USER MANUAL

MARSTEK

MARSTEK VENUS-A

MST-HIE2.0-0800/MST-E2.0ST



EN DE NL IT FR ES PL

MARSTEK ENERGY CO., LIMITED

WWW.MARSTEKENERGY.COM

EN

Content

1. Product Overview 1
   - 1.1 Introduction 1
   - 1.2 Model 1
   - 1.3 Product Dimensions 1
   - 1.4 Interface Introduction 2
   - 1.5 LED Indicators 3
   - 1.6 Battery Capacity 3
   - 1.7 Working Modes 4
   - 1.8 Advanced Function 4
   - 1.9 System Layout 5
2. Installation Instructions 6
   - 2.1 Pre-installation Checklist 6
   - 2.2 Installing Accessories and Required Tools 6
   - 2.3 Installation Steps 7
3. MARSTEK APP for Smart Control 15
4. Maintenance 16
   - 4.1 Routine Maintenance 16
   - 4.2 Trouble Shooting 17
5. Technical Specifications 19
6. Safety Information 22

1. Product Overview

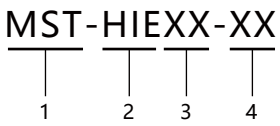
1.1 Introduction

- MARSTEK VENUS-A is a balcony photovoltaic (PV) modular energy storage system that supports PV charging and AC coupling. It offers three operating modes: AI Optimization Mode, Self-Consumption Mode, and Manual Mode. The system can be charged via PV panels and the power grid, providing stable electricity to household loads and the grid, while also serving as a reliable backup power source during outages.
- The product consists of two parts: the Power Module and the Extra Battery Module, which can be flexibly configured according to user needs to meet diverse home energy storage requirements.

1.2 Model

The following are the product models of MARSTEK VENUS-A:

Product Name	Short Form	Product Model
MARSTEK VENUS-A	Power Module	MST-HIE2.0-0800
MARSTEK VENUS-A	Extra Battery Module	MST-E2.0ST



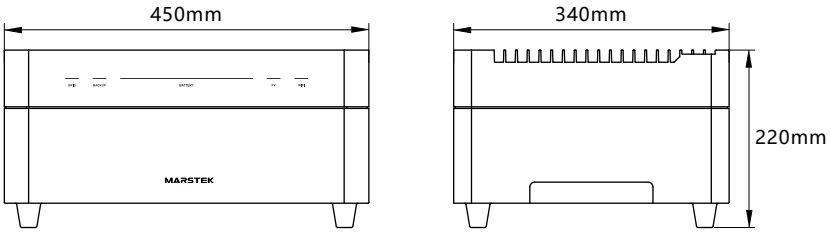
1	Company name	MST: Marstek Energy Co., Limited.
2	Series name	HIE: Balcony photovoltaic integrated machine
3	Power identification	XX: 2.0 means 2.12kWh
4	Power rating	XX: 0800 means 800W



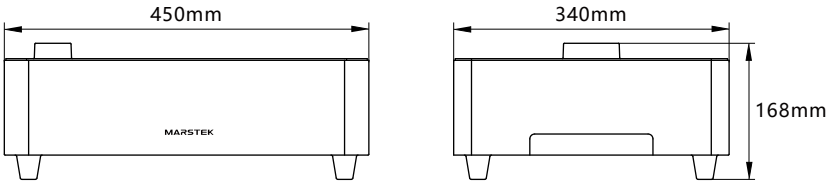
1	Company name	MST: Marstek Energy Co., Limited.
2	Series name	E: Energy storage
3	Power identification	XX: 2.0 means 2.12kWh
4	Status	ST: Stacked form

1.3 Product Dimensions

Short Form	Product Model	Dimensions(mm)
Power Module	MST-HIE2.0-0800	450×340×220
Extra Battery Module	MST-E2.0ST	450×340×168



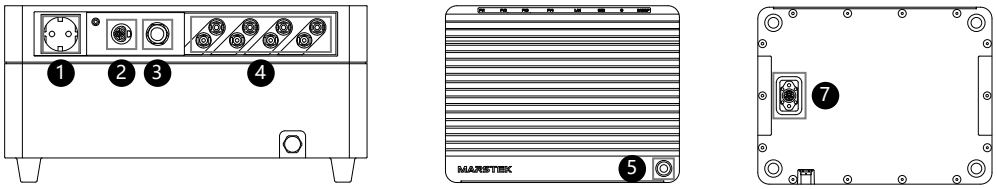
MST-HIE2.0-0800



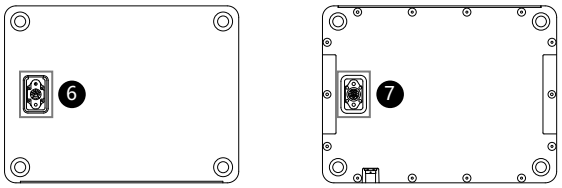
MST-E2.0ST

EN

1.4 Interface Introduction



MST-HIE2.0-0800

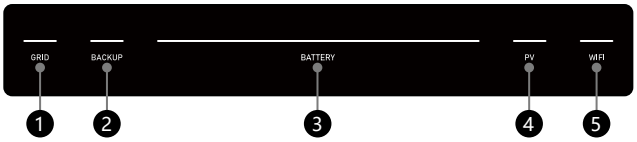


MST-E2.0ST

1. BACKUP: AC socket (EU standard), supplies power to loads during outages.
2. Grid: Connects the system to the home power grid.
3. Ethernet Port: Interface for Ethernet connection.
4. PV Input Terminals: Used for connecting to solar panels.
5. Power On/Off Button: Press to turn on/off the device.
6. TOP Stacking Port: Used for stacking connections.
7. Underside Stacking Port: Used for stacking connections.

1.5 LED Indicators

The indicator is located on the front of the MARSTEK VENUS-A power module and is used to display the operating status.



1. Grid socket on.
2. BACKUP socket on.
3. Battery Capacity Indicator.
4. PV Connected.
5. WIFI connected.

Indicator	Status	Description
Battery	Light bar goes from left to right	Charging in progress
	Light bar goes from right to left	Discharging in progress
Others	Off	Function: Off
	Steady on	Function: On

1.6 Battery Capacity

The MARSTEK VENUS-A Power Module supports up to 5 MARSTEK VENUS-A Extra Battery Modules. The following table lists the stacking examples and corresponding energy capacity.

Stacking						
Battery Module	×0	×1	×2	×3	×4	×5
Energy Capacity	2.12kWh	4.24kWh	6.36kWh	8.48kWh	10.6kWh	12.72kWh

1.7 Working Modes

- Self-Consumption: Requires a current transformer (CT). When the CT detects an active load, the device immediately supplies power. When the CT detects that the solar PV system is exporting electricity to the grid, the device starts charging to store energy. By working together, the device and CT create an independent home energy management system that maximizes energy efficiency.
- AI Optimization: Employs AI algorithms to develop cost-effective charging strategies based on the user's electricity consumption, solar generation, and real-time electricity pricing.
- Manual: Executes user-defined charge and discharge strategies.

These three modes can be configured through the app. Please refer to Chapter 3 for detailed operation steps.

1.8 Advanced Function

Compensation Function

This function applies to the "Self-Consumption + CT + Load" configuration. When the CT detects active load:

- Single-Phase Compensation:
  - MARSTEK VENUS-A supplies power only to the single-phase load connected to the live wire.
- Three-Phase Total Compensation:
  - MARSTEK VENUS-A distributes power across phases A, B, and C based on load demands to keep the net power fed into the grid close to zero, achieving true zero-export.

For multi-device installations at home, three-phase compensation mode is strongly advised for optimal system performance.

Meter Compatibility Instructions

The MARSTEK VENUS-A device is fully compatible with MARSTEK's own CT002 and CT003 meters. It supports the system's self-consumption and AI optimization modes, ensuring the stability and optimal performance of the system.

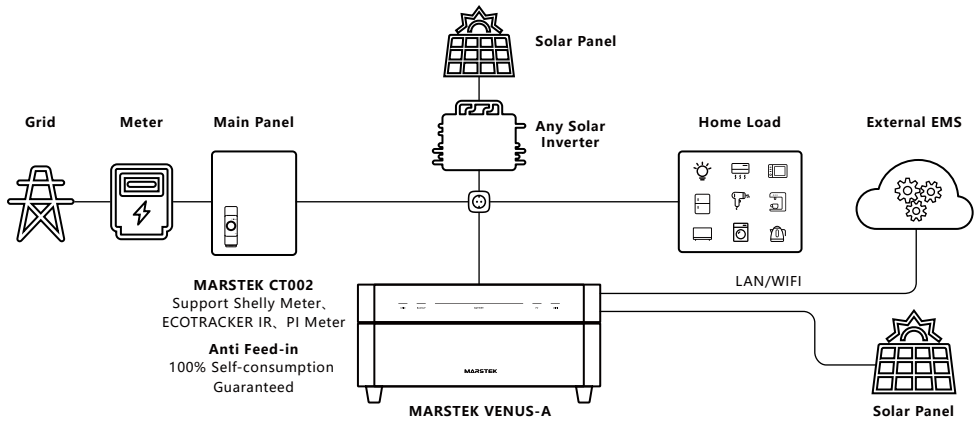
In addition, MARSTEK VENUS-A is also compatible with the following mainstream brands of meter products, supporting the access and use of corresponding functions:
(Note: Each of the following meter models supports connecting only one device per phase.)

- Shelly Pro 3EM (Shelly) Shelly EM Gen3 (Shelly) Shelly Pro EM-50 (Shelly)
  - Shelly is a registered trademark of SHELLY EUROPE LTD.
- ECOTRACKER IR (Everhome)
  - Everhome is a registered trademark of everHome GmbH.
- PI Meter (Homewizard)
  - Homewizard is a registered trademark of Homewizard B.V.

1.9 System Layout

Plug-in Solution

The MARSTEK VENUS-A system stores energy from the grid or solar power and supplies selected loads during a grid outage. By working in coordination with a CT, the system enables self-consumption and AI optimization functions. Below are plug-and-play household application scenarios.



2. Installation Instructions

2.1 Pre-installation Checklist

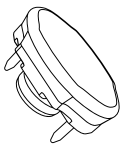
EN

- Before unpacking the device, inspect the packaging for any visible damage—such as holes, cracks, or other signs that may indicate internal issues—and verify the device's model number. If the packaging is damaged, or if the model number does not match, do not proceed with unpacking. Instead, contact the dealer immediately.
- After unpacking, examine the device for any visible external damage, such as dents, scratches, or other surface defects. Also, verify that all items listed on the packing list are included. If there is any damage or missing items, please contact the dealer or email support@marstekenergy.com for assistance.

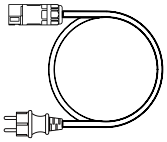
2.2 Installing Accessories and Required Tools

Installing Accessories

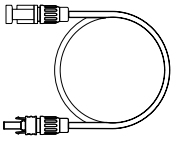
- Before installation, ensure you have the following accessories ready (as listed in the packing list):



Connector Plug×1



AC Cable×1

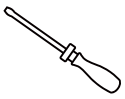


MC4 Extension Cable
Maximum 4 pieces, self-purchase

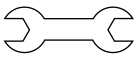
Note: Verify all items with the packing list. If any accessory is missing or damaged, contact your supplier immediately.

Required Tools

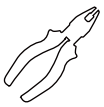
- We recommend that you prepare the installation tools, including but not limited to the following:



Screwdrivers



Wrench



Diagonal pliers



Insulating gloves



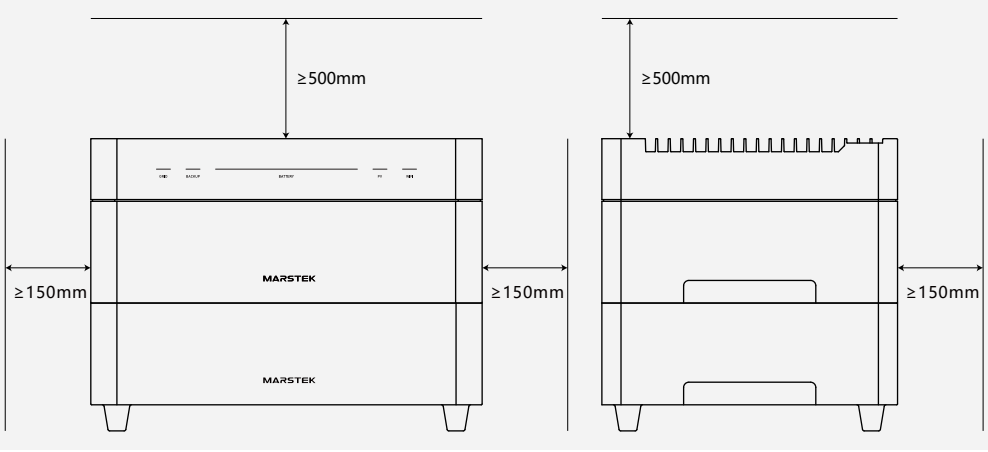
Measuring tape

2.3 Installation Steps

- The following steps describe how to install one Power Module and two Extra Expansion Batteries as an example.
- Ensure Power Module is off during installation.

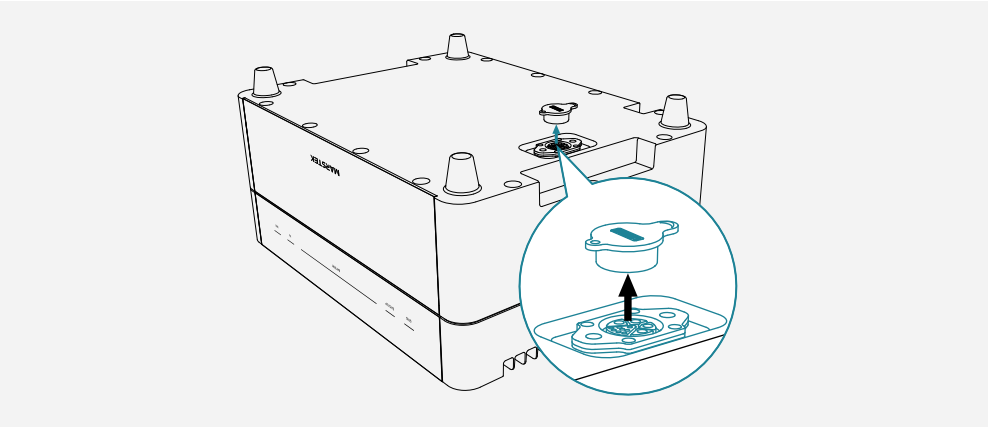
Step 1 Place the Bottom Extra Battery Module

- Position within Wi-Fi coverage for MARSTEK VENUS-A Power Module to connect to the network.
- A minimum clearance of 500 mm must be maintained at the top.
- A minimum clearance of 150 mm must be maintained around the equipment.

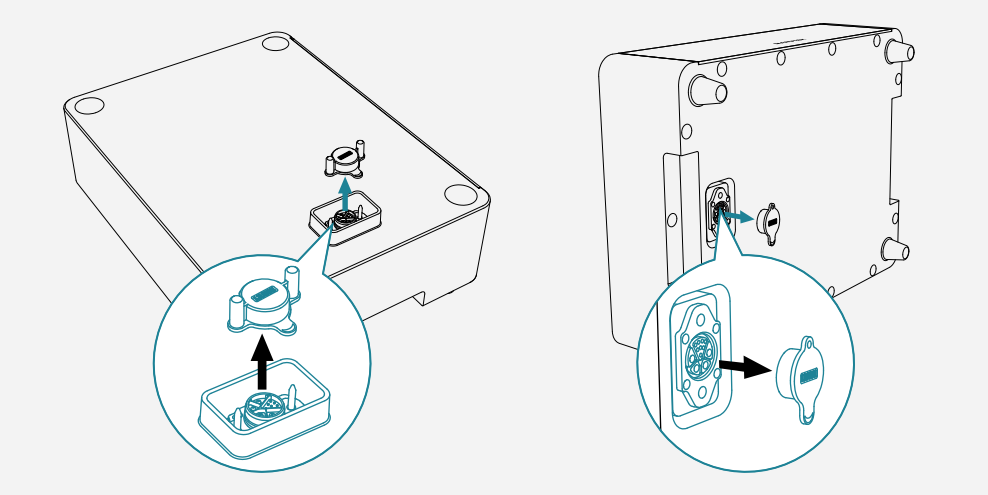


Step 2 Remove Protective Caps and Install the Connector Plug

- Remove the protective cap from the female stack connector at the bottom of the Power Module.

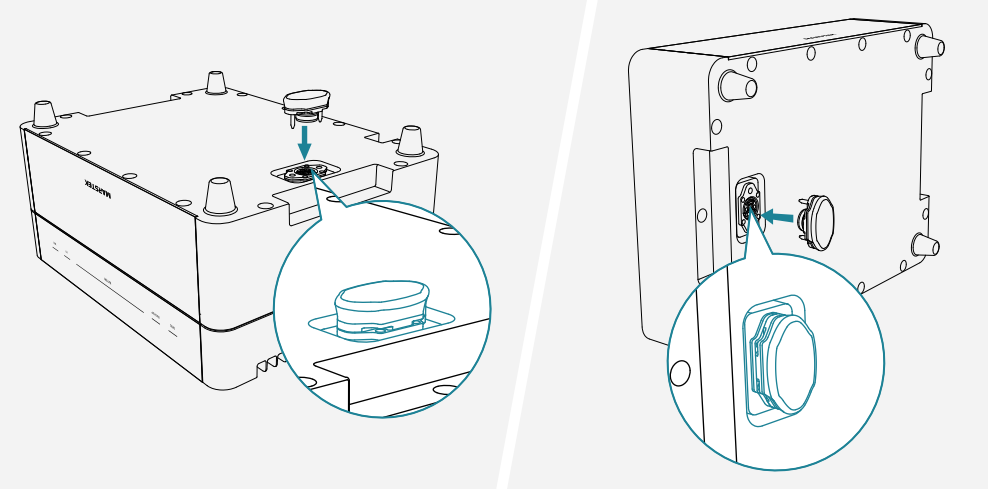


- Remove the protective caps from the male and female stack connectors at the top and bottom of the Extra Battery Modules.



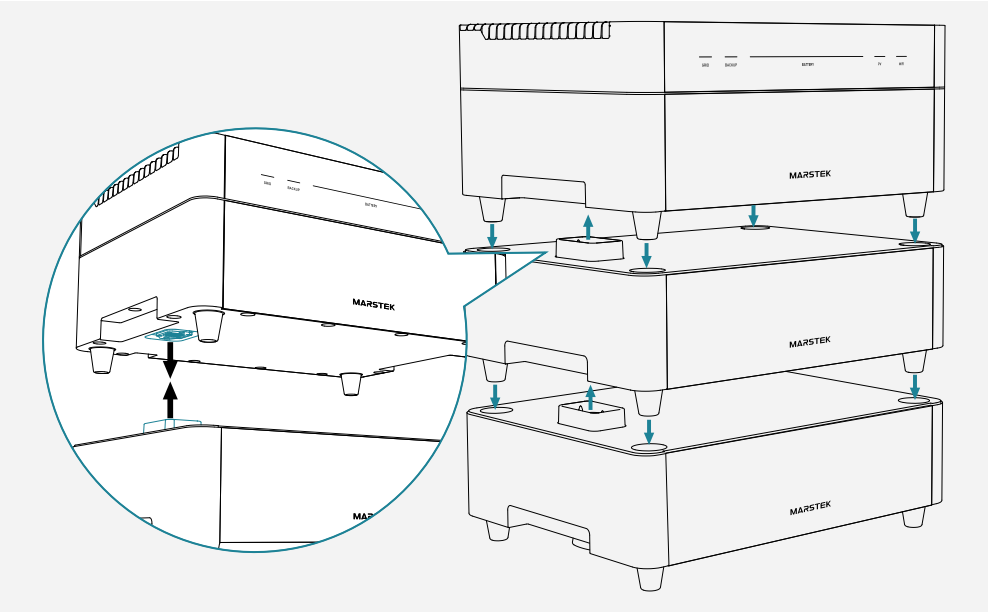
EN

- Install the Connector Plug (included in the Power Module package) onto the bottom-most Extra Battery Module to provide waterproof and dustproof protection. If no expansion batteries are installed, install the plug onto the bottom connector of the Power Module.



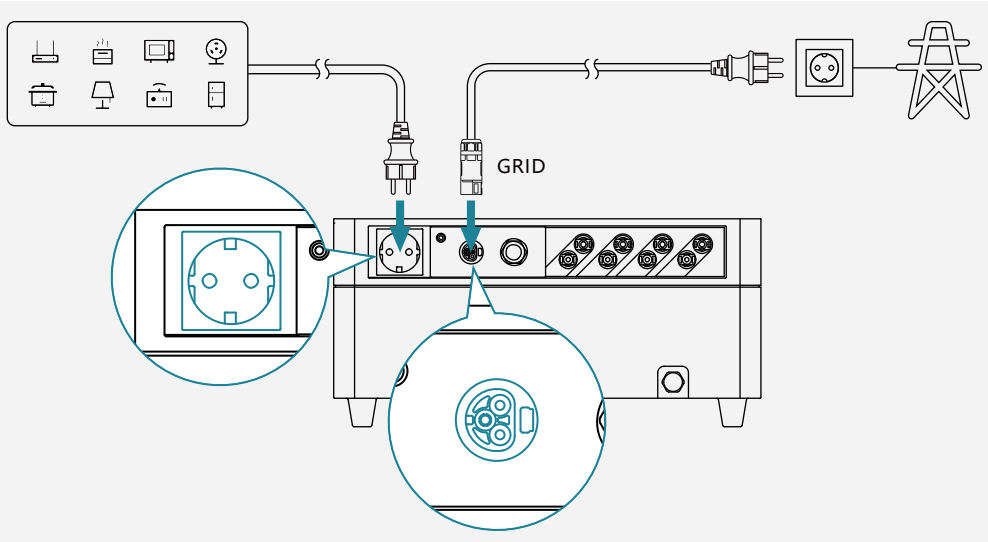
Step 3 Stack with Power Module at the top

- Stack Extra Battery Modules in sequence with Power Module at the top by inserting the two corresponding ports into each other.



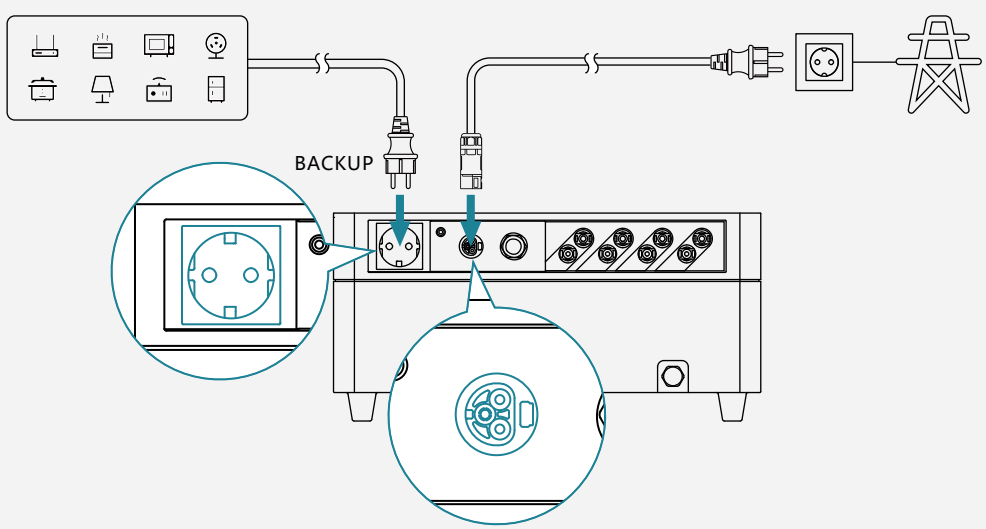
Step 4 Connect to the Grid

- Connect MARSTEK VENUS-A to a home outlet using the included AC cable with Schuko plug (included in the Power Module package).



Step 5 Connect to Your Device

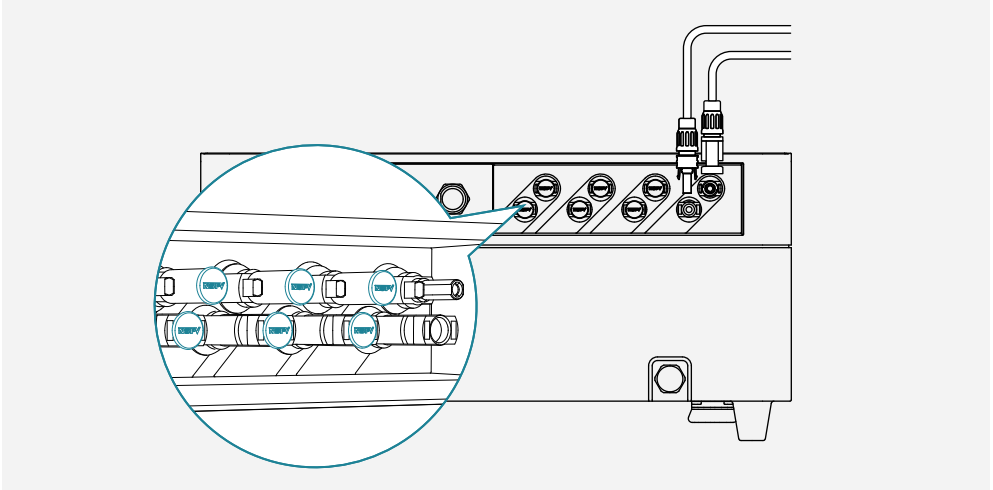
- Power your device directly using the backup port if needed.



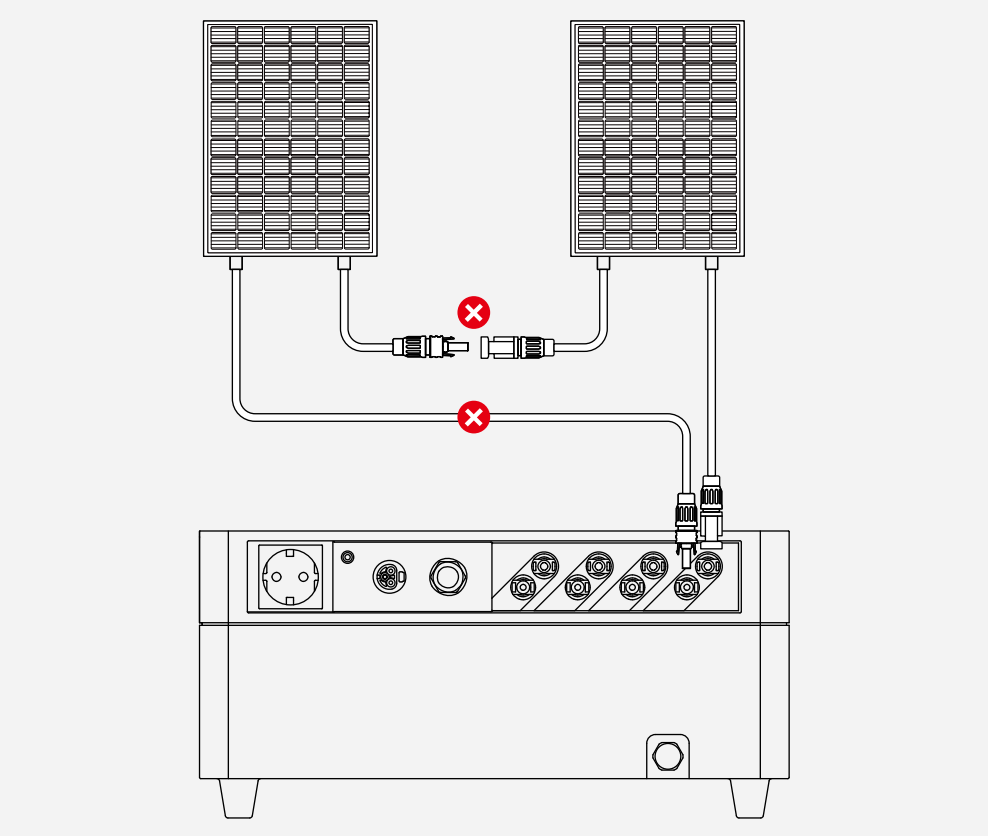
EN

Step 6 Connect to PV Modules

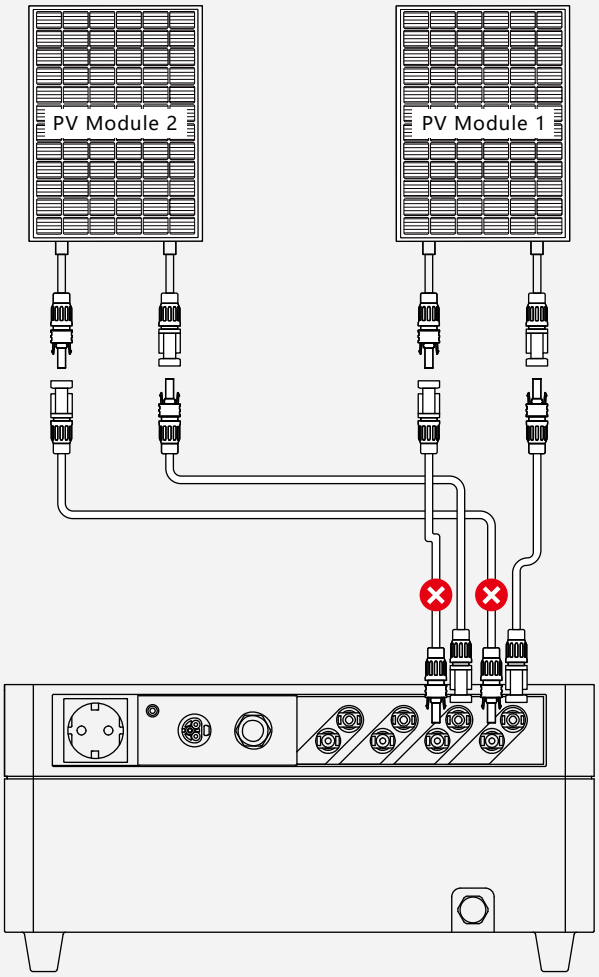
- Ensure that unused PV ports on MARSTEK VENUS-A Power Module are sealed with waterproof caps.



- When connecting PV modules in parallel, please check the specifications of the PV modules and ensure that the total short-circuit current does not exceed 20A.
- Never connect two or more PV modules in series because this causes the input voltage to exceed 60V and will damage the equipment.



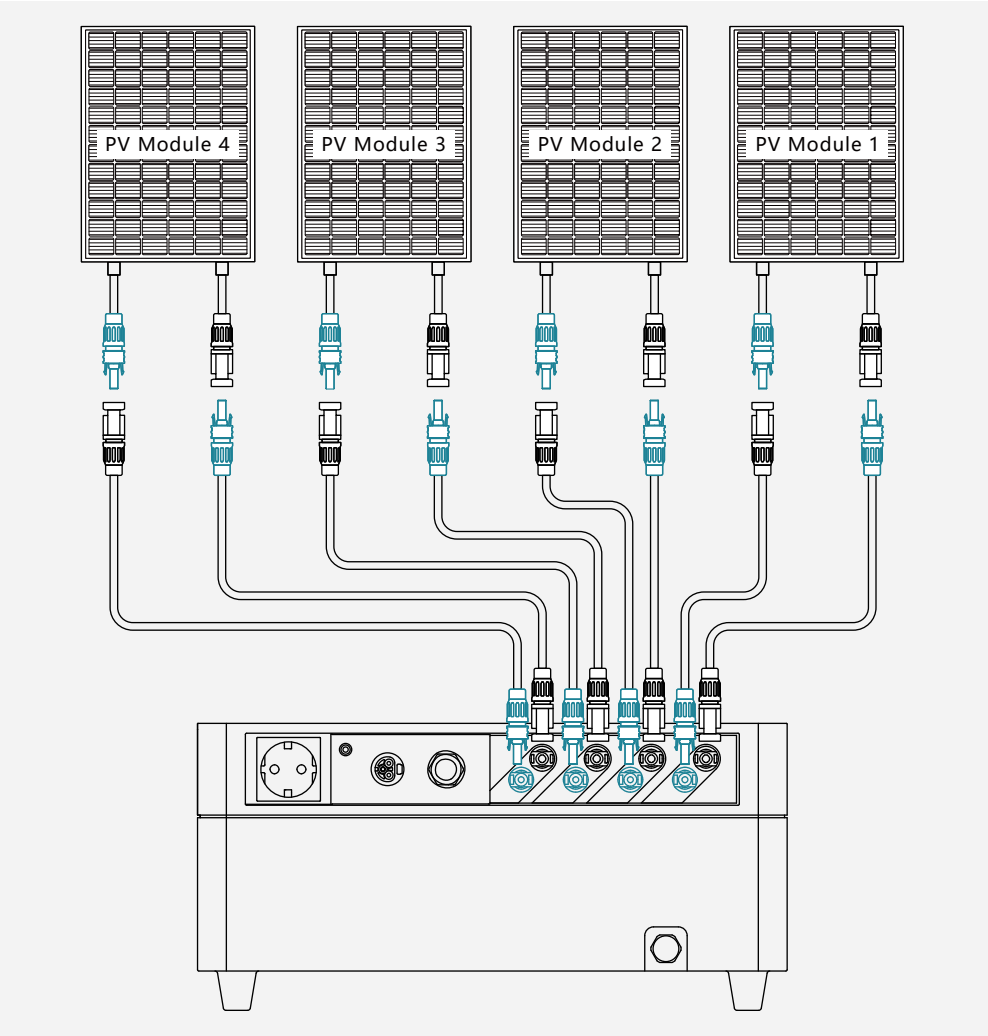
- Never connect the same set of PV connectors to different sets of PV input ports. For instance, connecting the positive connector of PV Module 1 to the negative PV2 input port of MARSTEK VENUS-A is prohibited.



EN

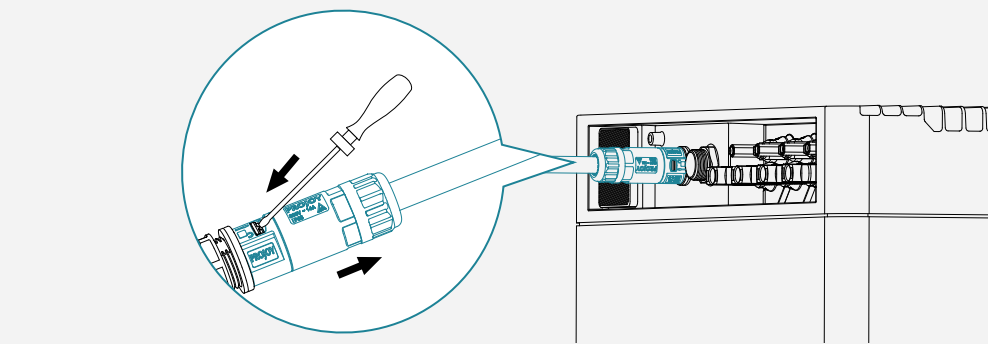
Direct Connection (Up to 4 PV Modules)

- Connect each PV module directly to the same set of PV input ports.



Step 7 AC Cable Disconnection

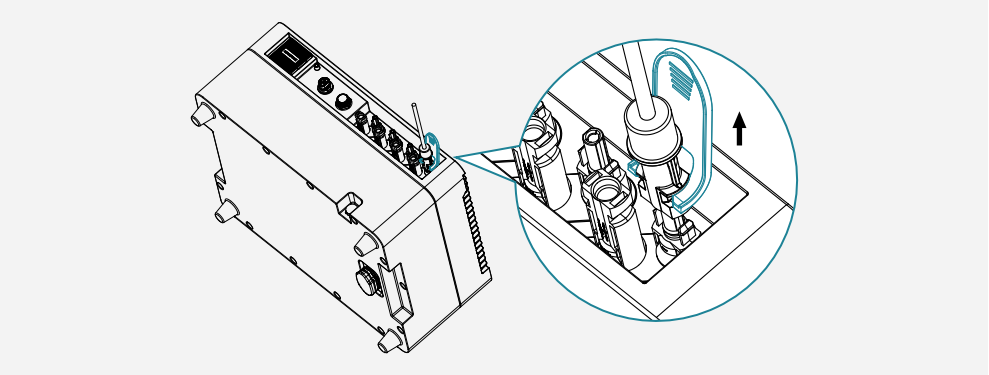
- Use a screwdriver with a 5~6.5 mm blade. Push the latch of the Grid terminal inward while pulling out the AC cable to disconnect it.



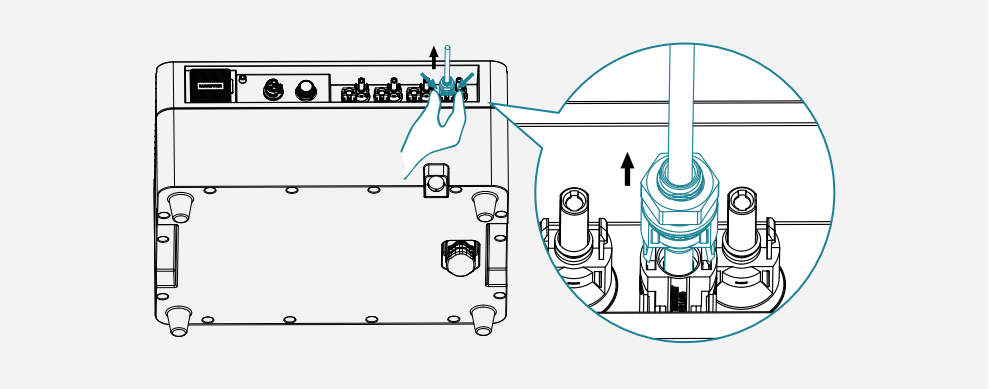
EN

Step 8 PV Modules Disconnection

- Male connector (panel side): Use the removal tool included in the package. Slide the tool onto the male connector until it reaches the latch, press inward, and pull upward to remove the PV cable.



- Female connector (panel side): Press the latch on the female connector and pull it out to disconnect.



3. MARSTEK APP for Smart Control

- Download URL:

  https://eu.hamedata.com/ems/apk/marstek/index.html

- QR code download:

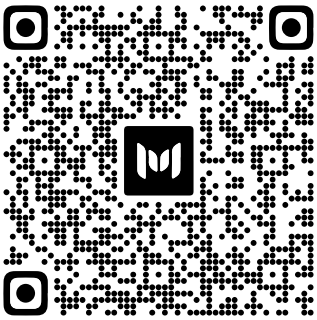




Google Play and the Google Play logo are trademarks of Google Inc.

Apple and the Apple logo are trademarks of Apple Inc.

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



4. Maintenance

4.1 Routine Maintenance

EN

- Maintenance work should only be performed by authorized personnel.
- When conducting maintenance, make sure to wear personal protective equipment.
- During normal operation of the MARSTEK VENUS-A, make sure the environmental conditions meet the requirements of the "Technical Specifications". Additionally, the equipment is not exposed to severe weather.
- If the device has problems, do not use it. When problems are solved, resume normal usage.
- Check the MARSTEK VENUS-A at least once a year to ensure that each component is in good condition.
- The heat dissipation components are not blocked in any way.

	Do Not Dismantle	The MARSTEK VENUS-A should only be serviced by authorized personnel. Users are strictly prohibited from repairing any internal parts to ensure safety and maintain insulation performance.
	AC Output Harness	The AC output harness (also known as the AC tapping cable) must not be replaced. If the wires become damaged, the entire device must be scrapped.
	Disconnection from Power Source	Unless specified conditions,otherwise, always disconnect the device from the grid by unplugging it from the socket before performing any maintenance or repairs.
	Cleaning Instructions	Do not use cleaning rags made from filamentous or corrosive materials, as these can generate static electricity or cause corrosion.
	Repairs	Do not attempt to repair the product yourself. Always use qualified parts when servicing the device.
	Circuit Breaker Requirements	Ensure that each branch line is equipped with a circuit breaker; however, a central protective device is not necessary.

4.2 Trouble Shooting

If the equipment does not work as expected, follow the steps below:

- Check all electrical connections and battery status.
- Restart the system in accordance with the correct power cycling procedure.
- Refer to the user manual or the Frequently Asked Questions (FAQ) section for known issues and their solutions.

If the problem persists, please provide the following information to our customer support department:

- Complete equipment specifications.
- A detailed description of the fault condition.
- Any observed error codes or indicator lights.

Issue		Possible causes	Solution
PV Section	No PV power input	Insufficient sunlight/ Unconnected modules/ Incorrect wiring	Check the lighting conditions, and ensure the PV panel wiring is correct and free from looseness.
	Excessively high PV voltage	Series connection of modules/Voltage exceeding the allowable range	Reduce the number of series-connected modules and ensure the input voltage is within the rated range.
	PV overcurrent	Excessive power of connected PV modules/ Abnormal controller	Ensure the PV capacity configuration is reasonable and check the operating status of the controller.
Energy Storage Section	Battery unable to charge/discharge	Low battery level/ Activation of the protection board/Communication interruption	Check the battery level, restart the equipment, and inspect the battery communication cable.
	Battery sampling failure	Loose battery sampling line/Abnormal module	Check the battery sampling interface and cables, and contact after-sales service if necessary.
	High battery temperature	Excessively high ambient temperature/Poor heat dissipation	Ensure good ventilation around the equipment and move it to a cool environment.
Grid-connection Section	Unable to connect to the grid/ Grid-connection failure	Grid voltage or frequency exceeding the limit	Confirm whether the connected grid parameters meet the equipment requirements.
	Frequent disconnection after grid-connection	Grid fluctuation/ Equipment protection activation	Check the grid stability, and contact technical support if the abnormality persists.

Backup Section Troubleshooting	Off-grid power supply startup failure	Function not enabled/ Insufficient battery level	Check if the function is enabled, confirm the battery level, and try again.
	Off-grid power overload	Load power exceeding the inverter capacity	Reduce the load and ensure the power is within the allowable range.
	High temperature of the power circuit	Long-term full-load operation/Poor heat dissipation environment	Reduce the load and improve the heat dissipation conditions.

EN

If needed, the support team will provide maintenance guidance and solutions within 7 working days. The warranty scope includes free repair or replacement; otherwise, a maintenance quotation will be provided.

5. Technical Specifications

Specification Type	MST-HIE2.0-0800
DC: Photovoltaic input	
Max. Input Power	2400W
MPPT voltage range	16~55V
MPPT starting voltage	22V
Operating voltage range	16~60V
Max. input voltage	60V
Rated input current (single channel)	16A
Max. input short-circuit current(Single channel)	20A
Number of PV input channels	4
MPPT tracking quantity	4
AC: Grid-connected input	
Rated input power	1200VA
Operating phase	L/N/PE
Rated grid voltage	230V
Rated grid frequency	50Hz
Rated grid Input current	5.22A
Power factor	>0.99 default(-0.8~0.8 adjustable)
AC: Grid-connected output	
Rated output power	800VA(Default)/1200VA(*Premium)
Operating phase	L/N/PE
Rated grid voltage	230V
Rated grid frequency	50Hz
Rated grid output current	3.48A(Default)/5.22A(*Premium)
Power factor	>0.99 default(-0.8~0.8 adjustable)
AC: Off-grid output	
Rated output power	1200VA
Peak output power	1440VA, 60s
Rated output current	5.22A
Rated output voltage	230V
Rated output voltage frequency	50Hz

Battery parameters	
Rated voltage	41.6V(13S)
Capacity	2.12kWh
Life cycle	>6000(25°C)
Battery type	LiFePO4
Depth of discharge	90%

EN

Protect	
Protection level	I
Overvoltage withstand voltage rating	DC II/AC III

Basic parameters	
Size	450×340×220mm
Weight	26±1kg
Ambient temperature range	-20~+60℃ (Storage -30~+85℃)
Relative humidity	0-95%
Protection level	IP65
Cooling method	Natural cooling
Maximum altitude	2000m
Grid connection AC connect	PECO-S-BM Small connectors
Photovoltaic connection	MC4
Off-grid port	European standard socket
Show	Led Light strip display
Communication methods	Bluetooth,WIFI, Ethernet port

Specification Type	MST-E2.0ST
Battery parameter	
Rated voltage	41.6V(13S)
Capacity	2.12kWh
Life cycle	>6000(25°C)
Battery type	LiFePO4
Depth of discharge	90%
Number of energy storage units	0~5PCS
Total energy storage capacity of the system	2.12~12.72kWh
Basic parameters	
Size	450×340×168mm
Weight	19±1Kg
Ambient temperature range	-20~+60℃ (Storage -30~+85℃)
Relative humidity	0-95%
Protection level	IP65
Cooling method	Natural cooling
Maximum altitude	2000m

Note 1: Rated voltage/frequency range can be changed according to the requirements of the local power department.

Note 2: Please refer to local electrical regulations to determine the number of the MARSTEK VENUS-A units that can be connected to each branch circuit.

*Enabling this function must comply with local regulations and should only be performed by authorized personnel!

6. Safety Information

Safety Precaution

EN

- The MARSTEK VENUS-A series has been designed and tested in accordance with international safety standards. However, safety regulations must still be followed during the installation and operation of the MARSTEK VENUS-A series. Installers must carefully read, fully understand, and strictly comply with all instructions, precautions, and warnings in this installation manual.
- It is strictly prohibited to reverse engineer, decompile, disassemble, adapt, implant, or perform any other derivative operations with the device software. Studying the internal implementation logic, obtaining the source code, infringing intellectual property rights in any way, or disclosing the results of software performance tests is also forbidden.
- All operations including transportation, storage, installation, usage and maintenance must comply with applicable laws, regulations, standards and specifications.
- This equipment must be used in an environment that meets the specified design conditions. Any equipment failure, malfunction, or component damage caused by an improper environment is not covered under the product's quality assurance. The company will not be liable for any compensation related to personal injury, property loss, etc.

The Company shall not be liable for any of the following circumstances or their consequences:

- Equipment damage caused by natural disasters (e.g., earthquakes, floods, volcanic eruptions, mudslides, lightning strikes, fires, wars, armed conflicts, typhoons, hurricanes, tornadoes, extreme weather) or force majeure events.
- Failure to operate the equipment within the conditions specified in this manual.
- Installation and usage in environments that do not comply with relevant international, national, or regional standards. Installation or operation conducted by authorized personnel.
- Failure to follow the operating instructions and safety warnings provided in the product documentation.
- Unauthorized disassembly, modification of the product including alternations to the software code.
- Damage incurred during transportation by the user or by a third party acting on behalf of the user.
- Damage resulting from storage conditions that do not meet the product documentation requirements.
- Use of materials and tools that violate local laws, regulations, or applicable standards.
- Damage resulting from negligence, gross negligence, intentional misconduct, improper operation, or any other causes not attributable to the Company.

Personal Safety

- Ensure that power is turned off before installation. Do not install or remove cables while the power is on.
- Non-standard or improper operation on energized equipment may result in fire, electric shock, or explosion, causing property damage, personal injury, or even death.
- Before beginning any operation, remove conductive objects such as watches, bracelets, rings, and necklaces to avoid electric shock.
- Use dedicated insulated tools during operation to prevent electric shock or short circuits.

- Do not directely or indirectly contact with other conductors or indirectly contact power supply equipment through damp or wet objects.
- Do not power on the equipment until it has been correctly installed or confirmed by a professional.
- Only qualified professionals or properly trained personnel are allowed to install, operate, or maintain this equipment.
- If there is any risk of personal injury or equipment damage during operation, cease work immediately and report the incident.
- Do not touch the equipment when energized, as its surface may be hot.

Electricity Safety

- Before installation, ensure that the equipment is intact. Otherwise, electric shocks or fires may occur.
- Non-standard and improper operations may result in fire or electric shocks.
- Prevent foreign matter from entering the equipment during operations.
- For the equipment that needs to be grounded, install the ground cables first when installing the equipment and remove the ground cables last when removing the equipment.
- Disconnect the equipment and its switches before installing or removing any power cables.
- Do not damage the grounding conductors.
- Equipment terminals should only be used for electrical connections.
- Ensure all electrical connections comply with local electrical codes and standards.
- Approval from the local utility company must be obtained before operating in grid-tied mode.
- Use dedicated insulated tools for all high-voltage operations.
- Repairs must be performed with qualified and compliant parts, installed by an authorized contractor or service representative of Marstek Energy Co., Limited. Such components must only be used for their intended and certified purposes.
- Do not expose the equipment to flammable or explosive gas or smoke. Do not perform any operation on the equipment in such environments.
- Do not store any flammable or explosive materials near the equipment.
- Install the equipment in a dry, well-ventilated area, away from any liquids.
- Ensure ventilation openings or heat dissipation systems are not blocked to prevent overheating or fire.

Mechanical Safety

- Do not drill holes into the equipment.
- Be cautious to avoid injury when moving heavy objects.

Scan the QR code to access the digital user manual.

MARSTEK

Power Anywhere & Anytime