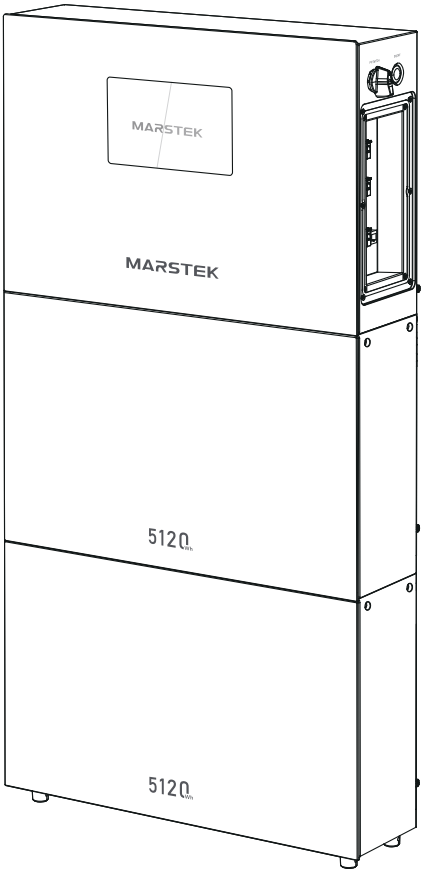
MARSTEK

Mars I PLUS
Single phase Energy Storage System

USER MANUAL

V 1.4



This manual is valid for system below

- MARS I PLUS series single phase inverter with corresponding battery sets.

Readers

- This document is for product users and professionals.

Thoroughly review this manual before

- Operating the system.
- Installing related products.

Revision History

Version	Date	Description
1.1	26/Nov/2025	First released edition.
1.2	09/Mar/2026	Added CHAPTER 4: MECHANICAL INSTALLATION Added CHPATER 5: SYSTEM CONNECTION Updated 1.2 Complilance and Limitations Updated CHAPTER 2: PRODUCT INTRIDUCTION Updated CHAPTER 6: COMMISSIONING AND OPERATION
1.3	30/Apr/2026	Added APPENDIX D: Parameters Updated 2.4 System Wiring Updated 4.2 Pre-installation Check Updated CHAPTER 5: SYSTEM CONNECTION Updated 7.1 Routine Maintenance Updated APPENDIX B: Alarm Code Index
1.4	26/May/2026	Updated CHAPTER 4: MECHANICAL INSTALLATION Updated 6.1 System Initialization and Commissioning

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SAFETY PRECAUTIONS

1.1 Safety Sign Defination

DANGER	**Danger.** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
WARNING	**Warning.** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	**Caution.** Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.
NOTICE	**Notice.** Indicates a situation which could lead to damage or failure of equipment, systems, or property, but is not related to personal injury.
	**Tips.** Provides useful information and best practices for the optimal use of equipment or to achieve a task more efficiently.

1.2 Compliance and Limitations

1.2.1 Disclaimers

The MARS I PLUS energy storage systems, including the inverter, battery packs, and all associated accessories (hereinafter "the Product"), contains high-voltage electrical components and stores significant amounts of energy. Failure to strictly adhere to the instructions in this manual and all applicable local and national electrical codes may result in serious injury, electrocution, fire, property damage, or reduced product lifespan.

To the fullest extent permitted by law, the manufacturer, its affiliates, and distributors shall not be held liable for any direct, indirect, incidental, special, consequential, or punitive damages, including

but not limited to loss of profits, data, or revenue, damage to property, or personal injury arising from or in connection with:

- Improper installation, misuse, abuse, neglect, or alteration of the Product.
- Failure to follow the instructions and safety warnings in this manual.
- Use of the Product with non-compatible or third-party components not expressly approved by the manufacturer.
- Acts of God, natural disasters, fire, flood, war, or any other events beyond the manufacturer's reasonable control.
- Normal wear and tear or gradual deterioration of performance.

Any warranty provided with the Product may be voided if the product is damaged due to improper use, accident, tampering, unauthorized service, or use outside of the specified environmental and electrical parameters.

This Product is designed to comply with relevant safety and performance standards. However, it is the responsibility of the installer and user to ensure that the installation and use of the system comply with all local, state, and national laws, regulations, and electrical codes.

By installing and using this Product, you acknowledge that you have read, understood, and agreed to the terms of this disclaimer and all accompanying documentation.

1.2.2 Unapproved Uses

The system is not designed for, and shall not be connected to, critical infrastructure including:

- Elevator systems.
- Essential emergency medical equipment.
- Fire and rescue equipment.
- Any device that, once stopped, may pose a threat to human safety or cause serious economic losses.

1.3 Safety Requirements

⚠ DANGER

- Always power off the entire system, including the grid and PV supply, before installation, maintenance, or cable handling. Installing or removing cables while energized can cause electric arc, sparks, fire, or explosion, resulting in severe personal injury or death.
- Non-standard or improper operation on energized equipment may cause fire, electric shock, or explosion, resulting in property damage, serious personal injury, or death.
- Remove conductive objects such as watches, bracelets, and rings before operating the equipment to prevent electric shock.

- Never short-circuit the battery. Do not connect the battery positive and negative terminals together. A short circuit can generate high instantaneous current, leading to leakage, smoke, flammable gas release, thermal runaway, fire, or explosion. Always power down the system before performing any battery maintenance.
- Use only the battery model recommended by the manufacturer. Incorrect battery types pose a risk of fire or explosion.
- Protect the battery from mechanical shock, vibration, puncture, or crushing. Physical damage to the battery may cause it to catch fire.
- Do not touch battery terminals with any metal objects, as this may cause heating or electrolyte leakage.
- Do not operate the equipment in the presence of flammable or explosive gases or dust. Performing operations in such an environment can cause an explosion.
- Battery electrolyte is toxic and volatile. If you suspect a leak, do not contact the liquid or inhale gases. Immediately evacuate the area and contact a qualified professional. Professionals handling a leaking battery must wear rubber gloves, goggles, a gas mask, and protective clothing, power off the unit, isolate the battery, and contact technical support.

⚠ WARNING

- For equipment requiring grounding, always connect the grounding cable first during installation and disconnect it last during removal.
- To prevent overheating, fire, or damage, ensure that ventilation openings and heat dissipation systems are not blocked or covered during operation.
- Do not touch the heat sinks while the equipment is operating, as they can be extremely hot and cause burns.
- Do not drill holes into the equipment. This can compromise its sealing (IP rating), electromagnetic shielding, and damage internal components, leading to malfunctions or hazards.

⚠ CAUTION

- Ensure all necessary tools are ready and have been inspected by a professional body. Do not use tools that are damaged (e.g., with scratched insulation) or have not passed inspection.
- Do not use the equipment if it shows any signs of defect, such as leakage, deformation, or abnormal operation. Contact your installer or sales representative. Do not disassemble the equipment by yourself.

NOTICE

- Do not mix and match with other unauthorized third-party products, as this may result in product damage. We are not responsible for any issues caused by this practice.

PRODUCT INTRODUCTION

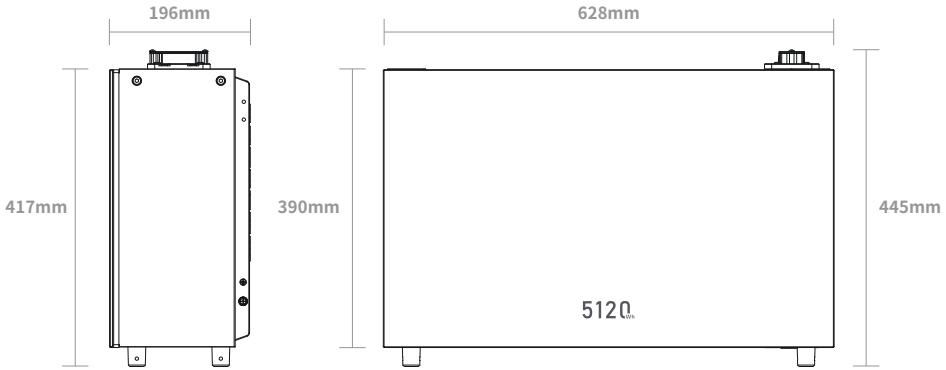
2.1 About Product

Product Introduction

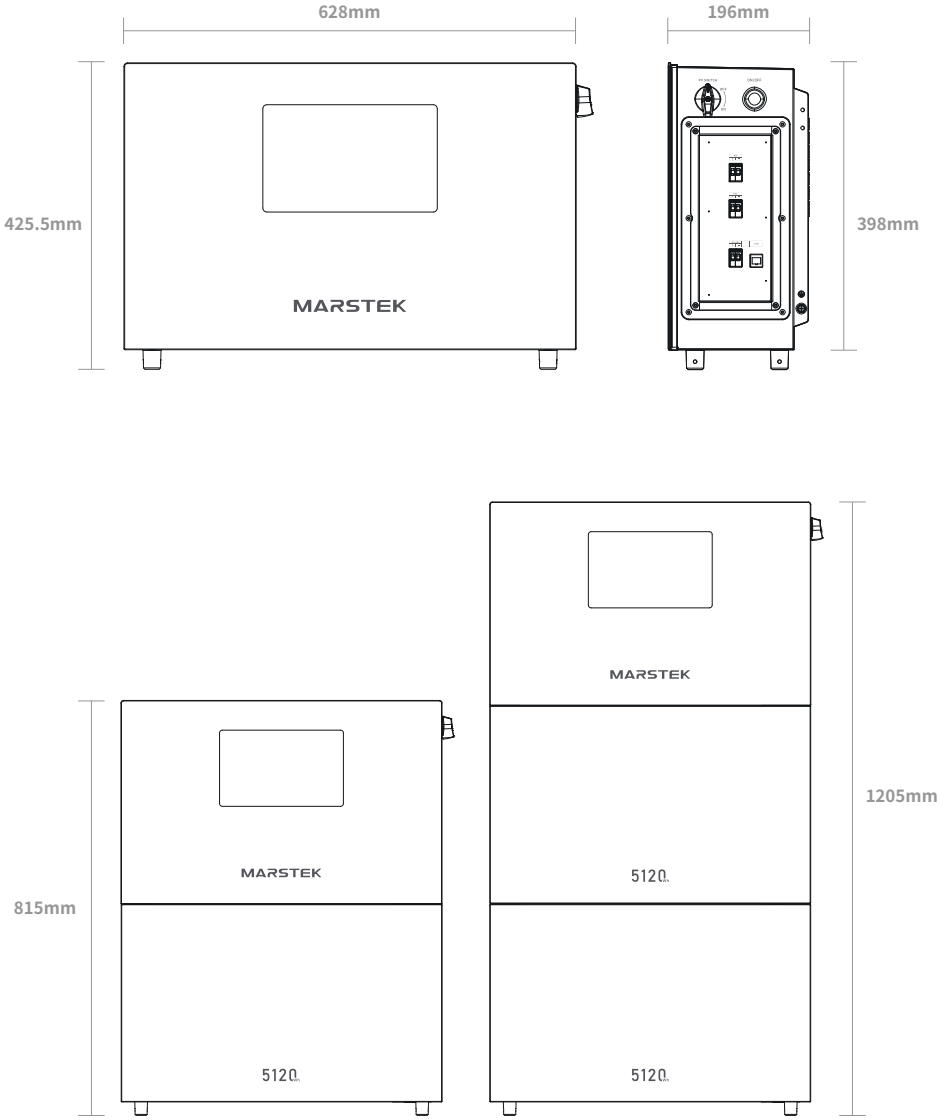
Series Code	Model	Name
MARS I PLUS	MST-3.6KSH-M0	MARS I PLUS 3.6kW Single Phase Hybrid Inverter
	MST-4.6KSH-M0	MARS I PLUS 4.6kW Single Phase Hybrid Inverter
	MST-5KSH-M0	MARS I PLUS 5kW Single Phase Hybrid Inverter
	MST-6KSH-M0	MARS I PLUS 6kW Single Phase Hybrid Inverter
	MST-MARS I PLUS-5KBAT	MARS I PLUS V-boost Battery 5.12 kWh

Dimensions(Unit: mm,tolerance：±1mm)

MST-MARS I PLUS-5KBAT



MST-3.6KSP-M0/MST-4.6KSP-M0/MST-5KSP-M0/MST-6KSP-M0



2.2 Symbol on Label

Symbol	Description
	**CE mark.** The product complies with the requirements of the applicable CE.
	**Warning! Brun hazard.** Surfaces in the heat dissipation area become hot during operation. Do not touch to prevent burns.
	**Warning! Risk to life.** Potential hazards exist during and after equipment operation. Always use appropriate protective measures when working with this equipment.
	**Danger! High Voltage.** High voltage is present inside this equipment when powered on. Do not open the casing while the equipment is operating. All maintenance or servicing must be carried out by qualified and trained electrical personnel.
	**Refer to operating instructions.** Indicates that users should refer to operating or installation instructions befor proceeding.
	**Separate collection of batteries.** Please follow the REGULATION (EU) 2023/1542 of the european parliament and of the council to return batteries/rechargeable batteries to the appropriate local collection facilities.
	**Special disposal requirements.** The product can't be disposed together with the household waste. Disposal information can be found in the enclosed documentation.
	**No fire or open flame.** Prohibit any open flame from or near the system.
	**Warning! Delay Discharge.** Internal components may retain hazardous energy after power-off. Allow at least 10 minutes for complete discharge as indicated on the label before proceeding.

2.3 Compatible Components and System Scaling

Building Your Residential Energy Storage System (RESS) : Inverter and Battery Compatibility

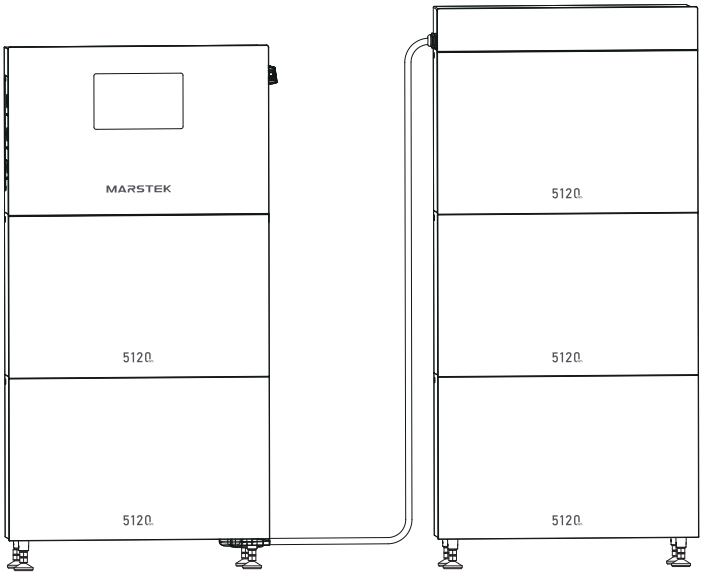
Select the appropriate inverter and suitable number of battery modules.

For MARS I PLUS single phase system
e.g. 1 MST-6KSP-M0 inverter with 2 to 6 pieces (pcs) of MST-MARS I PLUS-5.0KBAT battery models.

Inverter		**Batteries***	
Module	Quantity (pcs)	Module	Quantity (pcs)
MST-3.6KSP-M0	1	MST-MARS I PLUS-5.0KBAT	1~6
MST-4.6KSP-M0	1	MST-MARS I PLUS-5.0KBAT	1~6
MST-5KSP-M0	1	MST-MARS I PLUS-5.0KBAT	1~6
MST-6KSP-M0	1	MST-MARS I PLUS-5.0KBAT	2~6

* For battery quantity more than 3 pcs, an expansion box is needed.

System Scaling
For system with more than 3 batteries, expansion kit is needed.



2.4 System Wiring

2.4.1 System Load Types

The energy storage system has Emergency Power Supply (EPS) port, therefore can manage two distinct types of electrical loads, ensuring intelligent and prioritized power distribution.

- **EPS (Backup) Loads**

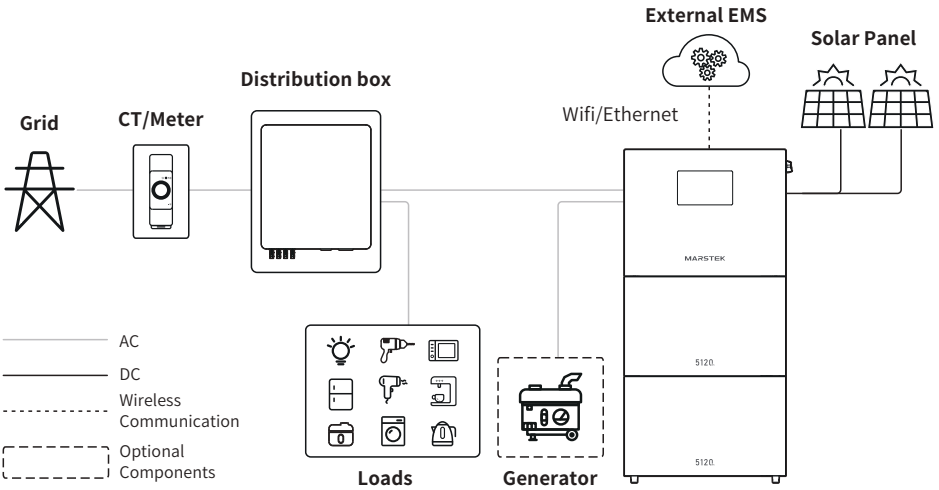
These are critical circuits that you configure to remain powered during a grid outage. Typically, these include essential appliances like refrigeration, lighting, or communication systems. The system intelligently prioritizes and guarantees that all available energy from the batteries and solar is supplied to the EPS loads first whenever necessary.

- **On-Grid Loads**

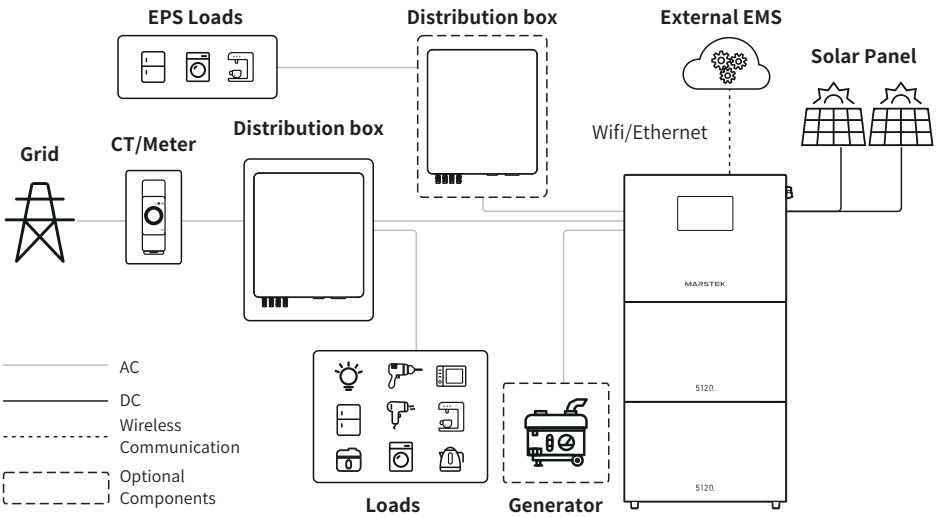
These are the standard household circuits located within the main electrical panel, downstream of the system's CT sensor or meter. This category includes non-essential appliances such as air conditioners and clothes dryers. On-grid loads can take power from both inverter and grid. The system will power these loads only when there is sufficient excess energy available, after the demands of the EPS loads are fully met.

2.5.2 System Wiring Diagram

Non-backup



Partial Home Backup



TRANSPORTATION AND STORAGE

3.1 Transportation

- As the product contains battery modules, the transportation and warehousing service provider must possess the qualifications for handling dangerous goods as required by local laws, regulations, and standards.
- Packaging must be sturdy and durable. Secure packages firmly to prevent shifting during transit.
- Do not place packages on their side or invert them.

- When transporting stacked units (e.g., battery packs), ensure they are securely fastened together as a single unit according to the manufacturer's instructions to prevent shifting, tipping, or falling. Do not exceed the maximum recommended stacking height for transport.
- Before transporting a faulty battery (showing signs of scorching, leakage, swelling, or water ingress), its positive and negative terminals must be insulated. The battery should then be packaged and promptly placed in an insulated and explosion-proof container. The container must be clearly marked with the site name, address, time, and a description of the fault symptoms.

3.2 Storage

- Do not store any flammable or explosive materials in the device storage area.
- Do not place devices near heat or ignition sources, such as smoke, candles, heaters, or other heating appliances. Overheating may damage the device or cause a fire.
- Do not unpack inverters or batteries from their original packaging until they are ready for installation.
- Protect stored units from dust, moisture, direct sunlight, and corrosive chemicals.
- Strictly adhere to the storage temperature and humidity ranges specified in the product specifications. Deviation from these ranges may cause irreversible product damage.
- Products in storage for more than six months require inspection. For batteries, a charge-discharge maintenance cycle must be performed to ensure optimal health.
- When stacking units in storage, do not exceed the maximum recommended stacking height. Ensure the stack is stable and placed on a level, solid surface.

Series Code	Model	Storage Temperature	Relative Humidity
MARS I PLUS	MST-3.6KSP-M0	-40~70°C（-40~158 °F）	5%~95%
	MST-4.6KSP-M0		
	MST-5KSP-M0		
	MST-6KSP-M0		
	MST-MARS I PLUS-5.0KBAT	-20~35°C（-4~95 °F）	10%~80%

MECHANICAL INSTALLATION

The whole system shall be installed and configured by professional technicians who are

- Company authorized.
- Familiar with local standards and relevant safety regulations of electrical systems.
- Formally trained and certified in the installation of energy storage systems (ESS).
- Experienced in ESS installation, capable of identifying and mitigating potential risks, and responsible for completing all necessary commissioning and documentation.

⚠ DANGER

After the system is professionally installed

- Do not relocate or reposition any system components.
- Do not modify electrical wiring, connections, or non-user system settings.
- Do not tamper with or adjust external accessories, including smart meter, current transformer (CT) and power distribution box connection.
- Only authorized personnel may perform these tasks.

4.1 Site Requirements

Selecting the right location for your energy storage system is crucial for its safety, performance, and longevity.

Ambient Environment Requirements

- Install the system in a location free from flammable liquids, gases, aerosols, or excessive combustible materials.
- The installation site must provide sufficient natural or forced airflow around the unit, especially the heat sinks. Do not install in sealed enclosures or cramped spaces.
- Indoor Installation is strongly recommended to ensure optimal operating conditions and longevity. If outdoor installation is unavoidable, the unit must be placed under a protective structure (e.g., waterproof canopy) to avoid prolonged direct sunlight, rain, snow, or hail.
- Install the system away from coastal areas or other locations with high salt content in the air, as salt corrosion can severely damage components and electrical connections, leading to safety hazards.
- Avoid environments with excessive dust, conductive pollution, or corrosive chemical fumes.

Mounting Structure Requirements

- The mounting structure (wall, rack, floor) should be constructed of non-combustible or fire-resistant materials (e.g., concrete, brick, metal) to delay potential fire spread.
- The mounting structure must be robust enough to securely support the total weight of the entire system, including batteries, inverters, and all components, for the entire operational lifetime.
- The chosen wall or structure must be solid enough to allow secure drilling and anchoring.

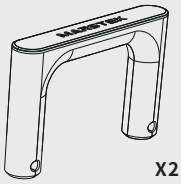
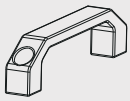
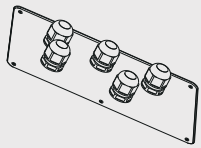
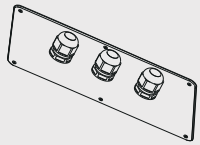
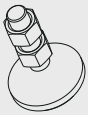
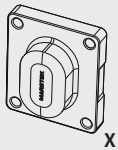
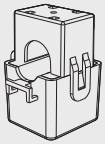
4.2 Pre-installation Check

4.2.1 Package

Before beginning any installation work, complete the following checks to ensure a safe and successful installation.

- Check outer packaging for serious damage (holes, cracks, crushing). If any damage is found, contact your vendor for help.
- Confirm the model on the shipping label matches your order. If receiving unsuitable model, contact your vendor for help.
- Unpack and check all items for visible damage. Additionally, please verify all components against the packing list. If any accessories are lost or damaged, contact your vendor for help.

Inverter Packing List

Battery Handle  X2	Inverter Handle  X2	AC Side Wiring Cover Plate  X1	DC Side Wiring Cover Plate  X1
Adjustable Feet  X4	Battery Handle Latch  X4	Battery Plug  X1	Wall Bracket  X2	M8 Expension Bolt  X2
Parallel Plug  X1	Wire Ferrule  X20	KM4 Cover Plate Screw  X12	M6 Wall Bracket Screw  X4	M4 Battery End Plug Screw  X4	M6 Inverter Handle Screw  X4
CT with cable  X1	User Manual  X1	Quick Guide  X1	Warranty Card  X1	Limited Warranty Certificate  X1	

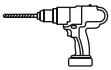
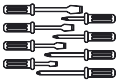
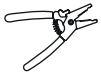
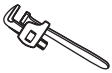
Battery Packing List

M6 Module Stack Screw	M6 Wall Bracket Screw	M8 Expension Bolt	Wall Bracket	Warranty Card
				
X4	X4	X2	X2	X1

4.2.2 Tools

Check the following protective equipments and installation tools before installtion.

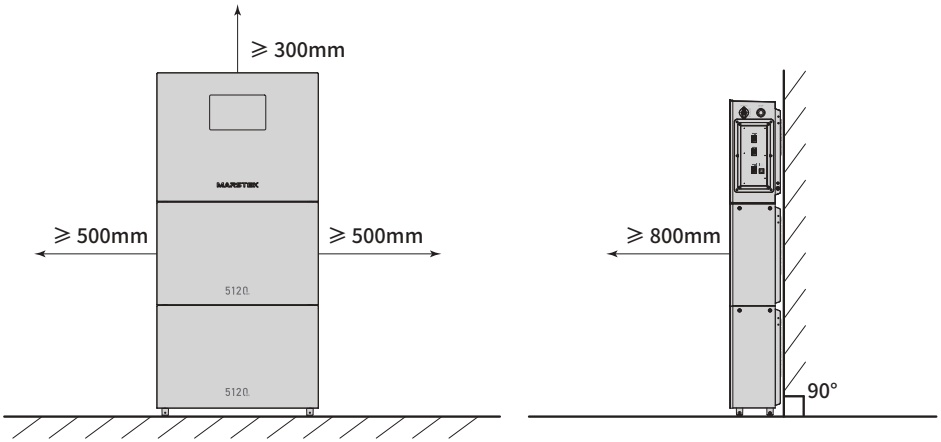
Protective Equipments					
Safety hat		Goggles		Insulating gloves	
Protective gloves		Dust mask		Insulating shoes	

Installation Tools					
Power drill		Heat shrink tube		Ferrule crimp tool	
Screwdriver set		Crimping pliers		Level	
Marker		RJ45 crimp tool		Wire stripper	
Tape measure		Cable tie		Wire cutter	
Adjustable pipe wrench		Heat gun		Hammer	

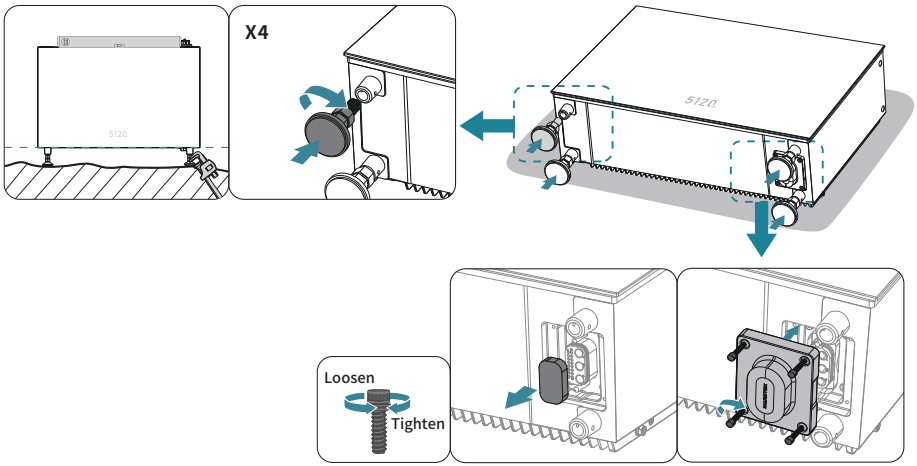
4.3 Installation Steps

For mechanical installtion details, please refer to the official website's documentation and video support.

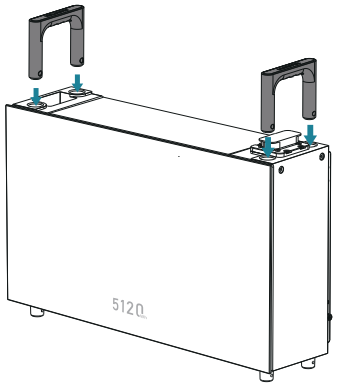
The installation area should meet the installation space requirements.

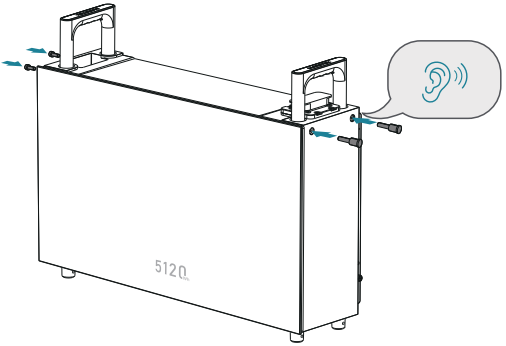


Bottom Battery

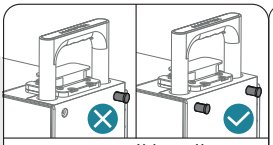


1. Place the bottom battery module with the back on soft padding.
2. Remove upper and lower connector cover. Install the bottom battery plug.
3. (Optional) Screw 4 adjustable feet into the battery and roughly adjust them.

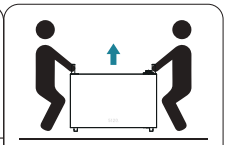


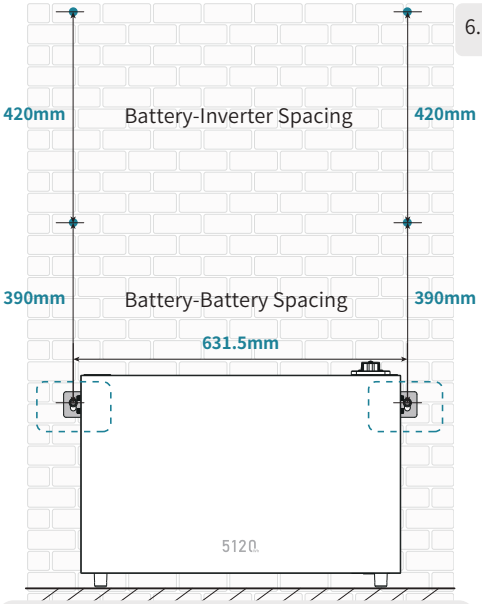


4. Use handles to carry the battery to the installation site.
5. (If install adjustable feet) Use wrench and level to adjust feet.

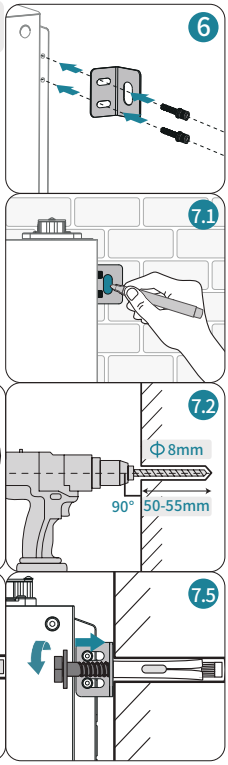


Ensure all handle latches are installed



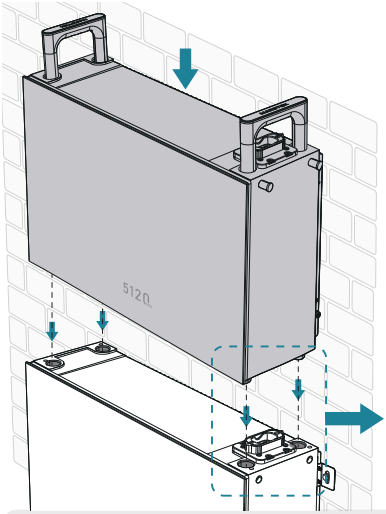


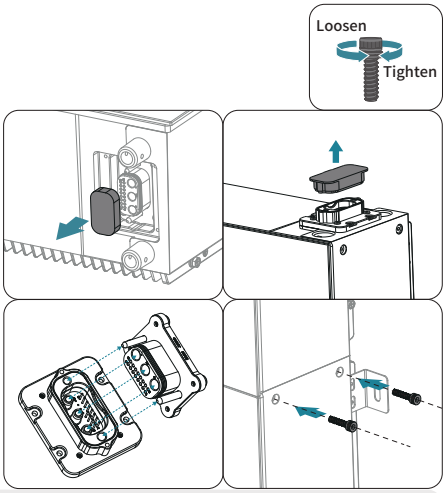
6. Install the wall bracket.



7. After choosing the installation place, mark the positions for drilling holes. Drill holes using power drill.
8. (Optional) Connect and tighten the enclosure ground wire.

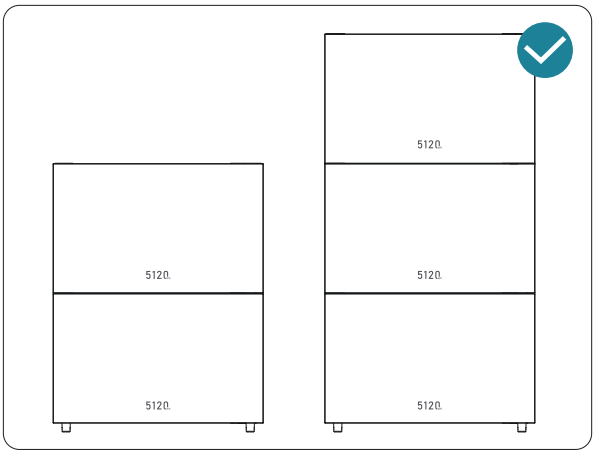
Stack the Battery

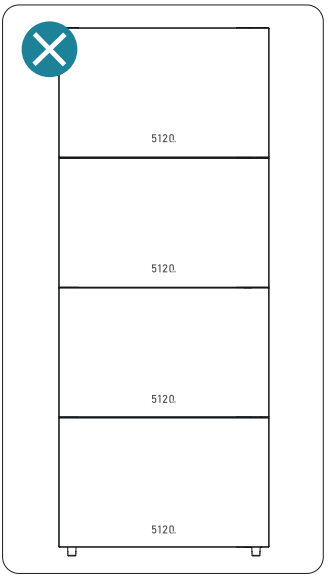




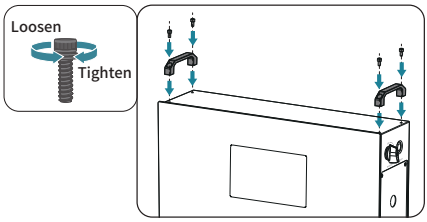
1. Place the battery module with the back on soft padding.
2. Remove upper and lower connector cover.
3. Carry and stack batteries, ensuring connector alignment.
4. After stacking the battery, lock the fixing screws.
5. Install the wall bracket.
6. (Optional) Connect and tighten the enclosure ground wire.

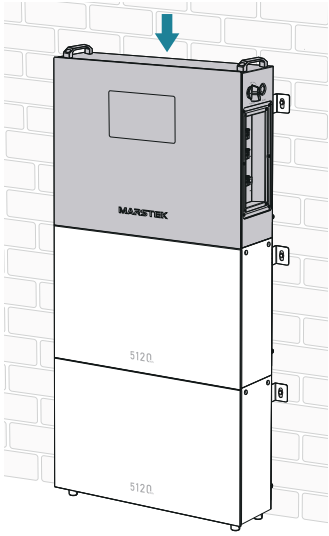
The maximum number of batteries in a stack is 3, otherwise it may be unsafe.



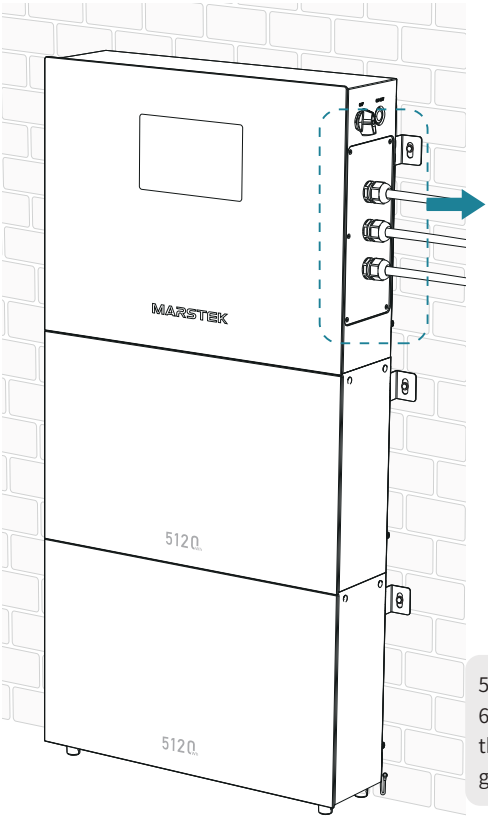


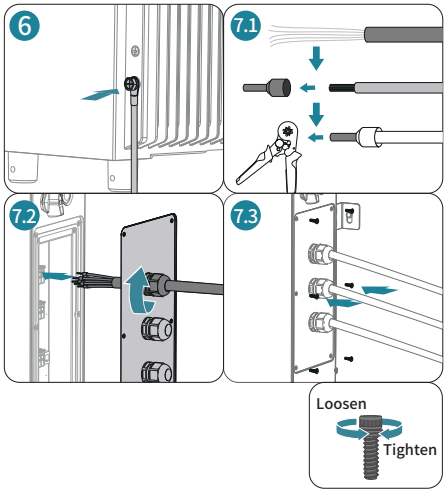
Install the Inverter





1. Place the inverter module with the back on soft padding.
2. Install the handle latches on the top of the inverter, and secure them with the supplied handle latch screws.
3. Remove the connector cover.
4. Lift the inveter, stack it at the top of batteries. Notice that inverter connector need to be aligned with battery connector.
5. After stacking the inverter, lock the fixing screws.

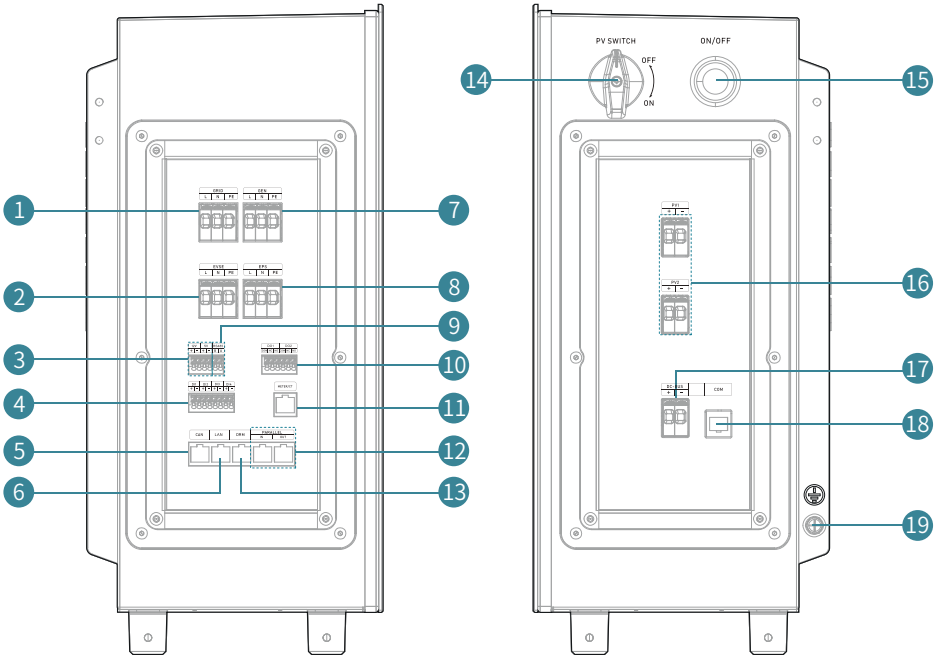




5. Connect and tighten the enclosure ground wire.
6. When finishing system connection, screw to fix the window plate and twist to tighten the PG glands.

SYSTEM CONNECTION

5.1 Ports and Components



No.	Name	Marking	Description
1	Grid Terminal	GRID	Grid power terminal.
2	EVSE Terminal	EVSE	Single phase power terminal for MARSTEK EV charger.
3	Additional Power Supply	5V/12V	Unauthorized users are not allowed to use this interface, as short circuits or overloads can cause irreparable damage to the system.
4	Digital Input	DI1/DI2/DI3/DI4	\
5	EVSE Communication Port	CAN	Port for EV Charger communication.

No.	Name	Marking	Description
6	Ethernet Port	LAN	Connect to Internet via cable.
7	Generator Terminal	GEN	Single phase generator power terminal.
8	EPS Terminal	EPS	Connect to EPS load or distribution box.
9	RS485 Signal	RS485	For extarnal EMS or heat pump communication.
10	Digital Output	DO1/DO2	\
11	CT/Meter Port	METER/CT	Port for single phase CT or smart meter.
12	Parallel Port	PARALLEL	System parallel communication port.
13	Demand Response Mode	DRM	According to Australia regulation, demand response mode (DRM) need to be supported by solar inverters.
14	PV Switch	OFF<->ON	Switch to turn on and off PV input.
15	System Switch	ON/OFF	Switch to turn on and off system.
16	PV Terminal	PV1/PV2	PV power input terminal.
17	V2X Power Terminal	DC-BUS	Power connection to V2X.
18	V2X Communication Port	COM	Communication port with V2X.
19	Protective Earthing (PE) Point	⏚	Enclosure grounding.

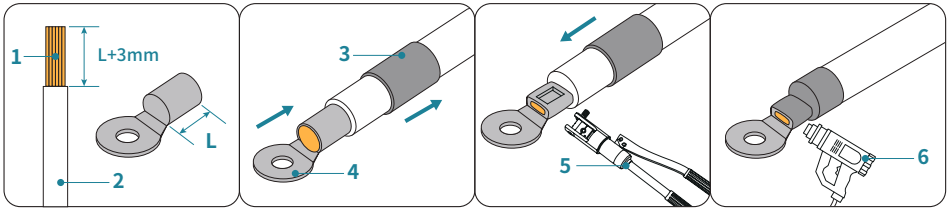
5.2 Wire Harness Assembly

5.2.1 Preparation

Tabel below listed cables that are needed to prepare with related connector recommendation and cable specification.

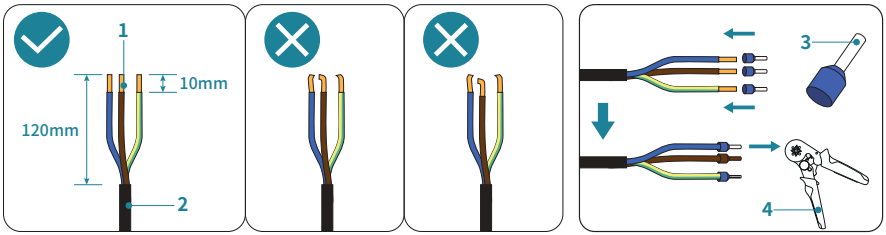
Cable Name	Description	Connector Recommendation	Cable Specification
PE cable	Cable for enclosure grounding.	Ring Connector - 1/4"Stud	12~14AWG Hook-Up Wire (Green, Yellow)
AC power cable	Cable for single phase AC power.	Crimp Wire Ferrule - 8 AWG	8~10 AWG 3 Core Cable
DC power cable	Cable for high voltage DC power.	Crimp Wire Ferrule - 10 AWG	10~12 AWG Hook-Up Wire (RED for positive and BLACK for negative)
Digital signal cable	Cable for digital input and output signal.	Crimp Wire Ferrule - 20 AWG	20~22 AWG Hook-Up Wire
RS485 communication cable	RS485 protocal communication cable.	Crimp Wire Ferrule - 20 AWG	20~22 AWG Twisted Shield 2 Core Cable
Additional power supply cable	Cable for 5V or 12V power supply.	Crimp Wire Ferrule - 20 AWG	20~22 AWG Hook-Up Wire (RED for positive and BLACK for negative)
RJ45 network cable	Communication cable.	RJ45 Plug - 8P8C	CAT6 Cable

5.2.2 PE Cable



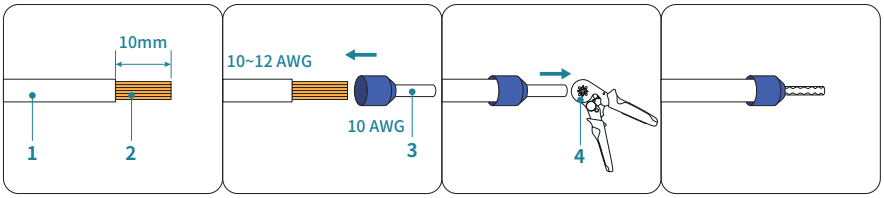
No.	Name	No.	Name
1	Core wire	4	Ring Tongue Connector
2	Cable	5	Crimping pliers
3	Heat shrink tube	6	Heat gun

5.2.3 AC Power Cable



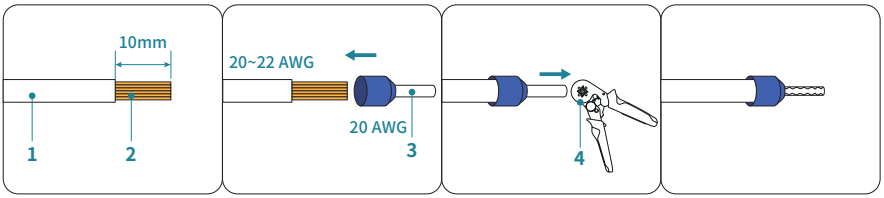
No.	Name	No.	Name
1	Core wire	3	Crimp wire ferrule
2	Cable	4	Ferrule crimp tool

5.2.4 DC Power Cable



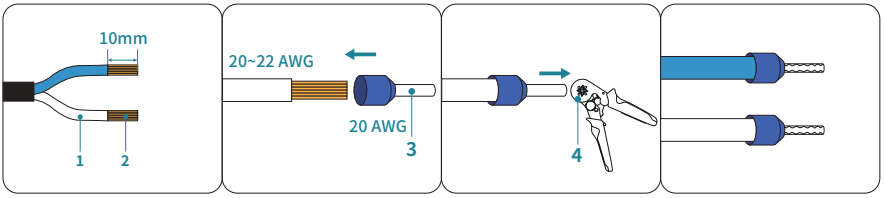
No.	Name	No.	Name
1	Cable	3	Crimp wire ferrule
2	Core wire	4	Ferrule crimp tool

5.2.5 Digital Signal Cable



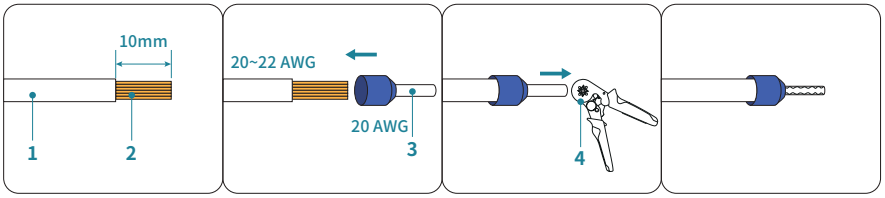
No.	Name	No.	Name
1	Cable	3	Crimp wire ferrule
2	Core wire	4	Ferrule crimp tool

5.2.6 RS485 Communication Cable



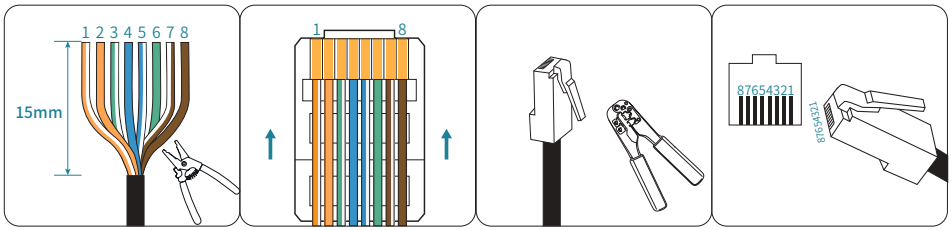
No.	Name	No.	Name
1	Cable	3	Crimp wire ferrule
2	Core wire	4	Ferrule crimp tool

5.2.7 Additional Power Supply Cable



No.	Name	No.	Name
1	Cable	3	Crimp wire ferrule
2	Core wire	4	Ferrule crimp tool

5.2.8 RJ45 Network Cable

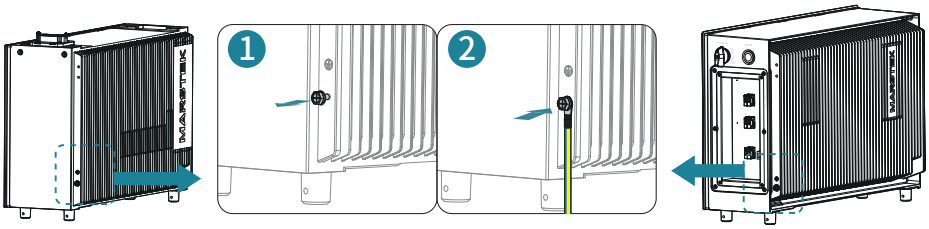


Although the assembly process of the network cable is the same, please note that the corresponding pin definitions vary for different terminals.

Color	White-Orange	Orange	White-Green	Blue	White-Blue	Green	White-Brown	Brown
Pin Defination	1	2	3	4	5	6	7	8
COM	BAT_485B	BAT_485A	X	X	V2X_CAN_L	V2X_CAN_H	X	X
PARALLEL	SYNC_ CANAL	SYNC_ CANAH	SYNC_A1	SYNC_B1	INV_SYNC-	INV_SYNC+	CARRIER_ SYNC-	CARRIER_ SYNC+
DRM	DRM1/5_U	DRM2/6_U	DRM3/7_U	DRM4/8_U	COM_5V_1	DRM0_U	COM_GND	COM_GND
LAN	D0P_A	D0M_A	D1P_A	D1M_A	D2P_A	D2M_A	D3P_A	D3M_A
CAN	X	X	X	EVSE_ CAN_H	EVSE_ CAN_L	X	X	X
METER/CT	CT1+	CT1-	X	X	X	X	METER_ 485A	METER_ 485B

5.3 Connecting Cables

5.3.1 Enclosure Grounding

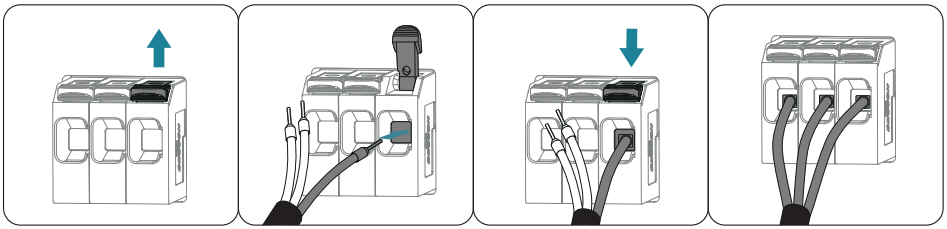


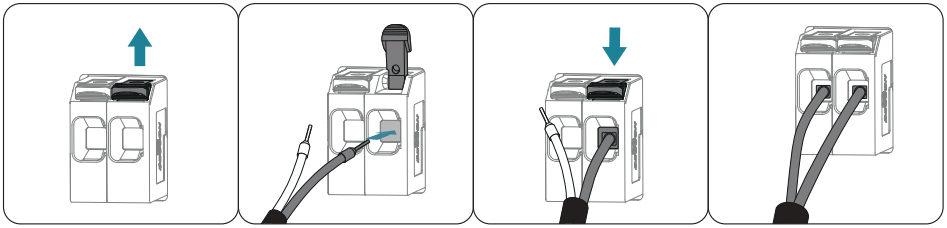
After the mechanical installation is completed, please prioritize installing the casing grounding (or PE) cable. Both the inverter and battery casing have corresponding grounding holes. The grounding of the inverter is necessary, while the grounding of the battery is highly recommended.

5.3.2 Plug Wires with Ferrule into Terminals

There are two types of terminal blocks you can plug crimped wire ferrule in.

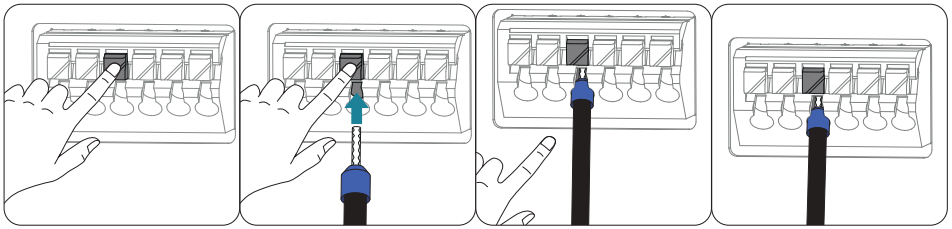
Bar-locked terminal





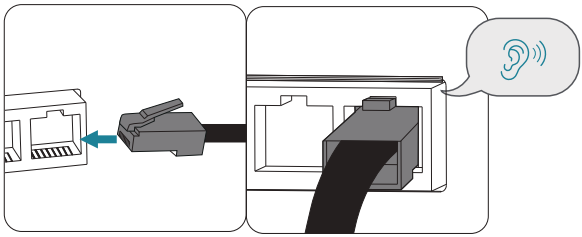
Steps	Description
1	Find the orange-color bar above each terminal port. Lift ths bar fully upward to its open position. You will hear or feel a distinct "click," indicating the terminal clamp is now open and ready to accept the wire.
2	Fully insert the ferrule into the terminal opening until it cannot go further.
3	Firmly press the lever all the way down to its closed position. You should hear a second "click," confirming that the internal clamp has securely gripped the wire.
4	Gently but firmly pull on the wire to verify that it is locked in place and cannot be dislodged. A properly connected wire will not move or come loose.

Button-locked terminal



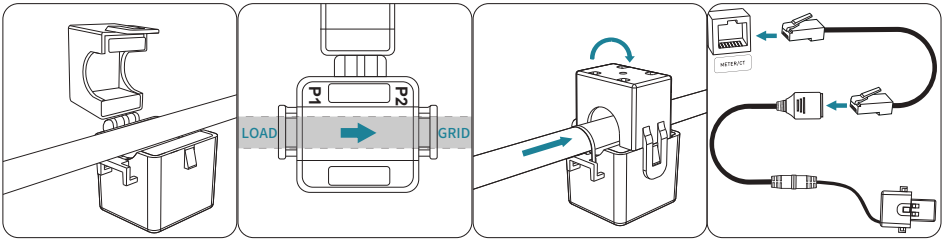
Steps	Description
1	Locate the release button above to the terminal port. Press and hold this button fully inward.
2	While holding the button depressed, fully insert the ferrule into the terminal opening.
3	Release the button.
4	Gently but firmly pull on the wire to verify that it is locked in place and cannot be dislodged. A properly connected wire will not move or come loose.

5.3.3 Plug in Network Cables



Steps	Description
1	Align the plug with the port, ensuring the connector's shape matches the port opening. Gently but firmly insert the plug straight into the port until you hear and feel a distinct "click".
2	Visually check that the plug is fully seated. The locking tab should have engaged, and the cable should not disconnect with a gentle pull.

5.3.4 CT Installation*



Steps	Description
1	Open the CT sensor clamp and place the CT sensor around a single conductor of the main grid cable.
2	Orient the CT correctly. The arrow marking on the CT housing must point toward the grid side (utility source). Incorrect orientation will cause reverse power readings.
3	Close the clamp securely until it clicks or locks. Ensure there is no gap between the clamp halves.
4	Use a network cable to connect the CT assembly to the dedicated Meter/CT port on the inverter. Ensure both connectors are fully inserted and securely locked in place. The network cable length shall not exceed 25 meters.

*Our system is compatible with third-party CTs and smart meters. For details on specific supported models and corresponding operation guidelines, please refer to the relevant technical documentation available on our official website.

COMMISSIONING AND OPERATION

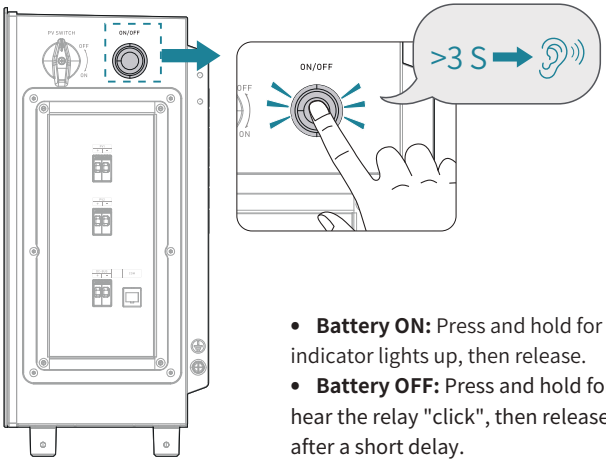
6.1 System Initialization and Commissioning

6.1.1 Check List

Before first time energizing the system, a certified installer must perform the following safety checks to ensure a safe and reliable operation. Confirm each item before proceeding.

No.	Check Item	Verification Action / Standard
1	ESS Mechanical Installation	• All units (inverter, batteries) are securely mounted to a solid wall or structure. • Required clearances for ventilation (as per manual) are maintained on all sides. • The installation location meet the site requirement.
2	Cable Routing & Integrity	• All power cables (AC and DC) and communication cables are properly routed and securely fastened. • Cables are undamaged, with no signs of pinching, cuts, or abrasion. • Cables are kept away from sharp edges and heat sources.
3	Reliable Grounding (Earthing)	• The protective earth (PE) cable is properly connected to the system's grounding terminal. • The grounding connection is tight and secure. • The integrity of the overall building grounding system has been verified.
4	Cable Connection Integrity	• All DC and AC connections are tight and secure. • Polarity is correct for all DC connections (PV input, battery). • Communication cables (to meter, batteries, etc.) are fully seated and locked.
5	AC Grid & Load Connections	• Grid phase, neutral, and earth wires are connected to the correct terminals. • Backup load circuit is correctly identified and connected. • All AC circuit breakers are in the OFF position before startup.
6	Battery System	• All battery modules are properly installed and interconnected. • No visible damage, swelling, or leakage on any battery module.
7	Final Area Check	• All tools, loose wires, and foreign objects have been removed from the equipment area. • The system's covers are properly installed and closed.

6.1.2 Power ON/OFF



- **Battery ON:** Press and hold for more than 3 seconds until the indicator lights up, then release.
- **Battery OFF:** Press and hold for more than 3 seconds until you hear the relay "click", then release. The indicator light will turn off after a short delay.

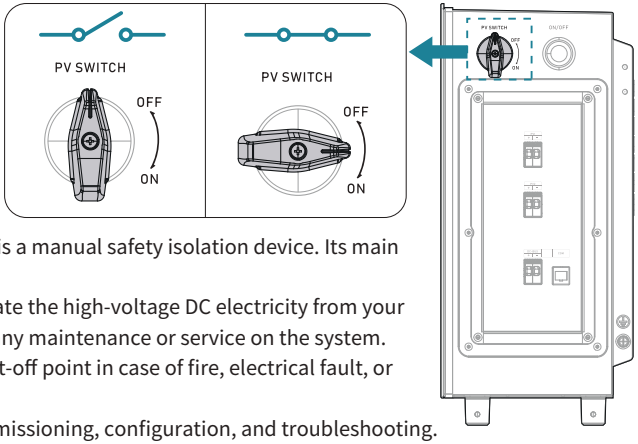
DANGER

- After turning off the switch and confirming the indicator light is completely off, wait for at least 10 minutes before proceeding with any other operations. This allows internal capacitors to discharge.

NOTICE

- The battery can only be shut down or disconnected when there is no input from both the utility grid and the PV array. The battery features an automatic wake-up function. If AC grid power or PV input is detected while the battery is shutdown, it will automatically power on and commence operation.

6.1.3 PV ON/OFF



The PV Switch (the rotary knob) is a manual safety isolation device. Its main functions are:

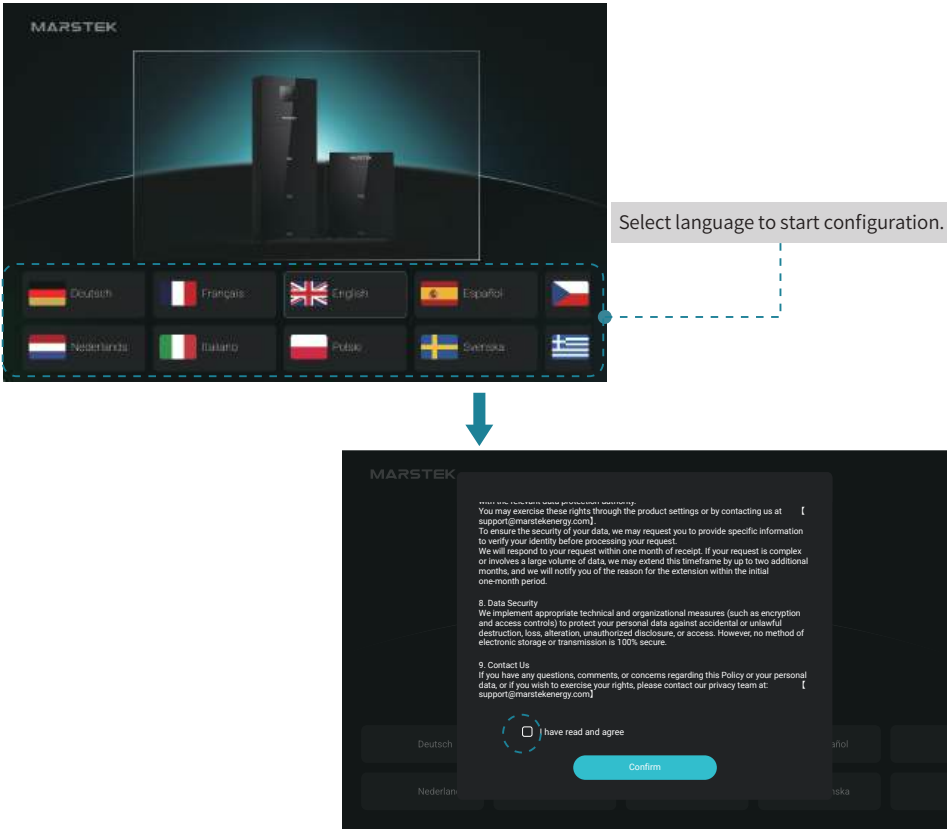
- To safely and completely isolate the high-voltage DC electricity from your solar panels before performing any maintenance or service on the system.
- To provide an emergency shut-off point in case of fire, electrical fault, or other hazards.
- To allow for safe system commissioning, configuration, and troubleshooting.

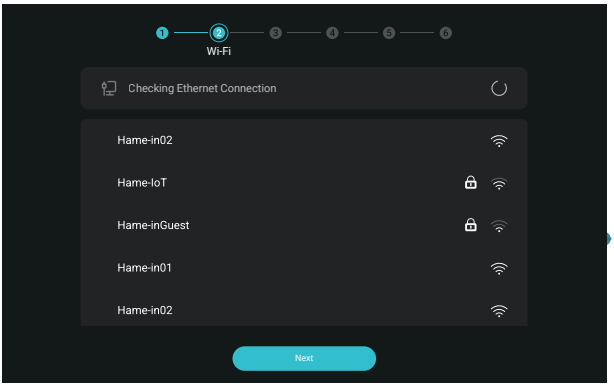
Make sure to turn off the PV switch:

- During initial installation or system commissioning. It should only be turned ON after all connections have been verified as correct and secure, allowing PV current to enter the inverter.
- When performing inspection, maintenance, or repair work on the PV modules, DC wiring, or the inverter itself.
- In the event of a fire, electrical fault, or other emergency. Operate the switch promptly to manually cut off the DC power input from the solar panels and help prevent the situation from escalating.

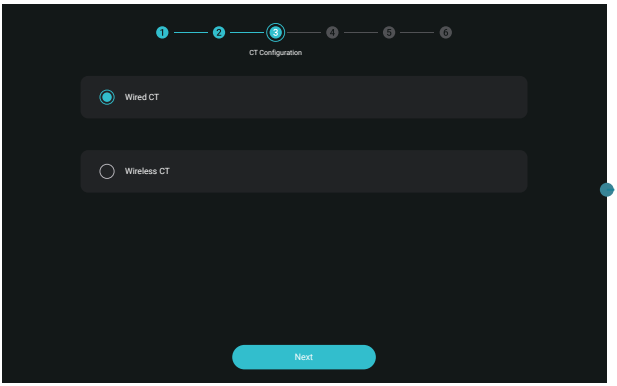
6.1.4 Setting up and Configuration

When the device is turned on for the first time, the system will perform configuration boot.

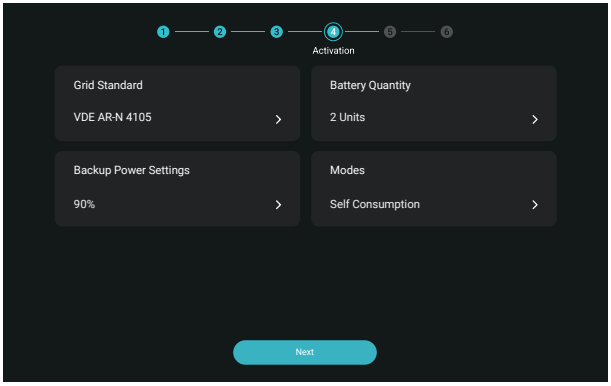


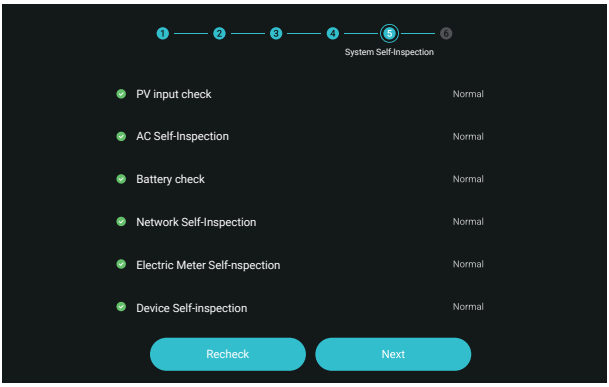


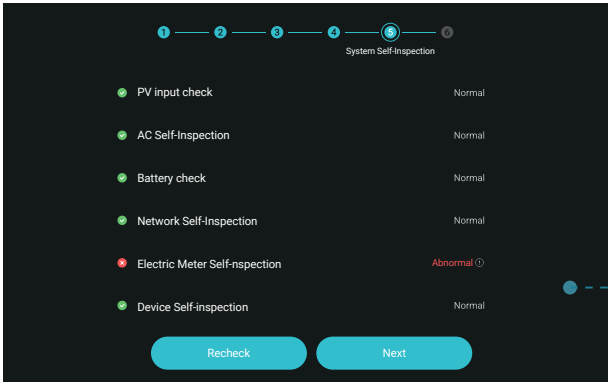
Plug in an Ethernet cable or choose Wi-Fi to connect.



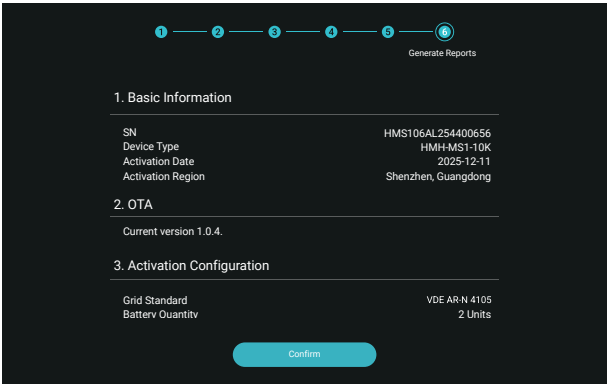
If using a wired CT, select the "Wired CT" option and click Next. If using a wireless CT, please refer to section 6.2.4.







If there is an item that can't pass the checking step, it will display "Abnormal". Please click to view possible causes and solutions.



Steps	Description
1	The initial step involves selecting your preferred language for the device interface. Following this, you will be presented with the privacy policy and user agreement. Please read through these terms carefully, and proceed by confirming your acceptance to continue with the activation process.
2	In this step, you will be prompted to connect the device to your local network. Choose your Wi-Fi network from the available list and enter the corresponding password, or connect via an Ethernet cable if preferred. A stable internet connection is required for subsequent setup and device functionality.
3	Proceed to configure basic system settings. Once configured, you will be guided to activate the device.
4	Upon activation, the system will automatically perform a comprehensive self-test to verify that all hardware components and software functions are operating correctly. The results will be displayed on the screen. If any issues are detected, follow the recommended trouble-shooting steps to resolve them before regular use.

Parameter	Description
Grid Standard	Depending on the country or region, different grid standards may be followed. For system supported standard please refer to APPENDIX A - Grid Code.
Battery Quantity	The number of battery of this system.
Backup Power Setting	Considering the lifespan of the battery, the system needs to retain a minimum amount of energy. In addition, for the emergency and electricity cost considereation, you can choose to increase the back-up energy capacity. This value can be adjusted between 30% and 90%.
Mode	Different working modes correspond to different energy priorities. For more details please refer to 6.2.2 Working Modes.

6.2 System Operation

6.2.1 Language

Our energy management system (EMS) support 10+ languages including English, German, France, Italian and so on. Check Appendix D - System Language to get the full list.

6.2.2 Working Modes

There are three system working modes: Self-Consumption Mode, AI Mode and Manual Mode. By selecting different working mode, RESS will follow corresponding working rules and behave differently.

Self-Consumption Mode

The goal for self-consumption mode is simple: Use your own solar energy first, before buying from the grid. It makes using clean, free solar power a top priority.

When PV generation is sufficient:

- Solar power prioritizes supplying your home's loads.
- Any excess solar energy is used to charge the battery.
- If the battery is full and anti-backflow is disabled, surplus energy is exported to the grid.

When PV generation is insufficient (e.g., at night or cloudy days):

- The system prioritizes using energy from the battery to power your loads.
- If the battery is depleted to its Depth of Discharge (DOD) setting or cannot provide enough power, the system automatically draws electricity from the grid to ensure a continuous supply.

This mode maximizes your independence and dramatically reduces your electricity bills by ensuring every bit of solar energy you produce is used by you, for you. From the perspective of energy flow, "solar power comes FIRST, and battery is energy bank, grid is backup plan".

AI Mode

Simply select your electricity provider and ensure your system is online. Our AI will then take over, automatically optimizing your home's energy flow to lower your bills (money saving) and reduce waste (energy saving), all without you lifting a finger. Please refer to the official website document for the list of supported electricity provider.

Manual Mode

This mode offers full control, allowing you to create a custom weekly schedule for your system's operation (up to 6 time slots).

You can define specific time slots for different behaviors throughout the week:

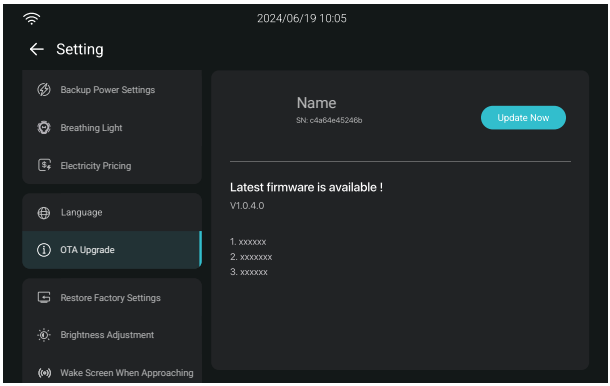
- Charge: The system uses both PV and grid power (if needed) to charge the battery after meeting home load demand. If PV is surplus and anti-backflow is disabled, energy is exported to the grid.
- Discharge: The battery and PV work together to power your loads and can export energy to the grid. If their combined power is insufficient, the grid is used to ensure load supply.
- Self-Consumption: The system operates as in "Self-Consumption Mode" described above, but only for the scheduled period.
- Standby: For any time slot not explicitly scheduled in Manual Mode, the system enters a standby state. In this state, the battery will not discharge. However, if PV generation exceeds your home's consumption, the excess energy will still be used to charge the battery.

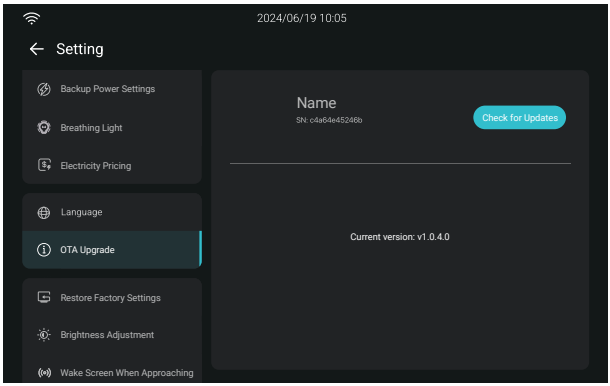
6.2.3 OTA Upgrade

The system software of RESS includes both display software and operation firmware. Periodically upgrading the system software is essential for ensuring your system operates optimally, securely, and with access to the latest features.

A software upgrade is a critical process. Please follow these precautions carefully:

- Stable Internet Connection: Ensure your system's communication gateway maintains a stable internet connection throughout the entire process. An interruption may cause the upgrade to fail.
- Do Not Power Off: Under no circumstances should you manually power off the system or disconnect its batteries during an upgrade. This may corrupt the software and render the system inoperable.
- Grid or PV Power Supply: The system requires a stable power supply to support upgrades. When there is a lack of continuous power supply, software upgrades may fail.
- System Status: The upgrade will typically proceed automatically once initiated. The system may restart one or more times; this is normal behavior. During this time, the system will not charge or discharge, and the backup power function may be temporarily unavailable.
- Optimal Timing: We recommend initiating the upgrade at a time when you are not relying on backup power and when grid power is stable.





While the upgrade process is designed to be seamless, you should be aware of the following:

- The system's monitoring app or portal may be temporarily inaccessible or display outdated data during the upgrade. It should return to normal once the process is complete.
- If the upgrade file is corrupted or the connection is lost, the upgrade may fail. At some circumstances, the system might need to perform an upgrade process again until success.
- In rare cases, the upgrade process might take longer than expected. Please be patient and allow the system to complete its sequence.
- In very rare cases, certain user settings might be reset to factory defaults after an upgrade. We recommend noting your custom settings (e.g., operating mode, time-of-use schedules) so you can reconfigure them if necessary.

If your system remains unresponsive for an extended period (e.g., over 2 hours) or display a persistent error message after a failed upgrade, please contact our technical support team.

6.2.4 Other Settings

For other settings, please scan QR code to get the display & app guide.

Download the app

- Android: Download via Google Play
- iOS: Download via App Store
- Download Link: https://eu.hamedata.com/ems/apk/marstek/index.html
- QR Code Download:

- Scan the QR code to access the APP user guide.
- Scan the QR code to access the Display Guide.

SYSTEM MAINTENANCE

7.1 Routine Maintenance

Routine maintenance is essential for ensuring your system's optimal performance, longevity, and safety. We strongly recommend you to perform routine maintenance according to instructions below.

Visual Inspections (Monthly Recommended)

- Ensure there are no signs of corrosion on the terminals or connectors of battery (if visible without opening the unit).
- Check for any alarm codes on the EMS display panel.
- Inspect for any loose cables or connections in the system.
- Keep surrounding area free from flammable materials, liquids, and excessive dust.

Cleaning (As Needed)

- Always turn the system OFF before cleaning.
- Use a soft, dry cloth to wipe the exterior surfaces of the battery unit, inverter, and display.
- Do not use any liquid cleaners, solvents,or abrasive sprays, as they can damage the electronics or cause a short circuit.

System Performance Monitoring

- Check the State of Charge (SoC), power flow (charging from solar/grid vs. discharging to home), and overall energy statistics.
- Review the system's event logs for any notifications or fault records.
- A significant, unexplained drop in capacity or performance may indicate an issue. Contact support if this occurs.
- When the system is in off-grid state (with neither AC grid nor PV input connected), it is recommended to press and hold the power button to shut down the system. If it is necessary to keep the system powered on and in operation, please charge the system regularly to avoid the system being in a low battery state.

7.2 Troubleshooting

If a system alarm is triggered:

- Consult Appendix C - Alarm Code Index for the specific alarm meaning and recommended actions.
- Contact your installer or authorized service provider if the issue persists or for any operations you are not qualified to perform.
- DO NOT attempt to resolve the alarm by disassembling the system or ignoring the instructions.

7.3 Emergency Procedures

In the event of an emergency, your safety is the top priority. Follow these procedures to protect yourself and prevent further damage.

Fire Emergency

⚠ DANGER

- Evacuate immediately and call the emergency services
- If safe to do so, shut off the AC and DC power to the system at the main disconnect switches.
- Inform firefighters that a energy storage system is present on-site.
- Do not use water to extinguish an electrical or battery fire.

Flood Emergency

⚠ DANGER

- Prioritize your safety. Evacuate to higher ground if instructed by authorities.
- If there is advance warning, shut down the system completely via the main switches to prevent electrical hazards.
- Do not approach or touch the system if water has reached any components. It can be electrified.
- Do not attempt to restart the system after water recedes. A qualified technician must inspect it first.

Gas Leak or Explosive Risk

⚠ DANGER

- Evacuate immediately.
- Do not operate the RESS or try to shut it down.
- Do not operate any electrical switches, plug or unplug any devices.
- Call emergency services from a safe distance.

System Malfunction

⚠ DANGER

- When system overheat, smoke or have strange odors etc., if safe, immediately shut off the system at the main disconnect switches.
- Contact your installer or technical support.
- Do not ignore the signs. Continuing to operate a malfunctioning system is dangerous.
- Do not try to investigate or repair the problem yourself.

APPENDIX

A - Grid Codes

No.	Grid Code	Description	MST-3.6KSP-M0 / MST-4.6KSP-M0 MST-5KSP-M0 / MST-6KSP-M0
1	EN 50549-10	Europen grid standard	Supported
2	VDE AR-N 4105	Germany grid standard	Not Supported
3	NA/EEA-NE7	Switzerland grid standard	Not Supported
4	CEI 0-21	Italy grid standard	Supported
5	EN 50549-1 + C10/11	Belgium grid standard	Supported
6	OVE-directive R25	Austria grid standard	Not Supported
7	CSN 50549-1	Czech grid standard	Not Supported
8	NEN EN50549-1	Netherland grid standard	Supported
9	PN-EN50549-1	Poland grid standard	Not Supported
10	SS EN 50549-1	Sweden grid standard	Not Supported
11	NEK EN 50549-1	Norway grid standard	Not Supported
12	AS/NZS 4777.2	Australia and New Zealand grid standard	Supported
13	G99	Britain grid standard	Supported
14	UNE217001	Spain grid standard	Supported
15	NF EN 50549-10	France grid standard	Supported

B - Alarm Code Index

Code	Alarm	Possible Cause	Suggestions
001	Insulation Fault	1. Insufficient insulation between PV panels and ground. 2. Internal inverter failure.	1. Check all wiring for damage. Verify insulation between PV panels and ground. 2. Turn the inverter off, wait for 5 minutes, and restart to see if it operates normally. 3. If the problem persists, contact the manufacturer for technical support.
002	PV Overvoltage	1. PV string voltage exceeds the system's maximum input voltage. 2. Internal inverter failure.	1. Check if the number of PV panels in a string is within specification. 2. If the configuration is correct, turn the inverter off, wait for 5 minutes, and restart. 3. If the problem persists, contact the manufacturer for technical support.
003	PV Overcurrent	1. PV array has been struck by lightning. 2. Internal inverter failure.	1. Turn the inverter off, wait for 5 minutes, and restart. 2. If it does not return to normal operation, contact the manufacturer for technical support.
004	Bus Overvoltage	1. Abnormal fluctuation in grid voltage. 2. Too many PV panels connected in series. 3. Internal inverter failure.	1. Turn the inverter off. Check the PV string configuration and grid voltage for abnormalities. 2. If no issues are found, wait 5 minutes and restart. 3. If the problem persists, contact the manufacturer for technical support.
005	Bus Undervoltage	1. Insufficient energy from PV and battery while operating off-grid. 2. Internal inverter failure.	1. Check battery level and PV generation power. 2. If energy is insufficient, connect to the grid and check if it operates normally. 3. If the problem persists, contact the manufacturer for technical support.
006	Bus Unbalance	1. Connected load is excessively unbalanced. 2. Internal inverter failure.	1. Remove all loads and check if the system returns to normal. 2. Turn the inverter off, wait for 5 minutes, and restart. 3. If the problem persists, contact the manufacturer for technical support.
007	Relay Fault	1. Internal inverter failure.	1. Turn the inverter off, wait for 5 minutes, and restart. 2. If the problem persists, contact the manufacturer for technical support.

Code	Alarm	Possible Cause	Suggestions
008	PV Overtemperature	1. Heat sink is blocked. 2. Ambient temperature is too high. 3. Internal inverter failure.	1. Turn the inverter off. Check if the heat sink is blocked. Allow the inverter to cool down before restarting. 2. If the problem persists, contact the manufacturer for technical support.
009	Communication Fault	1. Internal inverter failure.	1. Turn the inverter off, wait for 5 minutes, and restart. 2. If the problem persists, contact the manufacturer for technical support.
010	Storage Fault	1. Internal inverter failure.	1. Turn the inverter off, wait for 5 minutes, and restart. 2. If the problem persists, contact the manufacturer for technical support.
011	PV Reverse Polarity	1. PV positive and negative cables are reversed. 2. Internal inverter failure.	1. Turn the inverter off. Check the polarity of the PV cables. Wait 5 minutes and restart. 2. If the problem persists, contact the manufacturer for technical support.
012	Sampling Error	1. Internal inverter failure.	1. Turn the inverter off, wait for 5 minutes, and restart. 2. If the problem persists, contact the manufacturer for technical support.
013	Grid Overfrequency	1. Abnormal local grid frequency. 2. Internal inverter failure.	1. Wait for the grid frequency to return to the normal range. 2. If it does not recover for an extended period, contact the manufacturer for technical support.
014	Grid Underfrequency	1. Abnormal local grid frequency. 2. Internal inverter failure.	1. Wait for the grid frequency to return to the normal range. 2. If it does not recover for an extended period, contact the manufacturer for technical support.
015	Grid Overvoltage	1. Abnormal local grid voltage. 2. Internal inverter failure.	1. Wait for the grid voltage to return to the normal range. 2. If it does not recover for an extended period, contact the manufacturer for technical support.

Code	Alarm	Possible Cause	Suggestions
016	Grid Undervoltage	1. Abnormal local grid voltage. 2. Grid is not connected. 3. Internal inverter failure.	1. Wait for the grid voltage to return to the normal range. 2. Check if the grid is properly connected. 3. If it does not recover for an extended period, contact the manufacturer for technical support.
017	Abnormal Grid Voltage Ride-Through	1. Abnormal local grid voltage. 2. Grid is not connected. 3. Internal inverter failure.	1. Wait for the grid voltage to return to the normal range. 2. Check if the grid is properly connected. 3. If it does not recover for an extended period, contact the manufacturer for technical support.
018	Abnormal Grid Frequency	1. Abnormal local grid frequency. 2. Internal inverter failure.	1. Wait for the grid frequency to return to normal. 2. Power off the unit, wait for 5 minutes, and restart. 3. If it does not return to normal, contact the manufacturer for technical support.
019	Abnormal Grid Voltage	1. Abnormal local grid voltage. 2. Grid is not connected. 3. Internal inverter failure.	1. Wait for the grid voltage to return to the normal range. 2. Check if the grid is properly connected. 3. If it does not recover for an extended period, contact the manufacturer for technical support.
020	Grid Phase Sequence Fault	1.The three-phase grid is not correctly connected to the inverter. 2.Internal inverter failure.	1. Check if the three-phase grid is correctly connected to the inverter. 2. If the phase sequence wiring to the inverter is correct and the unit still does not return to normal, contact the manufacturer for technical support.
021	Islanding Protection	1. Local grid fault detected. 2. Internal inverter failure.	1. Power off the unit and check if the local grid voltage is normal. 2. Wait for 5 minutes and restart. 3. If the problem persists, contact the manufacturer for technical support.
022	Grid Loss	1. Local grid failure. 2. Internal inverter failure.	1. Power off the unit and check if the local grid voltage is normal. 2. Wait for 5 minutes and restart. 3. If the problem persists, contact the manufacturer for technical support.

Code	Alarm	Possible Cause	Suggestions
023	Inverter Overcurrent	1. Short circuit at the LOAD terminals. 2. Abnormal local grid. 3. Internal inverter failure.	1. Power off the unit and check the output terminals for a short circuit. 2. Wait for 5 minutes and restart. 3. If the problem persists, contact the manufacturer for technical support.
024	Inverter Overvoltage	1. Abnormal local grid voltage. 2. Internal inverter failure.	1. Power off the unit, wait for 5 minutes, and restart. 2. If the problem persists, contact the manufacturer for technical support.
025	Inverter Undervoltage	1. Internal inverter failure.	1. Power off the unit, wait for 5 minutes, and restart. 2. If the problem persists, contact the manufacturer for technical support.
026	Inverter Soft Start Failure	1. Internal inverter failure.	1. Power off the unit, wait for 5 minutes, and restart. 2. If the problem persists, contact the manufacturer for technical support.
027	Inverter Short Circuit	1. Short circuit at the output terminals. 2. Internal inverter failure.	1. Power off the unit and check the output terminals for a short circuit. 2. Wait for 5 minutes and restart. 3. If the problem persists, contact the manufacturer for technical support.
028	Bus Soft Start Failure	1. Internal inverter failure.	1. Power off the unit, wait for 5 minutes, and restart. 2. If the problem persists, contact the manufacturer for technical support.
029	Inverter Overtemperature	1. Heat sink is blocked. 2. Ambient temperature is too high. 3. Internal inverter failure.	1. Turn the inverter off. Check if the heat sink is blocked. Allow the inverter to cool down before restarting. 2. If the problem persists, contact the manufacturer for technical support.
030	Abnormal DC Current Component	1. Abnormal local grid voltage. 2. Internal inverter failure.	1. Turn the inverter off, wait for 5 minutes, and restart. 2. If the problem persists, contact the manufacturer for technical support.
031	Abnormal DC Voltage Component	1. Internal inverter failure.	1. Turn the inverter off, wait for 5 minutes, and restart. 2. If the problem persists, contact the manufacturer for technical support.

Code	Alarm	Possible Cause	Suggestions
032	Abnormal Leakage Current	1. Insufficient insulation between PV panels and ground. 2. Internal inverter failure.	1. Check all wiring for damage. Verify insulation between PV panels and ground. 2. Turn the inverter off, wait for 5 minutes, and restart. 3. If the problem persists, contact the manufacturer for technical support.
033	Meter Communication Fault	1. Meter connection is abnormal. 2. Internal inverter failure.	1. Power off the unit and check the meter connection. 2. If the problem persists, contact the manufacturer for technical support.
034	Arc Fault	1. Poor connection between PV panels and the inverter. 2. Internal inverter failure.	1. Power off the unit and check all connections between the PV array and the inverter. 2. If the problem persists, contact the manufacturer for technical support.
035	Overtemperature Derating	1. Heat sink is blocked. 2. Ambient temperature is too high. 3. Internal inverter failure.	1. Turn the inverter off. Check if the heat sink is blocked. Allow the inverter to cool down before restarting. 2. If the problem persists, contact the manufacturer for technical support.
036	Balancing Bridge Arm Overcurrent	1. Internal inverter failure.	1. Turn the inverter off, wait for 5 minutes, and restart. 2. If the problem persists, contact the manufacturer for technical support.
037	Parallel Master Unit Loss	1.Abnormal operation of the parallel master unit. 2.Internal inverter failure.	1. Check if the parallel master unit is operating normally. 2. Check the parallel configuration settings. 3. If the parallel master unit and parallel configuration settings are verified to be correct and the unit still does not return to normal, contact the manufacturer for technical support.
038	Parallel Signal Loss	1. Internal inverter failure.	1. Check the parallel configuration settings. 2. If the problem persists, contact the manufacturer for technical support.
039	Parallel Communication Abnormal	1. Parallel communication cable connection is abnormal. 2. 120-ohm parallel termination resistor is not connected. 3. Internal inverter failure.	1. Power off the unit and check the parallel communication cable connections. 2. Check if the 120-ohm termination resistor is properly connected. 3. If the problem persists, contact the manufacturer for technical support.

Code	Alarm	Possible Cause	Suggestions
040	Excessive Negative Power	1. Internal inverter failure.	1. Turn the inverter off, wait for 5 minutes, and restart. 2. If the problem persists, contact the manufacturer for technical support.
041	Parallel Version Mismatch	1. Inverters in parallel have different firmware versions.	1. Check that all parallel inverters are running the same firmware version. 2. If the problem persists, contact the manufacturer for technical support.
042	Parallel Setting Error	1. Incorrect parallel configuration.	1. Check the parallel configuration settings. 2. If the problem persists, contact the manufacturer for technical support.
043	Off-grid Overload	1. The load power connected to the EPS terminal exceeds the rated power. 2. The load connected to the EPS terminal has a high inrush current.	1. Check if the total load is too high. 2. If the problem persists, contact the manufacturer for technical support.
044	On-grid Overload	1. The load power connected to the EPS terminal exceeds the rated power. 2. The load connected to the EPS terminal has a high inrush current.	1. Check if the total load is too high. 2. If the problem persists, contact the manufacturer for technical support.
045	Battery Overcurrent	1. Short circuit at battery output. 2. Internal battery pack failure.	1. Turn the inverter off. Check the battery output terminals for a short circuit. 2. Wait for 5 minutes and restart. 3. If the problem persists, contact the manufacturer for technical support.
046	Battery Overtemperature	1. Heat sink is blocked. 2. Ambient temperature is too high. 3. Internal battery pack failure.	1. Turn the inverter off. Check if the heat sink is blocked. Allow the battery to cool down before restarting. 2. If the problem persists, contact the manufacturer for technical support.
047	Battery Low Temperature	1. Ambient temperature is too low. 2. Internal battery pack failure.	1. Turn the inverter off. Check if the ambient temperature is within the normal operating range. 2. If the problem persists, contact the manufacturer for technical support.
048	Battery Short Circuit	1. Internal battery pack failure.	1. Power off the unit and contact the manufacturer for technical support.

Code	Alarm	Possible Cause	Suggestions
049	Battery Overvoltage	1. Battery overcharged. 2. Poor cell consistency (a single cell voltage is too high). 3. Internal battery pack failure.	1. Power off the unit and contact the manufacturer for technical support.
050	Battery Undervoltage	1. Battery self-discharged after prolonged storage. 2. Internal battery pack failure.	1. Connect PV or grid to use the battery activation function for charging. 2. If the battery cannot be activated, contact the manufacturer for technical support.
051	Battery Cell Inconsistency	1. A single cell voltage is too high or too low. 2. A single cell temperature is too high or too low. 3. Internal battery pack failure.	1. Power off the unit and contact the manufacturer for technical support.
052	Low Battery State of Health (SOH)	1. Battery cell performance has degraded.	1. Contact the manufacturer for technical support.
053	Battery Bus Overvoltage	1. Too many PV panels connected in series. 2. Abnormal grid voltage. 3. Internal battery pack failure. 4. Internal inverter failure.	1. Turn the inverter off. Check if the number of PV panels in a string is within specification. 2. Check if the grid voltage is normal. 3. If the problem persists, contact the manufacturer for technical support.
054	Cycle-by-Cycle Current Limiting Protection	1.Excessive load. 2.Internal inverter failure.	1. Turn the inverter off. Check if the total load is too high. 2. Check if the grid voltage is normal. 3. If the problem persists, contact the manufacturer for technical support.
055	Battery Overload	1. Battery output power exceeds the rated power. 2. Internal battery pack failure.	1. Turn the inverter off, wait for 5 minutes, connect to the grid, and restart. 2. If the problem persists, contact the manufacturer for technical support.
056	Battery Auxiliary Power Fault	1. Poor connection between battery pack and inverter. 2. Internal battery pack failure. 3. Internal inverter failure.	1. Power off the unit and check the connection between the inverter and the battery. 2. If the problem persists, contact the manufacturer for technical support.

C - System Language

Language		Display	App
中文	Chinese	Supported	Supported
English	English	Supported	Supported
日本語	Japanese	Supported	Supported
Français	French	Supported	Supported
Deutsch	German	Supported	Supported
Nederlands	Dutch	Supported	Supported
Polski	Polish	Supported	Supported
čeština	Czech	Supported	Supported
Română	Romanian	Supported	Supported
Svenska	Swedish	Supported	Supported
українська	Ukrainian	Supported	Supported
Español	Spanish	Supported	Supported
ελληνικά	Greek	Supported	Supported
Magyar	Hungarian	Supported	Supported
Italiano	Italian	Supported	Supported
Pilipino	Filipino	Not Supported	Supported
Русский	Russian	Not Supported	Supported
แบบไทย	Thai	Not Supported	Supported

D -Parameters

Electrical Performance Parameters

Model	MST-3.6KSH -M0	MST-4.6KSH -M0	MST-5KSH -M0	MST-6KSH -M0
PV Input				
Max. PV Power	7.2kW	9.2kW	10kW	12kW
Max. DC Input Voltage	550V			
Rated DC Input Voltage	650V			
Start-up Voltage	150V			
MPPT Voltage Range	120-500V			
Max. Input Current	16A*2			
Max. Short-circuit Current	20.8A*2			
Number of MPPT Trackers	2			
Number of PV Strings Per MPPT	1			
DC Terminal Type	Push-in			
PV DC Isolation Switch	Standard			
DC Overvoltage Category (OVC)	Class II			
AC Output (Backup)				
Rated Output Voltage	230V			
Rated Output Frequency	50Hz / 60Hz			
Rated Output Power	3.6kW	4.6kW	5kW	6kW
Max. Output Apparent Power	3.8kVA	4.8kVA	5.3kVA	6.3kVA
Rated Output Current	15.7A	20.0A	21.7A	26.1A
Max. Output Current	23.4A(5.4kW,1s)	30A(6.9kW,1s)	32.6A(7.5kW,1s)	39.1A(9kW,1s)
Total Voltage Harmonic Distortion	THDv < 2%			
Disruption Time of Backup Switch	<10ms			
Overload Capacity	105%<Load ratio≤125%, Alarm and shutdown after 10min 125%<Load ratio≤150%, Alarm and shutdown after 1min Load ratio>150%, Alarm and shutdown after 1s			

Model	MST-3.6KSH -M0	MST-4.6KSH -M0	MST-5KSH -M0	MST-6KSH -M0
AC Input and Output (On-grid)				
Grid Type	L/N/PE			
Rated Voltage	230V			
Voltage Range	170-280V			
Rated Frequency	50Hz / 60Hz			
Frequency Range	45-55Hz(50Hz)/55-65Hz(60Hz)			
Max. Input Apparent Power	5.9kVA	7.5kVA	7.5kVA	7.5kVA
Max. Input Current	25.7A	32.6A	32.6A	32.6A
Rated Output Power	3.6kW	4.6kW	5kW	6kW
Rated Output Current	15.7A	20.0A	21.7A	26.1A
Total Current Harmonic Distortion	THDi < 3%			
Power Factor (PF)	0.8 Leading - 0.8 Lagging (Adjustable)			
Anti Feed-in Protecion	Configurable			
AC Overvoltage Category (OVC)	Class III (General)			
Generator Input				
Grid Type	L/N/PE			
Rated Input Voltage	230V			
Voltage Range	170-280V			
Rated Input Frequency	50Hz / 60Hz			
Frequency Range	30-70Hz			
Max. Input Apparent Power	5.4kVA	6.9kVA	7.5kVA	7.5kVA
Max. Input Current	23.5A	30A	32.6A	32.6A
EVSE Output				
Rated Output Voltage	230V			
Rated Output Frequency	50Hz / 60Hz			
Rated Output Power	3.6kW	4.6kW	5kW	6kW
Rated Output Current	15.7A	20.0A	21.7A	26.1A

Model	MST-3.6KSH -M0	MST-4.6KSH -M0	MST-5KSH -M0	MST-6KSH -M0
Battery Parameter				
Battery Type	LFP			
Rated Voltage	400V			
Voltage Range	350-500V			
Max. Charging/Discharging Power	6kW			
Max. Charging/Discharging Current	17.1A			
Battery Capacity	5.12kWh			
Battery Voltage Monitoring	Integrated			
Battery Current Monitoring	Integrated			
Efficiency				
Max. Efficiency	97.60%			
European Efficiency	97.10%			
MPPT Efficiency	99.60%			
Battery Conversion Efficiency	97.00%			
General Parameter				
Dimensions (W/H/D)	628*196*398mm			
Weight	35kg			
Storage Temperature Range	-40°C-70°C			
Operating Temperature Range	-25°C-60°C			
Relative Humidity Range	0-100%			
Max. Operating Altitude	>2000m derating			
Cooling	Natural cooling			
System Ingress Protection Rating	IP65			
Noise Level	<30dB			
Display	LCD, App			
Communication	Wi-Fi, LAN, CAN, RS-485			

Model	MST-3.6KSH -M0	MST-4.6KSH -M0	MST-5KSH -M0	MST-6KSH -M0
General Parameter				
Pollution Degree	PD2			
Warranty	10 Years			

Scan the QR code to obtain the latest user manual.
More language updates are underway...

WEEE Reg. No.:89860626

Manufacturer: Marstek energy Co.Ltd.
Address: 1-4F, BLDG#9, 1/F, BLDG#5, West Industrial Park,South of the Intersect ion of Ma'anshan Tunnel and Zhangshe Avenue, Xiangxi High-tech Zone, Hunan Province, China.

MARSTEK

CE

EU Declaration of Conformity (EN)

Within the meaning of the EU directives

- Radio Equipment Directive 2014/53/EU (RED)
- Restriction of Hazardous Substances in Electrical and Electronic Equipment 2011/65/EU and (EU) 2015/863 (RoHS)

The subject matter of the declaration described below meet the requirements relating to Union harmonization legislation.

The applied harmonized standards are listed in the following table.

Brand	MARSTEK
Product Category	Residential Energy Storage System
Product Name	Hybrid Inverter
Models	MST-6KSH-M0,MST-5KSH-M0,MST-4.6KSH-M0,MST-3.6KSH-M0
Radio Equipment Directive (RED)2014/53/EU	
EN IEC 61000-6-3:2021	√
EN IEC 61000-6-4:2019	√
EN IEC 61000-6-1:2019	√
EN IEC 61000-6-2:2019	√
EN 62109-1:2010	√
EN 62109-2:2011	√
ETSI EN 301 489-1 V2.2.3(2019-11)	√
ETSI EN 301 489-17 V3.3.1(2024-09)	√
EN IEC 61000-3-2:2019+A1:2021+A2:2024	√
EN 61000-3-3:2013+A1:2019+A2:2021	√
EN IEC 61000-3-11:2019	√
EN 61000-3-12:2011+A1:2024	√

ETSI EN 300 328 V2.2.2(2019-07)	√
EN IEC 62311:2020	√
EN 50665:2017	√
Restriction of the use of certain hazardous substances (RoHS)	
IEC 62321-3-1:2013	√
IEC 62321-5:2013	√
IEC 62321-4:2013+AMD1:2017 CSV	√
IEC 62321-6:2015	√
IEC 62321-7-1:2015	√
Other specifications	
UN 38.3	×

√ Standard applicable

× Standard not applicable

Note:

The declaration of conformity is issued under the sole responsibility of the manufacturer. Without an explicit written confirmation by Marstek energy Co.Ltd., this declaration of conformity is no longer valid if the product is modified, supplemented or changed in any other way and if components which are not part of the Marstek energy Co.Ltd accessory, are integrated in the product, as well as if the product is used or installed improperly.

DocuSigned by:

Arvin Wu

Director, R&D Department

Marstek energy Co.,Ltd.

2025-11-24, Shenzhen, China

Manufacturer: Marstek energy Co.Ltd.
Address: 1-4F, BLDG#9, 1/F, BLDG#5, West Industrial Park,South of the Intersect ion of Ma'anshan Tunnel and Zhangshe Avenue, Xiangxi High-tech Zone, Hunan Province, China.

MARSTEK

CE

EU Declaration of Conformity (EN)

Within the meaning of the EU directives

- Electromagnetic Compatibility Directive 2014/30/EU (EMC)
- Restriction of Hazardous Substances in Electrical and Electronic Equipment 2011/65/EU and (EU) 2015/863 (RoHS)

The subject matter of the declaration described below meet the requirements relating to Union harmonization legislation.
The applied harmonized standards are listed in the following table.

Brand	MARSTEK
Product Category	Battery Module
Product Name	Residential Energy Storage System Battery
Models	MST-MARSIPLUS-5.0KBAT
Radio Equipment Directive (RED)2014/53/EU	
EN IEC 61000-6-3:2021	√
EN IEC 61000-6-1:2019	√
EN IEC 61000-3-2:2019+A1:2021	√
EN 61000-3-3:2013+A1:2019+A2:2021+AC:2022	√
Restriction of the use of certain hazardous substances (RoHS)	
IEC 62321-3-1:2013	√
IEC 62321-5:2013	√
IEC 62321-4:2013+AMD1:2017 CSV	√
IEC 62321-6:2015	√
IEC 62321-7-1:2015	√
Other specifications	
UN 38.3	√
IEC 62619	√

√ Standard applicable
× Standard not applicable

Note:
The declaration of

conformity is issued under the sole responsibility of the manufacturer. Without an explicit written confirmation by Marstek energy Co.Ltd., this declaration of conformity is no longer valid if the product is modified, supplemented or changed in any other way and if components which are not part of the Marstek energy Co.Ltd accessory, are integrated in the product, as well as

if the product is used or installed improperly.

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