGER INSTALLATION ⚠️ ⚠️ ⚠️ ⚠️

- The product installation i.e. the mounting, the connection and the operation instructions described in the installation manual must be followed at all times in the given order.
- The xStorage Home system must be installed in a temperature and humidity controlled, indoor environment that is free of conductive contaminants according to the recommendations provided in the xStorage Home installation manual. Never install the xStorage Home system in an airtight room, in the presence of flammable gases, or in an environment exceeding the specifications such as outdoors. The system is not intended for outdoor use. Excessive amount of dust in the operating environment of the xStorage Home system may cause damage or lead to malfunction.
- Allowed ambient temperature range is [0 °C, 30 °C] and must not exceed 30 °C especially for 10 consecutive days. Do not install and operate the xStorage Home system near water or excessive humidity (95 % maximum).
- Prior to starting any installation or service work, all AC and DC power sources must be disconnected. Ensure as well the system grounding/PE continuity.
- Do not open or mutilate the battery pack or the hybrid inverter.
- If accidentally dropping the battery pack or the hybrid inverter, immediately move back to the 5 meter safe distance and prepare foam fire extinguishers in case the battery pack cells ignite from the impact. Then inform your Eaton technical support representative. In case of fire, inform immediately the fire brigade, keep the safe distance from the hazard scene due to the potential risk of being exposed to toxic fumes and inhaling smoke. Inform all people in the near proximity not to enter the hazard area.
- In case of spillage incidents i.e. battery pack leakage, move away at least 5 meters from the leak point and inform your Eaton technical support representative and fire brigade. Keep away from the hazard area. The disposal of the battery needs to be handled by Eaton certified personnel.
- In the event of electrolyte contamination i.e. the exposure to uncovered battery material such as electrolyte, powder etc.; skin and eyes should be immediately flushed with plenty of clean water and contaminated clothing immediately removed. The user should request medical assistance.

If you disregard any of the listed danger points you are risking severe product damage, electrical shock hazard and potentially death.

⚠️ ⚠️ WARNING INSTALLATION ⚠️ ⚠️

- Prior to energizing the installed xStorage Home system, ensure that the hybrid inverter and/or the battery pack are not inadvertently grounded. If inadvertently grounded, remove the source from the ground. A contact with any part of a grounded battery pack or hybrid inverter can result in an electrical shock. The likelihood of a shock can be reduced if all grounds are removed during installation and maintenance. This is applicable to the equipment and the remote battery supplies not having a grounded supply circuit.
- To meet the warranty and safety requirements, keep the distance between the xStorage Home casing and the surrounding sides at a minimum of 15 cm.
- Prior to energizing the installed xStorage Home system make sure to connect physically all elements as it is instructed in the xStorage Home installation manual and cover the hybrid inverter and the battery pack with the xStorage Home casing in order to prevent potential contact with the operating system once energized.
- If the xStorage Home system application includes a connection to a photovoltaic (PV) solar system and/or to the grid make sure to deenergize the PV connecting and/or the battery pack, and/or the grid terminals prior to any work. Note that the xStorage Home system can be powered by the PV solar system, the grid or by its own energy sources (batteries) so deenergizing each connecting terminal is essential. Never let a foreign body penetrate inside the xStorage Home unit.
- Never block the natural air flow around the system, do not place anything on the top or near the sides of the xStorage Home system after installation.
- Never expose the system to direct sunlight or a source of heat.
- If the xStorage Home system must be stored prior to the installation, the storage must be in a dry place away from sun and rain exposure.
- When installing the hybrid inverter note that within this device AC and DC sources are terminated. To prevent risk of an electrical shock during the installation please ensure that all AC and DC terminals are disconnected from the power source.
- Make sure to secure the ground line to the grid's ground, and to double check power grid, and Neutral are not confused with the Ground.
- The hybrid inverter is designed to feed AC power directly to the public utility power grid only. Do not connect the AC output feed of the hybrid inverter to a private AC equipment. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
- Do not attempt to alter the battery pack wiring or connectors especially to the hybrid inverter. Attempting to alter wiring can cause injury.

⚠️ WARNING LOGISTICS ⚠️

- Do not lift the packed or unpacked units on your own without help or without an adequate machine lifter. There is a severe risk of self-injury.
- Do not pack pallets with products on top of each other. 1 pallet contains 3 rows of products i.e. 3 packs on top of each other distributed in 2 side to side columns. If the stacked number of packages exceeds the defined number there is a double risk of damaging the products and risking packages falling directly to the floor and on the handier of the units leading to potential death and product irreversible damage.
- When loading, lifting, storing and delivering products avoid uncontrolled product movements. These could harm both the product and the handier of the units.
- The battery pack and the hybrid inverter must be transported in their original packaging, in an upright orientation with the terminals at the top. Compliant, non-flammable material must be used to protect the battery pack from impact damage. Never lift the battery pack or the hybrid inverter by the terminals.
- During the delivery, the products must be carefully packed to prevent any product damage during the transport in case of excessive vehicle movements which should be avoided.

⚠️ CAUTION LOGISTICS ⚠️

- Both the packed hybrid inverter and the battery pack units are considerably heavy; safety shoes shall therefore be worn and a forklift could be used for all handling operations.
- All handling operations such as loading, lifting, moving packed units through the warehouse, delivery and unloading will require AT LEAST two persons working together.
- Always store packages in a dry and humidity controlled environment where the storage temperature range is from -10 °C up to 40 °C and far away from turning liquids.
- Never let a foreign body penetrate inside any of the packaging, i.e. neither inside the packaging of the battery pack nor inside the packaging of the hybrid inverter.
- In case of dropping any of the packaging report this immediately to the responsible personnel who then have to carry out a product quality control check and make sure that the fall or impact did not cause damage to the product.
- Do not leave packed products outside. Excessive weather might cause severe product damage.

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Figure 7: xStorage Home wall mounting bracket assembly

3. Mounting bracket

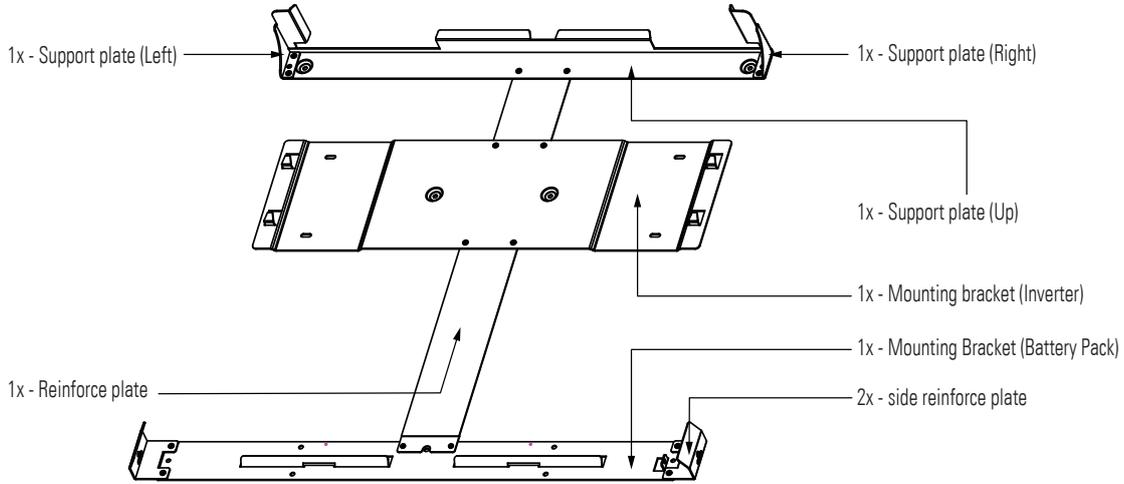
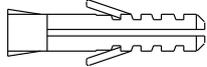
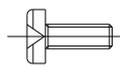
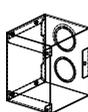
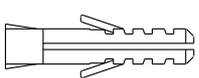
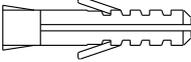
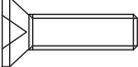
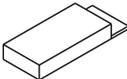
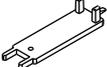
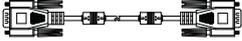
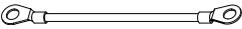


Figure 8: Accessory box kit

- | | | |
|-----|---|---|
| 4. |  | 8x M5*40 mm round thick head wall mounting screws for BT type |
| 5. |  | 8x Plastic wall insert plug (M5) type |
| 6. |  | 3x M4*15 mm truss cross |
| 7. |  | 3x M3*8 mm round washer head screw, machine type |
| 8. |  | 16x M4*6 mm flat cross |
| 9. |  | 1x Terminal block cover for AC load output and input |
| 10. |  | 1x Foot |
| 11. |  | 7x M5*40 mm round thick head |
| 12. |  | 7x Plastic wall insert plug (M5) |

13.		1x M4*30 round thick wall mount head
14.		1x Plastic wall insert plug (M4)
15.		5x M5*10 flat torx screws
16.		1x Battery pack support bracket
17.		1x EMC Core
18.		1x 270 CAN adaptor
19.		1x WiFi dongle
20.		1x RS-485 connector
21.		1x PV MC4 tool
22.		1x RS232 communication cable
23.		1x M6*12 hex Cross (battery pack grounding)
24.		1x Grounding wire
25.		2x PV MC4 connector
26.		1x EPO connector

6.3 Optional accessory elements

Please note that in some cases, installing the xStorage Home system (as detailed in Section 9) may require the connection and configuration of a power meter. Should this be the case, the Eaton certified installer will provide the appropriate power meter. For more information on whether a power meter is necessary for the installation of the xStorage Home system, please contact your Eaton technical support representative and read the complimentary xStorage Home power meters manual for further details.

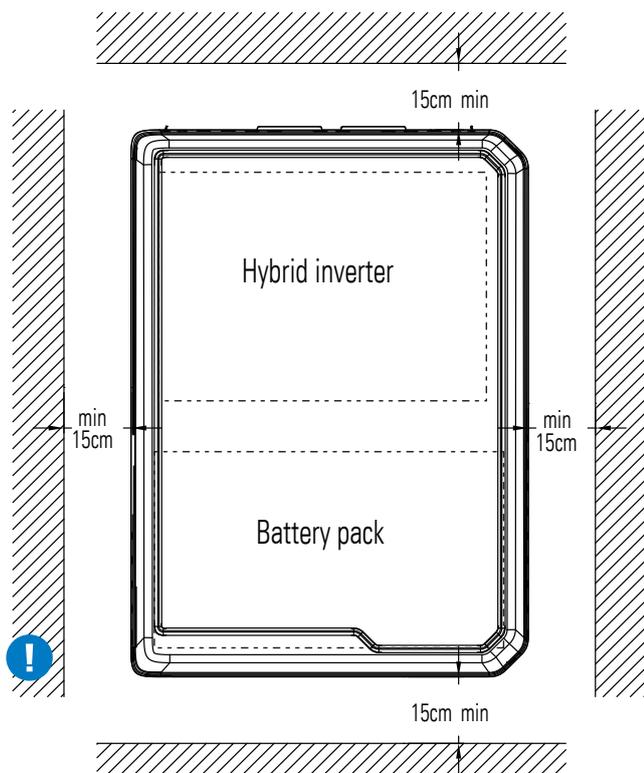
7. Mounting

The mounting phase consists of six sequential steps.

7.1 General instructions

- To comply with the warranty and safety requirements, a minimum distance of 15 cm should be maintained between the xStorage Home casing and its surroundings, as illustrated in Figure 9.
- A minimum wall area of 1,530 mm x 1,190 mm should be allocated that is free from any electrical wiring, pipework or other obstructions, either on the surface or embedded within the wall.
- The mounting wall must be able to support the following weights: 37 kg for the inverter, 83 kg for the battery pack, and approximately 15 kg for the casing and mounting bracket. The total combined weight amounts to 135 kg.
- The xStorage Home system must be mounted on a thick brick wall that is able to support this load.
- The xStorage Home parts MUST NOT be energized during mounting and installation until it has been ascertained that the system has been properly connected and grounded.
- The product must be mounted in a vertical position ONLY.
- The room where the installation is taking place must have its own source of ventilation.
- Note: the torque for tightening the mounting screws should not be higher than 0.4 Nm.

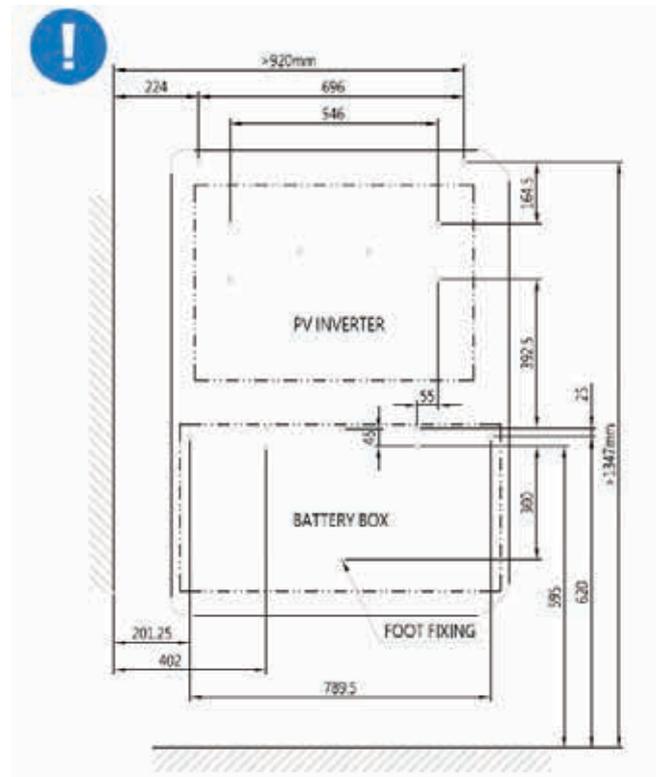
Figure 9: Required distance between the xStorage Home system and its surrounding



7.2 Mounting dimensions

Follow the mounting positioning guidelines as illustrated on Figure 10 in order to properly position the mounting bracket shown in Section 6.2, Figure 7. Dimensions are shown in [mm].

Figure 10: Mounting dimensions for the hybrid inverter and battery pack

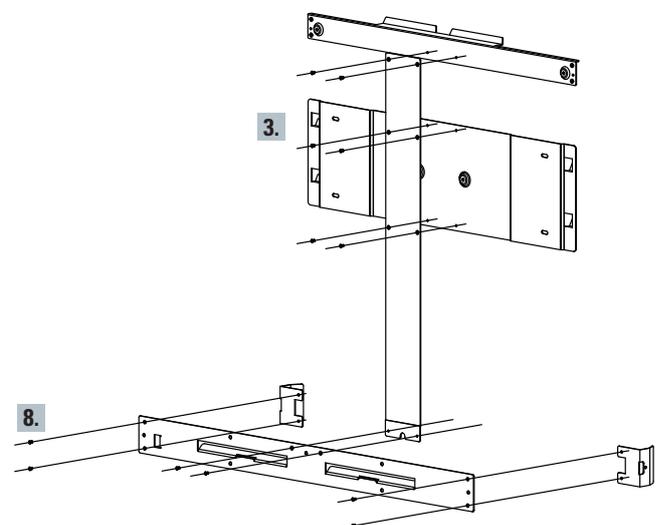


7.3 Assembly of mounting bracket

Connect the mounting bracket elements as shown in Figure 11.

Use the M4*6 flat cross screws from the accessory box kit (Section 6.2, Figure 8).

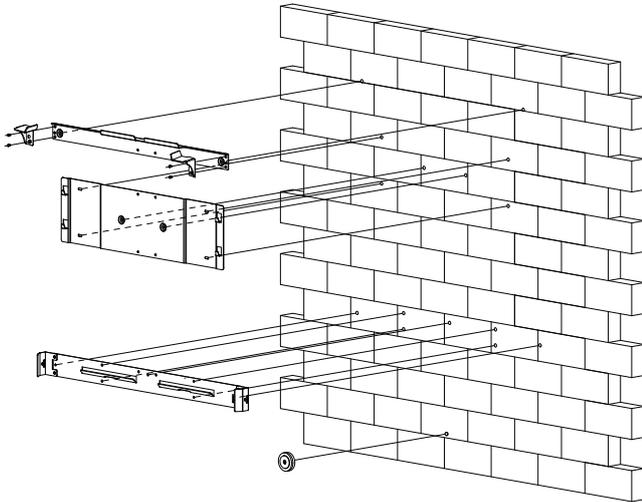
Figure 11: How to construct the wall mounting bracket



7.4 Drilling the holes in the wall

Mark the position of the holes on the wall using the mounting bracket, then drill the holes as it is shown in the figure below.

Figure 12: How to mark the position of the holes on the wall

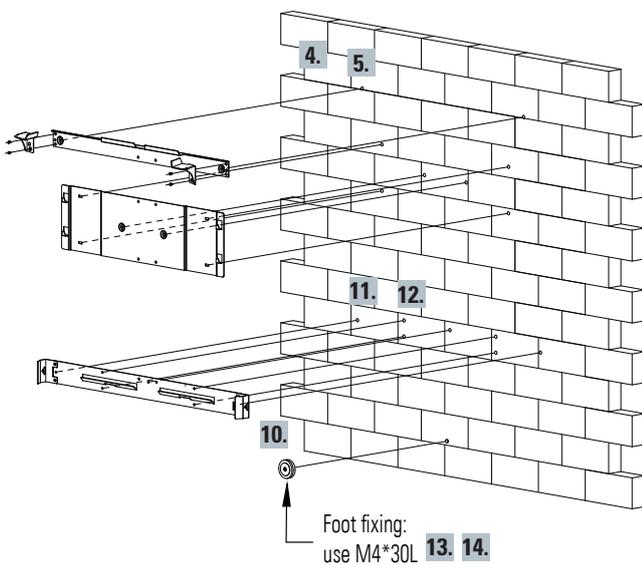


Once the holes are made, disassemble the wall mounting bracket.

7.5 Fixing the mounting bracket

Use the appropriate accessories (see Section 6.2) to fix the mounting bracket to the wall as shown in Figure 13.

Figure 13: How to fix the wall mounting bracket



Please note that the appropriate type of plastic plugs and screws (references 4 and 5 in the image) must be selected by an Eaton certified installer, based on the following considerations:

- the installation location, as well as;
- the type of the wall on which the system is to be mounted;

to ensure that the mounting of the hybrid inverter and the battery pack is done as safely as possible.

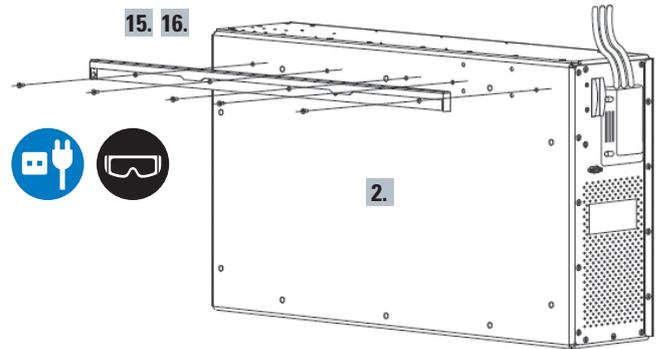
The mounting elements 4 and 5 proposed in Section 6.2 represent a general recommendation and should be adjusted as appropriate for mounting the system on the given wall.

7.6 Preparing the battery pack for mounting

Before mounting the battery pack, please note that:

- the battery pack mounting bracket must be attached as illustrated in Figure 14;
- the battery pack orientation indicated in Figure 14 is to be followed;

Figure 14: Prior to mounting the battery pack

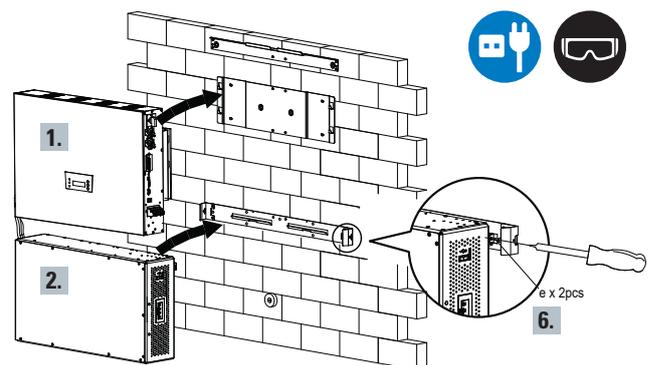


7.7 Mounting the hybrid inverter and the battery pack

When mounting the hybrid inverter and the battery pack, please ensure that:

- The soft start switch of the inverter is in position "I"
- Both the hybrid inverter and the battery pack should be mounted in the orientation illustrated in Figure 15.
- The hybrid inverter is to be mounted at the top, and the battery pack in a vertical position below.
- Please note that the xStorage Home battery pack can only be installed together with and connected to the xStorage Home hybrid inverter. In other words, the battery pack is not compatible with third party inverters.

Figure 15: Final step for mounting the xStorage Home system



8. Wiring



WARNING!

Prior to starting up the xStorage Home system, please make sure that all the circuit breakers for the battery pack, the DC input power (PV), the AC input power (AC grid) and the AC output power (AC loads) are all switched off.

Follow the illustrated step by step instructions to ensure the proper wiring of the xStorage Home system.

8.1 Hybrid inverter connections

The xStorage Home hybrid inverter has two sides that can be connected either to power, input/output loads or to communications network. These connection points are referenced and explained in Figure 16, Figure 17 and Table 5.

Figure 16: Hybrid inverter power and communication network - Available connections

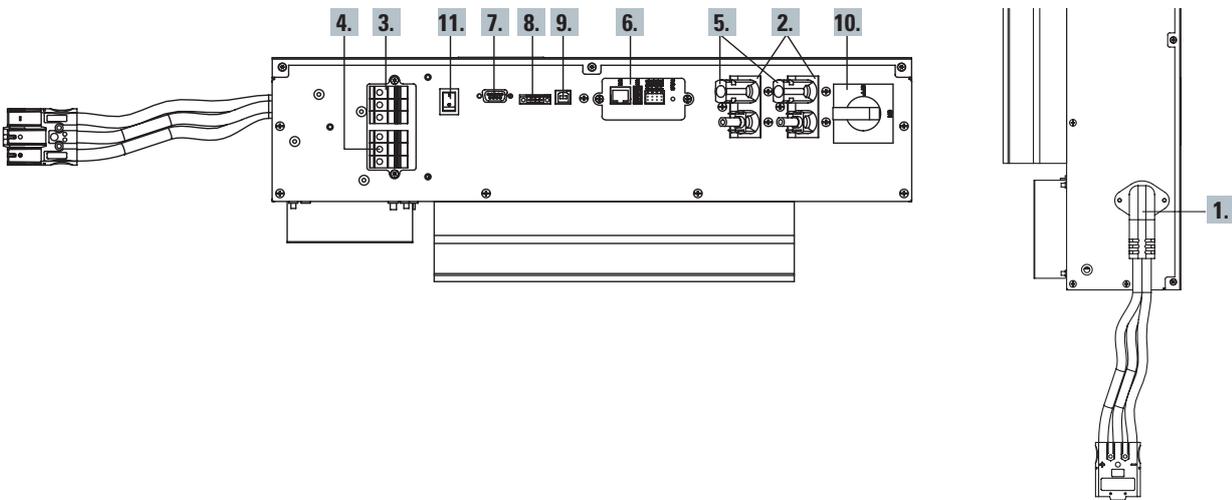


Figure 17: 3D view of hybrid inverter connection points

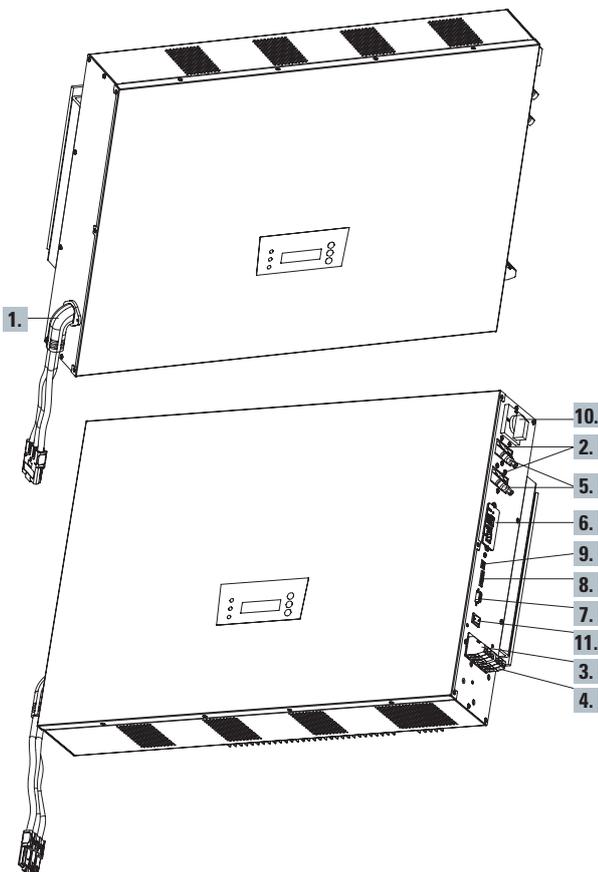


Table 5 Hybrid inverter connection points

Hybrid inverter	INVERTER POWER RANGE		
	3.6 kW	4.6 kW	6 kW
Connection reference	Description		
1	DC-input (BAT): Terminals for battery pack connection		
2	DC-input (PV): Cable cross section must be calculated according to I _{sc}		
3	AC load output: The terminal supports the AC power wires connection. L (Phase), N (Neutral), GND (PE): Ø 4/6mm ²		
4	AC grid-input: The terminal supports the AC power wires connection. L (Phase), N (Neutral), GND (PE): Ø 6/10 mm ²		
5	DC-input (PV)		
6	Communication slot: Ethernet card already assembled; LAN, USB and RS-485 port		
7	CAN-BUS BAT COMM: Accessory includes RS232 cable to communicate with BMS board		
8	Optional EPO port		
9	USB port		
10	DC switch disconnector		
11	Soft start switch for the installation		

8.2 Battery pack wiring connections

The battery pack contains two main connection terminals, as referenced and explained in Figure 18, Figure 19 and Table 6. Make sure that the breaker on the battery pack is open during the commissioning.

Figure 18: Battery pack power and communication network - Available connections

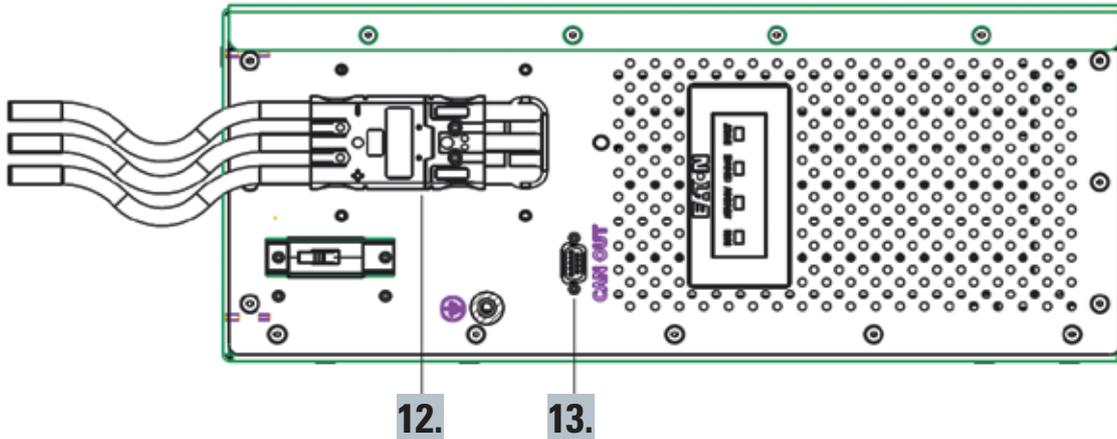


Figure 19: 3D view of battery pack connections for reference



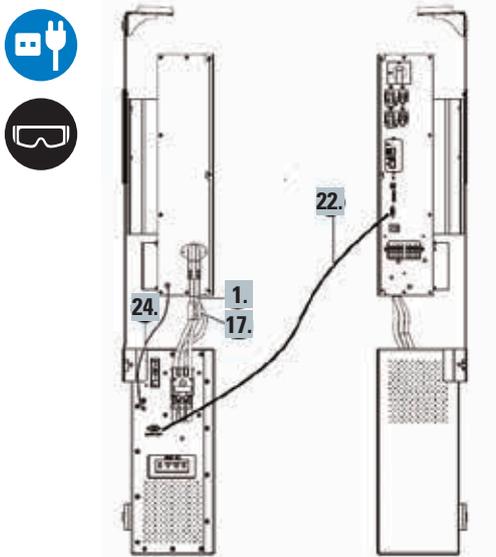
Table 6 Battery pack connection points

Battery pack	NOMINAL CAPACITY		
		4.2 kWh	6 kWh
Connection reference	Description		
12	DC-input (BAT): Terminals for battery pack connection		
13	CAN-BUS BAT COMM: Accessory includes RS232 cable		

8.3 Connecting

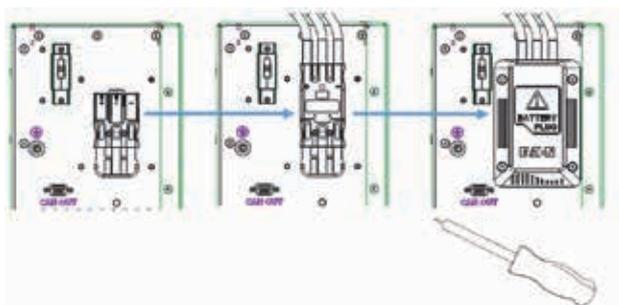
After mounting the xStorage Home system, familiarize yourself with the connections shown in Sections 8.1 and 8.2:

Figure 20: Hybrid inverter and battery pack wiring



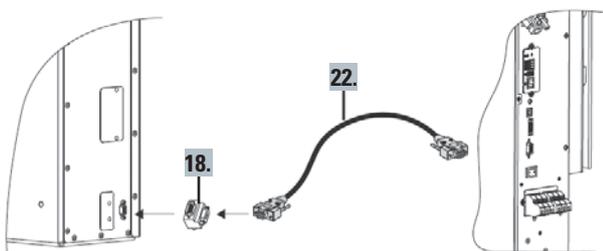
- Remove the plastic protection of the battery plug (Figure 21).
- Connect the hybrid inverter and the battery pack using the terminal. The terminal slides from the inverter directly into the battery pack.
- Connect the Ground system by using the grounding wire and connect the hybrid inverter and the battery pack as shown in Figure 21.
- Close the breaker on the battery pack.
- Add the core between the black and the red cable.
- Cover the terminal with the battery plug (Figure 21).

Figure 21 Battery terminal plug between the hybrid inverter and the battery pack



- Use the RS232 cable and connect the CAN-BUS BAT COMM port of the hybrid inverter port with the battery pack port via the CAN 270 connector as shown in Figure 22.

Figure 22 CAN-BUS BAT communication connection between the hybrid inverter and the battery pack

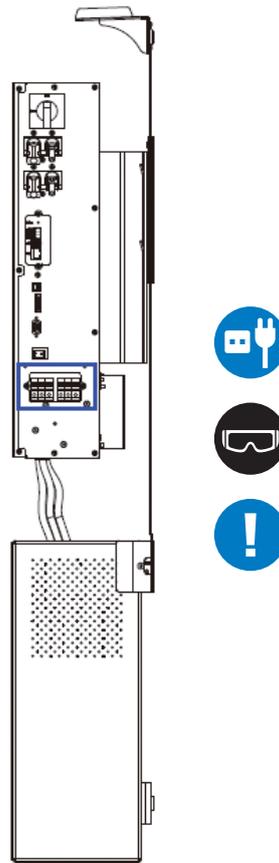


8.4 Connecting AC load output/input power cords

Finally, connect the hybrid inverter to the grid, i.e. to the power distribution board and to the critical loads, using the connection terminals 3 and 4.

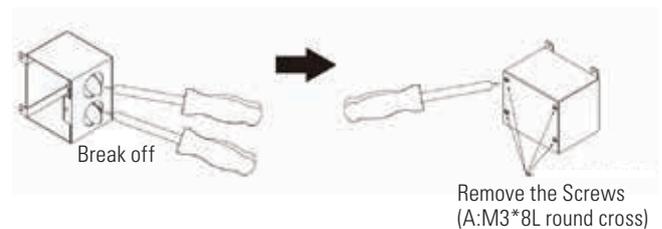
These connection points are illustrated in Figure 23; the AC power cords must be provided by the Eaton certified installer. Please note that the system must be disconnected from all power sources at **ALL TIMES**. Make sure that all relevant circuit breakers connected to the grid and to the critical loads are set to OFF while wiring.

Figure 23: AC load output/input terminals



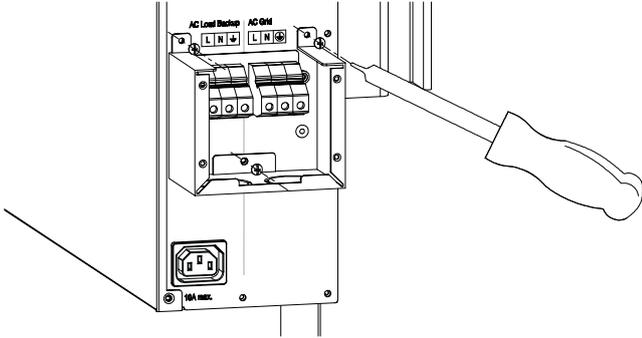
Prior to connecting, open up the terminal block cover for the AC load output/input (Figure 24), by removing the screws (A:M3*8L round cross) as shown in the following set of figures.

Figure 24: How to open the AC terminal block cover



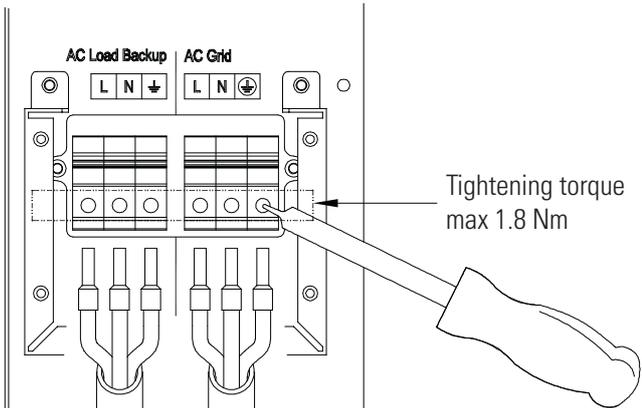
Connect the bottom part of the terminal block cover (Figure 25) for AC load output and input to the hybrid inverter.

Figure 25: How to connect the AC terminal block cover to the hybrid inverter



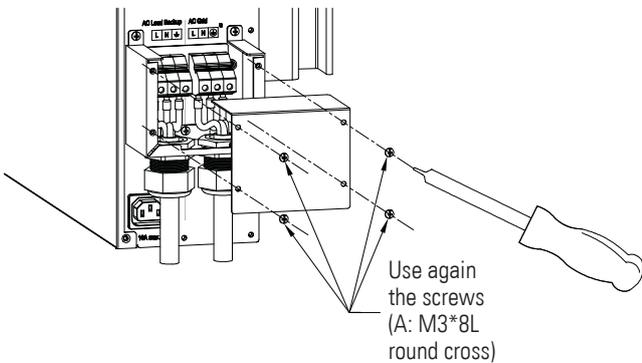
Next, connect the AC load input/output power cords that lead from the power distribution panel to the corresponding terminals on the hybrid inverter (Figure 26). The maximum tightening torque is 1.8 Nm.

Figure 26: How to connect the AC load input/output power cords to the hybrid inverter



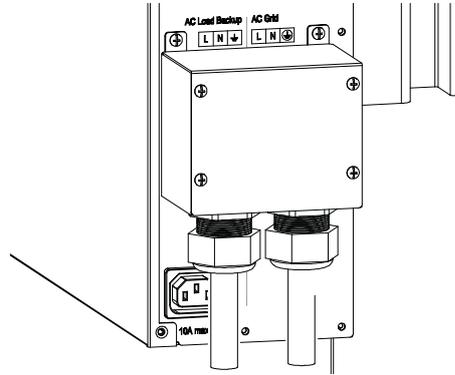
Close the terminal block cover for the AC load output and input and secure it onto the inverter, as illustrated in Figure 27.

Figure 27: Covering the AC load input/output terminals



The objective is to protect the AC load output/input with the closed terminal block cover as shown in Figure 28.

Figure 28: Covered and protected AC terminals



8.5 Connecting the DC input PV terminals with the MC4 connectors

When installing a PV generation system together with the xStorage Home system, it is necessary to connect the xStorage Home system to the PV system directly. To this end, the use of a short instead of a long MC4 connector is recommended:

- Recommended Part Number (P/N): 104-80128-00 and 104-80129-00.

Both MC4 connectors should be connected to the hybrid inverter as illustrated in Figure 29. When detaching the PV MC4 connectors, use the PV MC4 tool (Section 6.2, reference 21), as illustrated in Figure 30. Pull out the PV MC4 tool wire and remove the PV MC4 tool (Figure 31).

Figure 29: Hybrid inverter and MC4 connector

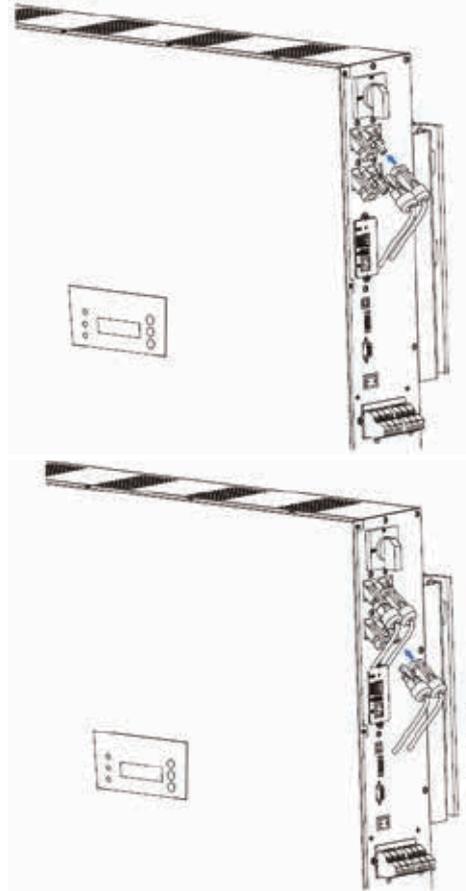


Figure 30: Disconnect using either ends of the PV MC4 tool

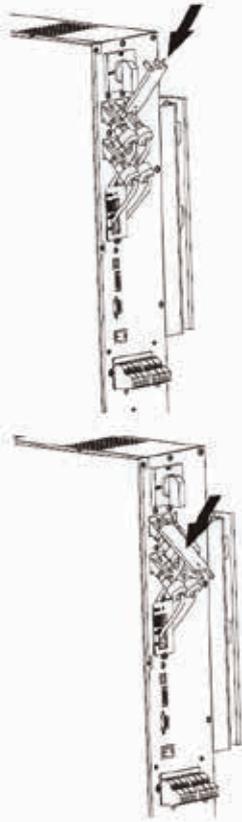
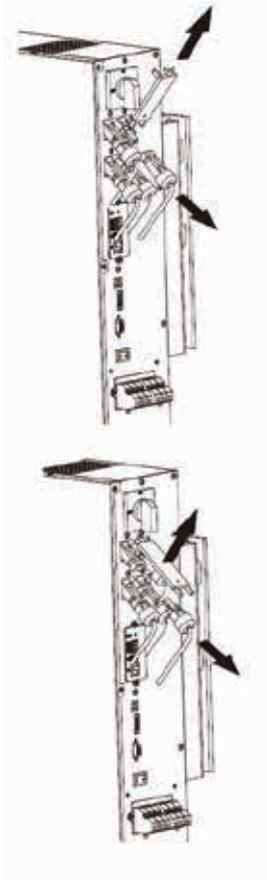


Figure 31: MC4 disconnected



8.6 Connecting an Emergency Stop Button

An optional emergency stop button can be connected to the EPO port of the hybrid inverter (Reference 8 in Figure 17). Please use the EPO connector in the accessory box.

- If the emergency stop button is engaged i.e. the EPO port is short circuited, the hybrid inverter will open the battery contactor, open the grid relay and the critical load relay. See Figure 32 as references.
- EPO port 1 and 2 should be normally closed to run the unit for Germany.

Figure 32: Connection diagram of emergency power off (EPO)

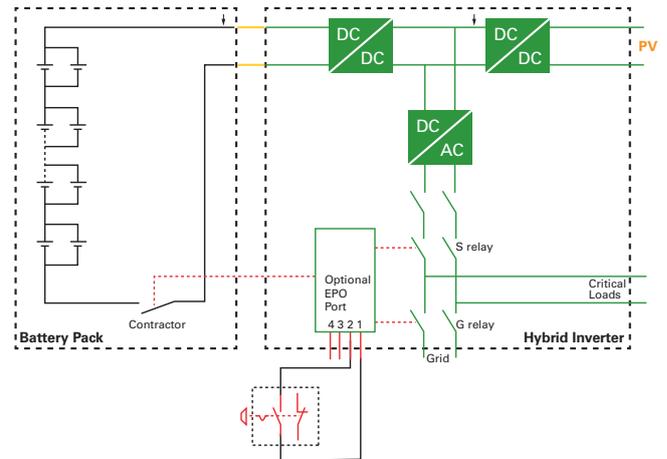
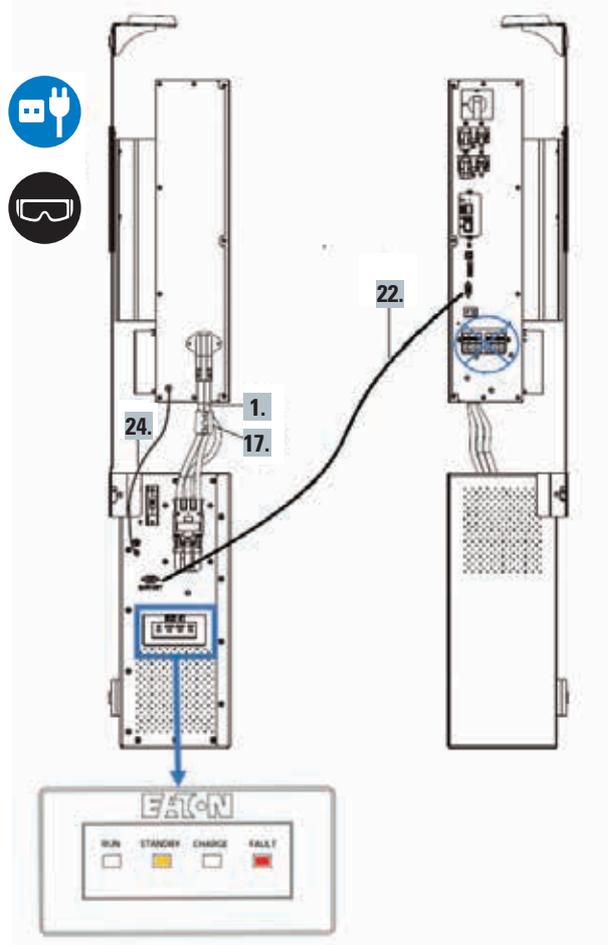


Figure 33: Configuration of the final installation



9. System installation and configurations

The appropriate type of the xStorage Home installation will vary depending on whether the household:

- already has an existing PV system: this type of installation is denoted as an AC coupled system;
- does not have a PV system, but this is to be installed together with the xStorage Home system: this type of installation is denoted as a DC coupled system;
- does not have a PV system, and none is to be installed with the xStorage Home system: this type of installation is denoted as a NO-PV installation.

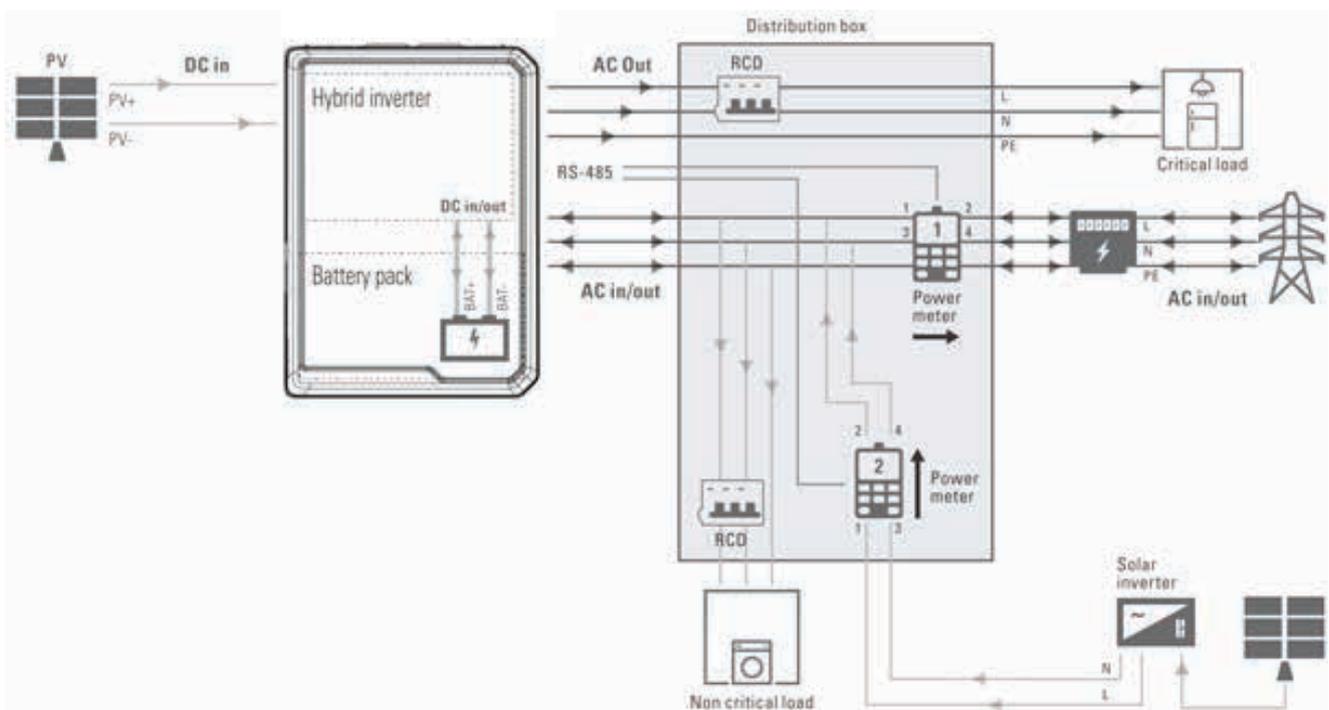
As the hybrid inverter is transformerless, the PV modules must have an IEC 61730-2 Class A rating.

Please also note that in order to enable the power monitoring and the full functional scope of the xStorage Home UI, it is necessary to install additional power meters, which are denoted as an optional element in Section 6.3. The generated data will be utilized by the xStorage Home UI for the purpose of energy consumption monitoring. Each of the installation types listed above is shown in Figure 33.

The PV DC switch must be selected according to the I_{sc} of the hybrid inverter ($I_{sc} = 35 \text{ A}$).

The AC breaker must be selected according to the maximum AC current of the hybrid inverter. All protective devices must be selected in accordance with local standards and regulations.

Figure 34: General wiring diagram for all types of installation



9.1 Additional electrical installation components

Depending on the electrical type of the xStorage Home installation, different electrical components will have to be placed in the power distribution box. In general, an Eaton certified installer will have to install some of the following protection devices which represent a minimal installation requisite:

- **Residual current device (RCD)** – 30 mA (not included in the xStorage Home list of accessories) This protects the loads directly connected to the xStorage Home system and powered up during the power outage (i.e. critical load).
- **Residual current device (RCD)** – 30 mA (not included in the xStorage Home list of accessories)- protects the loads directly connected only to the grid and NOT powered up during the power outage (i.e. non-critical load).

- **Power Meter 1** – measures the AC power injected from the grid to power up the non-critical loads.
- **Power Meter 2** – measures the AC power generated from the existing PV system.

The xStorage Home system is able to monitor only outgoing energy powering up the critical loads and incoming energy which source originates with the PV panels and/or the grid. Thus, without power meters the xStorage Home system is not able to estimate what exact energy is consumed by the non-critical loads. Note that the installation will be customized according to the local country installation regulations and that additional protective devices might be included in the installation. The Eaton certified installer will provide this information.

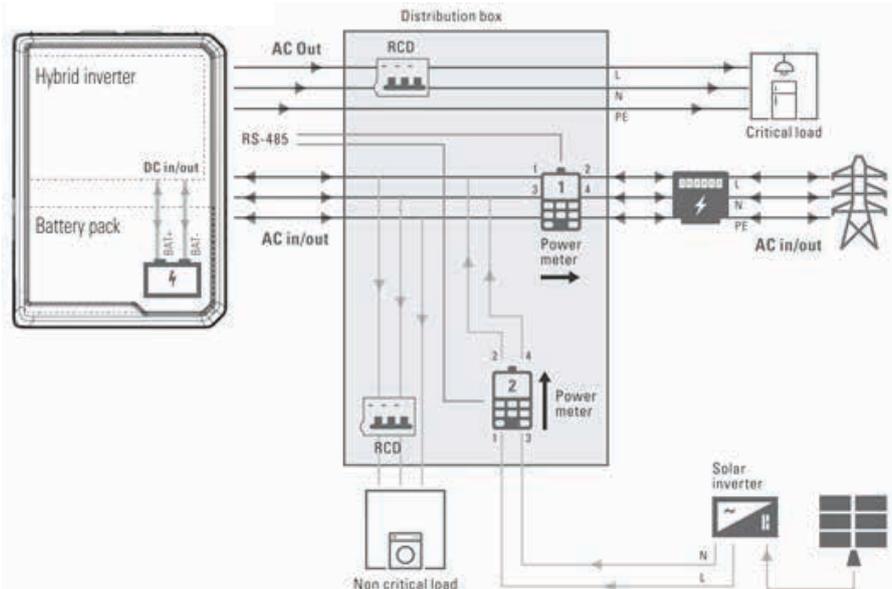
9.2 AC coupled system installation

AC coupled systems are typical for the so called retrofit installations where:

- Household have an existing PV generation system installed;
- The xStorage Home system is installed on the AC side of the installation and connected through the distribution box with the existing PV installation.

The following schematic (Figure 35) provides a general overview of the installation with loads divided into critical and non-critical. Power meters are, in general, necessary to monitor energy flows. Please refer to the complementary xStorage Home power meters manual in order to enable full functionality.

Figure 35: The AC coupled xStorage Home system installation



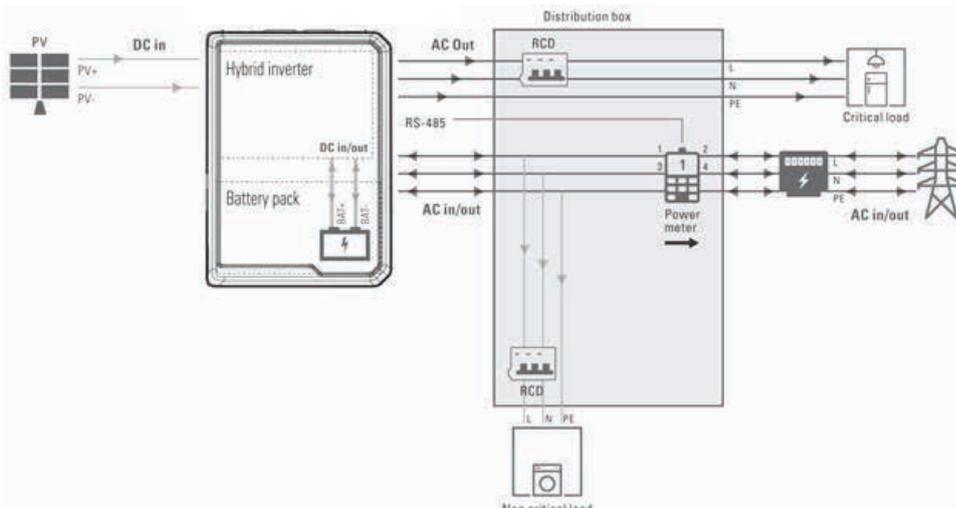
9.3 DC coupled system installation

DC coupled systems are typical for new installations where:

- Households do not have existing PV generation system installed;
- The xStorage Home system is installed together with the new PV installation;
- The xStorage Home and PV systems are connected directly through PV MC4 connectors.

The following schematic (Figure 36) provides a general overview of the DC coupled installation with loads divided into critical and non-critical. In this case, additional PV breakers should be added to the installation to protect the direct DC connection lines between the xStorage Home System and the PV panels. There is no need for an additional PV inverter to be installed as the hybrid inverter has this functionality integrated. The installation can be carried out without a power meter, but in that case the functionality of the UI will be limited.

Figure 36: The DC coupled xStorage Home system installation



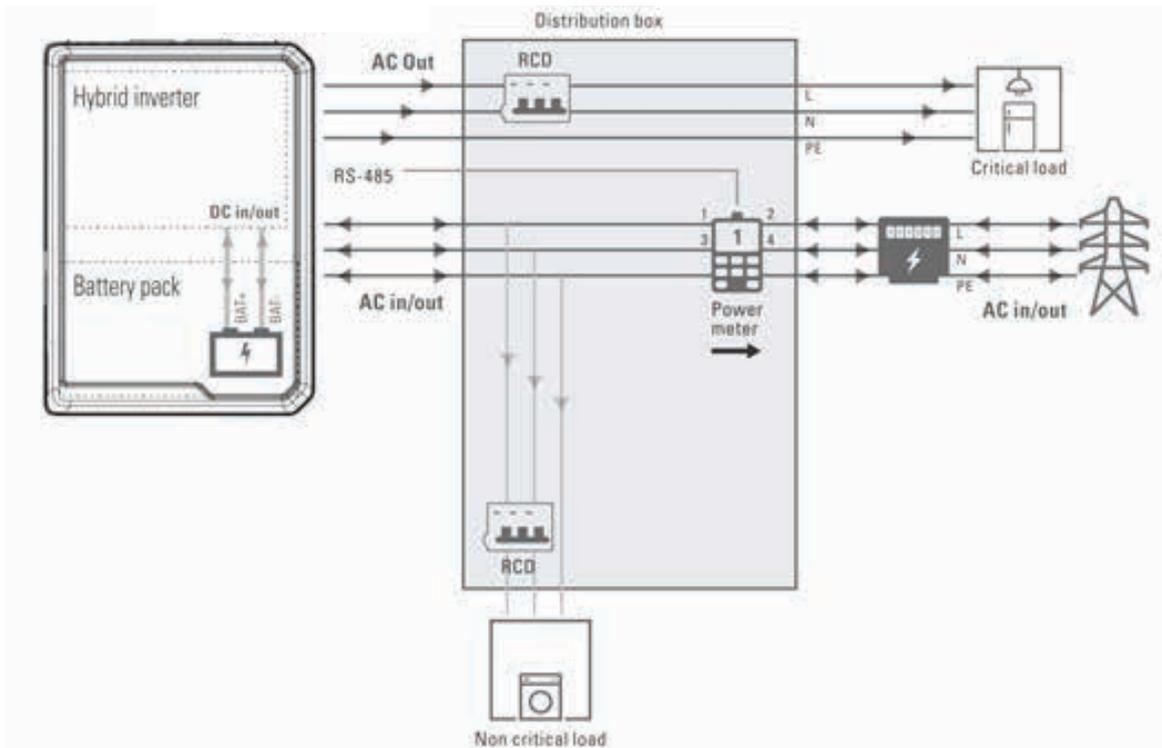
9.4 NO PV system installation

Characteristics of this type of installation are as follows:

- Household do not have an existing PV generation system installed and do not want to install one;
- The xStorage Home system is solely connected to the grid.

The following schematic (Figure 37) provides a general overview of the NO PV installation with loads divided into critical and non-critical. The installation can be carried out without a power meter but in that case the functionality of the UI will be limited.

Figure 37: The NO PV xStorage Home system installation



9.5 General installation remarks

9.5.1 Cable selection

- Connect both the AC grid and the AC distribution box with a 10AWG/6 mm² cable (preferred).

9.5.2 Installation notes

- RCD installation must be conducted in accordance with the local electrical codes and standards.
- The use of the off-grid AC output must be realized in accordance with the local grid connection rules and standards.
- System connection diagrams (Sections 9.2, 9.3, 9.4) illustrate the general installation scheme.

10. System start up

10.1 Start up sequence

To start the xStorage Home system:

1. Verify that all components have been properly connected as instructed in Section 8;
2. Verify and eventually put the soft start switch of the inverter in position "I" (Figure 17 reference 11);
3. Activate the circuit breakers for the AC input power and the AC output power in the designated power distribution box (Section 9);
4. Activate the battery pack switch (Figure 38);
5. Activate the hybrid inverter DC switch (Figure 39);
6. Configure the power meter as instructed in the complimentary xStorage Home Power meters manual;
7. If no fault trips, the start-up sequence has been successfully completed;
8. At this point, perform the FW upgrade if needed.

Figure 38: 3D overview of the xStorage Home battery pack



Figure 39: 3D overview of xStorage Home hybrid inverter



10.2 Hybrid Inverter – Front control display

The front control panel of the hybrid inverter consists of an LCD display, three status indication LEDs, and three keys as depicted below in Figure 40 and Figure 41. The functional description is provided in Table 7.

Figure 40: View of the xStorage Home hybrid inverter and its display



Figure 41: Overview of the display elements of the xStorage Home hybrid inverter

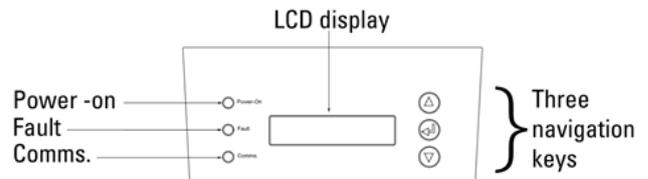


Table 7: Functional overview of the xStorage Home display elements

Hybrid inverter control panel elements		
LED	Power-on	Lights up when the inverter starts up
	Fault	Lights up if a fault is detected
	Comms	Lights up if the communications port is active and communications with the battery pack are up
Navigation keys		Scroll up the menu or move the cursor upward
		Set or confirm the setting
		Scroll down the menu or move the cursor downward
LCD display	16 characters x 2 lines; monochrome	Displays the operational status and parameter settings

The three LEDs are designed to indicate:

- Power-on: LED Green (Figure 42) → The hybrid inverter is connected to the grid, and it supplies or consumes power;

Figure 42: Power-on: Green on



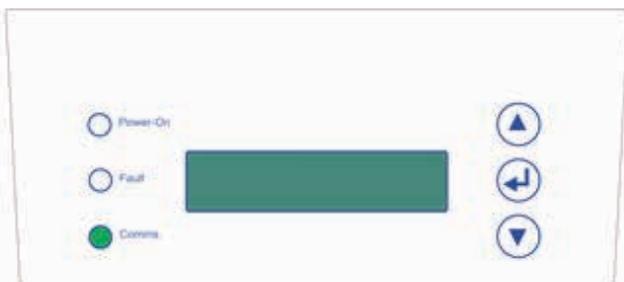
- Fault: LED Red (Figure 43) A fault has been detected, and the inverter has tripped and is no longer connected to the grid. Further details on possible faults and their remedial actions can be found in Section 16 "Troubleshooting";

Figure 43: Fault: Red on



- Communications: LED Green (Figure 44) Communications via the USB port or the RS-485 card are in progress.

Figure 44: Comms: Green on



10.3 Hybrid Inverter - initialization process

After powering up the xStorage Home system for the first time, perform the hybrid inverter set-up procedure by following the display messages and using the three navigational keys.

Please note that when powering up the hybrid inverter for the first time, the following will be displayed:

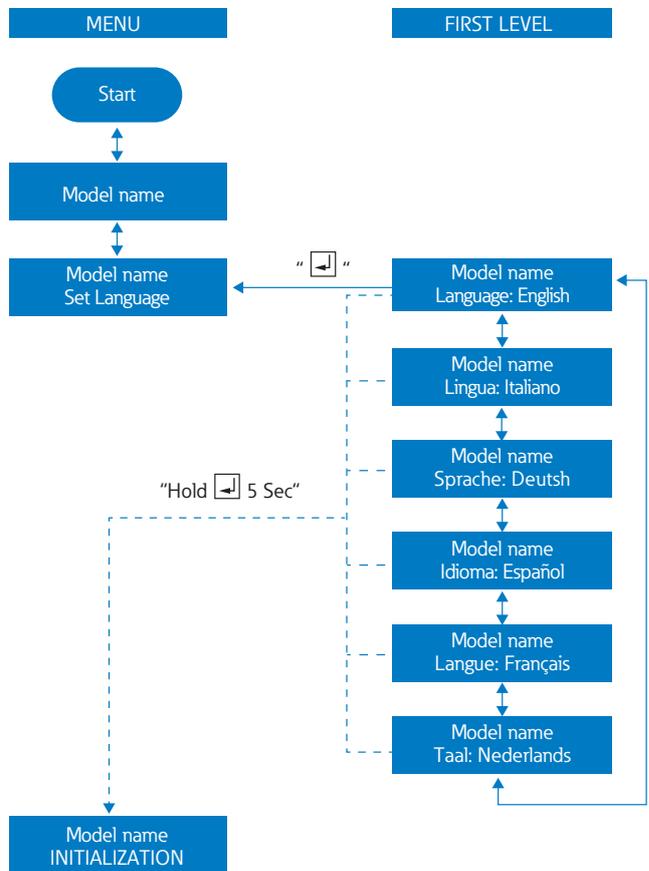
- the model name of the inverter (for example XSTH1P036P060V11);
- the initialization messages;

Then move to the *step-by-step* initialization process.

10.3.1 Language selection

Select the preferred language. The available languages are shown in Figure 45.

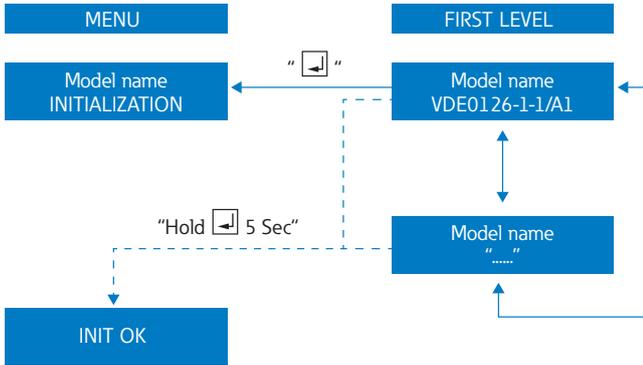
Figure 45: Hybrid inverter language options menu setup



10.3.2 Grid selection

Once the preferred language has been selected, move to "INITIALIZATION" for the grid selection (Figure 46). The grid choice will depend on the country of installation of the xStorage Home system. If the desired grid standard is not shown, check whether the latest FW version is installed. If the problem persists, contact your Eaton technical support representative.

Figure 46: Hybrid inverter grid options menu setup



WARNING!

If the selected grid standard is not in line with the applicable grid standard, the inverter will not function normally.

Once the grid standard has been selected, the Eaton certified installer will be able to navigate the options available in the main LCD menu of the hybrid inverter. Press \uparrow or \downarrow to go through the available options. Press \rightarrow to select the current option (if applicable) and make changes.

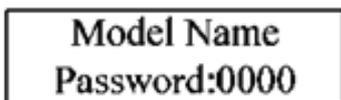
Table 8: Available options in the main LCD menu of the hybrid inverter

Option name	Description
Pac =	Active power injected (+) or absorbed (-) from the grid
Etoday =	Daily energy consumption and absorption
Vac =	Grid voltage
Iac =	Grid current injected or absorbed
Frequency =	Grid frequency
Vdc =	PV voltage / battery voltage
Idc =	PV current / battery current (+) = discharge, (-) = charge
Normal	"P reg active" is shown when the active power regulation mode is active (for CEI-021 only)
Ver	Current inverter FW version
Current regulatory setting	Currently selected grid code
Set Language	Change the LCD screen language
Set Date & Time	Change the date and time
Auto Test Set (CEI-021 only)	Autotest
Auto Test Result (CEI-021)	Autotest result
Set Active Power	Limit the maximum active power of the product
Active Power Val	Monitor the maximum active power setting
Set Reactive Power	Set up the reactive power control mode. Refer to Section 10.3.3 if you need to make any changes
React. Power Val	Monitors the reactive power control mode that is currently selected
Error History	Scroll through the error logs captured by the hybrid inverter. Use \uparrow or \downarrow to scroll through the list of errors.
Set Local Cmd (CEI-021 only)	Adjust the local command to select between the short and large frequency range. See 10.3.4 for instructions.

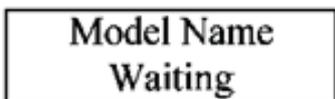
10.3.3 Changing the selected grid code

If the Eaton certified installer needs to change the regulatory setting, the following steps are to be followed:

1. Press \uparrow or \downarrow to scroll through the menu until the title of the current regulatory setting is shown on the LCD.
2. Hold \leftarrow for two seconds to lock the screen.
3. Keep holding \leftarrow for fifteen seconds to access the menu item for entering the inverter FW password.
4. Press \uparrow or \downarrow to change the number of the toggled digit. Press \leftarrow to confirm the setting and move the cursor to the next digit. Continue the process until all four digits have been set. The default hybrid inverter FW password is: 1234.



5. If the password is set correctly, "Waiting" will be shown on the LCD display, followed by the initialization menu for the grid code regulation. Select the grid standard of your choice.



10.3.4 Changing the frequency range

The large range is the default setting. If the Eaton certified installer needs to select the short range, both the Local Command and Distant Command must be adjusted accordingly.

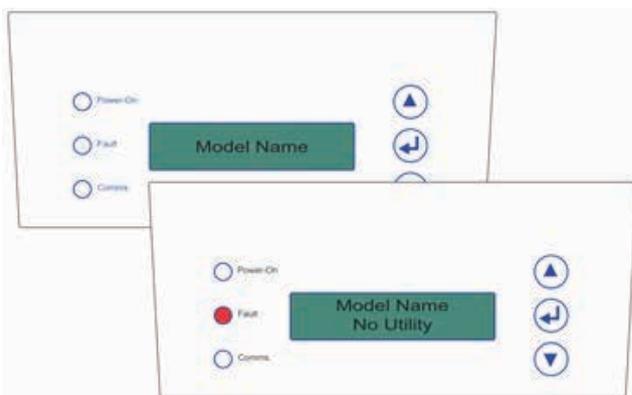
1. The Local Command can be set by navigating the main LCD menu of the hybrid inverter until reaching the option "Set Local Cmd", holding \leftarrow for ten seconds, inserting the password as explained in Section 10.3.3 and pressing \leftarrow to toggle the Local Command to ON or OFF.
2. The Distant Command can be set to ON by using a cable to short-circuit the third and fourth pin (from the top) of the optional EPO port on the hybrid inverter I/O.

10.3.5 Finalizing the initialization

After the initialization sequence, the hybrid inverter will restart automatically. If the device is still not connected to the AC grid, or the grid connection is lost, the hybrid inverter's LCD display will show:

- "No Utility" after displaying the "Model Name"
- The red Fault LED will be active as shown in Figure 47:

Figure 47: "No Utility" hybrid inverter display message



In order to establish the AC grid connection, verify that:

- the physical connection from the hybrid inverter to the grid utility has been properly wired, and that
- the Off/On status of the AC grid breaker in the designated power distribution box is set to "on".

In order to connect the device to the grid, the Eaton certified installer must first setup the UI as per Section 11.

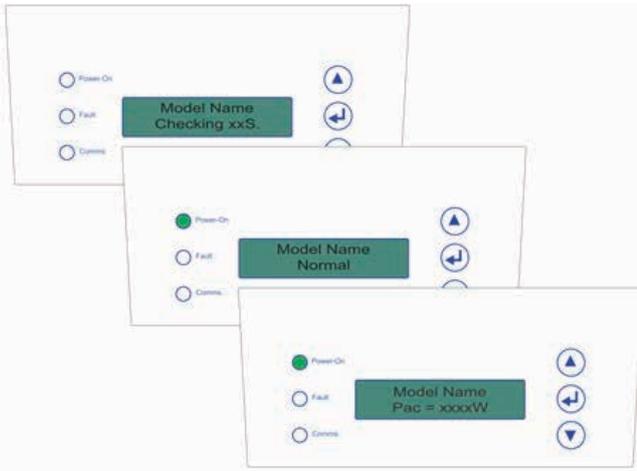
The connection to the grid command must be activated using the Power On Command on the UI.

If open, close the AC breaker between the hybrid inverter and the grid; the hybrid inverter will then enter into "Checking" status with a countdown shown on the LCD display.

During the countdown period (which is subject to the selected grid standard), the hybrid inverter will also check the DC and AC power conditions.

If the conditions fall within the operational criteria, the hybrid inverter will connect to the AC grid and "Normal" will be shown on the LCD display, indicating that the status of the device is normal (Figure 48).

Figure 48: Message series indicating the grid connection status of the hybrid inverter



Once the normal status is shown on the LCD display (Figure 48), the set-up has been successfully completed.

If the hybrid inverter is not able to detect a connection to the battery pack, the following message will be shown on the display, indicating that the communications or the connection to the battery pack have been lost:

- “No Battery” and;
- The red Fault LED will be active, as shown in the following image:

Figure 49: Hybrid inverter display message indicating lost connection with the battery pack



Should this be the case, double check whether the battery pack power switch is turned on. If the button is turned on but the message “No Battery” persists, turn off the entire system, disconnect it from the power supply and double check that the DC input connection power cords connect the hybrid inverter to the battery pack.

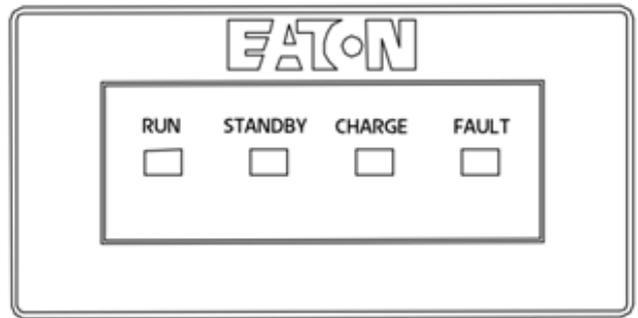
At this point, please move the soft start switch in position “O” (Figure 17 reference 11).

10.4 Battery pack LD indications

The battery pack has a total of four LD indication lights (Figure 50):

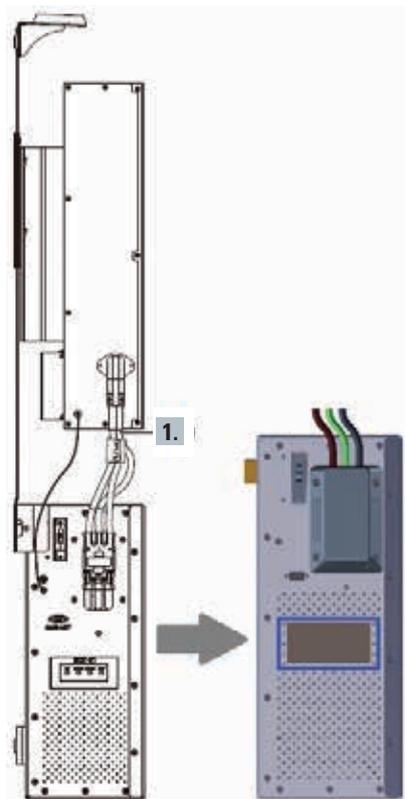
- **RUN** – Illuminated in normal battery pack operational mode;
- **STANDBY** – Illuminated when starting up the xStorage Home system for the first time or during restart;
- **CHARGE** – Illuminated during charging mode;
- **FAULT** – Illuminated to indicate system malfunction.

Figure 50: Battery pack LED indication lights



The location of the battery pack LED display is indicated here:

Figure 51: Battery pack display location



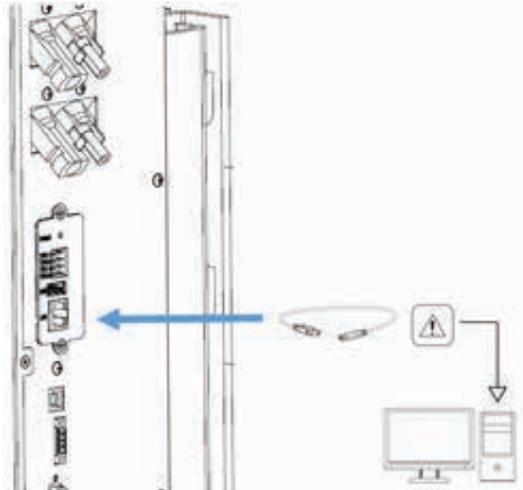
If the “FAULT” LED indication lights up together with one of the other lights, the following is the case:

- **STANDBY & FAULT** – a battery pack failure has occurred, and you should contact your Eaton technical support representative;
- **RUN & FAULT** – the battery pack is fully charged and its battery management system sends messages to the hybrid inverter to stop charging.

11. Configuring the communications interface

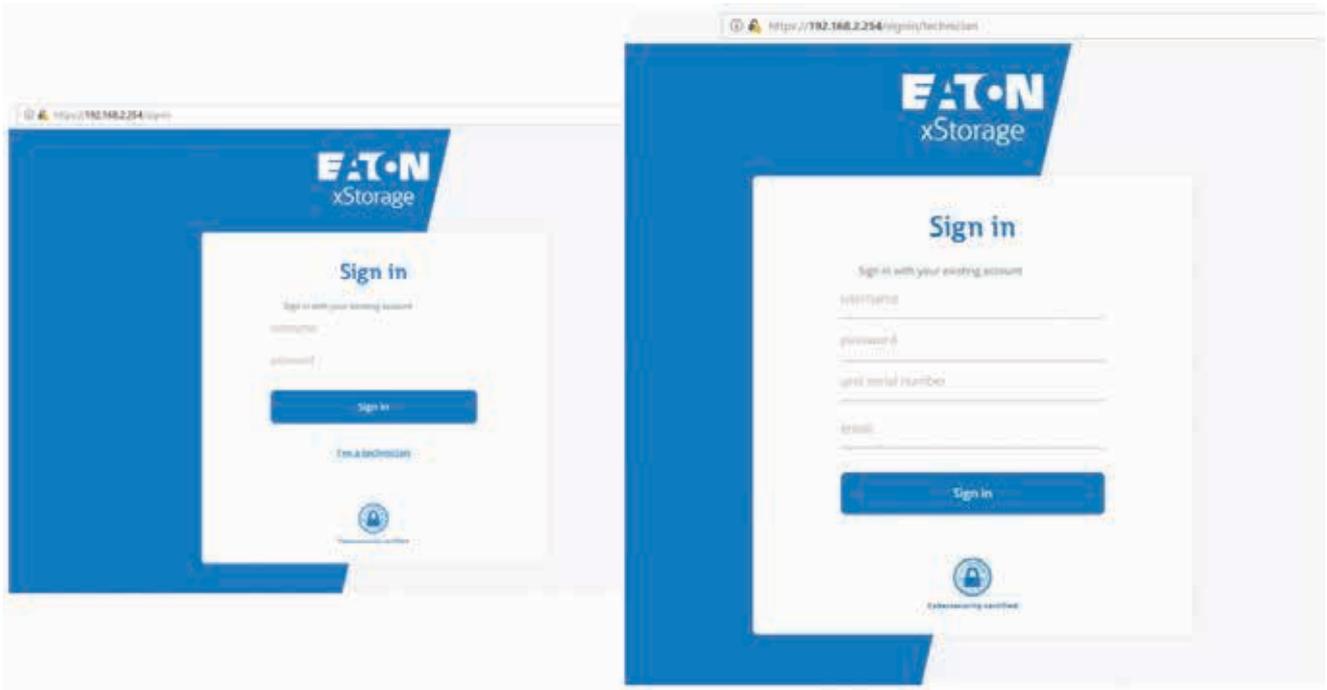
After verifying that the “system start-up” procedure of the xStorage Home system has been properly carried out, the network and functional configuration phase of the installation process can begin, using the step-by-step process illustrated below. Please refer to the xStorage Home User Interface manual for further details. The document is available for download on www.eaton.com/xstorage.

Setting the Ethernet card for the first time	
STEPS	Instructions
1.	Use a network cable to connect the hybrid inverter Ethernet card with your PC.



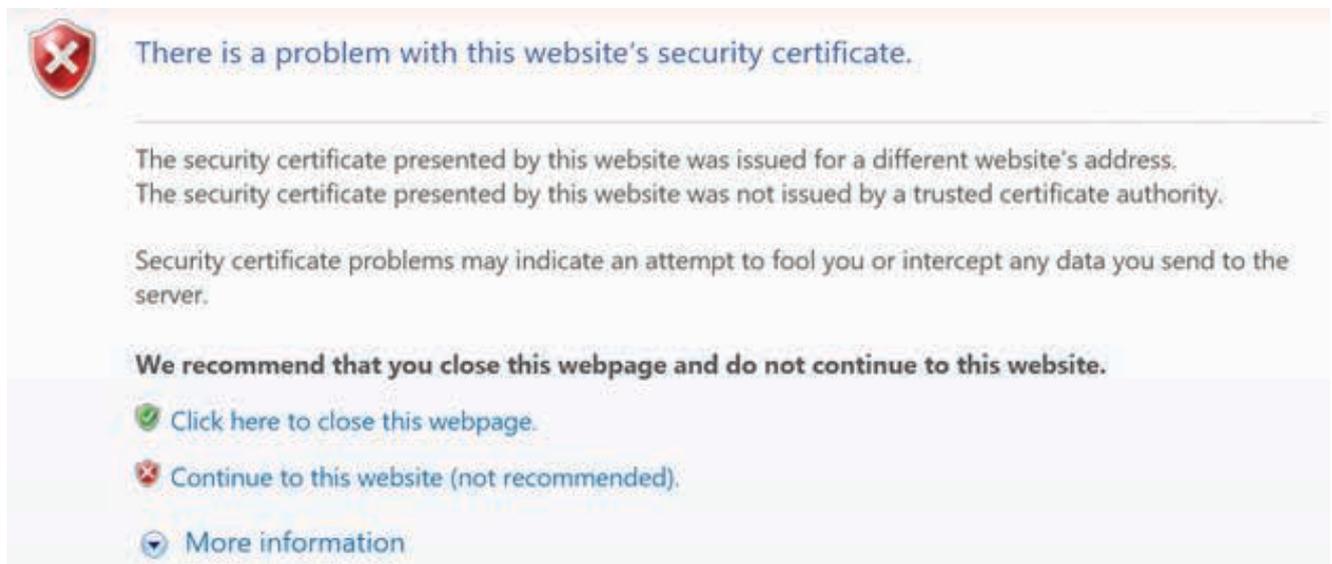
STEPS	Instructions
2.	<p>The default Ethernet card IP address of the hybrid inverter is 192.168.2.254. Set the PC's IP address to be in the same domain as the hybrid inverter's Ethernet card, by assigning it the following information in the TCP/IP setting:</p> <ul style="list-style-type: none"> • IP Address: 192.168.2.X (X=any number between 2-253) • Subnet mask: 255.255.255.0 • Default gateway: 192.168.2.1
3.	To enter the settings page for the hybrid inverter's Ethernet card, open the web browser on the PC and enter the default IP address of the Ethernet card as follows: https://192.168.2.254 .
4.	<p>If you are an installer click on "I am a technician" and enter the following login information (See Figure 52):</p> <p>Username: admin Password: jlwgK41G</p> <p>Please note that login information for the user are:</p> <p>Username: user Password: user</p>

Figure 52: Login pages of the local user interface



After the detailed network configuration, a browser message may be displayed indicating that the connection being established might not be private, and that there might be an issue with the security certificate of the UI website that is being accessed (Figure 53). This message can be disregarded, as the connection will not cause any technical harm to the PC.

Figure 53: Possible browser message when trying to establish a connection with the xStorage Home UI



Please refer to the xStorage Home Cybersecurity recommendations document for further details. The document is available for download on www.eaton.com/xstorage.

12. Completing the commissioning

After successfully:

- wired and powered up the xStorage Home system;
- gone through the system start-up steps;
- set the communications network card;
- and (if necessary) having performed an FW update;

the commissioning phase can be completed by placing the protective cover over the casing of the mounted and configured elements of the xStorage Home system, i.e. the hybrid inverter and the battery pack (Section 12.1).

Once the cover has been put in place, the xStorage Home system product must be registered online by an Eaton certified installer in order for the guarantee to enter into effect.

Once the cover is in place, the system can be turned on.

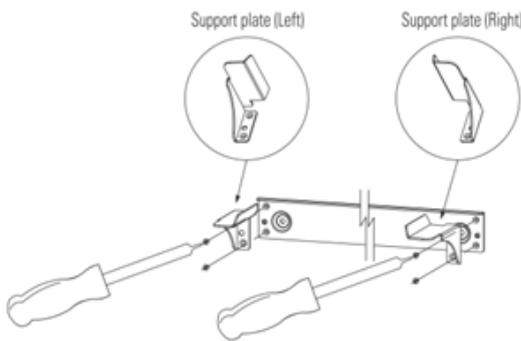
Refer to the complimentary xStorage Home Operation modes manual to customize the UI according to the end users' needs.

12.1 Mounting the casing

Perform the following:

- Prior to mounting the cover, tightly screw the support plate to the wall mounting bracket (Figure 7) as illustrated in Figure 54.

Figure 54: Adding the supporting plates to the wall mounting bracket



- Mount the casing vertically so that it covers the xStorage Home system components, i.e. the hybrid inverter and the battery pack, as illustrated in Figure 55.
- As mentioned, once installed, the xStorage Home battery pack and inverter casing must not be opened under any circumstances. In case of an emergency, an Eaton certified installer must be contacted.
- After completing these final commissioning steps, keep the area surrounding the xStorage Home cover clean and clear of any objects. No objects should ever be placed on top of the xStorage Home system casing, the surrounding area must never be blocked, and natural ventilation must be ensured by leaving sufficient space on either sides.

Figure 55: Mounting the cover of the xStorage Home system

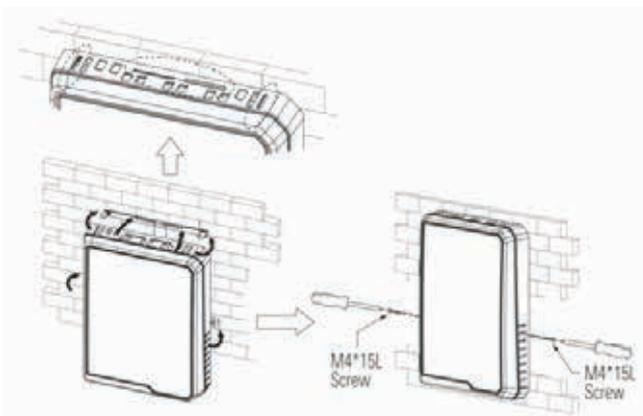
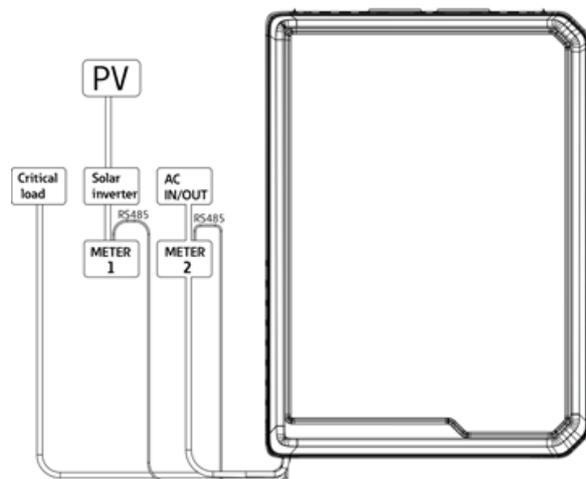


Figure 56: External outline of the AC coupled installation



13. Maintenance

For the best preventive maintenance, keep the area around the installed xStorage Home system, notably the protective casing, clean and dust free. This will allow for natural air

flow, which will ensure that the system is properly cooled. Please note that ANY TYPE of maintenance may only be performed by an Eaton certified installer. The end user should only access the xStorage Home system via the UI. There are no user serviceable parts inside the xStorage Home system. For any type of preventive maintenance, an Eaton certified installer should be contacted. This may include periodical torque and temperature control checks.

13.1 Charge and Discharge recommendations

To ensure optimal product lifespan, the xStorage Home system should only be used as advised in the guarantee conditions

13.2 Battery pack replacement and upgrading

As per the guarantee, the battery replacement is free of charge during the guarantee period, provided that the battery failure occurs suddenly and is not the result of equipment misuse. Once the guarantee has expired, the battery should continue to function properly, but in the case of failure it will have to be replaced at the end user's expense. Any battery replacement needs to be carried out by an Eaton certified installer.

13.3 xStorage Home casing – Cleaning recommendations

The casing doesn't require a specific cleaning process. Gently wipe it with a soft dry cloth.

13.4 xStorage Home – Switch off process

For safety reasons end users should be aware of the way to switch off the xStorage Home system. The Eaton certified installer must make the end users aware that they should not TOUCH THE INVERTER, THE BATTERY PACK AND THE CABLES. The steps to switch off the xStorage Home system are as follows:

- Switch off the xStorage Home system from the UI.
- Remove the cover.
- Disconnect the PV using the DC switch and/or the breaker.
- Disconnect the battery from the inverter using the breaker or the contactor.
- Disconnect the external AC circuit breaker.

14. Product disposal

When the xStorage Home system reaches the end of its service life, please contact an Eaton certified installer for disposal instructions.



This symbol indicates that waste electrical or electronic equipment (WEEE) as well as the Lithium-ion battery pack of the xStorage Home system may not be disposed of together with unseparated household waste. By separating waste electrical and electronic equipment and batteries, you will help reduce the volume of waste sent for incineration or landfills and minimize any potential negative impact on human health and environment. For proper disposal, contact your local recycling or hazardous waste facility.



Li-ion

Please note that Lithium-ion batteries must be disposed of in an environmentally responsible manner and in accordance with local regulations. These batteries contain toxic chemical elements and pose a danger to the environment, as they may cause heavy contamination and water pollution if discarded in an irresponsible manner.

15. Contact support information

Should any technical problems arise during the operation of the xStorage Home system, contact your Eaton technical support representative for assistance. The following information should be provided when contacting the Eaton technical support representative:

- Product Model;
- Fault messages displayed on the UI notification panel.

16. Troubleshooting



WARNING!

This section is shared with you for your information in order to give you an overview of the fault messages that may appear during the wiring and system set-up process. Please **DO NOT CLOSE THE BREAKER ON THE BATTERY PACK IF IT IS OPEN**. Contact your local Eaton technical support representative for assistance.

The following tables set out the preliminary guidelines for troubleshooting of the xStorage Home system and provides an overview of the fault messages that may appear on the hybrid inverter LCD display or the UI interface (i.e. the panel notifications). Two levels of failure can be identified:

- System failure (Table 9);
- Hybrid Inverter failure (Table 10).

In the event of a **system failure**, the end user should refer to the troubleshooting guide in order to ascertain the type of failure and to determine whether the PV or the grid connection is offline.

In the event of an **hybrid inverter failure**, the end user should immediately notify an Eaton certified installer, wait for his/her arrival and leave any debugging procedure to him/her. Bit codes are listed for the purpose of failure identification only.

Table 9: System troubleshooting

Level Of Failure	Bit Code	Error Message	Description & Diagnosis	Action
SYSTEM FAILURE	Bit 29	Grid Fac Fail	The grid frequency is out of grid code range.	The AC grid is affected by one of the following conditions: over or under frequency. In this case, please contact the Eaton technical support representative and make sure that the AC grid is operating normally.
	Bit 18	Zpv PE Fail	The isolation resistance of the PV panel is out of tolerable range before connecting to the grid.	The insulation to Ground for the PV DC input is poor and may result in a leakage current. Please contact an Eaton technical support representative and check if the impedance between PV(+) & PV(-) and Ground is higher than the DC insulation impedance, as set out in the technical specifications. If not, the system installation should be improved.
	Bit 26	Over Load	The critical load level is exceeded.	The number of connected critical loads should be decreased. If the fault persists after restarting the inverter, please contact the Eaton technical support representative.
	Bit 17	Grid Vac Fail	Grid voltage is out of grid code range.	The AC grid is affected by one of the following conditions: over or under voltage. In this case, please contact an Eaton technical support representative and make sure that the AC grid is operating normally.
	Bit 15	Vpv Max Fail	The PV input voltage exceeds the maximum tolerable value.	The DC voltage fed from PV arrays is too high. Please make sure the PV arrays used meet the specifications.
	Bit 10	RCMU Curr Fail	Residual current is too high.	The leakage current at the AC output is too high. Please make sure that the AC cables are properly connected to the terminals and that there is no other connection between the cables and ground. If the fault cannot be remedied by reconnecting the AC cables, please contact the Eaton technical support representative.
	Bit 9	No Utility	Grid voltage is lost.	The AC grid is not available. Please check that the AC cables are properly connected to the terminals. If an AC grid is present and the fault persists, please contact the Eaton technical support representative.
	Bit 8	No Battery	Battery communication or connection is lost.	Please check the battery communication or connection. If the battery communication or connection issue persists, please contact the Eaton technical support representative. Do not close the breaker on the battery pack if it is open.
	Bit 3	Emergency Off	Emergency power off is set.	Please check if the emergency power off is set. If the emergency power off persists, please contact the Eaton technical support representative.

Table 10: Hybrid inverter troubleshooting

Level Of Failure	Bit Code	Error Message	Description & Diagnosis	Action
HYBRID INVERTER FAILURE	Bit 31	Master-Slave Fail	The communication between the microcontrollers have failed.	A communications problem has been detected inside the inverter. If the fault persists after restarting the inverter, please contact an Eaton technical support representative.
	Bit 30	EEPROM Fail	EEPROM cannot be read or written.	A memory error has been detected. If the fault persists after restarting the inverter, please contact the Eaton technical support representative.
	Bit 28	Battery voltage High	The battery voltage is too high.	The battery voltage is abnormal. If the fault persists after restarting the inverter, please contact the Eaton technical support representative.
	Bit 27	Battery voltage Low	The battery voltage is too low.	The battery voltage is abnormal. If the fault persists after restarting the Inverter, please contact the Eaton technical support representative.
	Bit 25	Relay Fail	The relay has failed.	The relay inside the inverter has malfunctioned. If the fault persists after restarting the inverter, please contact the Eaton technical support representative.
	Bit 24	Over Power	The power on grid terminal is exceeded.	If the fault persists after restarting the inverter, please contact the Eaton technical support representative.
	Bit 23	ENS Vac Fail	There is a different value between Master and Slave for grid voltage.	There is a gap between Master and Slave for grid voltage detection. If the fault cannot be cleared after restarting the inverter, please contact the Eaton technical support representative.
	Bit 22	ENS Fac Fail	There is a different value between Master and Slave for grid frequency.	There is a gap between Master and Slave for grid frequency detection. If the fault cannot be cleared after restarting the inverter, please contact the Eaton technical support representative.
	Bit 21	ENS Iac Fail	There is a different value between Master and Slave for grid current.	There is a gap between Master and Slave for grid current detection. If the fault cannot be cleared after restarting the inverter, please contact the Eaton technical support representative.
	Bit 20	ENS GFCI Fail	There is a different value between Master and Slave for GFCI current.	There is a gap between Master and Slave for GFCI current detection. If the fault cannot be cleared after restarting the inverter, please contact the Eaton technical support representative.
	Bit 19	Offset Iac Fail	The DC injection check for the grid current has failed.	The inverter detects a high DC component in the AC output current. Disconnect the AC grid and wait for one minute. If the fault persists after restarting the inverter, please contact the Eaton technical support representative.
	Bit 14	Test Fail	Auto Test failed.	This only applies to grid code requirements for Italy. If the fault persists after restarting the inverter, please contact the Eaton technical support representative.
	Bit 13	Temperature Fail	The temperature exceeds the maximum tolerable value.	The ambient temperature of the inverter is too high. If necessary, improve the ventilation of the inverter. If the error message appears when the ambient temperature is below 40°C, please contact the Eaton technical support representative.
	Bit 12	M-S Version Fail	There is a mismatch between Master and Slave firmware versions.	If the fault persists after restarting the inverter, please contact the Eaton technical support representative.
Bit 11	Bus Fail	The DC bus faults.	The internal bus voltage is abnormal. If the fault persists after restarting the inverter, please contact the Eaton technical support representative.	

Table 10: Hybrid inverter troubleshooting (Continued)

Level Of Failure	Bit Code	Error Message	Description & Diagnosis	Action
HYBRID INVERTER FAILURE	Bit 7	Device Fault	The inverter device is abnormal or an output short circuit is present.	If the fault persists after restarting the inverter, please contact the Eaton technical support representative.
	Bit 6	Bus High Fail	The DC Bus voltage is too high.	The internal bus voltage is abnormal. If the fault persists after restarting the inverter, please contact the Eaton technical support representative.
	Bit 5	Bus Low Fail	The DC Bus voltage is too low.	The internal bus voltage is abnormal. If the fault persists after restarting the inverter, please contact the Eaton technical support representative.
	Bit 2	Ref 2.5V Fault	The internal 2.5 V reference is abnormal.	The reference voltage of the microprocessor is abnormal. If the fault persists after restarting the inverter, please contact the Eaton technical support representative.
	Bit 0	RCMU Device Fail	The RCMU detection circuit is abnormal.	The internal module is abnormal. If the fault persists after restarting the inverter, please contact the Eaton technical support representative.
	Bit 8	BMS Fault	General BMS fault detected.	If the fault persists after restarting the inverter, please contact the Eaton technical support representative.
	Bit 9	Battery Under Temp	The battery temperature is too low.	If the fault persists after restarting the inverter, please contact the Eaton technical support representative.
	Bit 10	Battery Over Temp	The battery temperature is too high.	If the fault persists after restarting the inverter, please contact the Eaton technical support representative.

Should the entire system need to be turned off for troubleshooting or maintenance:

- Please make sure to turn off the circuit breaker of the AC grid input power in the designated power distribution box.
- Please note that after this step, the system will still be powered up if the “battery on” mode is active.
- The casing should therefore be removed, and the battery pack should be deactivated by turning off its breaker and disconnecting the power cable. This will turn off the system completely.

17. Guarantee

The latest version of the product guarantee conditions are available for download from the web page www.eaton.com/xstorage.



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