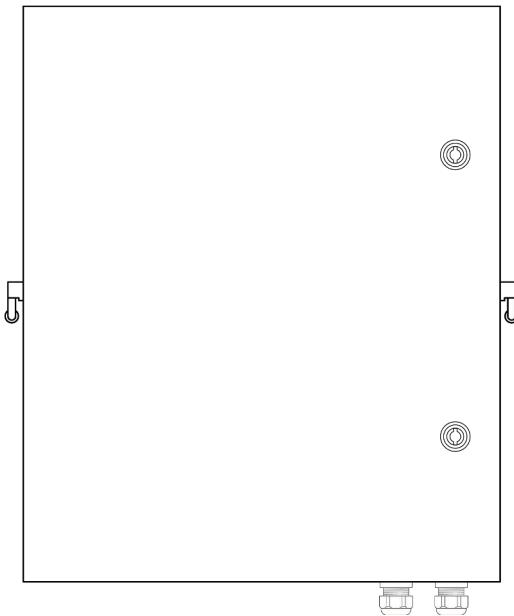


# Deye

## User Manual

Model: MS-EMS



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# 1 General information

## Warning!

**Read and follow carefully all safety warnings, instructions, illustrations and specifications provided with this product.** Failure to follow instructions mentioned may result in electric shock, fire or serious injury.

**Save all warnings and instructions for future reference.**

## 1.1 All Rights Reserved

No part of this document can be reproduced in any form or by any means without the formal permission of the manufacturer .

### Trademarks and Permissions

The trademarks used in this manual are owned by the manufacturer. All other trademarks or registered trademarks mentioned in this manual are owned by their respective owners.

### Software Licenses

- \* It is prohibited to use data contained in firmware or software developed by the manufacturer, in part or in full, for commercial purposes by any means.
- \* It is prohibited to perform reverse engineering, cracking, or any other operations that compromise the original program design of the software developed by the manufacturer.

### Disclaimer

“DANGER”, “WARNING”, “CAUTION”, “NOTICE” and “NOTE” in this manual do not represent all safety matters that should be followed, and you must also comply with relevant international, national or regional standards and industry practices. The manufacturer shall not be liable for personal injury,

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property loss, product damage and subsequent losses under the following circumstances:

- \* Damages caused by force majeure, including earthquake, flood, volcanic eruption, mudslide, lightning, fire, war, military conflict, typhoon, hurricane, and so on.
- \* Failure to comply with the provisions of this manual.
- \* The installation, operation and storage environment does not meet the relevant international, national or regional standards;
- \* Incorrect use of this product.
- \* Unauthorized or unqualified personnel repair the product, disassembly the rack and perform other operations.
- \* Use of unapproved spare parts.
- \* Unauthorized modifications or technical changes to the product or software.
- \* Incorrect shipment by yourself or the third party commissioned by you.
- \* Unsatisfactory materials and tools from your own that do not meet the relevant international, national or regional standards.
- \* Damage caused by yourself or the third party's negligence, intent, gross negligence, improper operation, or other accidents not caused by Deye.

## 1.2 About This Manual

This manual mainly describes the product information, guidelines for installation, operation and so on. In this manual, "equipment" or "device" refers to relevant product, software, part, spare part or service, etc; "The manufacturer" refers to the producer, seller or service provider of the equipment.

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# Product Description

## 2.1 Product Introduction

This product is an Energy Management System (EMS) specifically configured for Energy Storage Systems (ESS). It serves as the core control unit for energy storage power plants or commercial and industrial energy storage projects, responsible for the overall operation monitoring, energy dispatch, safety protection, and data analysis of the energy storage system.

It is highly noted that the complete user manual consists of two files, one document introducing hardware and the another software including user interface. Please follow the steps below to obtain the relevant documents.

1. Scan the following QR code.
2. Click the “**Software**” to access to **software version**.
3. Click the “**Download**” to access to **hardware version**.



## 2.2 Product Features

Your product features the following characteristics:

1. AI Intelligence:

- Large capacity energy aggregation
- Real-time electricity price revenue calculation
- One click generation of statistical charts
- Maximum profit charging and discharging strategy

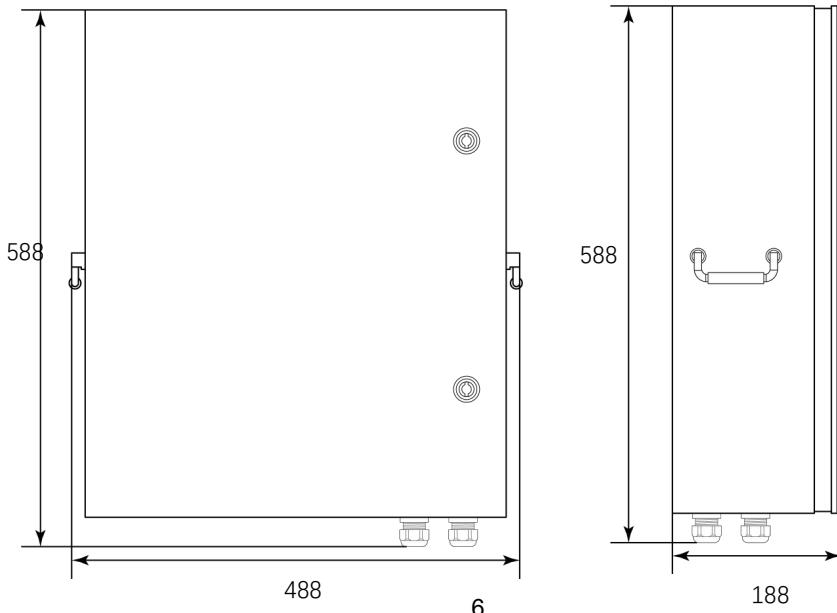
2. Efficient Operation and Maintenance:

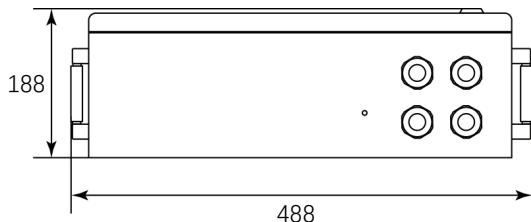
- Provide local / cloud operation and maintenance to ensure stable device operation
- Combination of multiple operation and maintenance methods for WEB / APP

3. Safety and Reliability:

- Real-time alarm for equipment malfunction
- Support SOC balance management.

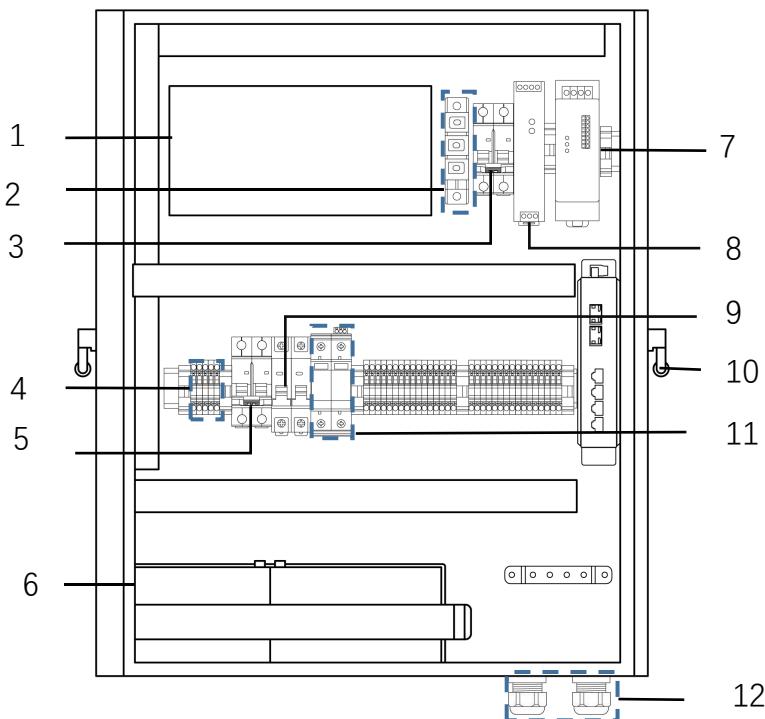
## 2.3 Product Size





Unit:mm

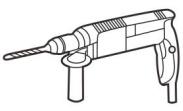
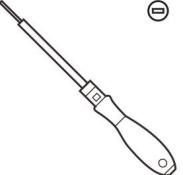
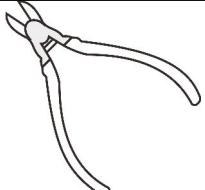
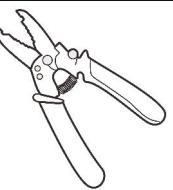
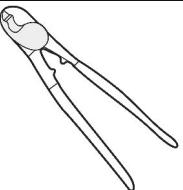
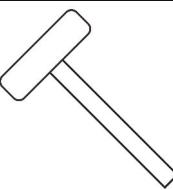
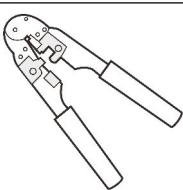
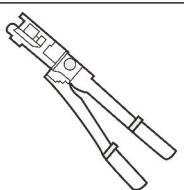
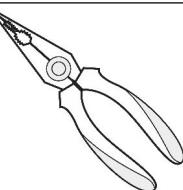
## 2.4 Product Overview

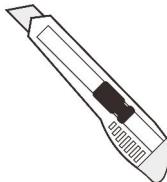
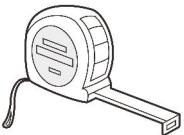
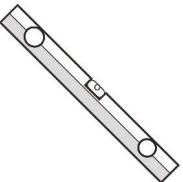
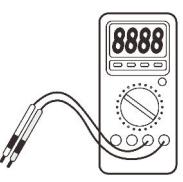
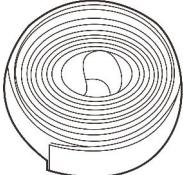
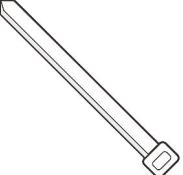
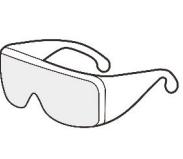
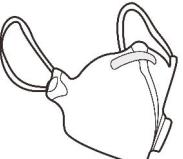


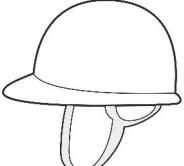
1. System energy management module	7. DC24V backup power module (UPS)
2. Diode	8. AC/DC power module (PS1)
3. Lead-acid battery circuit breaker QF2	9. Surge protector device circuit breaker (SCB1)
4. Power supply interface	10. Handle
5. AC auxiliary power supply circuit breaker QF1	11. Surge protection device (SPD1)
6. UPS module backup lead-acid battery	12. Cable outlet

# 3 Installation

## 3.1 Materials Required

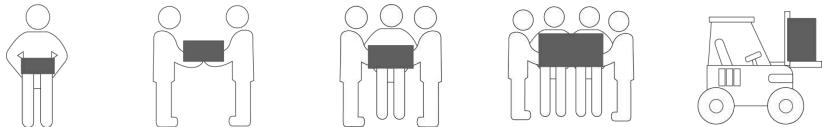
Tools			
			
Hammer drill	Phillips insulated torque screwdriver	Flat-head insulated torque screwdriver	Insulated torque socket wrench
			
Diagonal pliers	Wire stripper	Cable cutter	Rubber mallet
			
RJ45 crimping tool	Hydraulic pliers	Needle-nose pliers	Marker

			
Utility knife	Steel measuring tape	Level	Multimeter DC voltage measurement
			
Heat shrink tubing	Heat gun	Cable tie	Insulated ladder
			
Powered industrial forklift	Crane		
<b>Personal Protective Equipment</b>			
			
Insulated gloves	Protective gloves	Goggles	Dust mask

			
Insulated shoes	Safety helmet	Protective suit	

## 3.2 Moving Heavy Objects

After arrival of your goods, perhaps you need move it to designated working area. Refer to the following table for movement of heavy objects.



Weight	Method	Recommendation
<18 kg (40lbs)	Manual handling	1 person
18~32 kg (40~70lbs)	Manual handling	2 persons
32~55 kg (40~70lbs)	Manual handling	3 persons
55~68 kg (121~150lbs)	Manual handling	4 persons
> 68 kg (150lbs)	Moving device	Forklift

### When moving heavy objects manually:

- If multiple persons need to move a heavy object together, determine the manpower and work division with consideration of height and other condition to ensure that the weight is equally distributed.
- If two persons or more move a heavy object together, ensure that the object is lifted and landed simultaneously and moved at a uniform pace under the supervision of one person.
- Wear personal protective gears such as protective gloves and shoes when manually moving the equipment.
- To move an object by hand, approach to the object, squat down, and then lift the object gently and stably by the force of the legs instead of your back. Do not lift it suddenly or turn your body around.
- Move a heavy object stably with balanced force at an even and low speed. Put down the object stably and slowly to prevent any collision or drop from scratching the surface of the equipment or damaging the components and cables.

- When moving a heavy object, be aware of the workbench, slope, staircase, and slippery places. When moving a heavy object through a door, ensure that the door is wide enough to avoid bumping or injury.

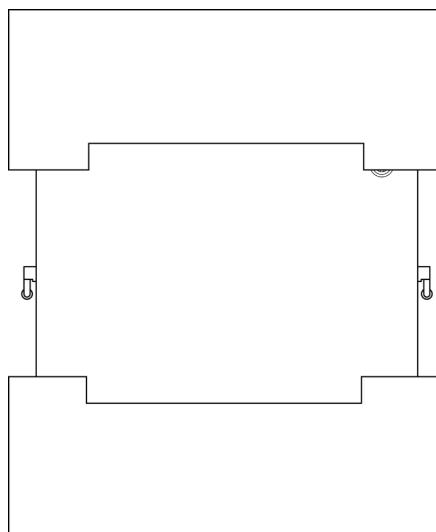
### **When moving with forklift:**

- Keep at least 2m away from the forklift during operation.
- No passengers are permitted to stand on or be lifted by forklifts.
- Do not overload forklifts or raise loads too high, as this can affect overall stability.
- Maintain speeds below 3mph and avoid sharp turns.
- Before reversing, the forklift operator must check behind them and ensure it is safe to proceed.
- When reversing in confined spaces, a spotter is needed, who directs the forklift operator.
- Use caution when lifting this load on uneven surfaces.
- Never operate the forklift on slopes  $\geq 5$  degrees.
- During movement, avoid tilting the machine or placing it upside down. If the device must be tilted or inverted, please straighten it as soon as possible, and the system needs to be left standing for 2 hours before it can be powered on.

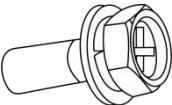
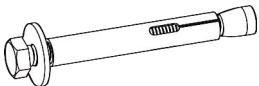
## 3.3 Unpacking

### Warning !

- After setting up the equipment well, carefully unpack the package so as to avoid scratching equipment.
- If possible, do not remove the transport packaging before arrival at the installation site.
- After unpacking, check whether the fasteners and removable parts are missing. If they are missing, please contact you vendor at once.
- Keep the equipment stable during unpacking.
- If the installation environment is not friendly to the equipment, take measures to prevent failure caused by condensation or dust corrosion (for example, cover with woven cloth or dust cover).
- When it comes to package, EPE foam is broadly used for most of products, which characterizes with anti-shock and easy-disassemble. It is possible to unpack the equipment with a tool like a cutter or knife.



After unpacking the equipment, check that the deliverable contents are intact and complete, and free from any damage. If any items listed in the Packing List is missing or damaged, contact your dealer or call service hotline: **+86-0574-86320560**.

<b>Packing List 1</b>		
		
M6 *10 Cross recessed hexagon bolt with indentation ×8 pcs	M6*100 Expansion bolt ×4 pcs	Key ×2 pcs

## 3.4 Installation



### Warning !

- Assembly must be carried out in accordance with the design, technological requirements, regulations and relevant standards.
- The parts must be cleaned before assembly, free of burrs, flash edges, oxide, rust, sand, dust and stains.
- The parts shall not be bumped, scratched or rusted during assembly.
- Wear appropriate personal protective equipment at all times during any assembly operation on site. The following personal protective equipment is considered a minimum requirement:
  - In a dry environment, wear S3 safety shoes .
  - On rainy or wet ground, wear S5 safety boots .
  - Wear flame-retardant work clothes.
  - Wear flame-retardant work pants.
  - Safety gloves.

### 3.4.1 Installation Requirements

#### 3.4.1.1 Installation Personnel

- Only qualified professionals or trained personnel are allowed to install, the equipment.
  - Professionals:personnel who are familiar with the working principles and structure of the equipment, trained or experienced in equipment operations and are clear of the sources and degree of various potential hazards in equipment installation.
  - Trained personnel:personnel who are trained in technology and safety have required experience,are aware of possible hazards on themselves in

certain operations and are able to take protective measures to minimize the hazards on themselves and other people.

- Personnel who plan to install the equipment must receive all necessary safety precautions and local relevant standards.
- Only qualified professionals are allowed to remove safety facilities and inspect the equipment.
- Knowledge of electronic, electrical wiring and mechanical expertise, and be familiar with electrical and mechanical schematics.
- Understanding and complying with this document and other applicable documents.

### 3.4.1.2 Installation site requirements

#### Danger!

Do not expose the equipment to flammable or explosive gas or smoke.  
Do not perform any operation on the equipment in such environments.

#### Danger!

Do not store any flammable or explosive materials in equipment area.

#### Danger!

Do not place the equipment near heat sources or fire sources, such as smoke, candies, heaters, or other heating devices. Overheat may damage the equipment or cause a fire.

#### Warning!

Install the equipment in an area far away liquids. Do not install it under areas prone to condensation, such as under water pipe and air exhaust vent, or area prone to water leakage, such as air conditioner vents, or ventilation vents.  
Ensure that no liquid enters the equipment to prevent faults or short circuits.

#### Warning!

To prevent damage or fire due to high temperature, ensure that the ventilation vents or heat dissipation systems are not obstructed or covered by other objects while the equipment is running.

- The installation and usage environment must meet relevant international, the local laws and regulations. The user is obliged to protect the equipment against fire or other hazards.
- Do not install in low-lying areas. The installation level must be at least 300mm higher than the highest water level in the area.
- To protect the equipment from wildfires caused by high temperatures in summer, it should be free of vegetation and flammable plants within 3 meters of the surrounding area.
- Considering safety, the distance between the equipment and residential buildings should be more than 12m, and the distance between the equipment and schools, hospitals and other densely populated buildings should be more than 30.5m. If this safety distance cannot be met, a

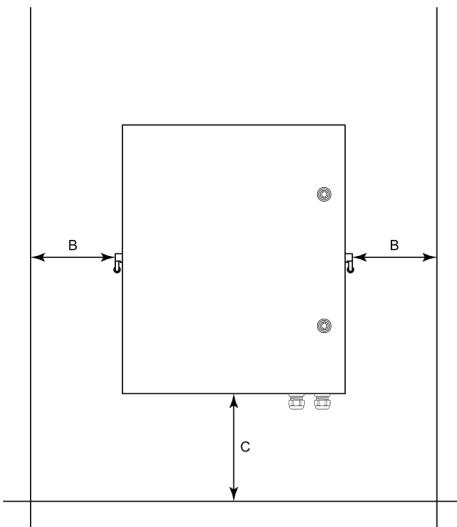
firewall should be built between the equipment and the building.

- The safe distance between the equipment and the production building shall comply with local fire codes or standards.
- Outdoor storage systems should be at least 10 feet away from boundaries, public roads, buildings, flammable materials, hazardous materials, high piles, and other hazards not associated with the grid infrastructure.
- The equipment should be installed in an environment free from the risk of explosion.
- Reserve enough space for expansion according to the needs of the whole life cycle.
- Ensure that the equipment is installed in a clean, dry and well ventilated area with proper temperature, humidity ,altitude range and so on. Check for more data in the "**Technical Specifications**" section.
- Do not install the equipment in salt-damaged or polluted areas because they may be corroded. This product can be used in the following or better environments:
  - In a place where is 2000m far away from the coast. It is not recommended to use the product when it within 500m to 2000m away from the coast . The equipment cannot be used when the distance from the coast is less than 500m .
  - In a place where the distance from heavy pollution sources, such as smelters, coal mines, thermal power plants, is more than 1500m at least.
  - In a place where the distance from moderate pollution sources such as chemical, rubber, and electroplating is more than 1000m at least.
  - In a place where the distance from light pollution sources such as food, leather, heating boilers, slaughter houses, centralized garbage dumps, and sewage treatment stations is more than 500m at least.
- Keep the equipment out of the reach of children and away from daily working or living area, including but not limited to the following areas:studio, bedroom, lounge, living room, music room, kitchen,game room, room theater, sunroom,toilet,bathroom,laundry, and attic.
- Do not install the equipment in places without proper fire fighting facilities, or difficult for firefighters to access.
- Do not install the equipment in an easily accessible position because the temperature of the enclosure and heat sink is high when the equipment is

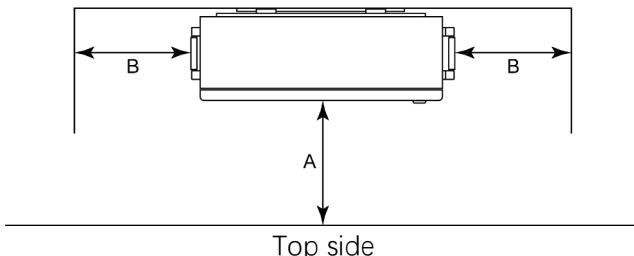
running.

- Do not install the equipment on a moving object, such as ship, train, or car.
- Do not install the equipment in an environment with magnetic dust, volatile or corrosive gases, infrared and other radiations, organic solvents, conductive metal, or salty air.
- Do not install the equipment in an area conducive to growth of microorganism such as fungus or mildew.
- Do not install the equipment in an area with strong vibration, noise, or electromagnetic interference.
- Do not install the equipment in a position that may be submerged in water.

### 3.4.1.3 Installation clearance requirement



Front side



Top side

Item	Distance (mm)
A	$\geq 200$
B	$\geq 200$
C	$\geq 300$

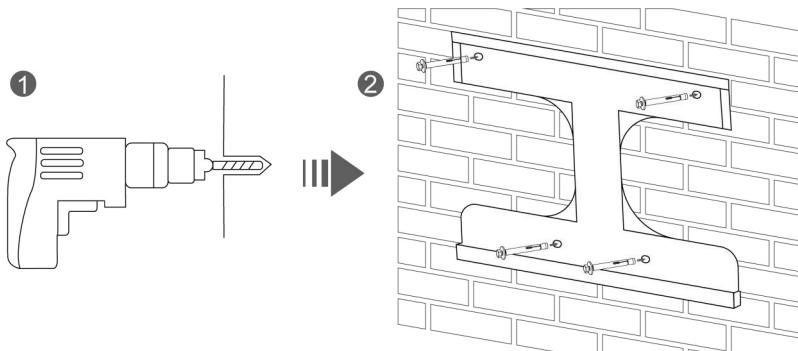
### 3.4.2 Installing the Product

1. 1. Based on the on-site installation environment and installation distance requirements, select an appropriate installation location and mark it. Then, use an electric drill to create holes, with a recommended hole diameter of 10mm and a depth of 100~110mm.

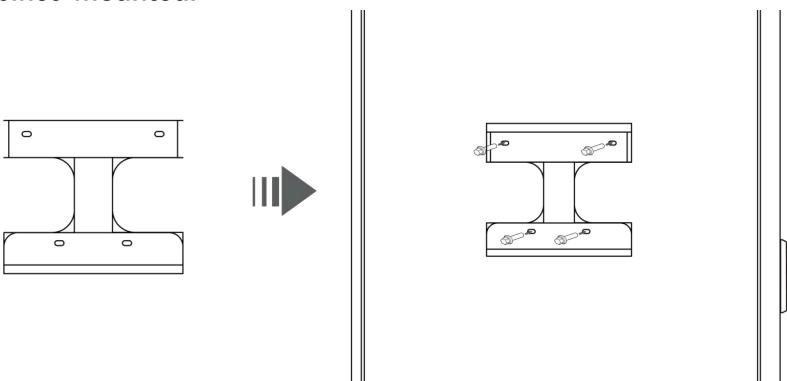
**Note:** It is worth mentioning that if you have purchased or are going to purchase the AC collection cabinet **MS-TS500-2-A** from our company, it is recommended to install the MS-EMS onto that product. We reserve corresponding mounting holes on the cabinet. For specific steps, please refer to the user manual of that product MS-TS500-2-A.

2. Fix the hanging plate onto the designated surface (wall or AC collection cabinet) with 4 expansion bolts (M6\*100).

#### Wall-mounted:

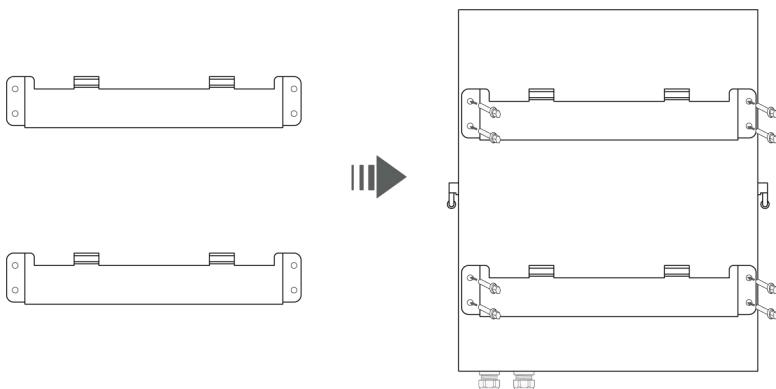


#### Cabinet-mounted:



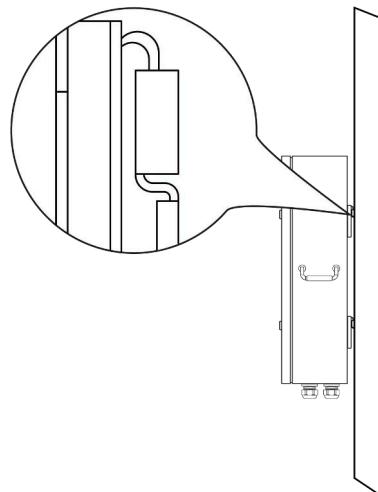
3. Use 8 bolts of M6\*10 to attach the backplane to the back of the

product MS-EMS.Tighten them.

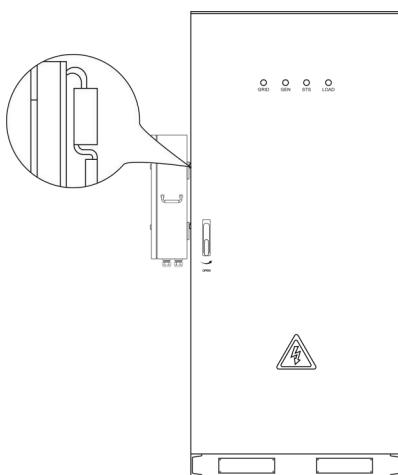


4. Carry the product MS-EMS and hook it onto the hanging plate. Ensure that the upper and lower hooks of the backplane are accurately buckled on the hanging plate.

**Wall-mounted:**



**Cabinet-mounted:**



# 4 Electrical Connection

## 4.1 Preparation before Connection



- Sand and moisture infiltration can damage the electrical equipment in the container or affect its operating performance!
- Do not perform electrical connections during sandstorms or when the relative humidity of the surrounding environment is greater than 95%.
- Make electrical connections when there is no wind or sand and when the weather is clear and dry.
- Before connecting cables, check that the polarity of all input cables is correct. Do not pull wires and cables forcibly during electrical installation.
- Otherwise, the insulation performance may be affected. Make sure all cables and wires have enough room to bend. Take necessary auxiliary measures to reduce the stress on cables and wires.
- After each connection is complete, carefully check whether the connection is correct and secure.

### Cable Requirements

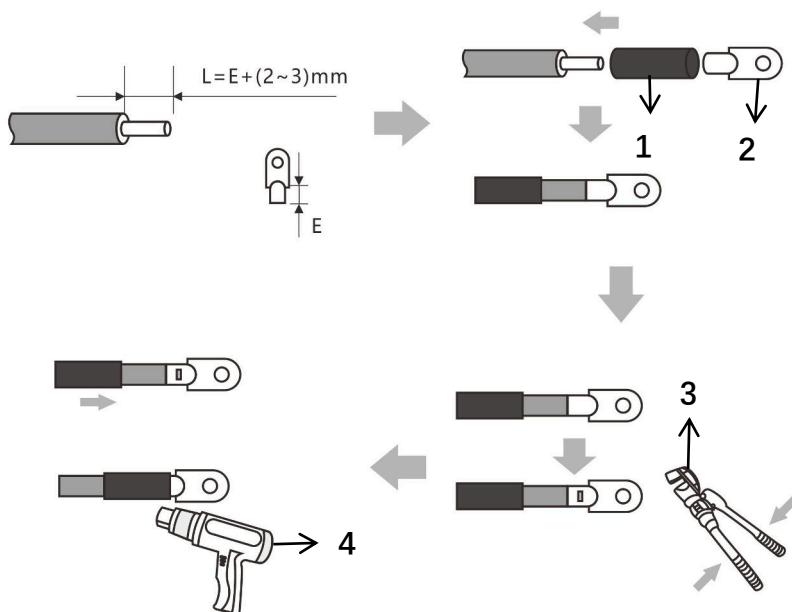
When wiring, cables are supposed to meet the following requirements:

- Sufficient current-carrying capacity. Factors that can influence this capacity are shown as follows:
  - environment condition;
  - the type of insulated materials of conductors;
  - cable routing;
  - material and cross-section of cables;
- Suitable diameter and length of cables
- Correct specification and material of cables used for DC input
- Correct specification and material of cables used for AC input
- Only use fire-resistant cables.

### How to crimp an OT or DT terminal?

## ⚠️ Notice!

- Avoid scratching the core wire when stripping a cable.
- The cavity formed after the conductor crimp strip of the OT terminal is crimped must wrap the core wire completely. The core wire must make close contact with the OT terminal.
- Wrap the wire crimping area with heat shrink tubing or insulation tape. The heat shrink tubing is used as an example.
- Use a heat gun carefully to avoid heat damage to the equipment.



NO.	Description	NO.	Description
1	Hot air duct	3	Hydraulic pliers
2	OT/DT	4	Heat Gun

## 4.2 Cable Connection

### Danger !

All electrical connections must be made when the equipment is completely powered off.

### Danger !

Do not smoke or have an open flame around the equipment. Wear personal protective equipment and use dedicated insulated tools to avoid electric shocks or short circuits.

### Warning !

- Equipment damage caused by incorrect connections is not covered by the product warranty.
- Only qualified electrical technicians are allowed to connect cables.
- Operation personnel must wear proper PPE when connecting cables.

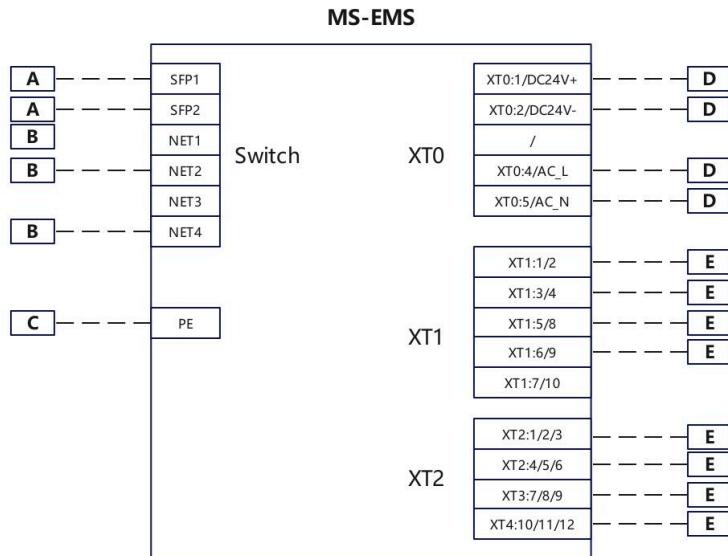
### Warning !

When connecting cables, do not place installation tools, metal parts, or sundries on the equipment. After the connection, clean up objects around the area.

### Caution !

- When connecting cables, observe the installation diagram and pay attention to the polarity of terminals . Otherwise, the products may not work properly due to incorrect cable installation.
- Stay away from the equipment when preparing cables to prevent cable scraps from entering the equipment. Cable scraps may cause sparks and result in personal injury and equipment damage.

## 4.2.1 Connection guidance

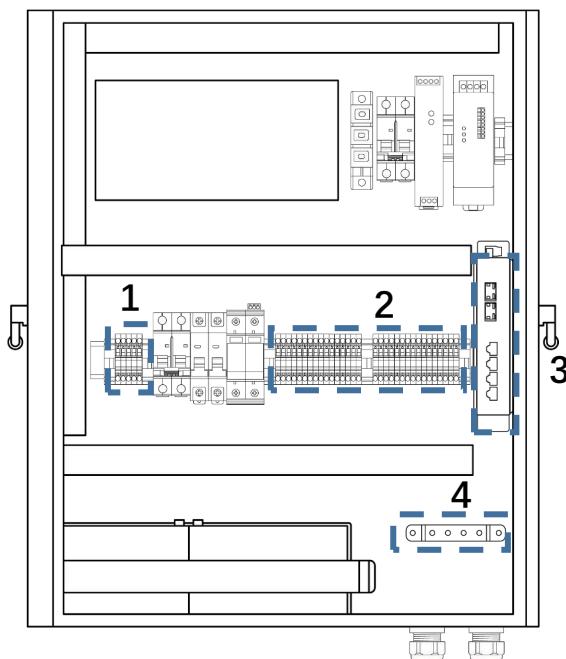


<b>Cable</b>	<b>Recommendation</b>
A	1310 nm/1550 nm
B	CAT.5E
C	12 AWG
D	16 AWG
E	2*0.5mm <sup>2</sup> , twisted pair shielded wire, twist pitch 25 ±5mm

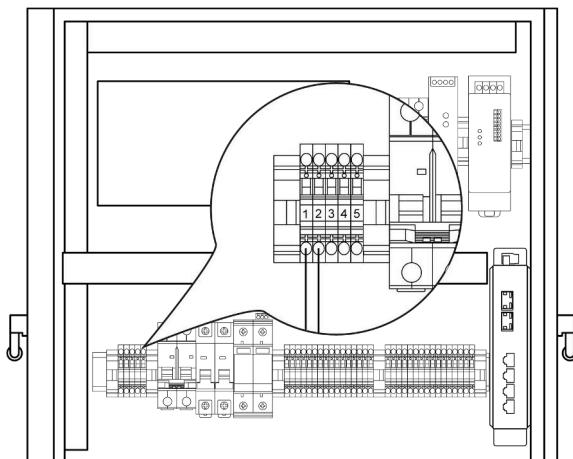
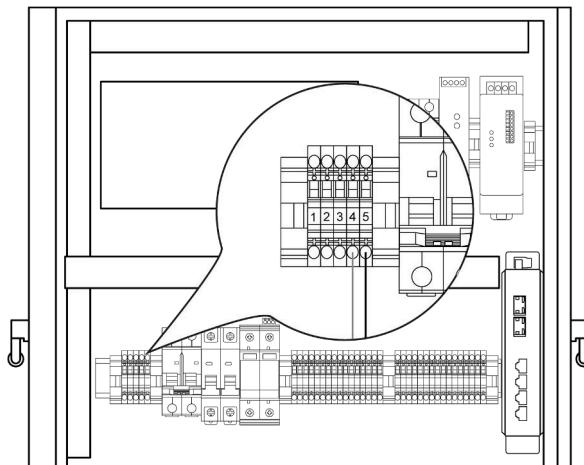
## 4.2.2 Connection steps



Generally, it is recommend to use the energy management system MS-EMS in conjunction with the AC collection cabinet MS-TS500-2-A. However, if you **did not** purchase **the AC collection cabinet MS-TS500-2-A**, the electrical connection here will be marked as "**Optional**" and you can omit and skip it.

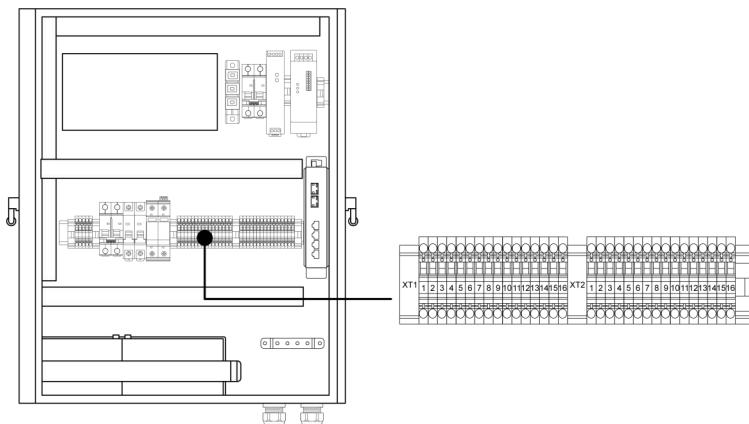


## 1. AC220V auxiliary power and DC24V supply power



No.	Cable	Port
1	Auxiliary Power	XT0:4 (Optional)
		XT0:5 (Optional)
	Power cable	XT0:1
		XT0:2

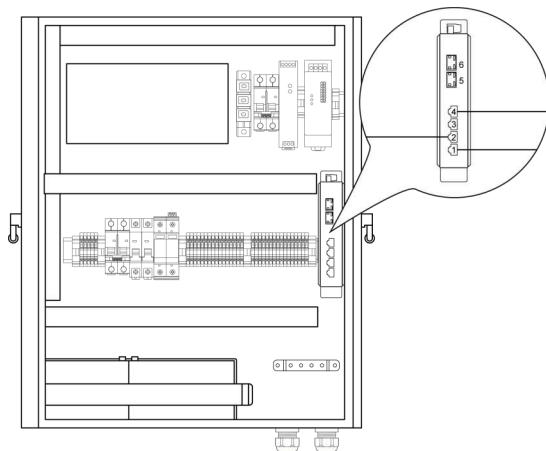
## 2. Signal output



No.	Cable	Port
2	Signal output	XT1:1
		XT1:2
		XT1:3
		XT1:4
		XT2:1 (Optional)
		XT2:2 (Optional)
		XT2:4
		XT2:5
		XT2:7
		XT2:8
		XT2:10
		XT2:11

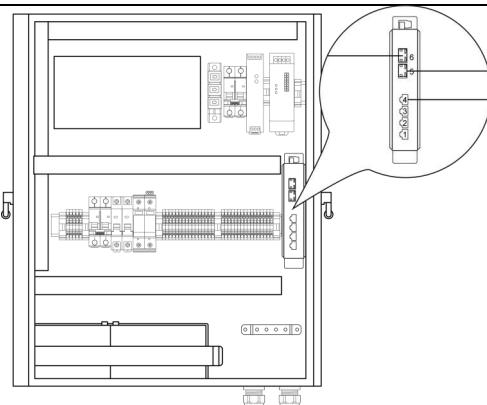
### 3. Ring network communication cable

**Situation 1:** When the physical length of the communication cable is **no more than** 100 meters



No.	Cable	Port
3	Communication cable	SW:1
		SW:2
		SW:4 (Optional)

**Situation 2:** When the physical length of the communication cable is **longer than** 100 meters



No.	Cable	Port
3	Communication cable	SW:4 (Optional)
		SW:5
		SW:6

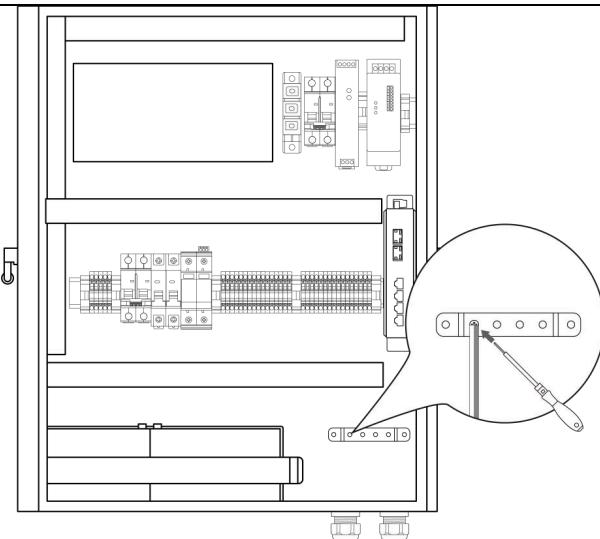
## 4. Grounding

### Warning !

Ensure that the PE cable is securely connected. Otherwise, electric shocks may occur.

### Note !

- The PE point at the AC output port is used only as a PE equipotential bonding point and cannot substitute for the PE point on the enclosure.
- It is recommended that silicone grease or paint be applied around the ground terminal after the PE cable is connected.
- After completing the grounding connection, the grounding resistance must be measured. The specific grounding resistance value should comply with the relevant national/local standards and regulations.



<b>No.</b>	4
<b>Cable</b>	Protective earth
<b>Section (AWG)</b>	12
<b>Torque (N•m)</b>	2~3
<b>Mounting hole</b>	M4-sized threaded holes with a thread depth of 18 mm
<b>Remarks</b>	Provided by the user

# 5 Maintenance

## General Check

No.	Check Item	Acceptance Criteria
1	Appearance	<ul style="list-style-type: none"><li>• The equipment is intact and free from rust or paint flake-off. If the paint flakes off, repair the damaged paint.</li><li>• The labels on the device are clear. Damaged labels must be replaced.</li></ul>
2	Cable appearance	<ul style="list-style-type: none"><li>• Cable sheathings are properly wrapped and not damaged.</li><li>• Cable hoses are intact.</li></ul>
3	Cable connection	<ul style="list-style-type: none"><li>• Cables are connected in the designed positions.</li><li>• Terminals are prepared as required and securely connected.</li><li>• Labels on both ends of each cable are clear and specific, and attached in the same direction.</li></ul>
4	Cable routing	<ul style="list-style-type: none"><li>• Cables are neat and tidy.</li><li>• Cable tie joints are evenly cut without burrs.</li><li>• Cables are placed properly and with slack at bending points to avoid stress.</li><li>• Cables are routed neatly without twists or crossovers in the cabinets.</li></ul>

**Cabinet**

No.	Check Item	Acceptance Criteria
1	Installation	<ul style="list-style-type: none"><li>• The installation meets the design requirements.</li><li>• The cabinet is level, and each door opens normally.</li></ul>
2	Appearance	<ul style="list-style-type: none"><li>• The cabinet surface is free from cracks, dents, and scratches. If the paint flakes off, repair the damaged paint.</li></ul>
3	Grounding	<ul style="list-style-type: none"><li>• Ground correctly according to local requirements.</li></ul>
4	Accessory	<ul style="list-style-type: none"><li>• The number and positions of accessories installed meet design requirements.</li></ul>
5	Label	<ul style="list-style-type: none"><li>• All labels are correct, clear, and complete.</li></ul>

**Interior**

No.	Check Item	Acceptance Criteria
1	Cable	The bolts for installing the cables are tightened and the cables are not loose.
2	Cable hole sealing	Cable holes are sealed.
3	Components	All components are intact.
4	Foreign object	Foreign objects such as tools and remaining materials are cleared.
6	Cabinet grounding	The ground conductor is securely connected to the ground terminal of the cabinet.

## 5.1 General Maintenance

### Danger!

- Servicing should be performed or supervised by professional personnel.
- Wear personal protective equipment and use dedicated insulated tools to avoid electric shocks or short circuits
- Do not smoke or have an open flame around the device.
- Do not use wet cloth to clean exposed copper bars or other conductive parts.
- Do not use water or any solvent to clean the device.

### Warning!

- Before maintaining the equipment, check that no hazardous voltages remain in the components to be maintained by using a multi-meters.
- Do not wear jewelry, watches and other metal jewelry when servicing.

### Caution!

- Place a warning sign indicating that switch must not be turned on at the position where the switch resides.
- Use a electroscope of a proper voltage level to check whether the equipment is energized and ensure that the equipment is completely powered off.
- Before performing maintenance or repair, securely connect the loop to be repaired to the main ground loop using a ground cable.
- After the maintenance or repair is complete, remove the ground cable between the loop that has been maintained and the main ground loop.
- Stay away from the equipment when preparing cables to prevent cable scraps from entering the equipment. Cable scraps may cause sparks and result in personal injury and equipment damage.
- Cables should be inserted and removed in accordance with regulations. Violent or brute force operations are prohibited.
- After the maintenance is complete, clean the tools and materials in time, and check whether metal objects remain inside or on the top of the product.
- If you have any questions about the operation and maintenance of this product, please contact the customer service center. Do not operate without authorization.

## 5.2 Maintenance Schedule

### 5.2.1 Routine Maintenance

Maintenance Category	Maintenance Action	Expected Result
System	Log in to the system management platform (WEB/EMS/APP, etc.) to view system alarm information	● NO primary or secondary alarm info.
Indicator	Check that indicators are in normal state.	All indicators are in normal run.
Outside the cabinet	Check that there are any foreign objects wrapped around the cabinet	● The cabinet is never wrapped around or covered by any foreign objects.
Inside the cabinet	Perform an inspection: ● Temperature ● Humidity	● Check that the temperature and humidity inside the cabinet are in reasonable ranges.

## 5.2.2 Quarterly Maintenance

Maintenance Category	Maintenance Action	Expected Result
Safety inspection	Check that switches to shut off the equipment can work normally	<ul style="list-style-type: none"><li>● Switches can work normally</li></ul>
Cabinet	<p>Perform the visual inspection:</p> <ul style="list-style-type: none"><li>● Appearance</li><li>● Rust condition</li><li>● Door lock</li><li>● Vent</li><li>● Fasteners</li></ul>	<ul style="list-style-type: none"><li>● There is no obvious paint peeling or rust.</li><li>● The door locks are not damaged.</li><li>● There is no dust at the vents.</li><li>● There are no insects, rodents, snakes or other animals.</li><li>● All fasteners are secured firmly.</li></ul>

## 5.2.3 Semi-annual Maintenance

Maintenance Category	Maintenance Action	Expected Result
Outside the cabinet	Perform the visual inspection: <ul style="list-style-type: none"><li>● Inflammable materials.</li></ul>	There is no any inflammable objects around the cabinet.
Cabinet	Perform the visual inspection: <ul style="list-style-type: none"><li>● Appearance</li><li>● Rust condition</li><li>● Door lock</li><li>● Vent</li><li>● Fasteners</li></ul>	<ul style="list-style-type: none"><li>● There is no obvious paint peeling or rust.</li><li>● The door locks are not damaged.</li><li>● There is no dust at the vents.</li><li>● There are no insects, rodents, snakes or other animals.</li><li>● All fasteners are secured firmly.</li></ul>
Cables	<ul style="list-style-type: none"><li>● Check whether cables are securely connected.</li><li>● Check whether cables are damaged, especially whether the cable sheath that contacts a metal surface is damaged.</li><li>● Check whether water is entering into your device</li><li>● Check whether any insulating tape on terminals is not detached.</li><li>● Check whether all cables are routed correctly.</li></ul>	<ul style="list-style-type: none"><li>● Cables are securely connected.</li><li>● No damages are found on the cables.</li><li>● No water enters the equipment and contacts with cables.</li><li>● There are no insulating tape is peeling off.</li><li>● Cable routing is performed correctly and reasonably</li></ul>

## 5.2.4 Annual Maintenance

Maintenance Category	Maintenance Action	Expected Result
Outside the cabinet	Perform the visual inspection: <ul style="list-style-type: none"><li>● Inflammable materials.</li></ul>	There is no any inflammable objects around the cabinet.
Cabinet	Perform the visual inspection: <ul style="list-style-type: none"><li>● Appearance</li><li>● Rust condition</li><li>● Door lock</li><li>● Vent</li><li>● Fasteners</li></ul>	<ul style="list-style-type: none"><li>● There is no obvious paint peeling or rust.</li><li>● The door locks are not damaged.</li><li>● There is no dust at the vents.</li><li>● There are no insects, rodents, snakes or other animals.</li><li>● All fasteners are secured firmly.</li></ul>
Cables	<ul style="list-style-type: none"><li>● Check whether cables are securely connected.</li><li>● Check whether cables are damaged, especially whether the cable sheath that contacts a metal surface is damaged.</li><li>● Check whether water is entering into your device</li><li>● Check whether any insulating tape on terminals is not</li></ul>	<ul style="list-style-type: none"><li>● Cables are securely connected.</li><li>● No damages are found on the cables.</li><li>● No water enters the equipment and contacts with cables.</li><li>● There are no insulating tape is peeling off.</li><li>● Cable routing is performed correctly and reasonably</li></ul>

	<p>detached.</p> <ul style="list-style-type: none"><li>● Check whether all cables are routed correctly.</li></ul>	
Alert labels	<ul style="list-style-type: none"><li>● Check the warning labels.</li></ul>	<ul style="list-style-type: none"><li>● All warning labels are visible, and no damages or stains on them.</li></ul>

# 6 Troubleshooting

When any error exists in your equipment, please contact the service center or service engineers for help.

# 7 Emergency Handling

If an accident (including but not limited to the following) occurs on the site, ensure the safety of onsite personnel first and contact the service engineers.

## 7.1 Strong Impact

- If the equipment has obvious damage or abnormal odor, smoke, or fire occurs, evacuate the personnel immediately, call emergency services, and contact the professionals. The professionals shall use fire extinguishing facilities to extinguish the fire under safety protection.

## 7.2 Flood

- Power off the system if it is safe to do so.
- If any part of the equipment is submerged in water, do not touch it to avoid electric shock.
- Do not force the equipment that have been soaked in water. Contact the customer service center for help.

## 7.3 Fire

### Suggestions for onsite O&M personnel:

- When a fire occurs, evacuate from the building or equipment area, press the fire alarm bell, and immediately call the fire emergency service. Notify the professional firefighters and provide them with relevant product information, including but not limited to product types, capacity, and so on.
- Do not enter the affected building or equipment area under any circumstances, and do not open the doors of the equipment. Isolate and monitor the site. Keep irrelevant personnel away from the site.
- After calling the fire emergency service, remotely power off the system while ensuring your own safety.
- After professional firefighters arrive, provide relevant product information, including but not limited to product types, capacity, user manuals and so on.
- After the fire is extinguished, the site must be handled by professionals in accordance with local laws and regulations. Do not open the doors of the equipment without permission.
- Post-disaster product maintenance: Contact the service engineers for evaluation.

### Suggestions for professional firefighters:

- For product information, see the information provided by O&M personnel, including but not limited to product types, capacity, user manuals and so on.
- Do not open the doors of the equipment before it is deemed safe by professionals.
- Follow local fire fighting regulations.
- When a fire occurs, prevent the fire from spreading to nearby the equipment.

# 8 Storage

## Note!

- Only trained and qualified personnel are allowed to operate the equipment. Wear insulated gloves and use dedicated insulated tools during the operation.
- The storage environment must comply with local regulations and standards.
  - You are advised to store the equipment in a dry, clean, and ventilated indoor environment that is free from sources of strong infrared or other radiations, organic solvents, corrosive gases, and conductive metal dust. Keep the equipment far away from sources of heat and fire.
  - Store the equipment separately to avoid mixing with other equipment. The site must be equipped with qualified fire fighting facilities, such as fire sand and fire extinguishers.
- The equipment must be disconnected from external equipment during storage, and the equipment indicators must be off.

Place the equipment correctly according to the signs on the packing case during storage. Do not place the equipment upside down, lay it on one side, or tilt it.

The packaging signs are described as follows.

Name	Symbol	Description
Up	 A symbol consisting of two thick black arrows pointing upwards, enclosed within a rectangular border.	The package shall be kept upright during transportation and storage.

Fragile		The package contains fragile objects and shall be handled with care.
Keep dry		The package shall be protected against rain, and rainproof measures shall be taken during transportation and storage.
Do not roll		The package shall not be rolled during transportation.
Do not stack		The package shall not be stacked.

- Do not unpack the equipment if it will be stored for a long time.
- Do not stack the equipment.
- Ensure that the ground surface is flat (for long-term or temporary storage).
- Refer to the section “Technical Specification” for storage temperature and humidity.
- Close the cabinet door.
- For long-term storage (more than six months after delivery), replace the desiccants with those of the same specifications and amount.
  - If the equipment has been stored for longer than allowed, promptly report the condition to the person in charge.
- Handle the equipment with care to prevent damage.

# 9 Transport

1. The products should be transported after packaging and during the transportation process. Severe vibration, impact, or extrusion should be prevented to prevent sun and rain. It can be transported using vehicles such as cars, trains, and ships.
2. Always check all applicable local, national, and international regulations before transporting the product.
3. Transporting an end-of-life, damage may, in certain cases, be specially limited or prohibited.
4. Transportation and storage service providers must have the certification for dangerous goods operations required by local laws, regulations, and standards.
5. Before transportation, make a compliant and accurate declaration. Ensure that the packaging, labels, and markings are intact and there is no abnormal smell, leakage, smoke, or fire. Otherwise, the equipment must not be transported.
6. Exercise caution when moving the product to prevent bumping and ensure personal safety.
7. Unless otherwise specified, dangerous goods must not be mixed with goods containing food, medicine, animal feed, or their additives in the same vehicle or container, and sharp objects are not allowed in the same vehicle or container.  
Store the product in a separate area away from heat sources. Protect the product from moisture, water, and rain.

# 10 Technical Specifications

<b>Model</b>	MS-EMS
<b>System</b>	
Configuration	EMS controller, lightning protection module, switch power supply, UPS module, switch
Single Point Access Capacity	Energy storage $\leq 3.44\text{MWh}$ , Photovoltaic $\leq 1.6\text{MWp}$
Function	Basic functions: peak valley arbitrage, anti backflow, main transformer overload protection, load tracking, demand control, backup power function, phase separation control, SOC balancing, Deye Cloud monitoring. Advanced features: load forecasting, production planning, electricity price planning, optimal economic curv
<b>Communicate</b>	
Ethernet (5 channels)	10/100/1000 Mbps
Guangkou (2 channels)	1Gbps
USB (2 channels)	Host
CAN (3 channels)	Isolation, with 2 channels supporting CAN-FD
RS485 (8 channels)	Isolation
RS232 (3 channels)	2 isolated channels, 1 non isolated debugging channel(DB9 socket)
TF Card (1 channel)	Standard TF card holder
LVDS (1 channel)	The physical interface is DVI( including 1 USB for touch)
M.2 Interfaces (1 channel)	PCIe2.0 X1,Scalable SSD (standard 1TB)
DI (17 channels)	Optocoupler isolation
DO (8 channels)	Relay isolation

WLAN	802.11b/AC g n,HT20/40, 2.4 GHz 5 Ghz
<b>Power Supply</b>	
Communication Input	220Vac
DC IN	24Vdc
UPS Backup Power	24Vdc
Consumption	Max 25W
<b>Environmental parameters</b>	
Operation Temperature	-15°C ~ +50°C
Storage Temperature	-15°C ~ +50°C
Working Humidity	5%~95%
Max. Working Altitude (m)	≤3000m
IP Rating of Enclosure	IP54
Anti-Corrosion Grade	≥C4
<b>Mechanical parameters</b>	
Dimension (WxDxH,mm)	488x188x588
Weight Appr. (kg)	≤24.5kg
Installation Location	Indoor or outdoor, wall-mounted
Box Material	Metal
Incoming Specifications	AC power cord:Recommended wire diameter 1.5mm <sup>2</sup> ; DC power cord:Recommended wire diameter of 1.5mm <sup>2</sup> ; Eight core Ethernet cable:Recommended CAT5e Ethernet cable RS485:Recommended 0.75mm <sup>2</sup> -1.5mm <sup>2</sup> outdoor UV protection with shielding layer twisted pair cable length<1000m ( baud rate 9600)

# 11 EU Declaration of Conformity



NINGBO DEYE ESS TECHNOLOGY CO. , LTD. confirms herewith that the products described in this document are in compliance with the fundamental requirements and other relevant provisions of the above mentioned directives .

250825052																					
www.deyeess.com																					
<b>EU Declaration of Conformity</b>																					
Product:Energy Management Controller																					
System model: MS-EMS																					
Name and address of the manufacturer: NINGBO DEYE ESS TECHNOLOGY CO. LTD. No.568, South Rixian Road, Binhai Economic Development Zone, Cixi, Ningbo, Zhejiang, P.R.China																					
This declaration of conformity is issued under the sole responsibility of the manufacturer. Also this product is under manufacturer's warranty.																					
This declaration of conformity is not valid any longer: if the product is modified, supplemented or changed in any other way, as well as in case the product is used or installed improperly.																					
The object of the declaration described above is in conformity with the relevant Union harmonization legislation:																					
The Electromagnetic Compatibility (EMC) Directive 2014/30/EU;the Radio Equipment Directive (RED) 2014/53/EU; the Low Voltage Directive(LVD) 2014/35/EU.																					
References to the relevant harmonized standards used or references to the other technical specifications in relation to which conformity is declared:																					
<table border="1"><tr><td>EN 301908-1 V15.2.1:2023</td><td>●</td></tr><tr><td>EN 301908-13 V13.2.1:2022</td><td>●</td></tr><tr><td>EN 301489-1 V2.2.3: 2019</td><td>●</td></tr><tr><td>EN 301489-52 V13.1:2024</td><td>●</td></tr><tr><td>EN 301489-1 V2.2.3:2019</td><td>●</td></tr><tr><td>EN IEC 62311:2020</td><td>●</td></tr><tr><td>EN IEC 61000-6-1: 2019</td><td>●</td></tr><tr><td>EN IEC 61000-6-3: 2021</td><td>●</td></tr><tr><td>EN 61010-1:2001+A1</td><td>●</td></tr><tr><td>EN 18031-1:2024</td><td>●</td></tr></table>		EN 301908-1 V15.2.1:2023	●	EN 301908-13 V13.2.1:2022	●	EN 301489-1 V2.2.3: 2019	●	EN 301489-52 V13.1:2024	●	EN 301489-1 V2.2.3:2019	●	EN IEC 62311:2020	●	EN IEC 61000-6-1: 2019	●	EN IEC 61000-6-3: 2021	●	EN 61010-1:2001+A1	●	EN 18031-1:2024	●
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Nom et Titre / Name and Title: <span style="float: right;">KunLei Yu</span>																					
Au nom de / On behalf of: <span style="float: right;">KunLei Yu</span>																					
Date / Date (yyyy-mm-dd): <span style="float: right;">2025-8-25</span>																					
A / Place : <span style="float: right;">NINGBO DEYE ESS TECHNOLOGY CO., LTD Ningbo, China</span>																					
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