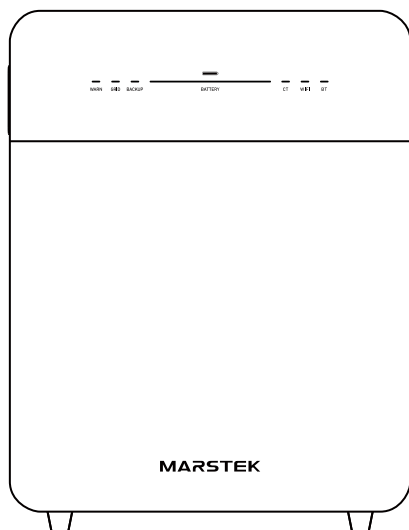


MARSTEK VENUS-E

MST-BIE5-2500



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1.

Product Overview

1.1 Introduction

MARSTEK VENUS-E is an AC-coupled energy storage system, offering three working modes: AI Optimization, Self-Consumption, and Manual. It can be charged by the grid and supply reliable power to both the grid and household loads.

1.2 Model

MARSTEK VENUS-E (5 kWh). The table below lists the models covered by this document.

Product Name	Product Model
MARSTEK VENUS-E	MST-BIE5-2500

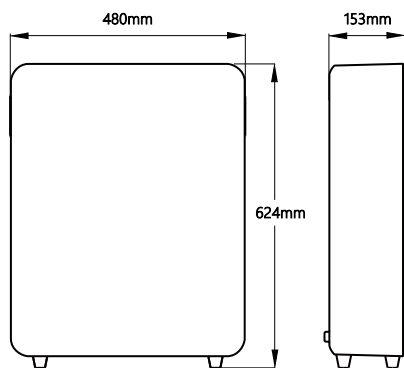
MST-BIEXX-XX

1 2 3 4

1	Company name	MST: Marstek Energy Co., Limited.
2	Series name	BIE: MARSTEK VENUS
3	Battery capacity	XX: 5 means 5kWh
4	Power rating	XX: 2500 means 2500W (Maximum output power)

1.3 Product Dimensions

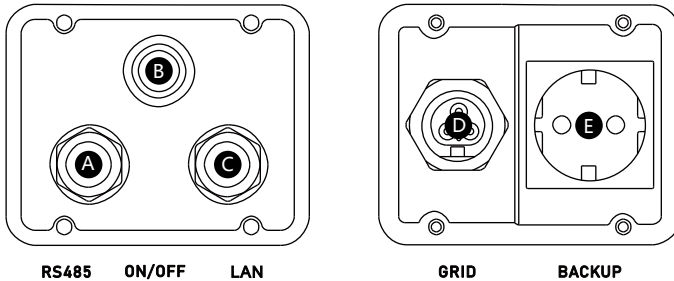
Product Name	Dimensions (mm)
MARSTEK VENUS-E	480*153*624



MARSTEK VENUS-E

1.4 Interface Introduction

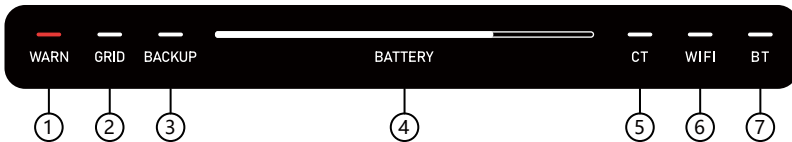
The Product interface layout and definitions are shown below.



- A** RS485: 485 protocol communication socket.
- B** On/Off Button: Press to turn on/ turn off.
- C** LAN: Wired network connection port.
- D** Grid: Connecting the system to the household grid.
- E** BACKUP: AC socket (EU standard) for powering loads during electricity outages.

1.5 LED Indicators

The indicator is located on the front of the product and are used to display the operating status of MARSTEK VENUS-E.



- ① Error.
- ② Grid socket on.
- ③ BACKUP socket on.
- ④ Capacity Indicator: Flashing from left to right in charging, right to left in discharging.
- ⑤ CT (Current Transformer) connected.
- ⑥ WiFi connected.
- ⑦ BT (Bluetooth) connected.

Indicator	Status	Description
Battery	Off	Power off
	Steady on	Power on
	Light bar goes from left to right	Charging in progress
	Light bar goes from right to left	Discharging in progress

Warn	Off	The device is operating normally
	Red light on	Device fault
Others	Off	Function: Off
	Steady on	Function: On

1.6 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 feeding electricity back 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 3.4 for detailed operation steps.

1.7 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-E supplies power only to the single-phase load connected to the live wire.
- Three-Phase Total Compensation:
 - VENUS 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-E 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, Venus-E is also compatible with the following mainstream brands of meter products, supporting the access and use of corresponding functions:

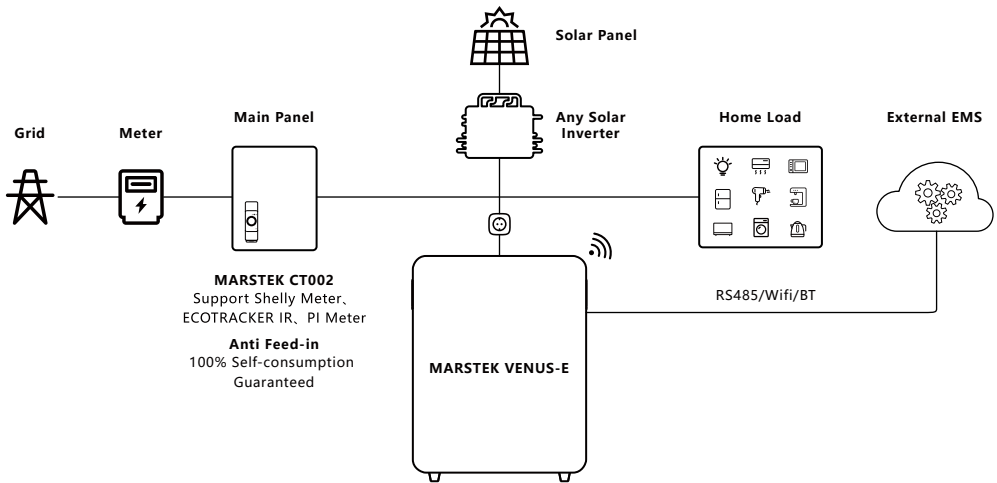
(Note: Each of the following meter models supports connecting only one device per phase.)

- 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.

1.8 System Layout

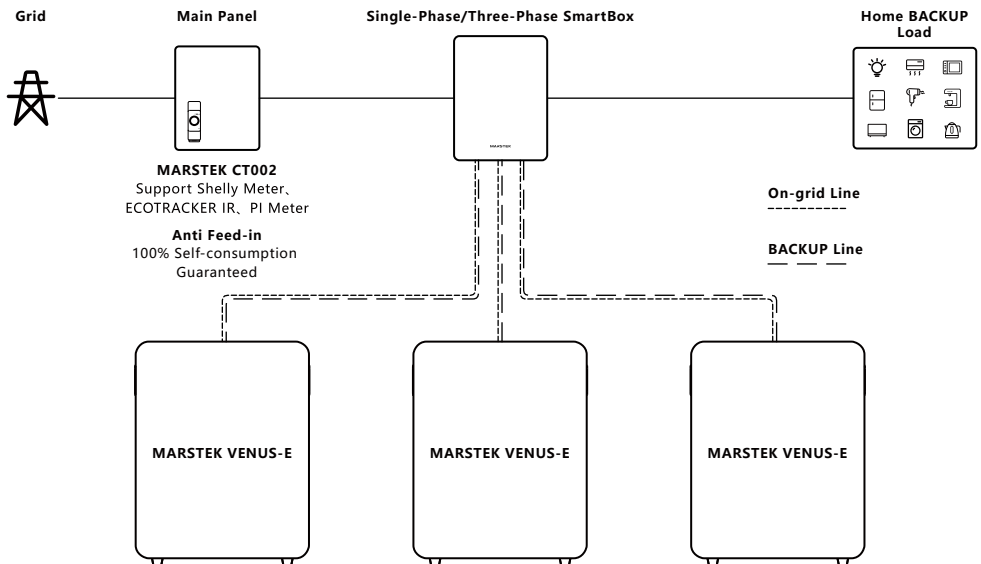
Plug-in Solution

The MARSTEK VENUS-E is compatible with all photovoltaic systems, enabling functions such as self-consumption and AI-based optimization. Below are household application scenarios integrated with solar systems.



Whole-house BACKUP Solution

The MARSTEK VENUS-E can also work in coordination with the MARSTEK SmartBox to provide whole-home BACKUP power.



2.

Installation Instructions

2.1 Pre-installation Checklist

- 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 info@MARSTEKenergy.com for assistance.

2.2 Selecting the Installation Site

Floor Installation & Angle Requirements

- The energy storage device must be installed in an upright position and must not be tilted forward, backward, sideways, or placed horizontally or upside down.

Site Notes

- Preferred installation surfaces include solid brick-concrete structures, concrete walls, or floors.
- Alternative surfaces: If other materials (e.g., drywall, wood) are used, they must meet the following conditions:



— the surface should be as flame-retardant as possible.

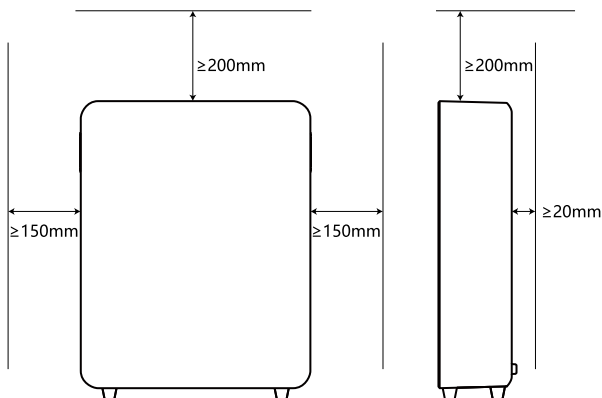


— Meet the load-bearing requirements of the equipment.

if not, it must be ensured that there are no flammable or explosive items in the installation environment.

Clearance & Safety Requirements

- A corresponding clearance must be maintained around the MARSTEK VENUS-E device to avoid obstruction and ensure no other equipment is placed nearby. This is essential to meet the requirements of heat dissipation and safety isolation.

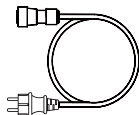


- Prohibited nearby items:
 - Other equipment (except VENUS-compatible devices and approved awnings).
 - Flammable or explosive materials.

2.3 Installing Accessories and Required Tools

Required Accessories

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



AC Cable×1



Unit-side mounting bracket×1

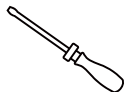


Wall-side mounting bracket×1

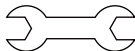
Note: Verify all items with the packing list. If any accessory is missing or damaged, contact your supplier immediately.

Installing Tools

- Tools below are highly recommended:



Screwdrivers



Wrench



Diagonal pliers



Insulating gloves

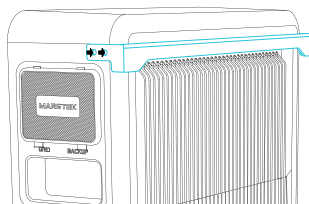
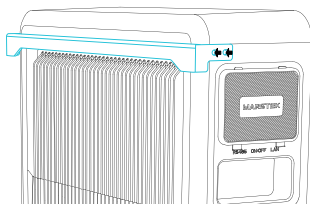


Measuring tape

2.4 Installation Steps

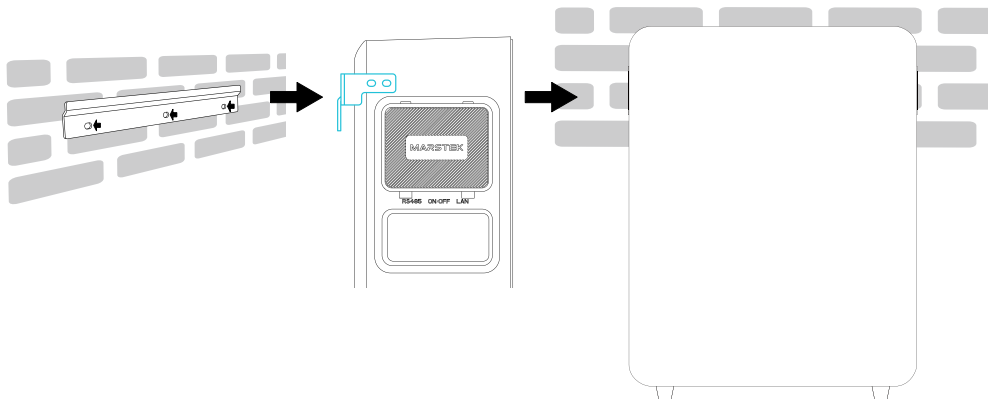
Step 1 (Optional step)

- Needed: the MARSTEK VENUS-E device, the unit-side mounting bracket, screws, a screwdriver.
- Actions: Align the screw holes on the unit-side mounting bracket with the corresponding mounting points on both sides of the device. Secure the bracket using the provided screws and a screwdriver.



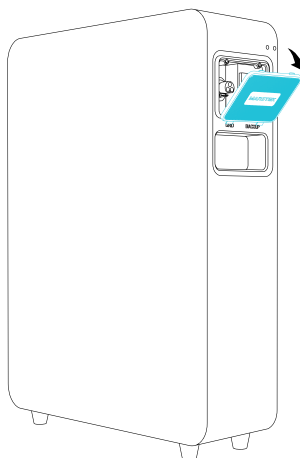
Step 2 (Optional step)

- Needed: the MARSTEK VENUS-E device, Wall-side mounting bracket, screws, a screwdriver.
- Actions: Secure the wall-side mounting bracket to the wall using screws, then engage the two mounting brackets by interlocking them. The unit will now be firmly wall-mounted.



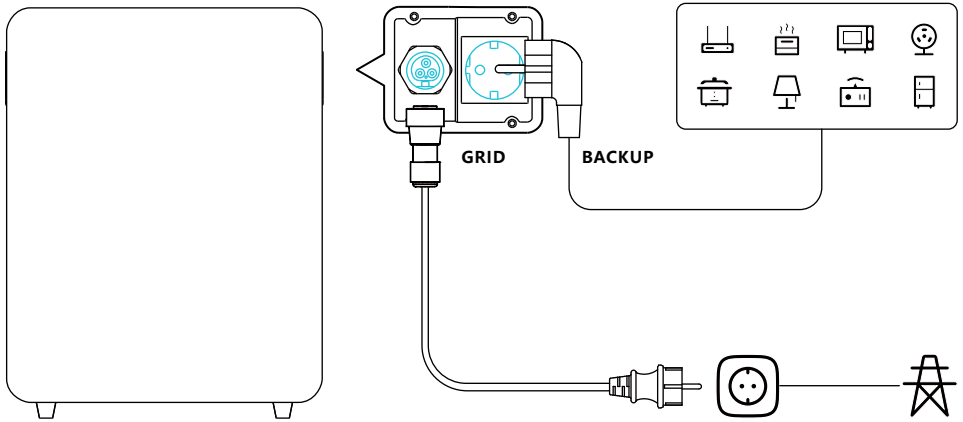
Step 3

- Needed: the MARSTEK VENUS-E device.
- Actions: Open the cover before wiring.



Step 4

- Needed: the MARSTEK VENUS-E device, AC cable, home-load.
- Actions: For the Grid socket, connect the cylinder-shaped end of the provided AC cable to the VENUS device, and the plug end to the household power socket (city grid). For the BACKUP socket, plug the home load wiring into the BACKUP socket.



Warning: DO NOT connect both the Grid and BACKUP sockets of the MARSTEK VENUS-E device to the city power network. Doing so will cause a circuit break or possible device damage.

WARNING!

Compliance Requirements

To ensure operational safety and optimize device longevity, strict adherence to the following PV charging interface and BACKUP socket connection guidelines is mandatory.

Improper wiring may result in:

- Short-circuit incidents due to voltage/current anomalies.
- System failures from current backflow or configuration incompatibility.
- Critical safety hazards including fire risks.

3.

MARSTEK APP for Smart Control

3.1 QR Code Installation

Scan the QR code to download the APP.



APP Download

3.2 APP Operation Guide

Scan the QR code to access the APP Operation Guide.



APP Operation Guide

4.1 Routine Maintenance

- 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-E, 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-E at least once a year to ensure that each component is in good condition. The heat dissipation components are not blocked in any way.
- To clean the device, use a vacuum cleaner or a special brush.

	Do Not Dismantle	The MARSTEK VENUS-E 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

In the event of device malfunction, please follow these steps:

- Verify all electrical connections and battery status.
- Restart the system following the proper power cycling procedure.
- Consult the User Manual or FAQ section for known issues and resolutions.

Should the issue persist, please contact our Customer Support Department with the following information:

- Complete device specifications.
- Detailed description of the fault condition.
- Any observed error codes or indicators.

If needed, the support team will provide a guidance on sending the device for repair and a solution within 7 business days. Warranty coverage includes free repair or replacement; otherwise, a repair quote will be provided.

Codes	Alarm range	Alarm status	Suggested treatments
400	Inverter Side	Overheat Protection	1. Check the ventilation in the inverter installation area and whether the ambient temperature exceeds the maximum allowable range. 2. If ventilation is insufficient or the temperature exceeds the range, please improve its ventilation and heat dissipation conditions. 3. If the issue remains unsolved, please contact the technical team.
401	Inverter Side	Self-test failed	1. Please try to restart. 2. If the issue remains unsolved, please contact the technical team.
402	Inverter Side	Eeprom read and write exception	1. Please try to restart. 2. If the issue remains unsolved, please contact the technical team.
405	Inverter Side	Off-grid output over-power protection	1. The instantaneous power on the off-grid side is too high, please reduce the off-grid power consumption. 2. If the issue persists at low power loads, please contact the technical team.
410-430	Inverter Side	Abnormality within the device	1. Wait half a minute for the inverter to return to normal. 2. If the issue remains unsolved, please try to restart or contact the technical team.

431	BAT Side	Unable to communicate with BMS	1. It may be caused by low battery voltage. Connect the battery to reactivate within 5 minutes. The issue disappears after the activation. 2. If the issue remains unsolved, please try to contact the technical team.
432	BAT Side	Battery overvoltage	If the issue remains unsolved, please try to contact the technical team.
433	BAT Side	Battery overcurrent	If the issue remains unsolved, please try to contact the technical team.
434	BAT Side	Battery undervoltage	1. Please ensure the grid-connected socket is properly connected. 2. If the issue remains unsolved, please try to contact the technical team.
440/441	Grid Side	Grid overvoltage	1. Grid fluctuations and loose connections may trigger this fault. 2. Check whether the grid is properly connected and wait for the grid to return to normal.
442	Grid Side	Grid undervoltage	1. Grid fluctuations and loose lines may trigger this fault. 2. Check whether the grid is connected correctly and wait for the grid to return to normal.
443	Grid Side	Grid overfrequency	1. Grid fluctuations and loose lines may trigger this fault. 2. Check whether the grid is connected correctly and wait for the grid to return to normal.
444	Grid Side	Grid underfrequency	1. Grid fluctuations and loose lines may trigger this fault. 2. Check whether the grid is connected correctly and wait for the grid to return to normal.
445	Grid Side	Grid-connected overcurrent	1. Check if the grid is properly connected. If so, it will return to normal within one minute. 2. Restart the inverter. 3. If the issue remains unsolved, please try to contact the technical team.

446	Grid Side	Grid fluctuations	1. Grid fluctuations and loose lines may trigger this fault. 2. Check whether the grid is connected correctly and wait for the grid to return to normal.
447	Inverter Side	DCI protection/ output DC component protection	1. Grid fluctuations and loose lines may trigger this fault. 2. Check whether the grid is connected correctly and wait for the grid to return to normal.
448	Inverter Side	DCV protection/grid voltage direct component protection	1. Grid fluctuations and loose lines may trigger this fault. 2. Check whether the grid is connected correctly and wait for the grid to return to normal.
530/558		Over temperature limit	1. Check the ventilation in the inverter installation area and whether the ambient temperature exceeds the maximum allowable range. 2. If ventilation is insufficient or the temperature exceeds the range, please improve its ventilation and heat dissipation conditions. 3. If the issue remains unsolved, please contact the technical team.
559		Low temperature limit	1. Check whether the ambient temperature meets the requirements. 2. If the ambient temperature is normal but the issue remains unsolved, please try to contact the technical team.
560		Low battery	1. The issue may be caused by the battery low power, please connect the grid. 2. If the issue remains unsolved, please try to contact the technical team.
5C0		Bluetooth status is abnormal	1. Check if the correct device and APP are being connected. The issue will be solved after a period of time. 2. If the issue remains unsolved, please try to contact the technical team.
5C1		OTA update failed	1. The issue will be solved after re-upgrading. 2. If the issue remains unsolved, please try to contact the technical team.
5C2/5C3 /5C4		Abnormal WiFi signal	1. Check if the Wi-Fi connection between the device and home network is stable. 2. If the issue remains unsolved, please try to contact the technical team.

5C8-5CB		Network abnormal	1. Check if the home network is normal, the issue may occur occasionally due to network fluctuations and will automatically resolve after a while. 2. If the issue remains unsolved, please try to contact the technical team.
5D2		CT connection abnormality	1. Check if the the CT is properly connected to the home network and ensure the home network is stable. 2. If the issue remains unsolved, please try to contact the technical team.

5.

Technical Specifications

Specification Type	MARSTEK VENUS-E
Battery Info	
Rated Voltage	51.2V
Battery Energy	5120Wh
Life Cycle (Times)	>6000(25°C)
Battery Type	LiFePO4
Depth of Discharge	90%
Capacity	100Ah
AC Input (On Grid)	
Rated Power	2.5kW
Grid Connection Type	L/N/PE
Rated Grid Voltage	230V
Grid Voltage Range	187V-253V
Rated Grid Frequency	50Hz
Rated Grid Current	10.9A
Power Factor	> 0.99(Default)/0.8 Leading~0.8 Lagging(Adjustable)
THDi	<3%
AC Output (On Grid)	
Rated Power	0.8kW(Default)/2.5kW(*Premium)
Grid Connection Type	L/N/PE
Rated Grid Voltage	230V
Grid Voltage Range	187V-253V
Rated Grid Frequency	50Hz
Rated Grid Current	3.48A(Default)/10.9A(*Premium)
Power Factor	> 0.99(Default)/0.8 Leading~0.8 Lagging(Adjustable)
THDi	<3%
AC Output (Off Grid)	
Rated Off-grid Output Power	2.5kVA
Max.Output Power	3.5kVA,10s
Rated Output Current	10.9A
Rated Output Voltage	230V
Rated Output Voltage Freq.	50Hz
THDu(Linear Load)	<3%

Efficiency	
Battery-AC Side Max.Efficiency	>93.5%
Protection	
Protection level	I
Overvoltage/Voltage Withstand Level	DC II/AC III
General Parameter	
Isolation Type	Isolated
Operating Temperature Range	-20 ~+ 55°C(Store-30 ~+ 85°C)
Relative humidity	0-95%
Ingress Protection	IP65
Cooling Strategy	Natural Convection
Max.Operating Altitude	2000m
On-grid Connection Standard	EN50549-1
Regulatory	IEC62040、IEC62477
EMC	IEC/EN 61000-6-1/-2/-3/-4
Dimension(L*W*H)	480*153*624mm
Weight	60kg
Addition Date	
On-grid AC Connection	Three-wire Household Plug(Euro16A)
Display	LED
Supported Communication Interface	WIFI&RS-485(Waterproof Aviation Plug)

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 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!

Safety Precaution

- The MARSTEK VENUS-E 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-E 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 eg. earthquakes, floods, volcanic eruption, 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 directly 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.
- Wear goggles and protective gloves when drilling holes.
- Be cautious to avoid injury when moving heavy objects.



Scan the QR code to access the digital user manual.