A2 Series Hydro Cooling User Guide

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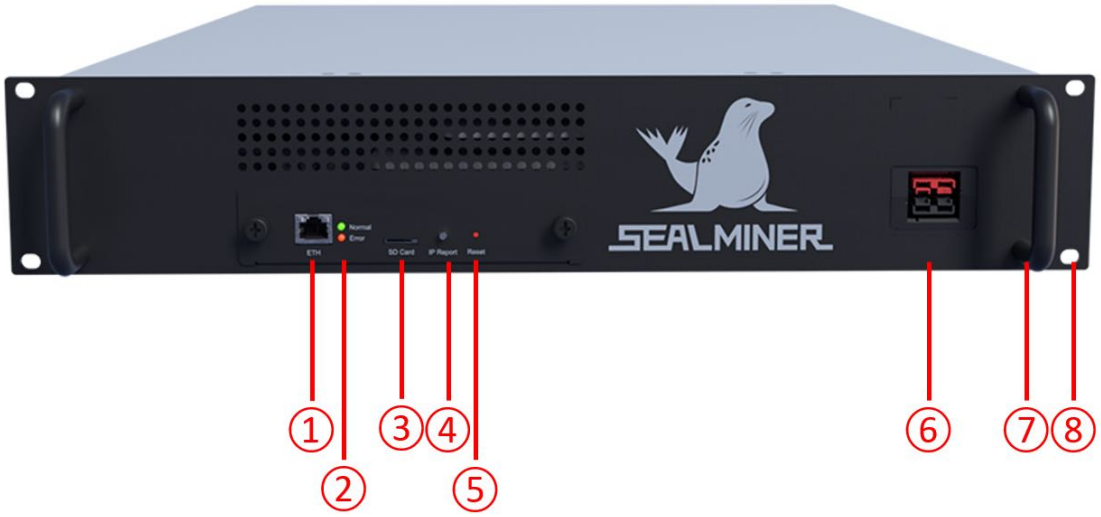
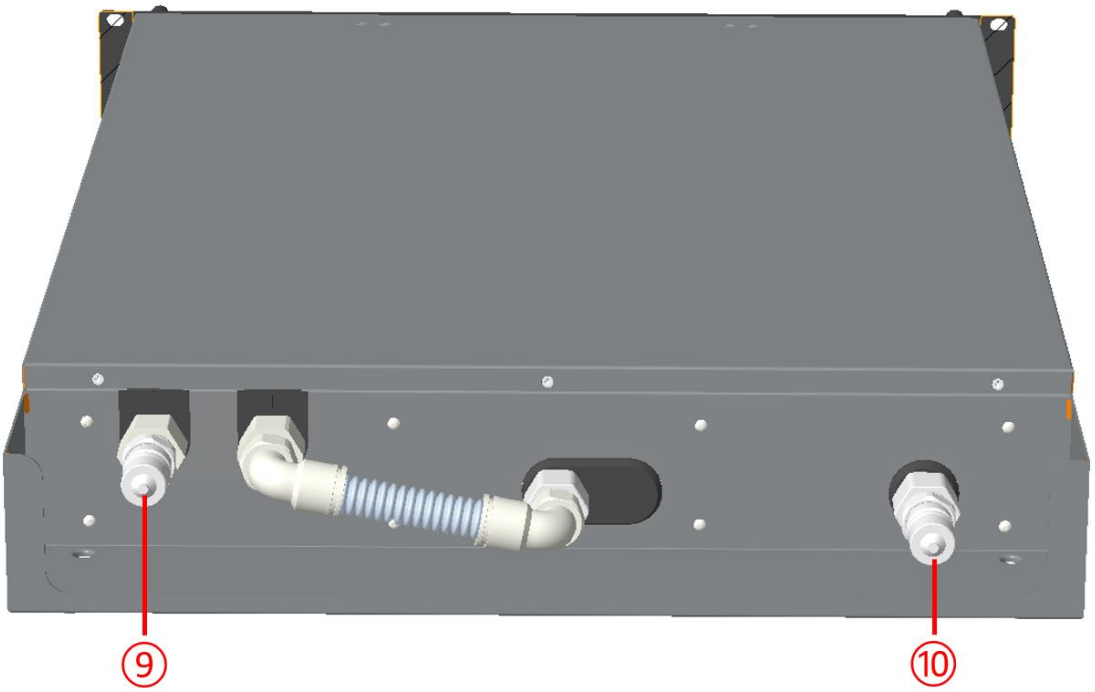
1.Product Introduction





①Ethernet port
②Indicator light
③SD card slot
④Find IP button
⑤Reset button
⑥Power port
⑦Handle
⑧Fixing hole
⑨Water inlet (blue mark)
⑩Water outlet (red mark).

2.Product And Environmental Parameters

Table 1: Product Parameters

Specifications		
Power Supply	Power Supply Model	AC380V~480V，3W+Ground, input 10KW
Physical Parameters	Product Dimensions, W*D*H	482*665*86mm
	Packing Dimensions, W*D*H	567*787*248mm
	Product Colour	Front Panel：Black Exterior：Grey
	Product Weight	Net Weight：20.5kg Weight Including Packaging：23kg
	Coolant Capacity (Single Server)	Approximately 0.7L
Material	Parts In Direct Contact With Coolant	Aluminum Alloy, Stainless Steel, EPDM, FEP
Environmental Parameters	Coolant Temperature	1. Working temperature (water inlet): 20℃~55℃@normal mode; 20℃~45℃@high hash mode; 2. Liquid inlet temperature control accuracy ±2℃; 3. Storage and transportation temperature: -30~70℃ (Note: Please drain the liquid in the server during storage and transportation; if not, ensure that the server is above the freezing point of the liquid)

	Coolant Flow Rate	1. Flow rate ≥ 10.2L/min; 2. Accuracy ±10%; 3. 10.2L/min corresponds to an inlet and outlet water temperature difference of approximately 10.5℃@normal mode, 13.5℃@high hash mode
	Coolant Pressure	≤350kPa (Note: When the pressure is too high, it may cause the pipes, joints, water cooling plates to deform, causing the risk of coolant leakage)
	Coolant Medium	Special coolant: pure water (or distilled water) + special corrosion inhibitor + antifreeze (select the ratio according to the freezing point); Note: (1) The coolant must meet the index requirements listed in Table 3; (2) The coolant needs to be tested regularly. The test index and test cycle can be referred to in Table 4. When the test data exceeds or falls below the test index, its performance will not meet the requirements and the coolant must be replaced; (3) It is recommended to replace the coolant after one year of use.

	Coolant Circulation System	1. Circulation System: The system should be rust-resistant and corrosion-resistant. Stainless steel pipelines are recommended, while copper is prohibited. 2. Filtration: The liquid medium's particle diameter should be ≤149 microns. Therefore, the main circulation path should include a filter with a mesh size of more than 100. Additionally, a 10-micron side filter is recommended to capture tiny suspended particles. 3. System Cleaning: Before connecting the cabinet to the cooling system, clean and filter the system pipelines multiple times using deionized water (conductivity ≤ 5 μS/cm) to remove impurities like dust and welding slag. The cleaning process should not exceed 8 hours, and the cleaning water should not remain in the system overnight. After cleaning, ensure all deionized water is completely drained before injecting the coolant for circulation. Residual deionized water may affect the coolant's performance. 4. Temperature Tolerance: System components must be capable of withstanding temperatures above 85°C. 5. Safety Features: The system must include a 3.5 bar safety pressure relief valve. 6. Pressure Management: The system should be equipped with a fixed pressure expansion tank.

		Note: As the coolant temperature rises after the server is powered on, it will cause an increase in system pressure.
	Humidity	1. Working humidity: 5%RH~85%RH (no condensation); 2. Storage humidity: 5%RH~90%RH (no condensation);

Note：The above-mentioned coolant temperature and flow parameters are the requirements for pure water + special corrosion inhibitor as the coolant medium. If the coolant medium comprises pure water + special corrosion inhibitor + antifreeze, its temperature and flow parameters are shown in Table 2.

Table 2 Recommended Temperature and Flow Parameters at Different Coolant Concentrations.

Coolant Medium	20% ethylene glycol or propylene glycol + special corrosion inhibitor	30% ethylene glycol or propylene glycol + special corrosion inhibitor	40% ethylene glycol or propylene glycol + special corrosion inhibitor	50% ethylene glycol or propylene glycol + special corrosion inhibitor
Freezing Point	-8.8℃ (20% ethylene glycol); -7.4℃ (20% propylene glycol);	-15.7℃ (30% ethylene glycol); -13.2℃ (30% propylene glycol);	-24.8℃ (40% ethylene glycol); -21.5℃ (40% propylene glycol);	-37℃ (50% ethylene glycol); -33.6℃ (50% propylene glycol);
Coolant Temperature	Inlet temperature: 20℃~55℃@normal mode; 20℃~44℃@high hash mode; Inlet temperature accuracy: ±2℃; Storage and transportation temperature: -30~70℃; Note: The coolant in the equipment must be drained if the storage and transportation is more than 2	Inlet temperature: 20℃~54℃@normal mode; 20℃~43.5℃@high hash mode; Inlet temperature accuracy: ±2℃; Storage and transportation temperature: -30~70℃; Note: The coolant in the equipment must be drained if the storage and transportation is more than 2	Inlet temperature: 20℃~53℃@normal mode; 20℃~43℃@high hash mode; Inlet temperature accuracy: ±2℃; Storage and transportation temperature: -30~70℃; Note: The coolant in the equipment must be drained if the storage and transportation is more than 2	Inlet temperature: 20℃~52℃@normal mode; 20℃~42.5℃@high hash mode; Inlet temperature accuracy: ±2℃; Storage and transportation temperature: -40~70℃; Note: The coolant in the equipment must be drained if the storage and transportation is more than 2

	hours.	hours.	hours.	hours.
Coolant Flow Rate	Rated flow: ≥10.7L/min; Flow accuracy: ±10%; This flow corresponds to an inlet and outlet water temperature difference of approximately 10.5℃@normal mode, 13.5℃@high hash mode.	Rated flow: ≥11.0L/min; Flow accuracy: ±10%; This flow corresponds to an inlet and outlet water temperature difference of approximately 10.5℃@normal mode, 13.5℃@high hash mode.	Rated flow: ≥11.3L/min; Flow accuracy: ±10%; This flow corresponds to an inlet and outlet water temperature difference of approximately 10.5℃@normal mode, 13.5℃@high hash mode.	Rated flow: ≥11.7L/min; Flow accuracy: ±10%; This flow corresponds to an inlet and outlet water temperature difference of approximately 10.5℃@normal mode, 13.5℃@high hash mode.

Table 3 Initial index requirements for coolant

Details	**Unit**	**Indicators**
pH（20℃）	/	7.0~8.7
Conductivity (20℃)	μS/cm	TBD
Total colony count (microorganisms)	CFU/mL	<100
Sulfate	mg/L	<10
Chloride	mg/L	<20
Sulphide	mg/L	＜1

Total hardness (CaCO3)	mg/L	<1
Copper ion	mg/L	<0.5
Iron ion	mg/L	<0.5
Aluminium ion	mg/L	<0.5
Reserve alkalinity	mL	2.9~3
Appearance	/	Clear liquid without precipitation
Corrosion inhibitor	/	100% active ingredient

Table 4: Coolant Testing Index Requirements

Items (Note: Items Marked With * Are Mandatory Items)	Unit	Testing Indicators	Testing Period	Test Instruments/Methods
Ph（20℃）*		7.5~9.5	Every 2 months	PH metre/ASTM E70
Conductivity (20°c)*	μS/cm	Increment ≤1500	Every 2 months	Conductivity metre/GB/T11446.4
Total Colony Count (Microorganisms)*	CFU/mL	≤1000	Every 6 months	3M Bacteria culture dish SN/T 1897
Sulfate	mg/L	≤10	Every 6 months	Ion chromatography/ HJ84
Chloride	mg/L	≤20	Every 6 months	Ion chromatography/ HJ84

Sulphide	mg/L	≤1	Every 6 months	Ion chromatography/ HJ84
Total Hardness (Caco3)	mg/L	≤20	Every 6 months	GB/T 6909
Copper Ion*	mg/L	Increment ≤ 0.1	Every 6 months	Inductively coupled plasma spectroscopy/HJ 776
Iron Ion*	mg/L	Increment ≤ 0.1	Every 6 months	Inductively coupled plasma spectroscopy/HJ 776
Aluminium Ion*	mg/L	Increment ≤ 0.1	Every 6 months	Inductively coupled plasma spectroscopy/HJ 776
Reserve Alkalinity	mL	≥2.3	Every 2 months	Automatic potentiometric titrator/ASTM D11221
Appearance*		Clear and transparent liquid without precipitation	Every 2 months	Visual Inspection
Corrosion Inhibitor*		≥ 80% of active ingredients	Every 2 months	Ultraviolet spectrophotometer, ion chromatograph, gas chromatography-mass spectrometer, etc.

3.Cooling system design requirements

3.1 Server Inlet Temperature Control

(1) Control requirements: constant inlet temperature control, control accuracy ±2℃.

(2) Control range: 20℃~55℃@normal mode (pure water + special corrosion inhibitor as coolant medium); 20℃~45℃@high hash mode (pure water + special corrosion inhibitor as coolant medium); other coolant temperatures refer to Table 2.

Note: Significant fluctuations in inlet temperature can lead to corresponding fluctuations in server temperature, potentially resulting in unstable server performance. If the inlet temperature is ex。

3.2 Server Inlet Flow Control

(1) Control requirements: constant inlet flow control, control accuracy ±10%.

(2) Control range: single machine flow ≥10.2L/min@pure water + special corrosion inhibitor as coolant medium, 10.2L/min corresponds to inlet and outlet temperature difference of 10.5℃@normal mode, 13.5℃@high hash mode; refer to Table 2 for the flow of other coolants.

Note: Excessive fluctuations in inlet flow can lead to significant variations in machine temperature, potentially causing unstable operation. If the liquid flow is too low, the outlet temperature may rise excessively, hindering the machine's normal functioning.

3.3 Server water inlet pressure

(1) Control range: Liquid pressure ≤ 350kPa;

Note: Excessive pressure may lead to deformation of pipes, joints, water-cooling plates, etc., causing the risk of coolant leakage, which may cause damage to the server, and the damaged server will not be covered by the warranty.

3.4 Server coolant medium

(1) Liquid Medium: special pure water (or distilled water) + special corrosion inhibitor + antifreeze (select the ratio according to the freezing point);

Note: Corrosion inhibitors must be added to the coolant, which must adhere to the specifications outlined in Table 3. If the coolant does not meet these standards, it must be replaced promptly to prevent rust and corrosion of system components. Failure to do so may result in the cold plate or joints becoming corroded or blocked, potentially damaging the server.

(2) Regular testing and replacement: The coolant needs to be tested regularly. Please refer to Table 4 for testing cycle and index requirements. If it does not meet the standards, it must be replaced immediately.

3.5 Circulation cooling system

(3) Pipeline: The circulation system should be rust-proof and anti-corrosive. It is recommended to use stainless steel pipes and copper is prohibited in the system.

Note: The cold plate is composed of aluminium. If copper is present in the system, electrochemical corrosion may occur. Additionally, carbon steel pipe welds can contain significant amounts of welding slag, which is difficult to clean and prone to rust and corrosion. This increases the risk of corrosion and blockage in the cold plate or joints, potentially causing damage to the server. Such damage will not be covered under the warranty.

(4) Filter: The main circuit is equipped with a filter with a mesh size of 100 or more; it is also recommended to configure a 10-micron side filter system to filter tiny suspended solids.

Note: If the filter mesh size is too small, larger particles of impurities in the system may not be effectively filtered, leading to potential blockages in the cold plate or joints. This could result in server damage, which would not be covered under the warranty.

(5) Circulation pump: It is recommended to use a stainless steel pump. To improve system reliability, it is recommended to ensure two pipes on

hand, one for use and one as a reserve.

Note: Cast iron pumps are prone to rust and corrosion, causing the risk of corrosion and blockage of cold plates or joints, which will further cause damage to the server, which would not be covered under the warranty.

(6) System pipeline pressure testing and leak detection: It is recommended to use an air compressor for gas inspections of the pipeline, and apply the soap bubble method to check the seal of the pipeline welds.

Note: If conducting a water inspection during winter, the system equipment must be drained to prevent freezing, as equipment that cannot be thoroughly drained may suffer damage. Gas inspections are more efficient than water inspections, as they do not require draining or antifreeze measures during winter leak detection.

(7) Exhausting and draining valves: Install automatic exhaust valves at local high positions and install drain valves at local low positions. It is recommended to install manual exhaust valves in multiple places in the system to improve the first injection efficiency of the system.

(8) Safety pressure relief valve: It is recommended that the system be equipped with a 3.5 bar safety pressure relief valve to prevent the system pressure from being too high.

Note: Ensure the pressure relief valve is properly adjusted before starting the machine. If the system fails to relieve pressure and the server's water inlet pressure exceeds 350kPa, it may result in server damage. Damage caused in this manner is not covered under the warranty.

(9) Constant pressure expansion tank: It is recommended that the system be equipped with a constant pressure expansion tank to prevent system pressure fluctuations;

Note: Please make sure that the expansion tank pressure value has been adjusted before operation. If the pressure tank fails to work, this may cause the server water inlet pressure to be greater than 350kPa, potentially damaging the server. Damage caused in this manner is not covered under the warranty.

(10) Temperature resistance of system components: ≥85℃;

Note: If the temperature resistance of the cooling system components

is below 85°C, it may lead to damage or leakage of liquid, potentially causing server damage. Such damage is not covered by the warranty.

(11) Cleaning system: Before installing the server in the shelves, the shelf system needs to be filtered and cleaned;

Note:

a. Prior to connecting the cabinet to the cooling system, clean the system pipes multiple times with deionized water (conductivity ≤ 5μS/cm) to remove impurities such as welding slag and dust. Ensure that the cleaning process does not exceed 8 hours, and do not leave the cleaning water in the system overnight.

b. After cleaning, completely drain the deionized water before injecting the coolant for circulation. Failure to fully drain the deionized water can adversely affect the coolant's parameters.

c. Excessive residual impurities in the system may lead to corrosion and blockage of the cold plate or joints, potentially damaging the server. Damage resulting from such issues is not covered by the warranty.

(12) Cleaning the server: Before installing the server in the shelves, the server needs to be cleaned;

Note:

a. Prior to connecting the cabinet to the cooling system, clean the system pipes multiple times with deionized water (conductivity ≤ 5μS/cm) to remove impurities such as welding slag and dust. Ensure that the cleaning process does not exceed 8 hours, and do not leave the cleaning water in the system overnight.

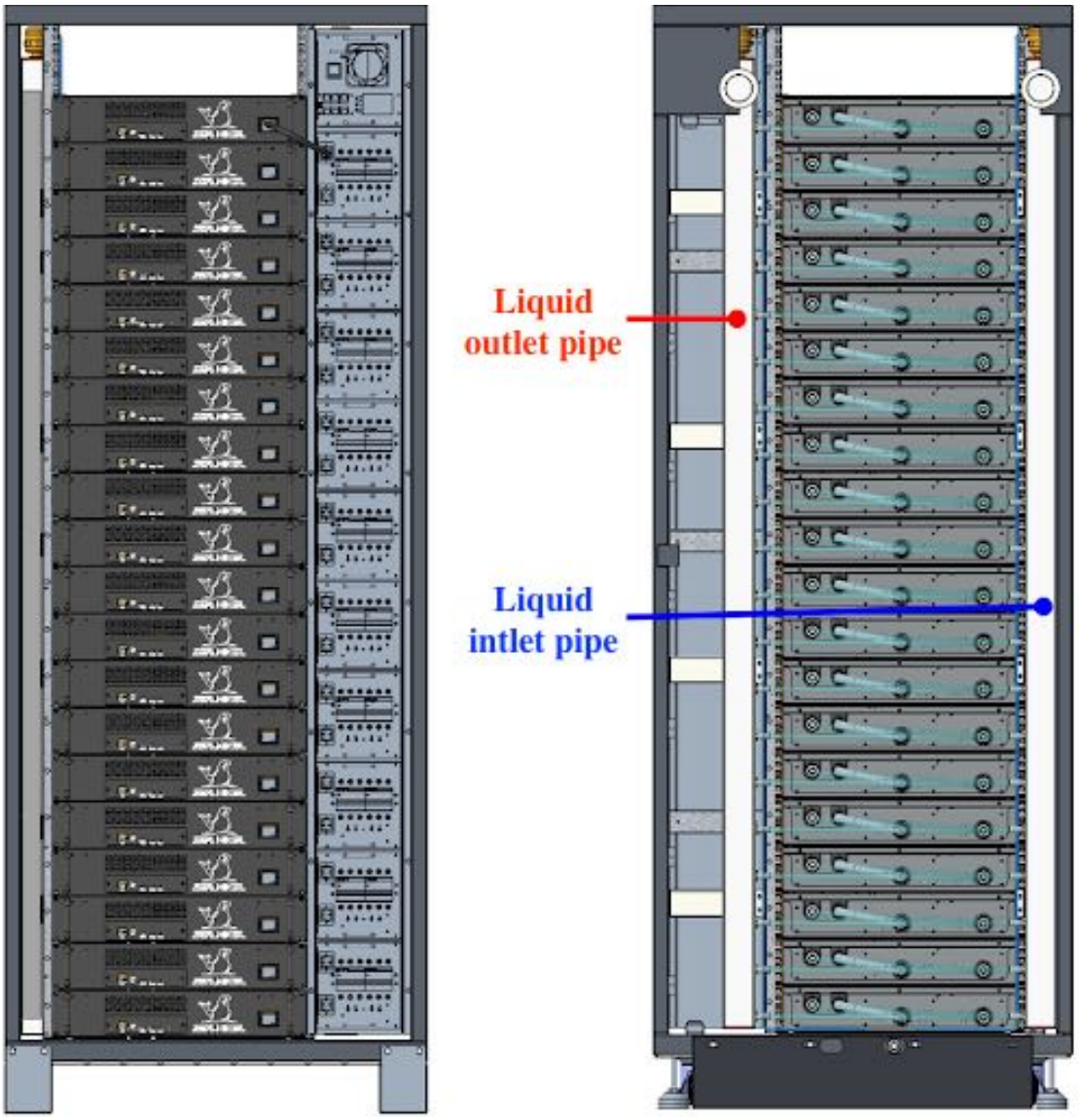
b. After cleaning, completely drain the deionized water before injecting the coolant for circulation. Failure to fully drain the deionized water can adversely affect the coolant's parameters.

C. Excessive residual impurities in the system may lead to corrosion and blockage of the cold plate or joints, potentially damaging the server. Damage resulting from such issues is not covered by the warranty.

4.Product installation and operation instructions

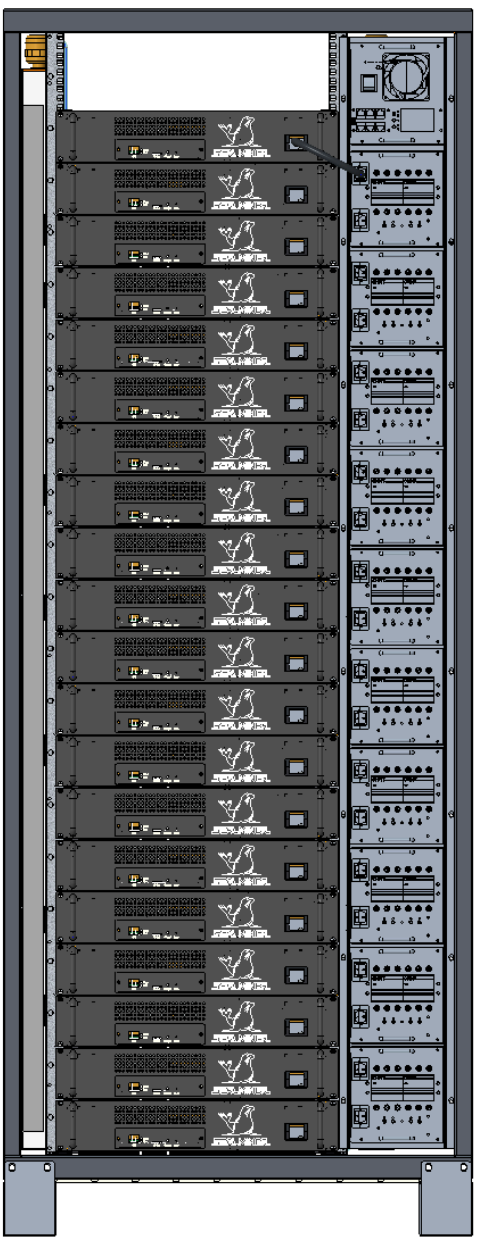
4.1 Installation location

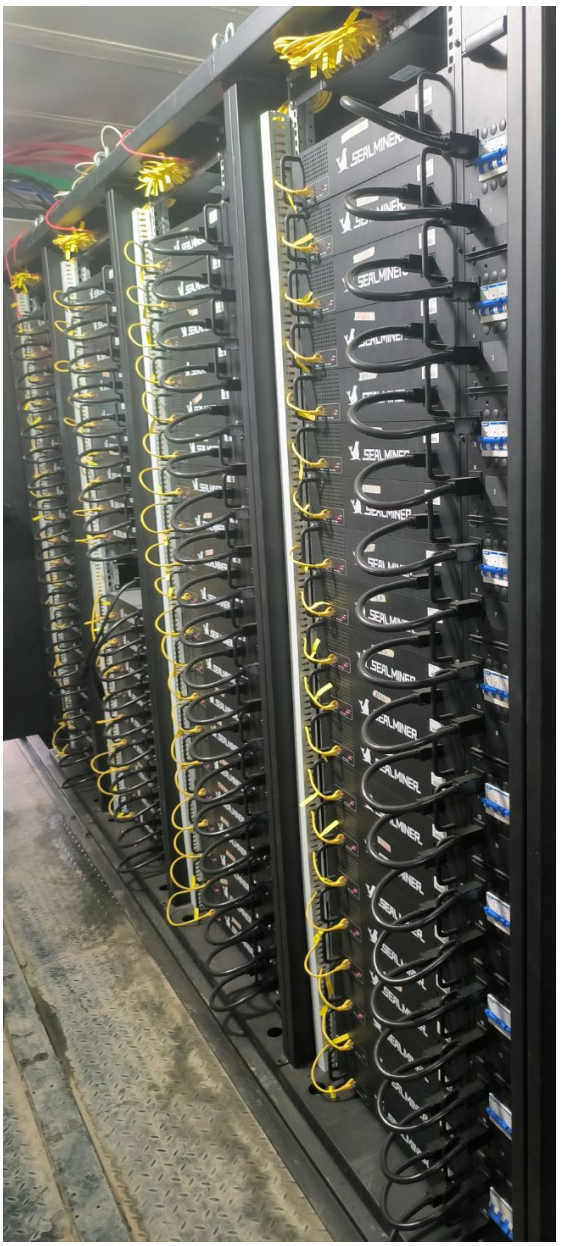
The water-cooled server adopts a standard 2U structure design and is installed in a standard 19-inch water-cooled cabinet. The front and back of the cabinet after the server is installed are shown in the following figure.



4.2 Installation Steps

(1) Slowly push the server into the cabinet along the slot. It is recommended to have two people for the installation. A full cabinet with 20 servers is shown in the following figure.

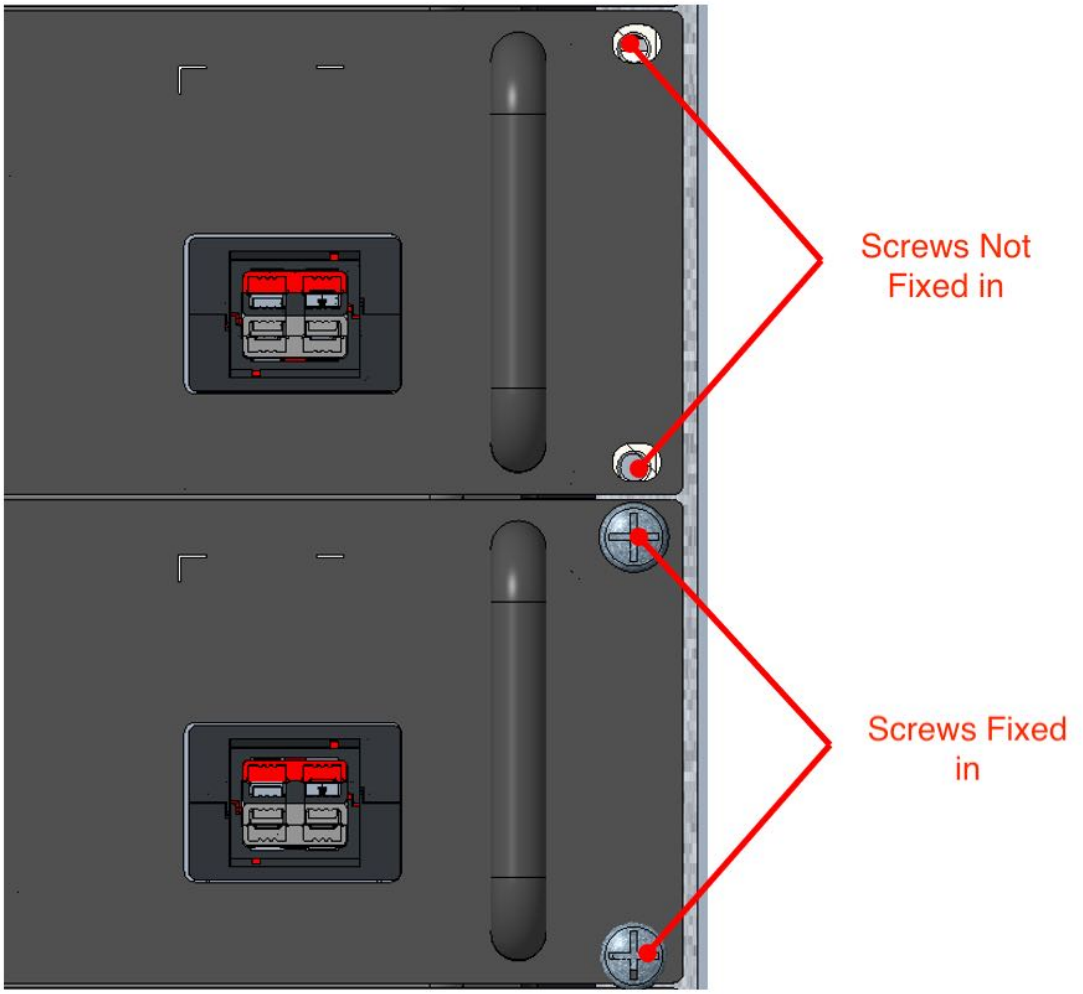




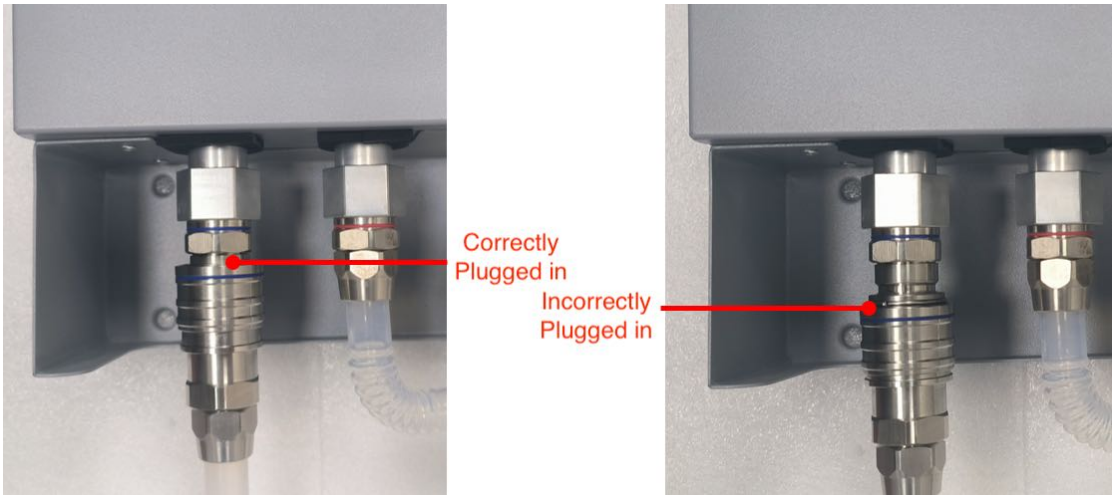
(2) Fix the server front panel to the cabinet with screws (the cabinet has floating nuts). The screws are fixed as shown in the figure below.

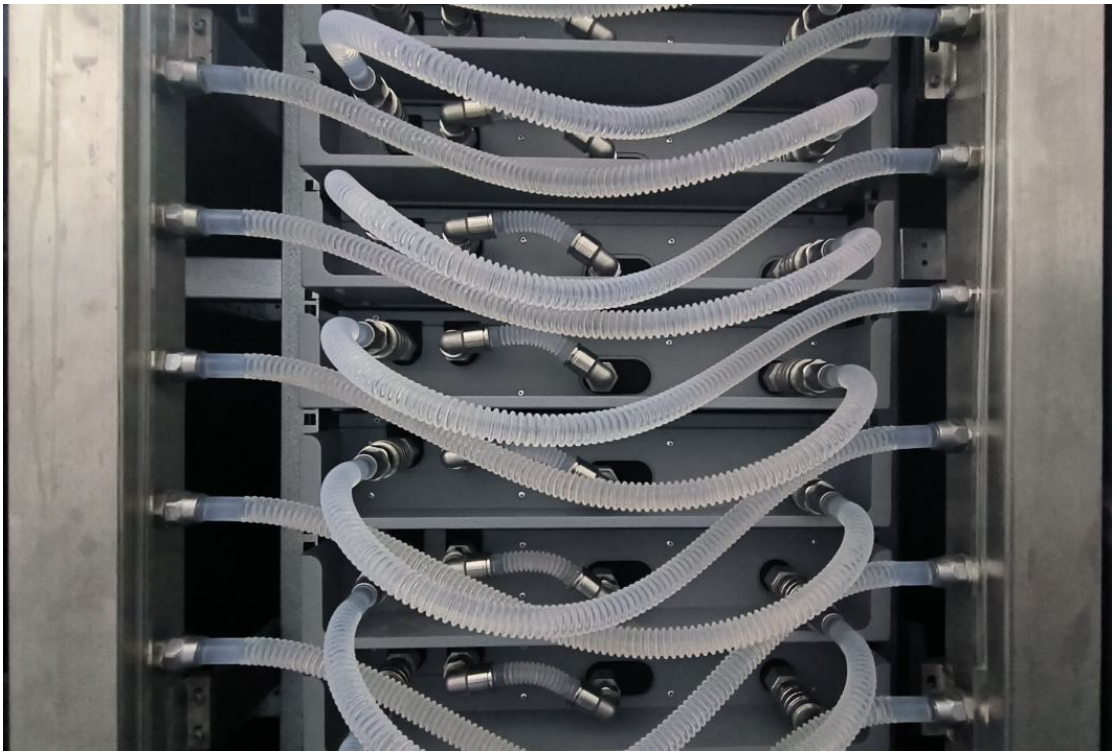
Note: It is not recommended to transport the servers within the

cabinet. When transporting the servers within the cabinet, the front panel screws must be tightened and fixed. The servers damaged due to poor installation during transportation will not be covered by warranty.



(3) Plug the inlet and outlet pipes into the server. Start by removing the protective caps from the joints, then connect the female quick connector to the inlet and outlet pipes, ensuring they match with the male quick connector on the server. Make sure all connectors are securely in place. The accompanying figure illustrates this process: the upper part of the figure depicts two scenarios—one where the connectors are properly plugged in and one where they are not. The lower part of the figure shows an example of the correct setup after the connections are complete.





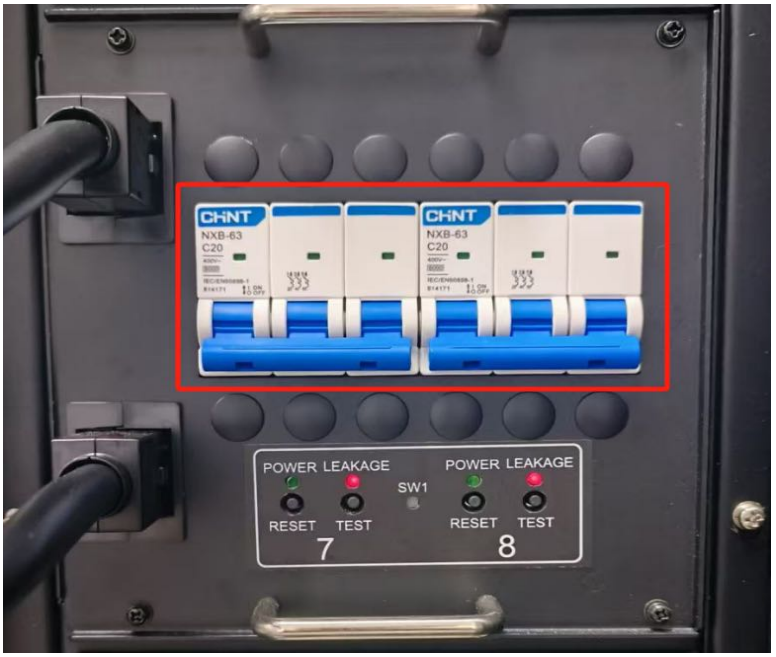
(4) Connect the network cable and power cable. The power cable uses the original factory configuration power cable. The example of the network cable and power cable connection is shown in the figure below.

(5) After the server is installed, first circulate the water through the system to check for leaks. If there is no leakage, connect to the network and turn on the power to start running the servers.

Note: When filling the circulation system with the water, fill the system completely until no air remains within the system before powering on, otherwise there may be risks such as overheating, burning or computing power loss in the server, and the damaged machines are not covered by warranty.

4.3 Uninstallation Steps

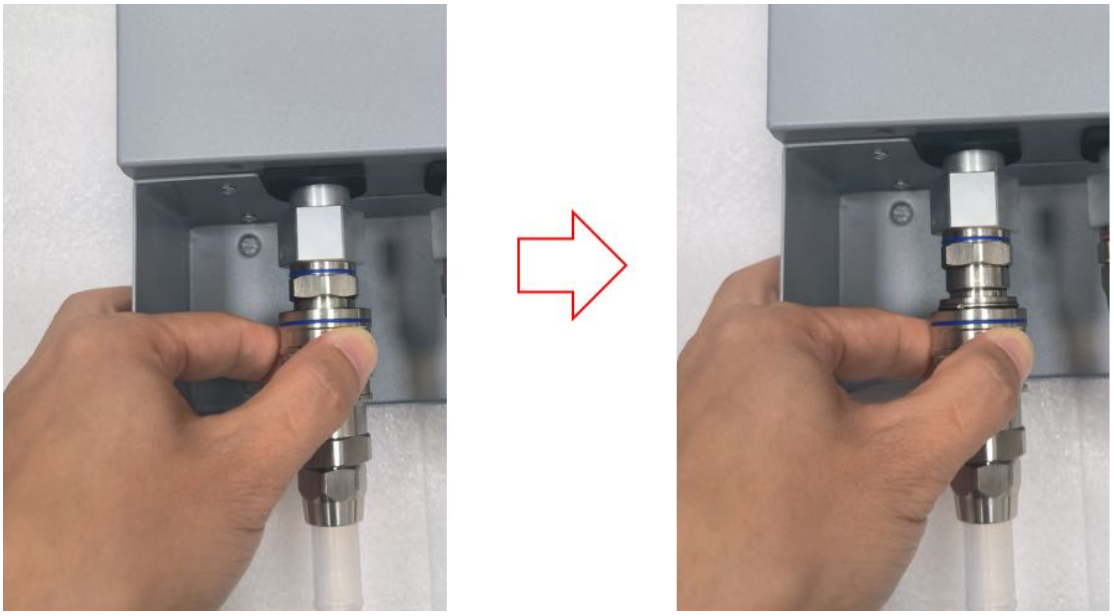
(1) Shut down the servers and disconnect the corresponding circuit breaker, as shown in the figure below.



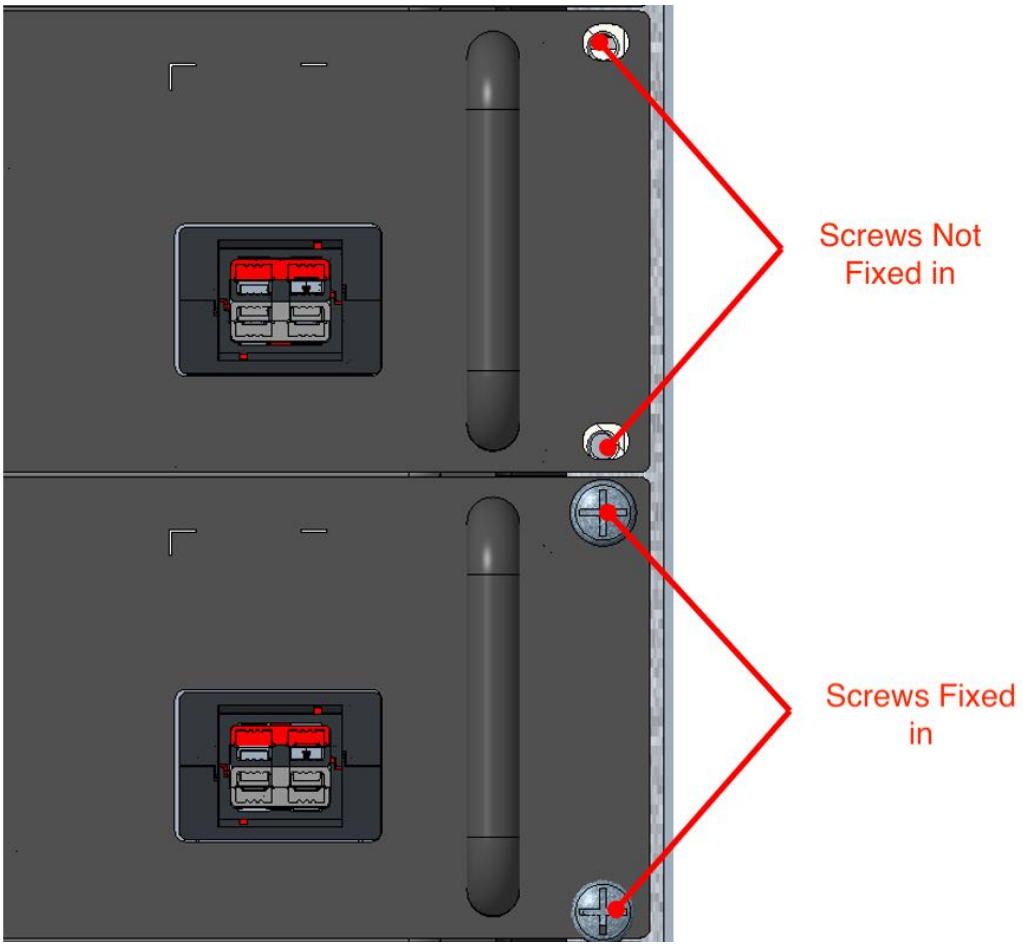
(2) Unplug the network cable and power cable, as shown in the figure below;

(3) Disconnect the water inlet and outlet quick connectors at the rear of the server. As shown in the figure below, hold the movable ring in the middle of the quick connector (female connector) and pull it back to disconnect.

Note: Disconnect the water inlet connector first and then the water outlet connector.



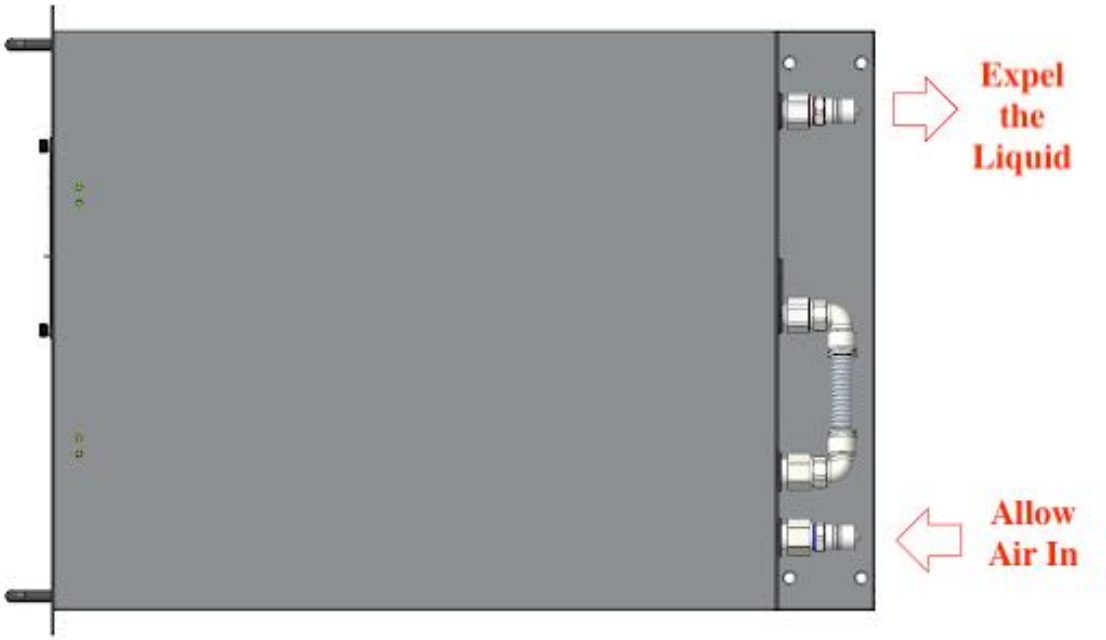
(4) Loosen the screws that fix the server front panel to the cabinet (the cabinet has floating nuts), as shown in the figure below.



(5) To remove the server slowly pull the server out, it is recommended to have two people when removing the server , one on each side, as shown in the figure below;

(6) Drain the server thoroughly. After removing the server from the rack, if it will be stored or transported for more than 2 hours, ensure that all liquid inside the server is drained.

To drain the liquid inside the server, use two female quick connectors and connect them to two sections of water pipes, and then connect them to the water inlet and outlet of the server respectively. Fill one of the interfaces with air, the air pressure will discharge all remaining coolant, as shown in the figure below.



4.4 Note

(1) Only original quick connectors and power cords should be used. Any damage resulting from the use of non-original parts will void the warranty.

(2) The quick connector should be inserted and removed as demonstrated in the figure below. Upon proper connection, the male and female ends will align, allowing fluid to flow, and the quick connector will automatically lock. When disconnected, both ends will seal off, preventing leakage. Once the connection is made, you can verify that the quick connector is secure by gently pulling the hose at the female end to ensure it is not loose

Note: If the socket is not properly inserted, the server may overheat and become inoperable, potentially causing damage to the water cooling plate.

Insertion Instructions: Grip the movable ring on the female quick connector and pull it back, while simultaneously pushing the entire quick connector forward until it is securely in place. The movable ring will automatically return to its original position, indicating that the connection has been properly made.。

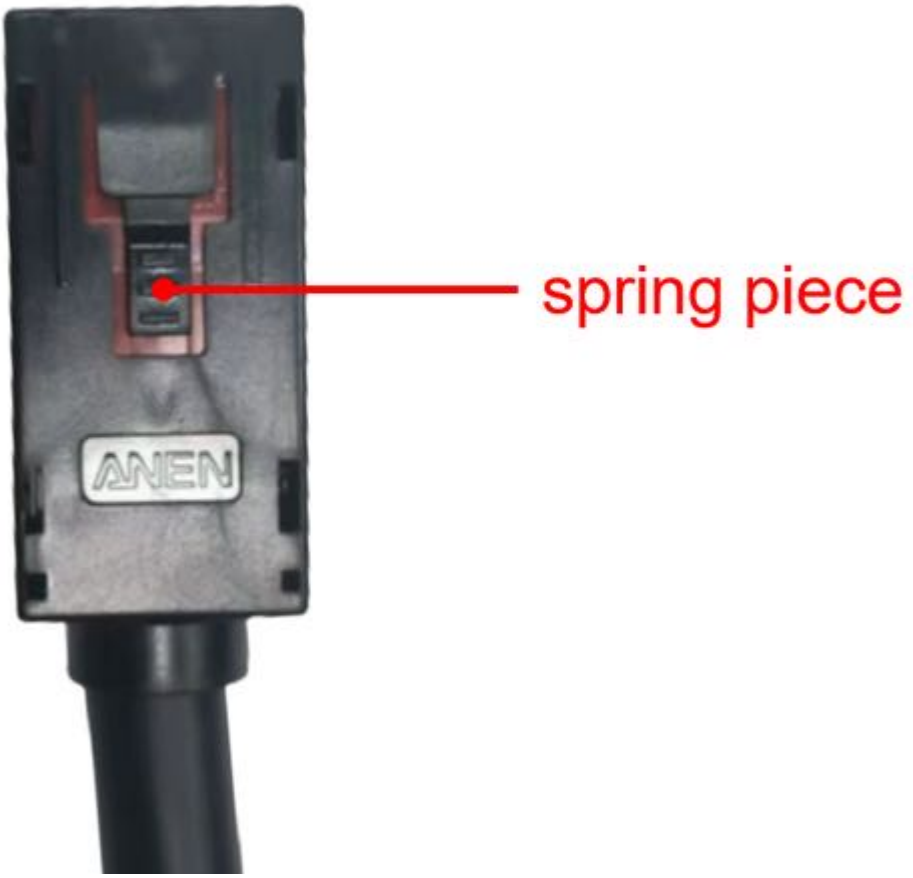
1. Hold the base of the connector and pull the movable ring back

2. Insert the entire connector forward

3. After the connector is inserted forward, the movable ring will automatically return to its original position

(3) If the internal pressure of the server is too high due to improper power-on and power-off operations, the quick connector will not be able to be plugged in due to the high internal pressure of the server. In this case, as seen in the figure below, use a tool to press the active part of the water inlet or outlet quick connector to release the pressure inside the server.

(4) When disconnecting the power cord, press the springs on both sides of the connector, as seen in the figure below.



5.Important Notes for Powering On and Off the Product

5.1 Pre-Startup Checklist

(1) Cooling System Inspection: Before powering on the server, ensure that the entire cooling circulation system is functioning correctly, that any air in the pipes has been fully purged, and that there are no leaks in the system.

Note: Air in the system can reduce cooling efficiency and may cause damage to the circulation pump. Any leaks or micro-seepage in the system can lead to poor heat dissipation in nearby servers, increasing the risk of damage and negatively impacting the long-term performance of the cooling system. Special attention should be given to inspecting pipe connections, the server's water inlet and outlet fittings, and the intermediate connecting pipes. Damage caused by these issues will not be covered under warranty.

(2) Check Water Filling Status: Before placing the server on the shelf and powering it on, ensure that air has been purged from the server through water circulation and that the water cooling plate is fully filled. It is recommended to place one server on the shelf at a time, moving on to the next only after water is fully filled.

Note: Prior to installation, the water cooling plate of the server typically does not contain water, requiring connection to the system's circulating water. During this process, air will be introduced into the system, which may cause a temporary shortage of water in the pipe system. For this reason, the pipe system must be equipped with both an exhaust mechanism and an automatic liquid filling device. If multiple servers without coolant are connected in quick succession, the system may experience a temporary water shortage, preventing timely air expulsion. This can lead to risks such as circulation pump failure, overheating, or damage to local chips in other servers, and reduced computing power. Damage caused by these issues will not be covered under warranty.

(3) Check for Condensation Before Startup

Note: When the server is idle, a rapid increase in ambient temperature may cause condensation if the server cannot acclimate to the

temperature change. In the event of condensation, the server can be dried using external heating methods, such as sunlight or hot water. Any damage resulting from condensation will not be covered under the warranty.

5.2 Startup Procedure

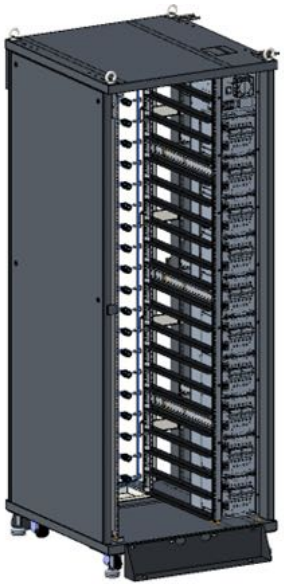
When powering on all servers simultaneously within the same cooling system, to prevent the water temperature control from becoming overwhelmed and triggering high-temperature protection, it is advisable to fully activate the cooling system's capacity before starting all servers. This means that all temperature control components, such as fans, circulation pumps, and electric valves, should be operating at full capacity. Once the servers approach their rated power levels, the cooling system will automatically adjust to maintain optimal water temperature.

5.3 Shutdown Precautions

After the server is shut down and its water inlet and outlet are disconnected from the cooling system (i.e., when the server is no longer circulating water), it is essential to drain the cooling water from the server to prevent damage to the cold plate.

Note: Any damage resulting from failure to drain the cooling water will not be covered under the warranty.

6. Product Accessory Specifications

Item	Specification	Image for Reference	Remarks
Water Cooling Cabinet	Effective Space: 43u Dimensions (Height X Width X Depth): 2100*800*850mm Water Supply And Return Side Interface Size: M16*1.0 Screw Thread		The cabinet integrates switches, water supply and return manifolds and PDUs, allowing 20 2U servers to work simultaneously
Quick Connector (Male)	Interface Size: M16x1.0 Screw Thread; Interface Sealing Method: Sealing Ring End Face Seal; Colour Identification: Blue		This connector is used for the server's original water inlet interface.
Quick Connector (Male)	Interface Size: M16x1.0 Screw Thread; Interface Sealing Method: Sealing Ring End Face Seal; Colour Identification: Red		This connector is used for the server's original water outlet interface.

Elbow Connector	Interface size: M16X1.0 thread, matching FEP tube with outer diameter of 16mm; Interface sealing method: Sealing ring end face seal		This connector is used to connect the server's original power supply to the water cooling plate.
Quick Connector (Female)	Interface Size: Φ13 Pagoda Head, Matching Fep Tube With Inner Diameter 12mm And Outer Diameter 15mm; Colour Identification: Blue		This connector is designed to be used in conjunction with the server's original water inlet connector. The customer's cabinet water supply system must utilise this specific connector to ensure compatibility with our server's water inlet. Note: Customers must not use connectors of different specifications or brands to replace this connector, as forcing a mismatch with the original water inlet connector on the server may

			result in damage.
Quick Connector (Female)	Interface Size: Φ13 Pagoda Head, Matching Fep Tube With Inner Diameter 12mm And Outer Diameter 15mm; Colour Identification: Red		This connector is designed to be used in conjunction with the server's original water inlet connector. The customer's cabinet water supply system must utilise this specific connector to ensure compatibility with our server's water inlet. Note: Customers must not use connectors of different specifications or brands to replace this connector, as forcing a mismatch with the original water inlet connector on the server may result in damage.

Corrugated Tube	Interface Size: ϕ16*100mm		This hose is the original pipe used to connect the server's power supply to the water cooling plate.
Power Cord	L=360mm, Double-Ended With Plug, 4*2.5mm².		This power cord is used to connect the server power supply to the PDU on the server cabinet, with plugs at both ends designed to match the server's power interface (socket). **Note:** The PDU interface on the cabinet must be a socket that matches the plug on this power cord. This power cord is specifically designed for the server cabinet setup provided by our company.

7.Network Configuration

7.1 Server Configuration Device List

No.	Item	Qty	Usage	Remarks
1	Computer	1 Set	Server Configuration Operations	
2	Network Switches	1 Set	Configure servers and configure operations Computer network communications	The network switch is capable of connecting to the external network
3	Dhcp/Router	1 Set	Assign a dynamic IP address to the server upon initial power-up.	The default setting of the server is DHCP to obtain a dynamic IP address.

7.2 Server Network Environment

The factory default for the server is to obtain a dynamic IP through DHCP, so a DHCP server must be configured in the network, or the router must enable the DHCP dynamic IP address service.

8. Data Configuration

8.1 Query the Dynamic IP Address Assigned to the Server

Connect the computer to the same network segment as the server, use the Sealminer management tool to detect, and click "Detect" to open the IP detection window

Click "Start" on the window to start detection as seen in the figure below.

(Note: The mining pool address, miner name, and password in the figure below are SEALMINER Demo examples. For actual operations, please refer to your own mining pool address, miner name, and password.)

Reporting IP method: After starting the mining machine, press and hold the IP Report button on the mining machine for 5 seconds as seen in the figure below. Wait for a few seconds or until the current device IP is displayed on the software (Note: the management tool PC and the mining machine must be in the same LAN).

Check the acquired IP and MAC addresses reported by the server in the Sealminer Tool software.

Note:

(1) If all lights on the server control panel are off after powering on, verify

that the power cord is securely and correctly connected.

(2) If the indicator light on the right side of the server control panel is on, but the network port light is off or the green light does not flash, check the functionality of the switch, ensure the network cable connection is secure, and confirm the quality of the network cable.

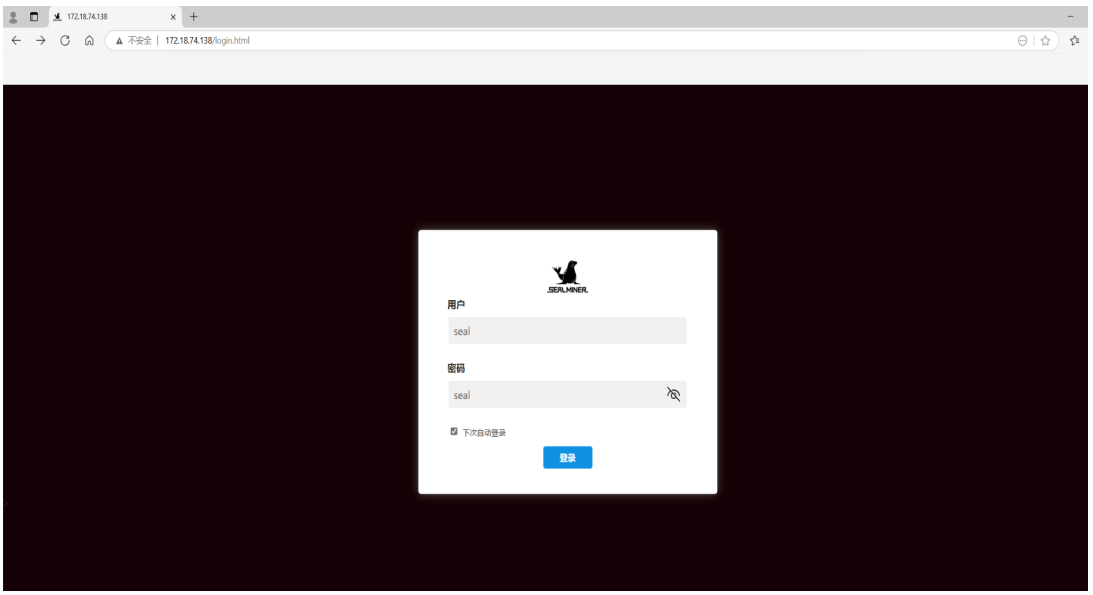
(3) The computer running the Sealminer Tool software and the server must be on the same network segment. Otherwise, the software may not receive the broadcast message sent by the server, preventing it from querying the IP address and MAC address information reported by the server's IP Report button.

(4) If the computer and server are in the same network segment and the DHCP service is enabled in the network, but the Sealminer management tool does not query the server IP after pressing the server IP Report button. Press and hold the Reset button on the server panel for more than 5s to restore the factory default configuration, then power off the server and restart it. After the server starts normally, press the IP Report button for 5s to detect the server IP address.

8.2 Mining pool & miner data

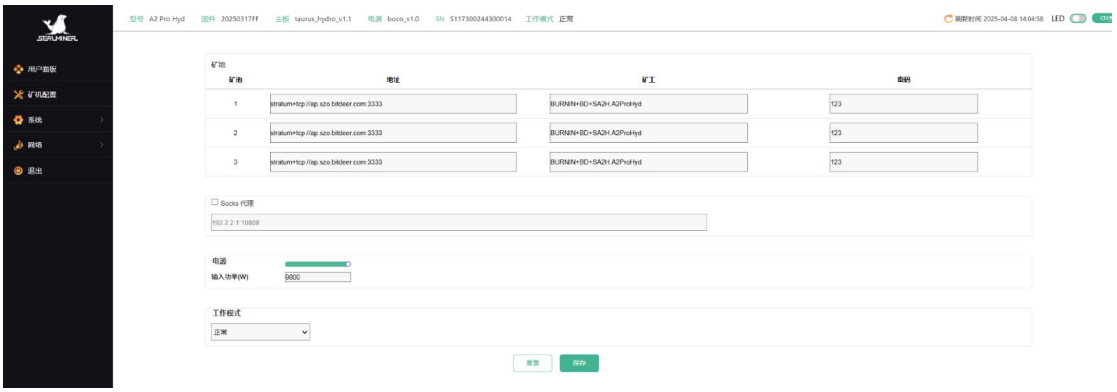
(1) Log into the webpage

Account: seal, Password: seal



(2) In the mining machine configuration interface, modify the mining pool

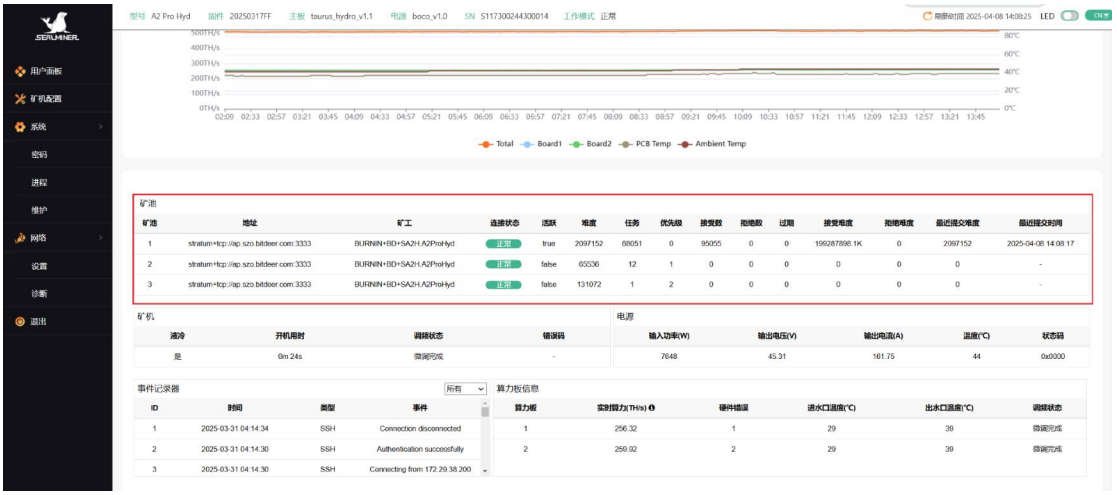
address and miner name. After making the changes, click "Save" below. (Note: The mining pool address, miner name, and password in the figure below are SEALMINER Demo examples. For actual operations, please refer to your own mining pool address, miner name, and password.)



Configuration Update Confirmation: Changes to the pool configuration will take effect immediately without requiring a restart of the Miner program or the mining machine.

(3) Verify Configuration Changes

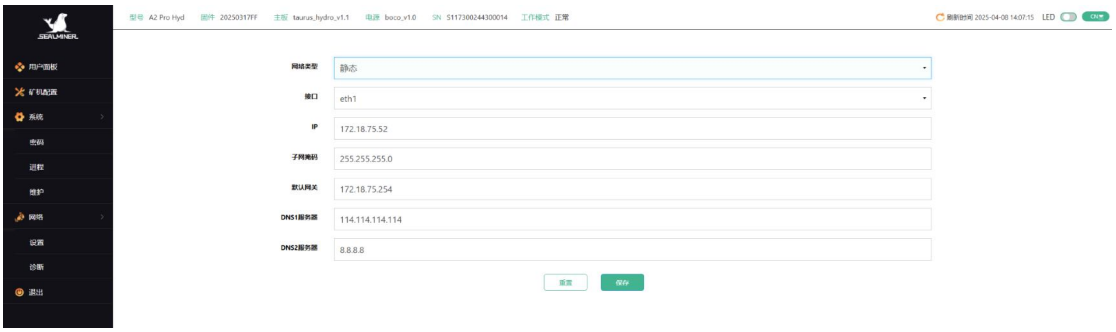
To ensure that the configuration modifications have been applied, go to the User Panel interface and verify that the updated mining pool and miner data are correctly reflected. (Note: The mining pool address, miner name, and password in the figure below are SEALMINER Demo examples. For actual operations, please refer to your own mining pool address, miner name, and password.)



8.3 Configuring a static IP address for the server

(1) Log into the web page

(2) On the Network->Settings page, select "Static" in the Network Type option, change the IP address, mask, gateway, and DNS address to the actual address planned for the mine, and click "Save".



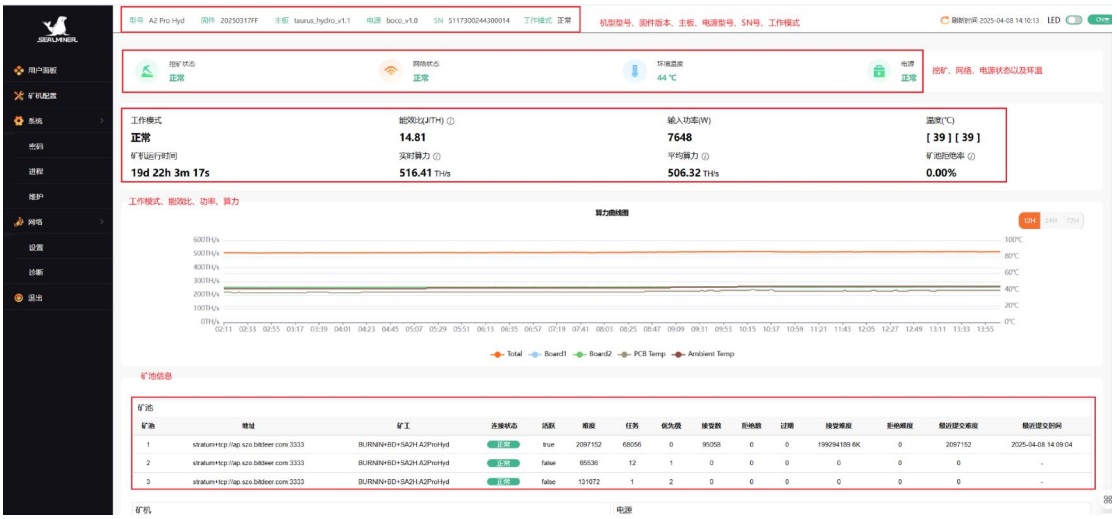
Note: After saving the configuration, use the newly set static IP address to log in to the server. Failure to do so will result in the page displaying "Loading" indefinitely until it fails to load.

9.Server Operation Status Check

After connecting the server to the network, log in to the server to review its operational status.

(1) In the server interface, select the "Overview" option to access the Miner running status page.

(2) Review the server's overall computing power, connected mining pool, individual board computing power, single board temperature, and other relevant performance metrics. (Note: The mining pool address, miner name, and password in the figure below are SEALMINER Demo examples. For actual operations, please refer to your own mining pool address, miner name, and password.)



10.Batch Configuration

The Sealminer Tool software can be used to perform server batch data configuration, status monitoring, and firmware upgrades. For detailed operations, please refer to the "Sealminer Tool Operation Guide".

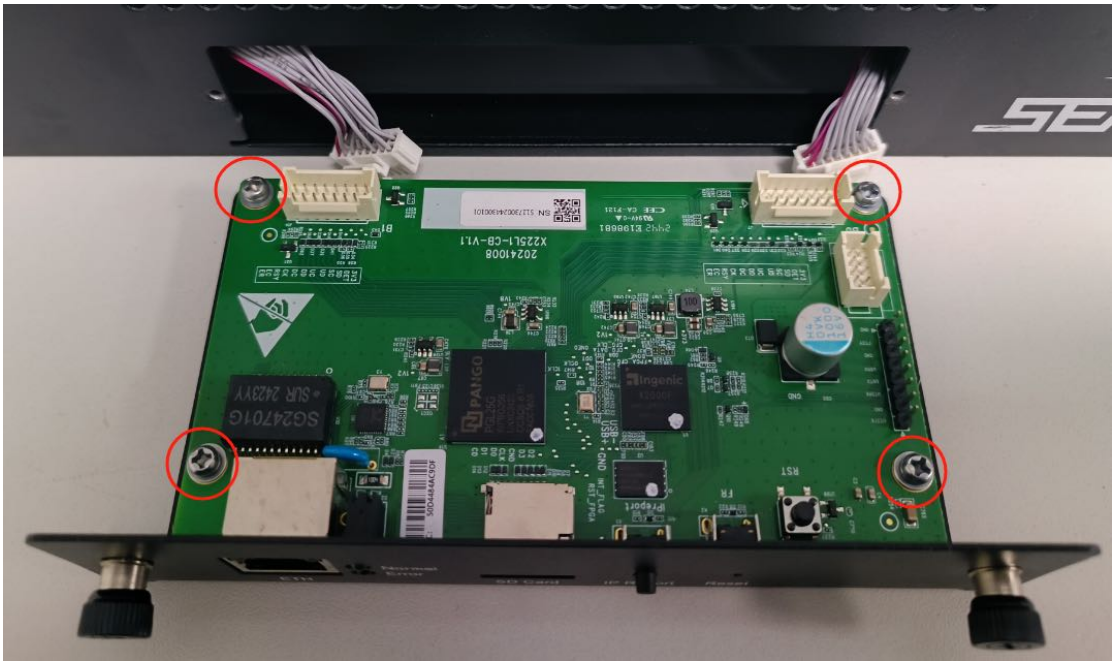
11.Disassembly and installation

11.1 Removing the Control Board

(1) Firstly, turn off the power, and then loosen the two cover screws on the control panel, and then pull out the board.

(2) Unplug the three cables as seen in the figure below.

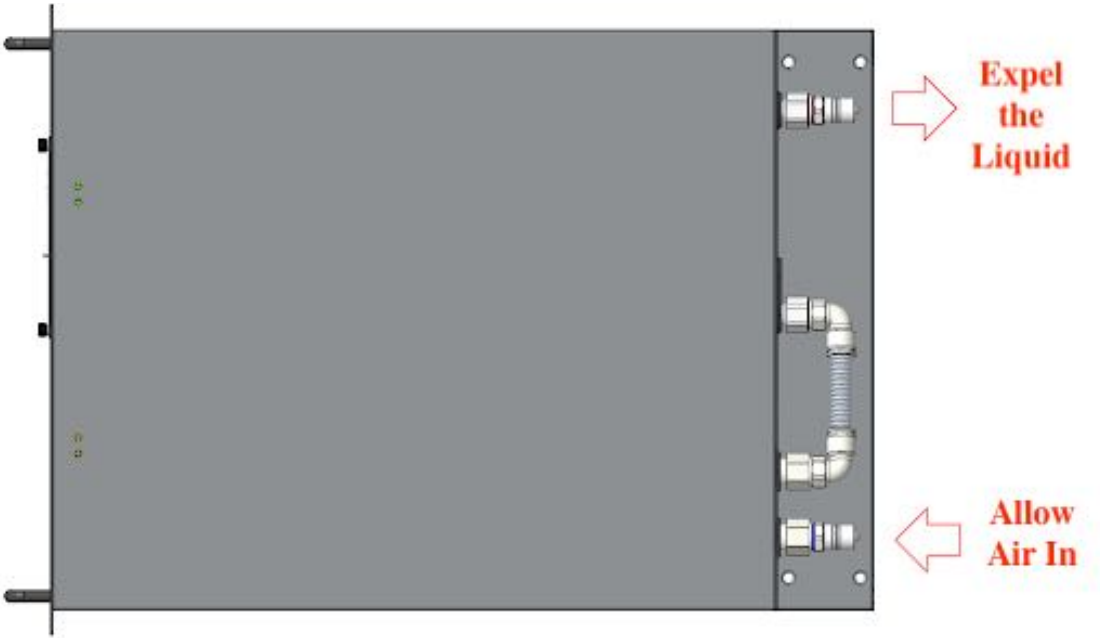
(3) Remove the 4 screws on the control board as seen in the figure below.



11.2 Disassembling the Hash Board

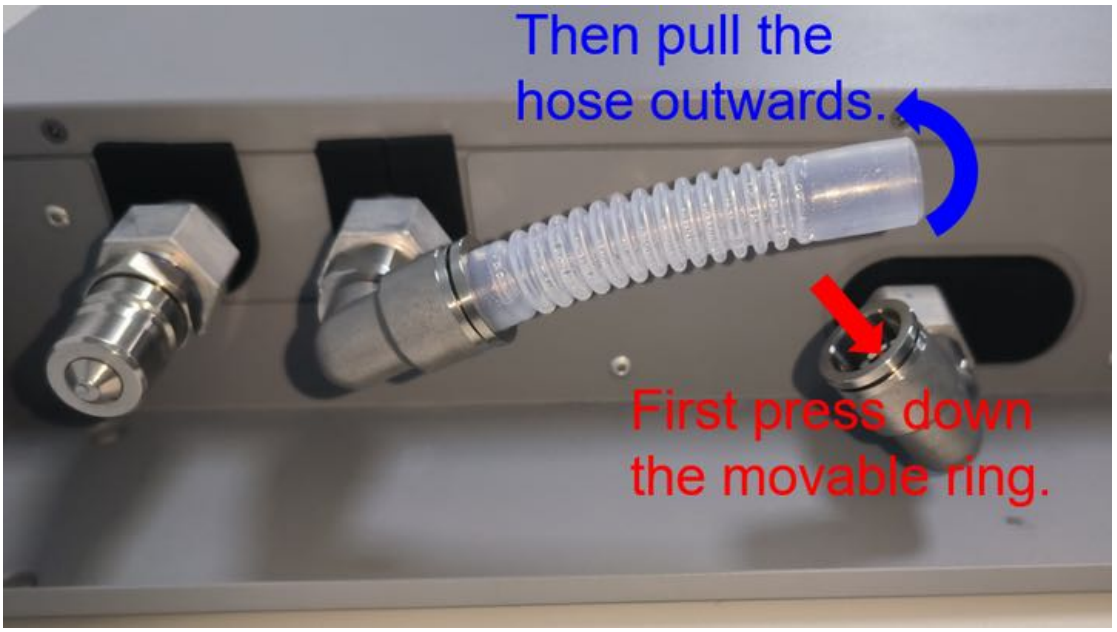
(1) First, power off the server and remove it from the cabinet.

(2) Drain the coolant from the server, refer to the figure below or section 4.3 for instructions on draining the coolant.

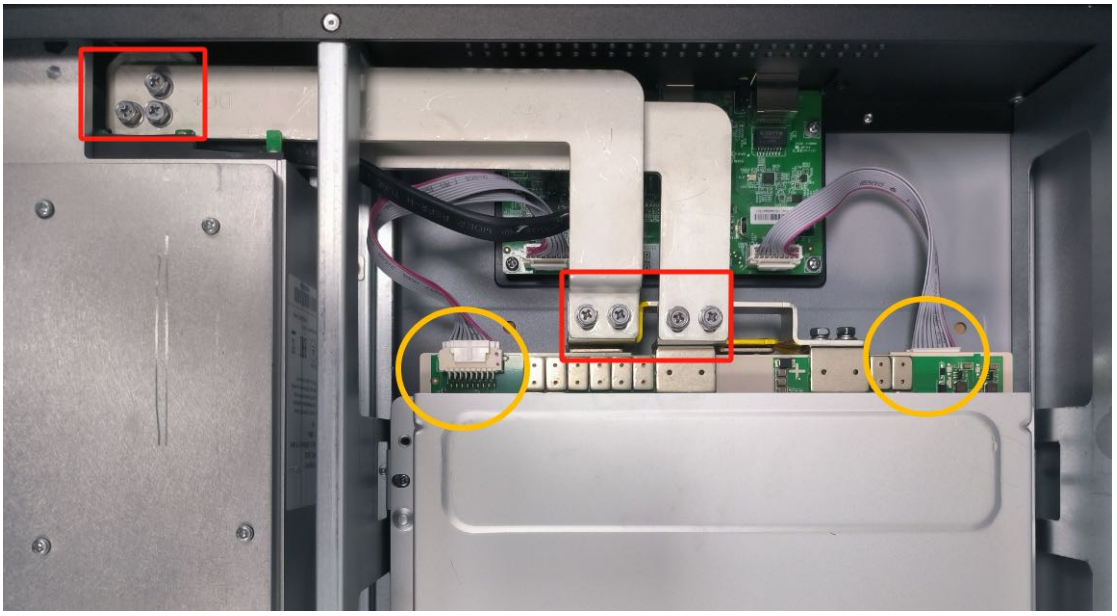


(3) Use a tool to press the water inlet or outlet quick-connect fitting to release the pressure inside the server.

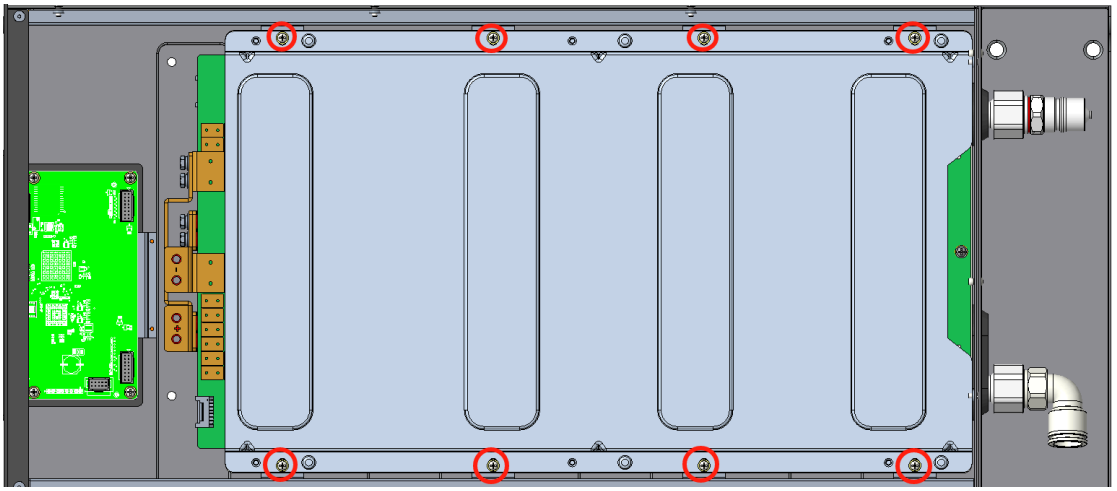
(4) Remove the corrugated hose as seen in the figure below. Press the movable ring of the quick-connect connector inwards, and then pull the corrugated hose out.



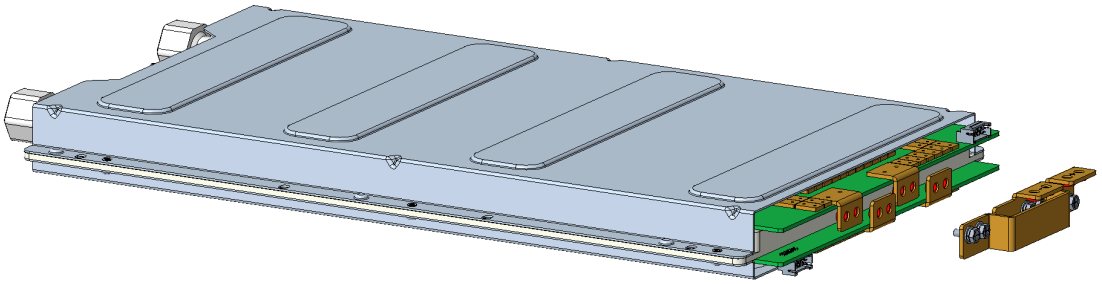
(5) After removing the server cover, remove the screws on the copper bus bars and cables connecting to the hash board.



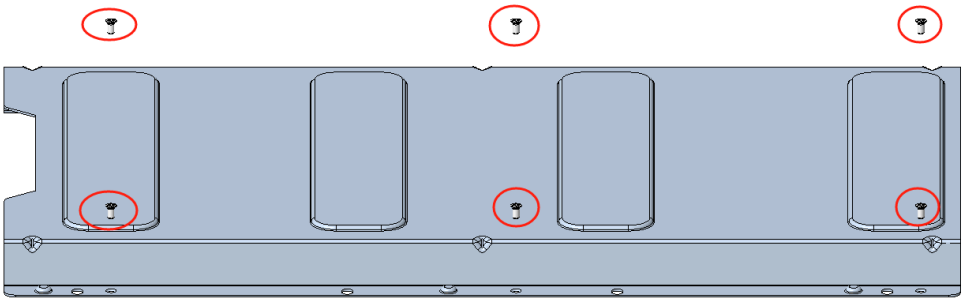
(6) Remove the 8 screws on both ends of the water cooling plate to remove the entire water cooling plate.

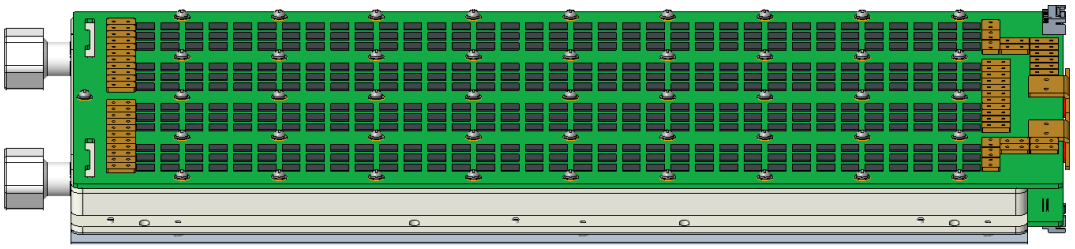


(7) Remove the copper busbars connecting the two hash boards as shown in the figure below.

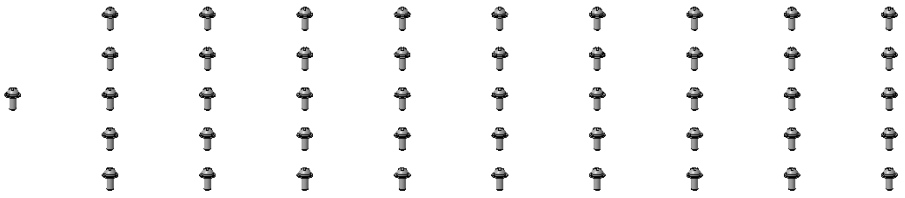


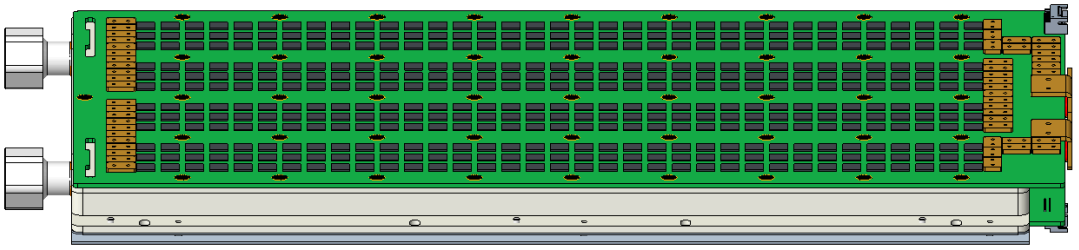
(8) Remove the 6 screws on the hash board protective cover and remove the cover.





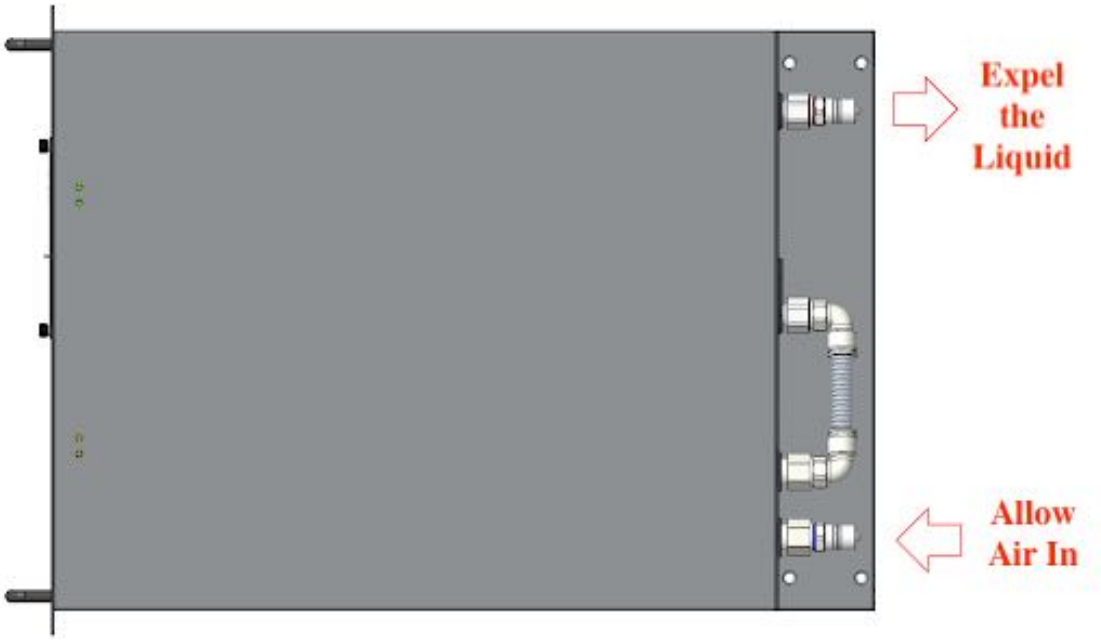
(9) Remove the screws the hash board as shown in the figure below to remove the hash board.





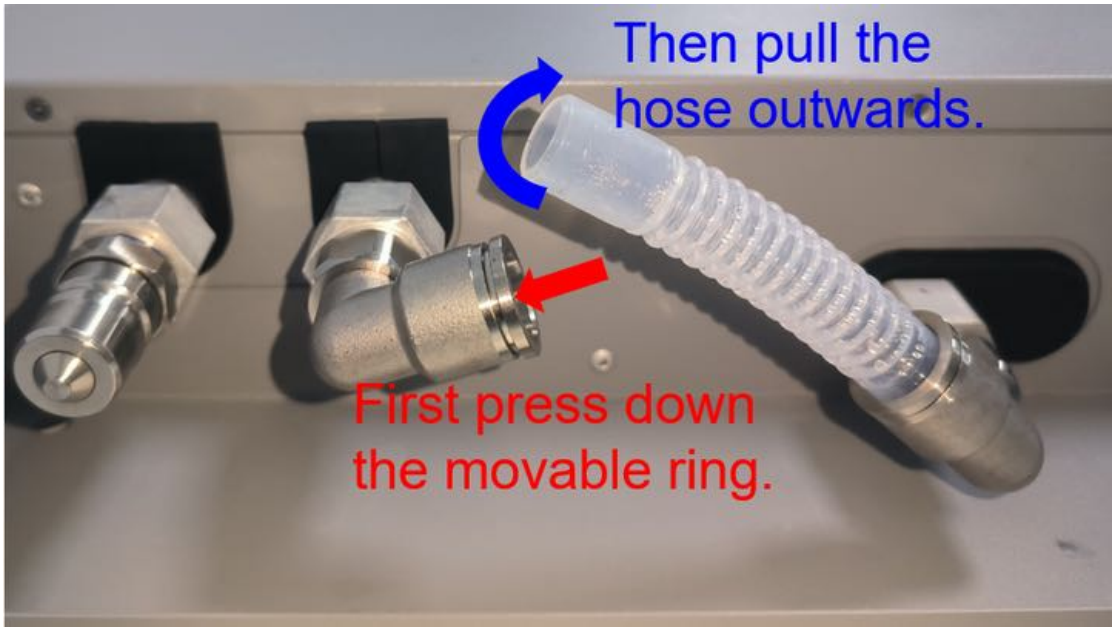
11.3 Removing the Power Supply

(1) Drain all of the coolant in the server.

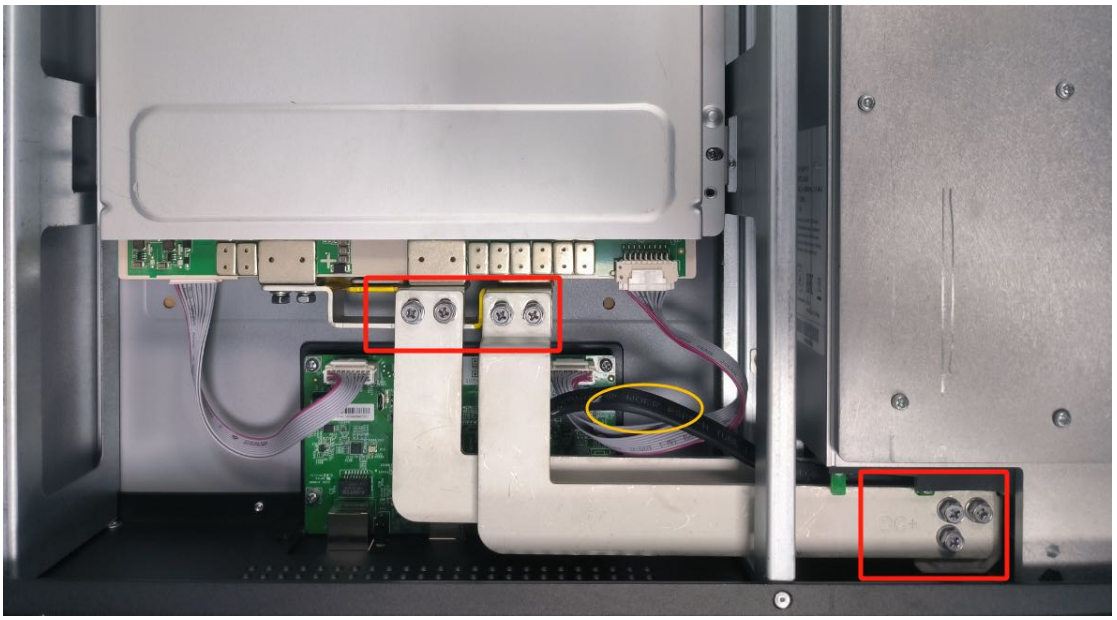


(2) Use a tool to press the water inlet or outlet quick-connect fitting to release the pressure inside the server.

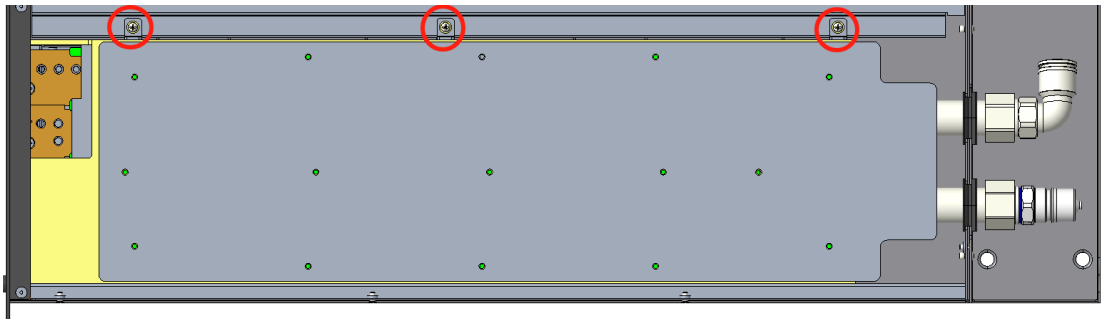
(3) Remove the corrugated hose as seen in the figure below. Press the movable ring of the quick-connect connector inwards, and then pull the corrugated hose out.

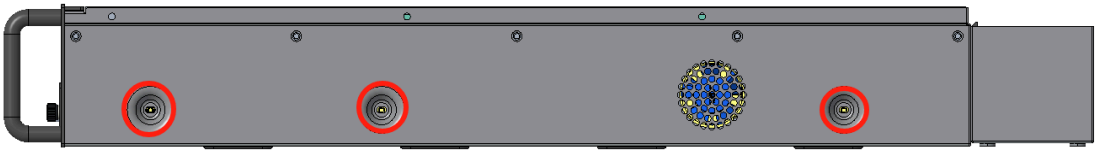


(4) After opening the server cover, remove the screws on the copper bus and unplug thecable as shown in the figure below.



(5) Remove the 6 screws on both sides of the power supply to remove the power supply as shown in the two figures below.





12. After-Sales Service

At Bitdeer, prioritising user experience is our primary objective. We actively seek customer feedback to enhance our services and are dedicated to assisting customers with their issues. Bitdeer offers a 1-year warranty on A2-Hydro products, including free repair services within the warranty coverage. By making a purchase, you agree to our warranty terms. However, please note that we will not provide repairs for the following situations or failures:

1. Damage resulting from failure to install, use, maintain, or service the machine according to the requirements outlined in the official documents.
2. Unauthorised disassembly, modification, assembly, or repair without official written or electronic authorization, leading to damage to the product.
3. Damage or loss caused by mishandling, misuse, abuse, improper operation, incorrect installation, or maintenance and storage that do not comply with regulations.
4. Product damage arising from operating the mining machine in environments that do not meet the specified requirements, including but not limited to high humidity, corrosive environments, electrical surges, extreme temperatures, abnormal voltage or current (including surges, impacts, and instability), excessively low or high AC voltage, excessive water inlet pressure, and improper use resulting in ice formation and deformation within the water-cooled product pipeline.
5. Damage to the entire machine, the panel, or components due to crushing, breaking, burning, or falling, resulting from improper operation or similar issues.
6. Product damage caused by overvoltage, undervoltage, or leakage.
7. Damage or loss resulting from unforeseen natural disasters, including but not limited to floods, fires, earthquakes, tsunamis, and lightning strikes.
8. Disassembly or modifications made by anyone other than us or our authorised service agencies.
9. Product failure or damage resulting from the use of accessories, parts, or components, such as power supplies, that are not manufactured by

us or our authorised agencies and do not meet our specified parameters.

10. Failure or damage resulting from the use of unauthorised firmware or drivers, including but not limited to unauthorised overclocking firmware.

11. Altered, defaced, or removed SN labels.

12. Use of non-original or mixed boards: if some or all of the computing boards, control boards, or power supplies are not original to the machine or if there is any situation preventing us from verifying the authenticity of these components.

13. Situations not caused by our company that make it impossible for us to determine whether the product is still under warranty.

Due to the specific regulatory requirements for water-cooling products concerning system environment, media, machine voltage, temperature, flow rate, and other factors, in addition to the general warranty exclusions mentioned above, the following conditions also void our product warranty for water-cooling products:

1. Failure to equip the piping system with a constant pressure tank and a mechanical pressure relief valve. If the water inlet pressure exceeds 350 kPa, causing deformation of the cold plate and damage to the product.

2. Use of coolant that does not meet the specified requirements, leading to corrosion, blockage, or other damage to system components.

3. As the product cold plate is made of aluminium alloy, corrosion or blockage of the cold plate or joints is possible due to the presence of metals or materials prone to electrochemical corrosion (e.g., copper, cast iron, carbon steel) in system components.

4. Inadequate filter mesh causing particulate impurities to enter the system, leading to blockage of the cold plate or joints and resultant damage.

5. Damage to system components or leakage of the liquid medium if the cooling system components have a temperature resistance lower than 85°C.

6. Failure to thoroughly clean and filter the system pipelines with deionized water (conductivity ≤ 5μS/cm) before connecting the cabinet

to the cooling system. The cleaning process should not exceed 8 hours, and cleaning water should not remain in the system overnight. After cleaning, deionized water must be completely drained before injecting coolant for circulation. Incomplete drainage of deionized water may affect the coolant's performance and parameters. Excessive impurities left in the system can cause corrosion and blockage of the cold plate or joints, resulting in product damage.

7. Improper insertion of the quick connector, which can lead to water leakage and failure of the server's over-temperature protection, causing damage to the product.

8. Lack of an exhaust device and an automatic refilling device in the pipeline system. Air mixed into the circulation system can cause the water pump to operate with gas, leading to potential damage. This can also result in overheating, burning of the server, or reduced computing power, thus damaging the product.

9. Condensation on the server: When the server is not in operation, a rise in ambient temperature from a low to a high level may lead to condensation if the server cannot adjust to the temperature change. To prevent damage, use methods such as sunlight to heat and dry the server. Failure to address condensation promptly may result in product damage.

10. Cooling water drainage: Within 2 hours of shutting down the server, when the server's inlet and outlet are disconnected from the cooling system (i.e., when the server is not circulating water), it is crucial to drain the cooling water inside the server to avoid damage to the cold plate. Neglecting this step may lead to product damage.

11. Legal Information: This warranty provides specific legal rights, and may also have additional legal rights that vary by country. Bitdeer reserves the right to interpret this warranty policy.

13.After-sales warranty Fee terms

1. If your product is deemed non-repairable, or if you opt not to repair or return a scrapped or mixed-board product, you will be responsible for the round-trip shipping costs associated with the repair order. Additionally, for products requiring repair, you will be responsible for the shipping costs to send the product to our designated address, while we will cover the shipping costs to send the repaired or replaced product back to your designated address. We do not cover any other costs, such as tariffs.

2. Please ensure that the product is sent to our designated address via a prepaid postage service. We cannot accept items sent with unpaid postage or to non-designated addresses (including logistics pick-up points), and any consequences of these errors will be borne by you.

3. The repaired or replaced product will be shipped according to the delivery information you or your designated contact provided in the work order. If the provided delivery information is incorrect or incomplete, you will be responsible for any additional costs incurred.

4. In the event of a Dead on Arrival (DOA) situation or secondary repair where the product is non-repairable or not eligible for free repair, you may apply for a freight subsidy after sending the product to us by post. The subsidy amount will not exceed the official logistics fee standard (insurance costs are the customer's responsibility). To qualify, you must provide us with a valid receipt for the shipping costs. The freight receipt must not be forged, altered, smeared, or tampered with in any way, and it must clearly show the total freight amount, which must align with the official logistics fee standard. If the receipt does not meet these requirements, we reserve the right to deny part or all of your freight subsidy request.

5. Please ensure that products eligible for a freight subsidy are mailed separately. If you send a package that includes both products eligible for a subsidy and those that are not, we will not be able to calculate the freight for the eligible items individually, and therefore, we will not issue any subsidy for that package.

6. The risk of damage or loss during the return process transfers to you once the product is handed over to the logistics company. If any damage or loss occurs during transit, you will be responsible for resolving any disputes directly with the logistics provider.

7. Any matters not covered in this clause shall be handled in accordance with the relevant regulations of Bitdeer. Bitdeer reserves the final right of interpretation of this clause.

A2 系列水冷服务器

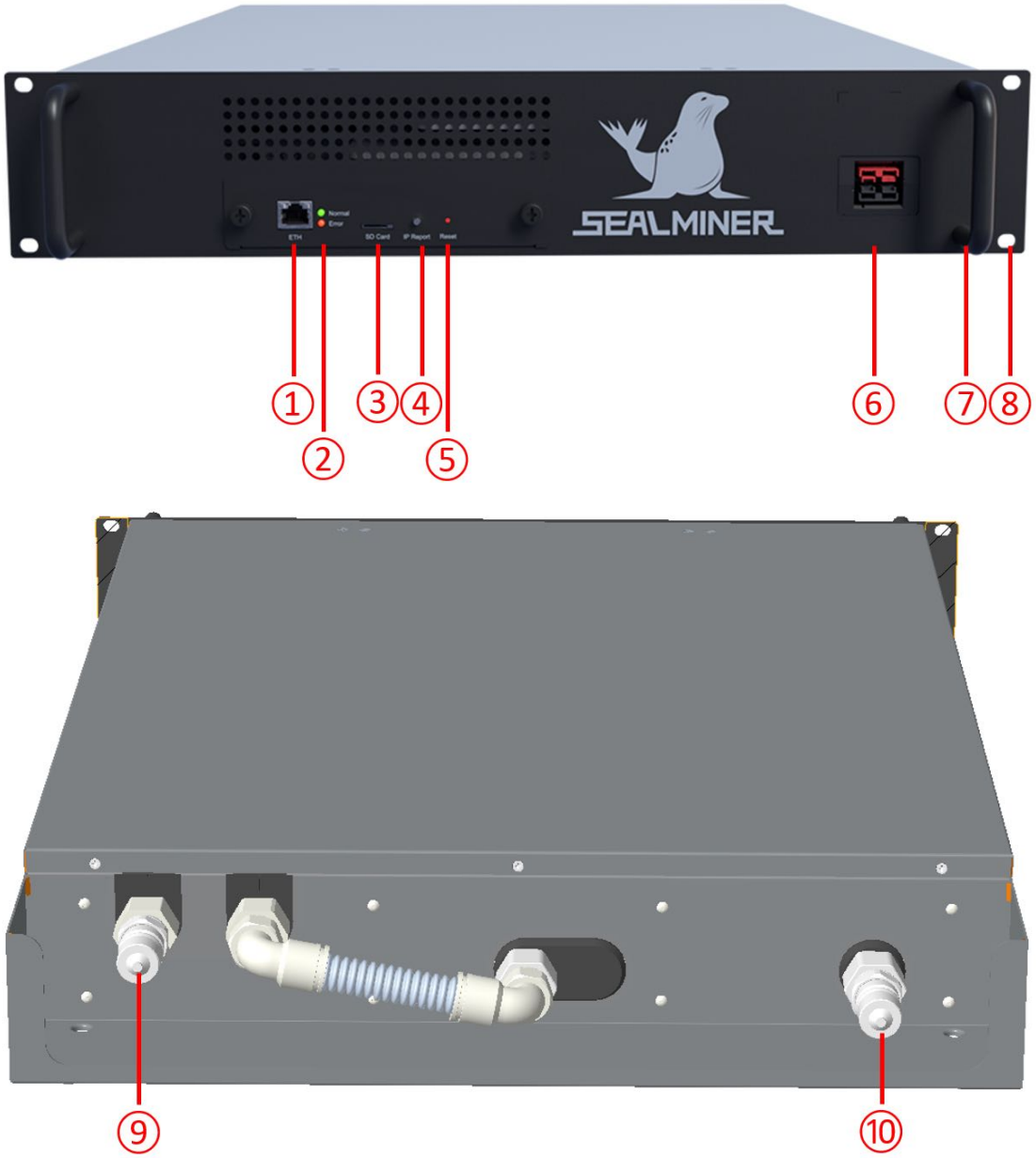
操作指导书

2025/04/02

www.bitdeer.com

目录

1.产品简介



①以太网接口 ②指示灯 ③SD卡槽 ④寻找IP按键 ⑤复位按键 ⑥电源接口 ⑦把手 ⑧固定孔 ⑨进水口(蓝色标识) ⑩出水口(红色标识).

2.产品参数与环境参数

表1 产品参数

类别	项目	指标参数
电源	电源模块	AC380V~480V，3W+接地，输入10KW
物理参数	外形尺寸，宽*深*高	482*665*86mm
	装箱尺寸，宽*深*高	567*787*248mm
	颜色	前面板：黑色 外壳：灰色
	重量	净重：20.5kg 含包装材料重量：23kg
	冷却液容量（单台服务器）	约0.7L
材质	服务器与冷却液接触部分	铝合金、不锈钢、EPDM、FEP

环境参数	冷却液温度	1、工作温度（进水）： 20℃~55℃@normal模式； 20℃~45℃@high hash模式； 2、进液温度控制精度±2℃； 3、储运温度：-30~70℃（注：储运时请将服务器内的液体排空；若未排空，需保证服务器在液体冰点温度以上）
	冷却液流量	1、流量≥10.2L/min； 2、精度±10%； 3、10.2L/min　对应进出水温差接近10.5℃@normal模式，13.5℃@high hash模式
	冷却液压力	≤350kPa（注：压力过大时，会导致管道、接头、水冷板变形等引起冷却液泄露的风险 ）
	冷却液介质	专用冷却液：纯水（或蒸馏水）+专用缓蚀剂+防冻液（根据冰点选择配比）；注：(1)冷却液必须符合表3所列指标要求；(2)冷却液需要定期检测，检测指标及检测周期参考表4，当检测数据超出或低于检测指标时，其性能将不能满足要求，必须进行冷却液更换；(3)冷却液使用满一年后建议更换。

	冷却液循环系统	1、循环系统防锈防腐蚀，建议用不锈钢管路，禁止含铜； 2、液体介质的颗粒直径≤149 微米，即循环系统主路配置 100 目以上的过滤器；同时建议配置 10 微米级的旁滤过滤系统，过滤微小悬浮物； 3、在机柜连接散热系统之前，先使用去离子水（电导率≤5μS/cm）对系统管路进行多次循环清洗过滤，除去灰尘焊渣等杂质，清洗时间不易超过 8h，清洗水不得在系统中过夜；系统清洗后一定要将去离子水全部排空，然后注入冷却液进行循环使用（去离子水未完全排空时会影响冷却液各项指标参数） 4、系统部件耐温85℃以上； 5、系统设置3.5bar安全泄压阀； 6、系统设置定压膨胀罐。 注：服务器开机后冷却液温度上升时会引起压力上升。
	湿度	1、工作湿度:5%RH~85%RH(无冷凝)； 2、存储湿度:5%RH~90%RH(无冷凝)；

备注：上述冷却液的温度、流量参数指标是以纯水+专用缓蚀剂作为冷却液介质的要求；若冷却液介质采用纯水+专用缓蚀剂+防冻液，

其温度、流量的参数如表2所示。

表2 不同浓度的乙二醇或丙二醇防冻液+专用缓蚀剂温度流量参数

冷却液介质	20%乙二醇或20%丙二醇+专用缓蚀剂	30%乙二醇或30%丙二醇+专用缓蚀剂	40%乙二醇或40%丙二醇+专用缓蚀剂	50%乙二醇或50%丙二醇+专用缓蚀剂
冰点参考值	• -8.8℃（20%乙二醇）； • -7.4℃（20%丙二醇）；	• -15.7℃（30%乙二醇）； • -13.2℃（30%丙二醇）；	• -24.8℃（40%乙二醇）； • -21.5℃（40%丙二醇）；	• -37℃（50%乙二醇）； • -33.6℃（50%丙二醇）；
冷却液温度	• 进液温度：20℃~55℃@normal模式；20℃~44℃@high hash模式； • 进液温度精度：±2℃； • 储运温度：-30~70℃； • 注：储运2小时以上必须将设备内的冷却液排空。	• 进液温度：20℃~54℃@normal模式；20℃~43.5℃@high hash模式； • 进液温度精度：±2℃； • 储运温度：-30~70℃； • 注：储运2小时以上必须将设备内的冷却液排空。	• 进液温度：20℃~53℃@normal模式；20℃~43℃@high hash模式； • 进液温度精度：±2℃； • 储运温度：-30~70℃； • 注：储运2小时以上必须将设备内的冷却液排空。	• 进液温度：20℃~52℃@normal模式；20℃~42.5℃@high hash模式； • 进液温度精度：±2℃； • 储运温度：-30~70℃； • 注：储运2小时以上必须将设备内的冷却液排空。
冷却液流量	• 额定流量：≥10.7L/min； • 流量精度：±10%； • 此流量对应进出水温差接近10.5℃@normal模式，13.5℃@high hash模式。	• 额定流量：≥11.0L/min； • 流量精度：±10%； • 此流量对应进出水温差接近10.5℃@normal模式，13.5℃@high	• 额定流量：≥11.3L/min； • 流量精度：±10%； • 此流量对应进出水温差接近10.5℃@normal模式，13.5℃@high	• 额定流量：≥11.7L/min； • 流量精度：±10%； • 此流量对应进出水温差接近10.5℃@normal模式，13.5℃@high

		hash模式。	hash模式。	hash模式。

表3 冷却液初始指标要求

项目	单位	初始指标
pH（20℃）	/	7.0~8.7
电导率（20℃）	μS/cm	TBD
菌落总数（微生物）	CFU/mL	<100
硫酸盐	mg/L	<10
氯化物	mg/L	<20
硫化物	mg/L	＜1
总硬度(CaCO3)	mg/L	<1
铜离子	mg/L	<0.5
铁离子	mg/L	<0.5
铝离子	mg/L	<0.5
储备碱度	mL	2.9~3
外观	/	无沉淀澄清透亮液体

缓蚀剂	/	有效成分100%

表4 冷却液检测指标要求

项目 （注：带*为必检项目）	单位	检测指标	检测周期	参考检测仪器/方法
pH（20℃）*		7.5~9.5	每2月	PH 计/ASTM E70
电导率（20℃）*	μS/cm	增量≤1500	每2月	电导率仪/GB/T11446.4
菌落总数（微生物）*	CFU/mL	≤1000	每6月	3M 细菌培养皿 SN/T 1897
硫酸盐	mg/L	≤10	每6月	离子色谱/ HJ84
氯化物	mg/L	≤20	每6月	离子色谱/ HJ84
硫化物	mg/L	≤1	每6月	离子色谱/ HJ84
总硬度(CaCO3)	mg/L	≤20	每6月	GB/T 6909
铜离子*	mg/L	增量≤0.1	每6月	电感耦合等离子光谱/HJ 776
铁离子*	mg/L	增量≤0.1	每6月	电感耦合等离子光谱/HJ 776

铝离子*	mg/L	增量≤0.1	每6月	电感耦合等离子光谱/HJ 776
储备碱度	mL	≥2.3	每2月	自动电位滴定仪/ASTM D11221
外观*		无沉淀澄清透亮液体	每2月	目测
缓蚀剂*		≥有效成分 80%	每6月	紫外分光光度计、离子色谱、气相色谱质谱联用仪等

3.冷却系统设计要求

3.1 服务器进液温度控制

(1)控制要求:进液温度恒定控制，控制精度±2℃;

(2)控制范围:20℃~55℃@normal模式(纯水+专用缓蚀剂作为冷却液介质）;20℃~45℃@high hash模式(纯水+专用缓蚀剂作为冷却液介质）;其他冷却液的温度参考表2;

注意:若进液温度波动过大，易导致机器温度波动过大，机器工作不稳定;若进液温度过高，易导致机器过温，机器无法正常工作。

3.2 服务器进液流量控制

(1)控制要求:进液流量恒定控制，控制精度±10%;

(2)控制范围:单台机器流量≥10.2L/min@纯水+专用缓蚀剂作为冷却液介质，10.2L/min对应进出液温差10.5℃@normal模式，13.5℃@high hash模式;其他冷却液的流量参考表2;

注意:若进液流量波动过大，易导致机器温度波动过大，机器工作不稳定;若液体流量偏低，易导致出液温度过高，机器无法正常工作。

3.3 服务器进水压力

(1)控制范围:液体压力≤350kPa;

注意:压力过大时，会导致管道、接头、水冷板变形等引起冷却液泄露的风险，进而导致机器损坏。

3.4 服务器冷却液介质

(1)介质:专用纯水(或蒸馏水)+专用缓蚀剂+防冻液(根据冰点选择配比);

注意:冷却液必须添加缓蚀剂，且冷却液满足表3各项指标，不达标需立即更换，否则易造成系统部件生锈腐蚀，冷板或接头等有腐蚀堵塞风险，可能会导致机器损坏。

(2)定期检测更换:冷却液需定期检测，检测周期及指标要求参考表4，不达标需立即更换。

3.5 循环散热系统

(1)管路:循环系统要考虑防锈防腐蚀，建议采用不锈钢管路，系统中禁止含铜;

注意:冷板采用铝质材质，系统若含铜会有电化学腐蚀，碳钢管焊口焊渣多，不易处理干净且容易生锈腐蚀，冷板或接头等有腐蚀堵塞风险，可能会导致机器损坏。

(2)过滤器:主路配置 100 目以上的过滤器;同时建议配置 10 微米级的旁滤过滤系统，过滤微小悬浮物;

注意:过滤器目数过低，系统大颗粒的杂质无法过滤到，冷板或接头等有堵塞风险，可能会导致机器损坏。

(3)循环泵:建议使用不锈钢泵，数量一用一备，提高系统可靠性;

注意:铸铁泵易生锈腐蚀，引起冷板或接头等有腐蚀堵塞风险，进一步会导致机器损坏。

(4)系统管路试压检漏:建议采用空压机进行管路气检，并采用肥皂泡法对管路的焊口密封性进行检测;

注意:若在冬天水检，则需要先对系统设备进行排水防冻，不易排干净的设备有冻坏风险。相比水检而言气检效率高，且在冬天检漏时省去对系统设备进行排水防冻的步骤。

(5)排气及排水阀:在局部高位安装自动排气阀，在局部低位安装排水阀。建议系统多处安装手动排气阀，可提升系统第一次注液效率。

(6)安全泄压阀:建议系统设置3.5bar安全泄压阀防止系统压力过高。

注意:开机运行前请确保已调整好泄压值;若系统无法泄压时导致服务器进水压力＞350kPa，可能会导致机器损坏。

(7)定压膨胀罐:建议系统设置定压膨胀罐用以防止系统压力波动;

注意：运行前请确保已调整好膨胀罐压力值，若定压膨胀罐无法工作时容易导致服务器进水压力＞350kPa，可能会导致机器损坏。

(8)系统部件耐温：≥85℃以上；

注意：若散热系统部件耐温低于 85℃，则易造成系统部件损坏甚至液体介质泄露，可能会导致机器损坏。

(9)清洗系统：在服务器上架前，需要对系统进行过滤清洗干净；

注意：a.在机柜连接散热系统之前，先使用去离子水（电导率≤5μS/cm）对系统管路进行多次循环清洗，过滤除去焊渣、灰尘等杂质，清洗时间不易超过8h且清洗水不得在系统中过夜；b.系统清洗后需将去离子水全部排空，再注入冷却液进行循环使用，否则去离子水未完全排空会影响冷却液各项指标参数；c.若系统中有过多残留杂质，容易引起冷板或接头等腐蚀堵塞的风险，可能会导致机器损坏。

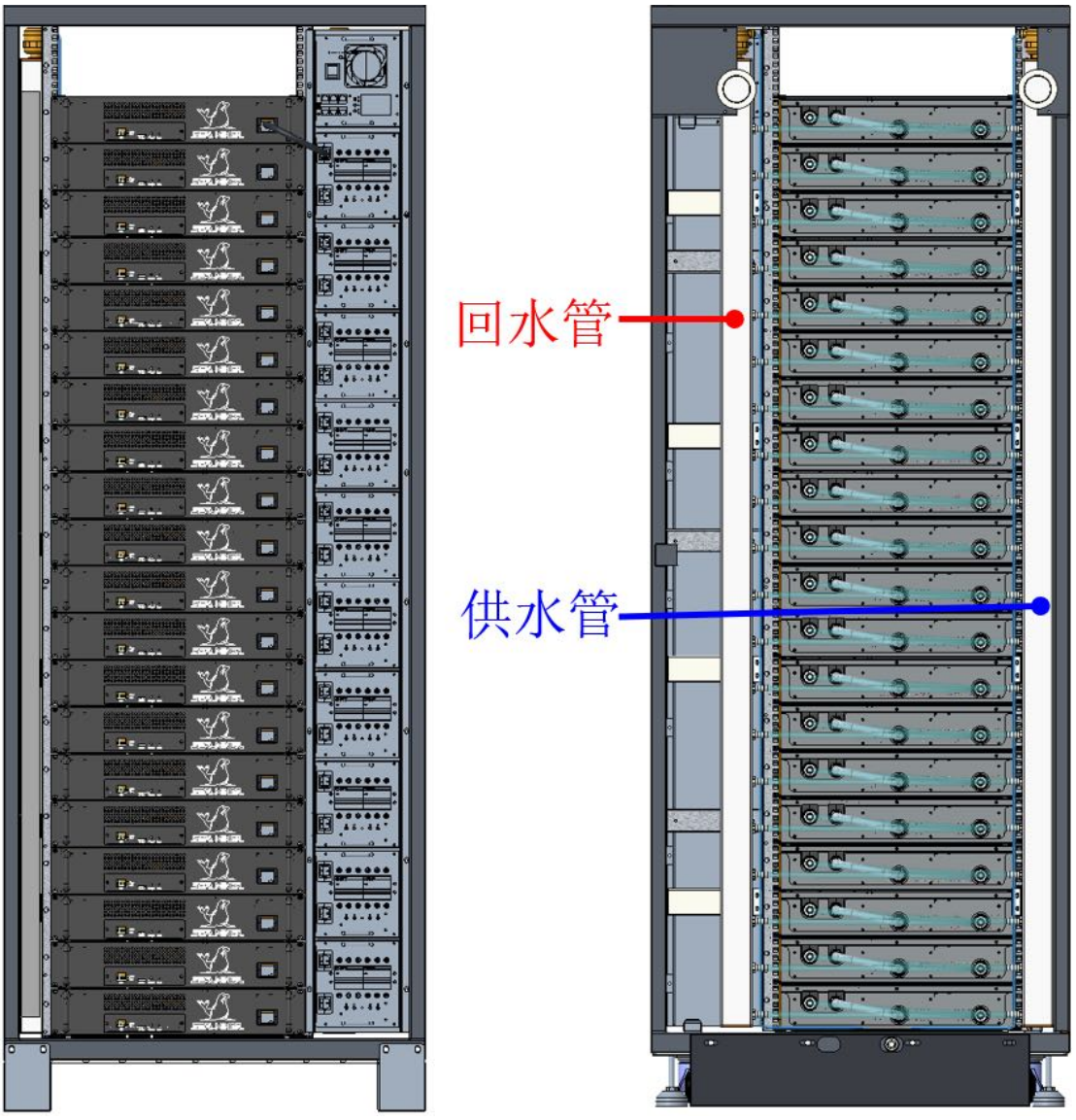
(10) 清洗服务器：在服务器上架前，需要对服务器进行清洗；

注意：a.在服务器上架之前，先使用去离子水（电导率≤5μS/cm）对服务器的流道进行多次循环清洗，过滤除去灰尘、残留液等杂质，清洗时间不易超过 8h且清洗水不得在服务器中过夜；b.服务器清洗后一定要将去离子水全部排空，然后注入冷却液进行循环使用，否则去离子水未完全排空时会影响冷却液各项指标参数；c.若服务器中有过多残留杂质，容易引起冷板或接头等腐蚀堵塞的风险，可能会导致机器损坏。

4.产品安装与操作说明

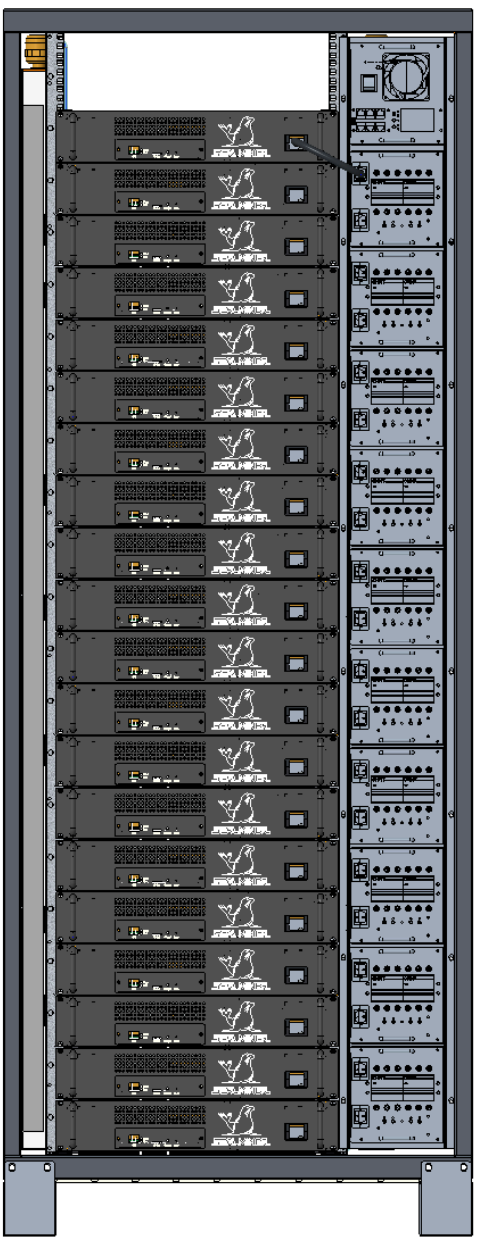
4.1 安装位置

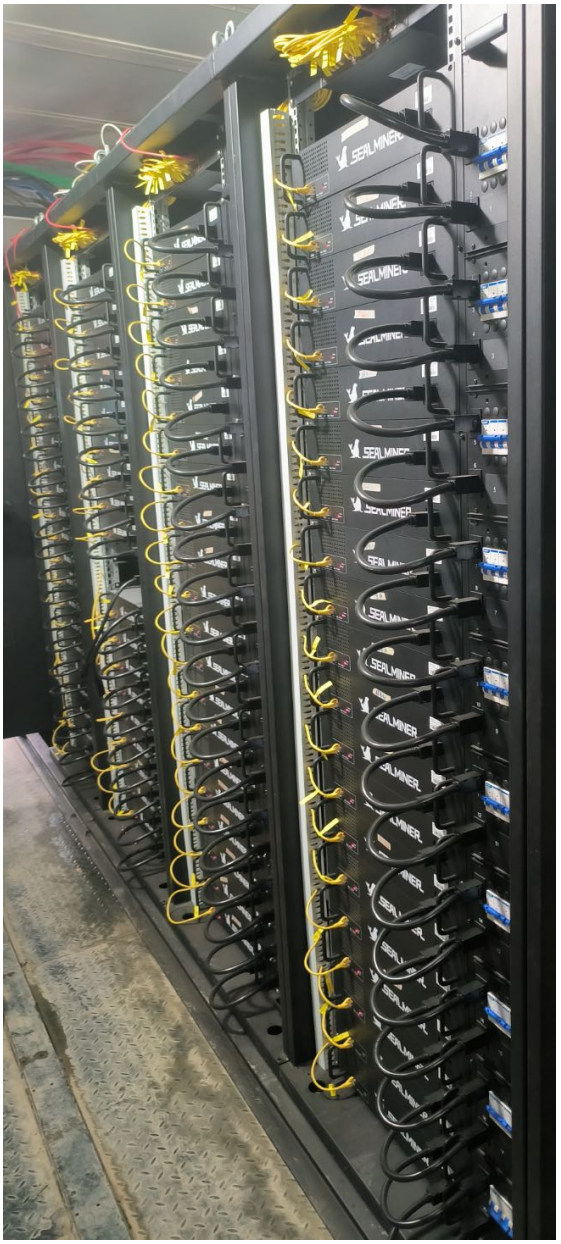
水冷服务器采用标准 2U 结构设计，安装在标准 19 英寸的水冷机柜上，服务器上架完成后的机柜正面及背面分别如下图所示。



4.2 上架步骤

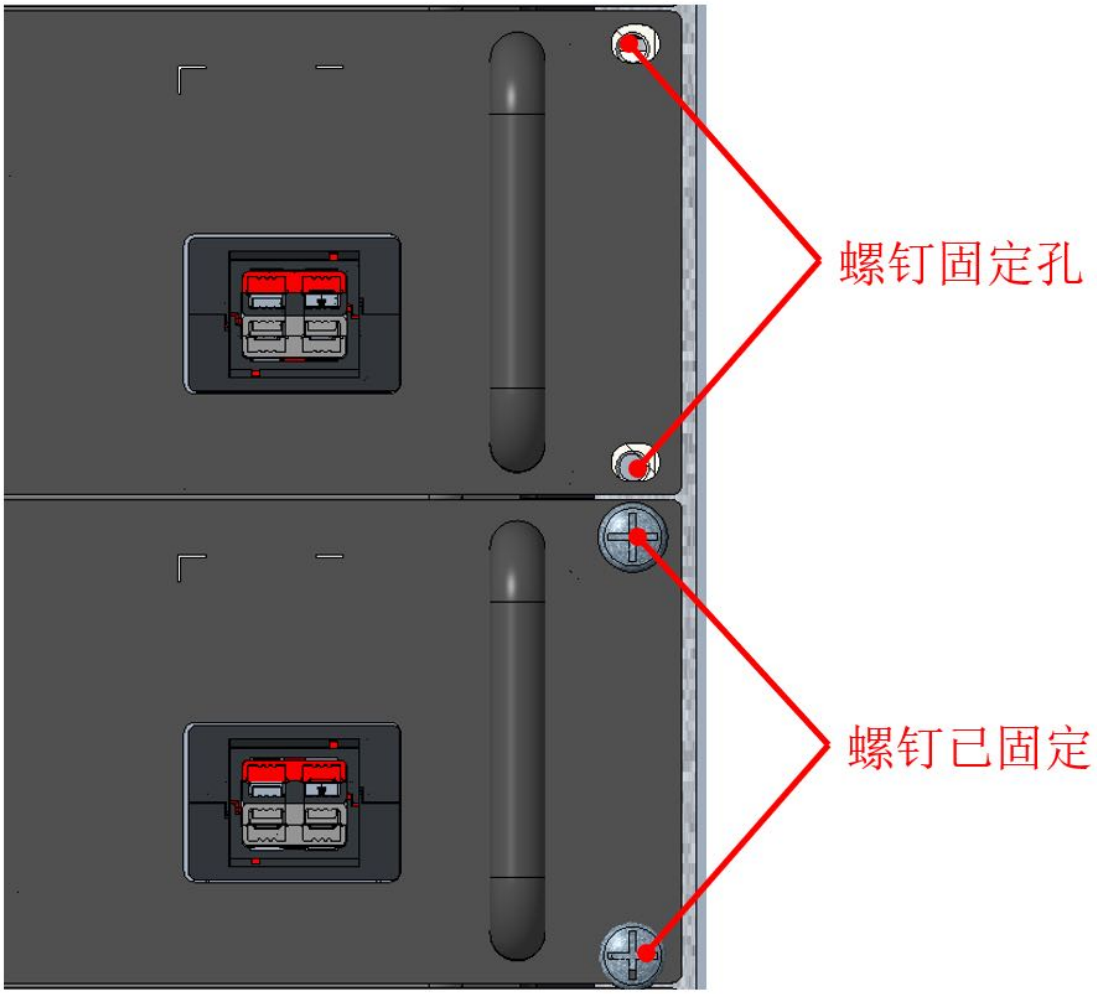
(1)将服务器沿着机位卡槽缓慢推入机柜，注意需要双人操作，20台服务器上满整机柜如下图所示；



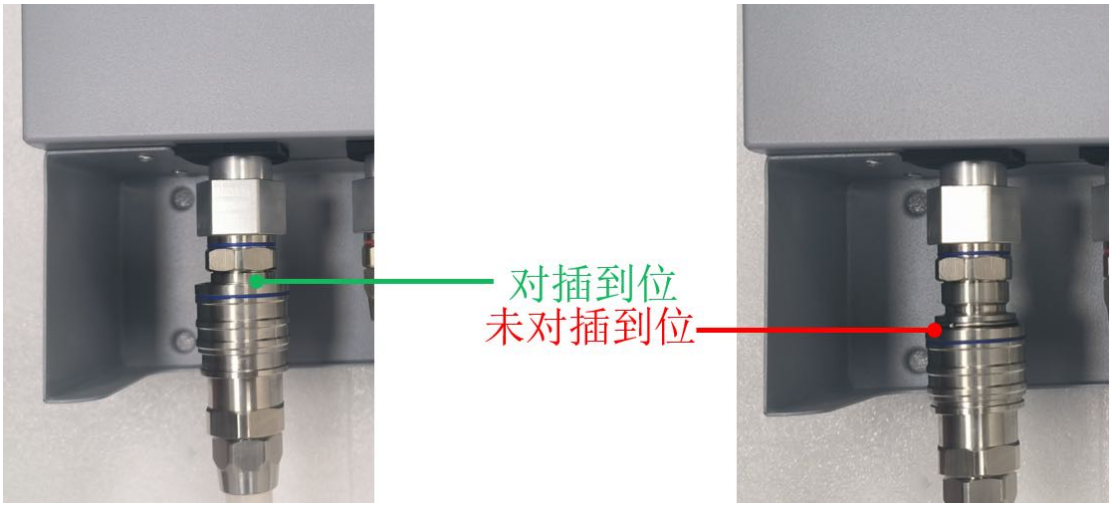


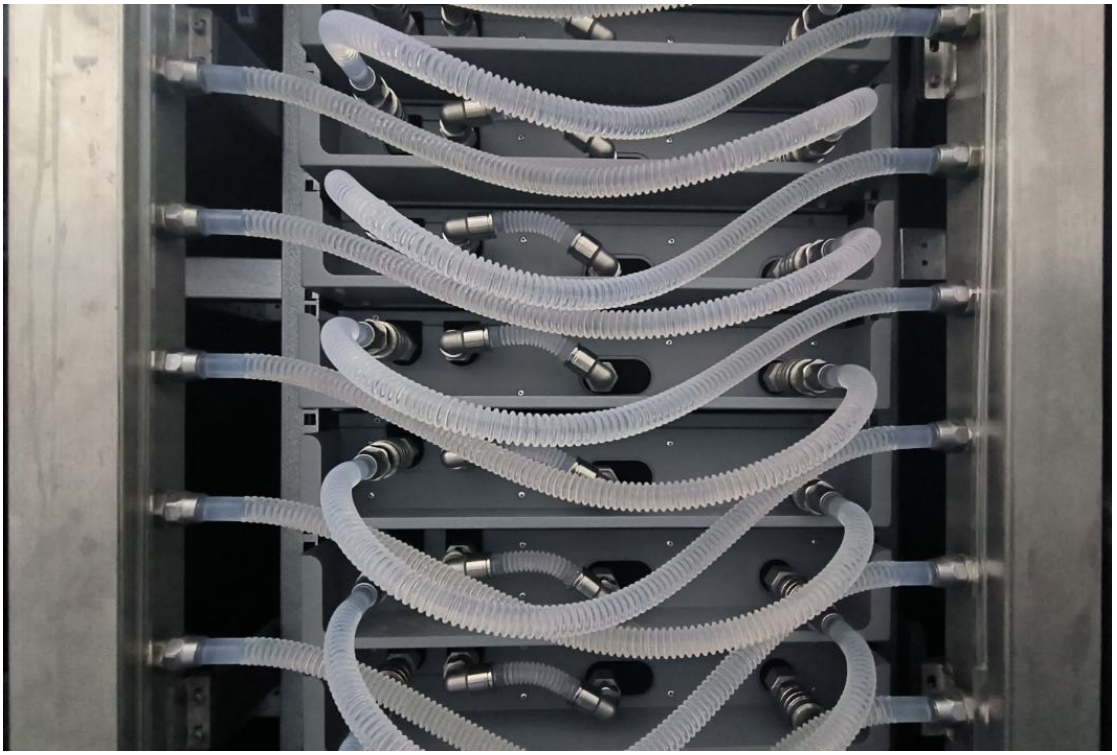
(2)通过螺钉将服务器前面板与机柜固定住(机柜带浮动螺母)，螺钉固定如下图所示；

注意:不建议机柜带服务器运输，机柜带服务器运输时一定要将前面板螺钉拧紧并固定，否则有可能导致机器跌落损坏。



(3)服务器插上进出水管，即先摘下接头保护帽，再将进出水管上快速接头母头与服务器上快速接头公头对接。注意插接到位，插接示例如下图所示，图示上方分别展示了插接到位与插接未到位两种情形，图示下方为插接完成后的示意图。





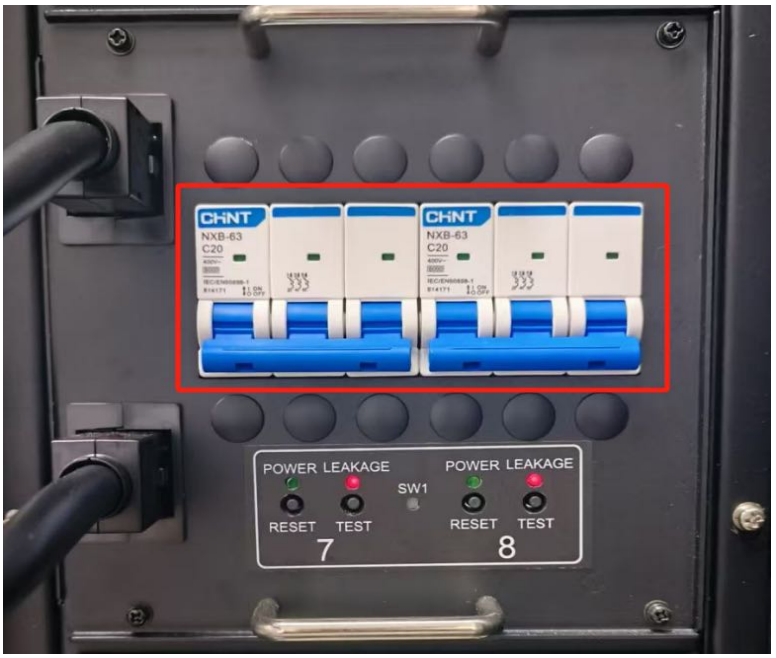
(4)接入网线和电源线，其中电源线采用原厂配置电源线，网线及电源线连接完成示例如下图所示；

(5)服务器上架完成，先通水循环一遍，检测有没有漏水等情况。若无异常，即可通网、通电开始运行。

注意：通水时需要将空气排空再上电，否则有可能导致服务器局部芯片过热、烧坏或算力影响等风险，可能会导致机器损坏。

4.3 下架步骤

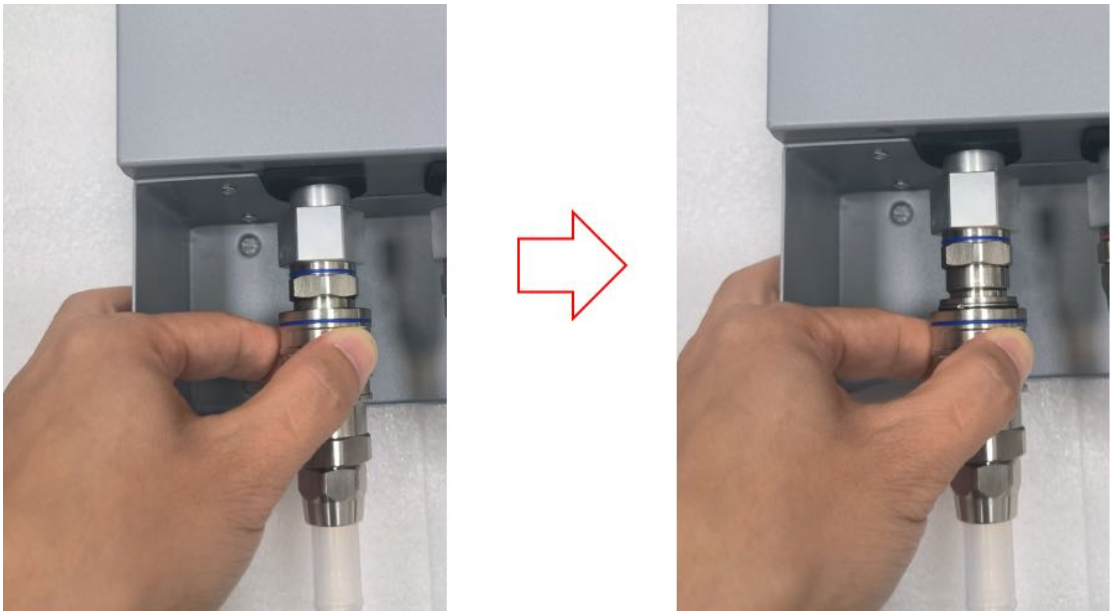
(1)将服务器关机，断开对应空开，如下图所示。



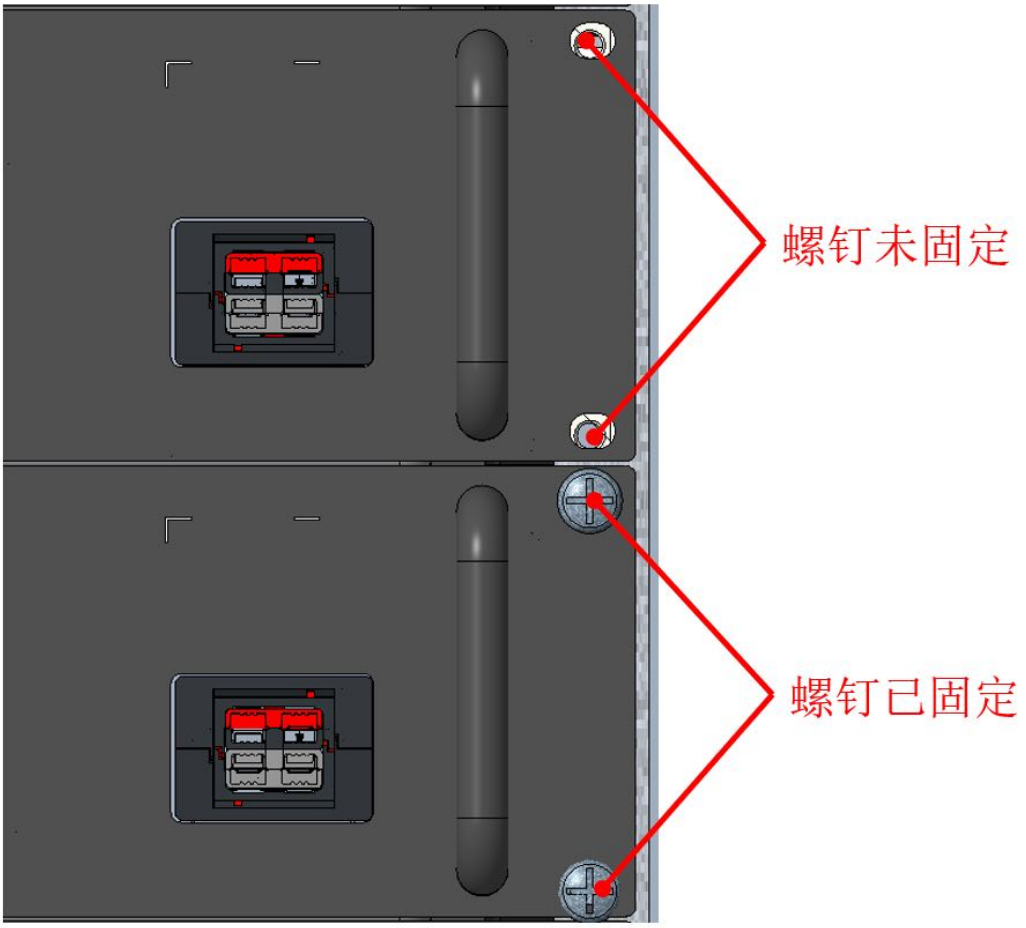
(2)拔开网线和电源线，如下图所示。

(3)断开服务器后方进出水快速接头，如下图所示，手握快速接头（母头）中间部位的活动环往后拉即可断开。

注意：需先断开进水接头再断开出水接头。

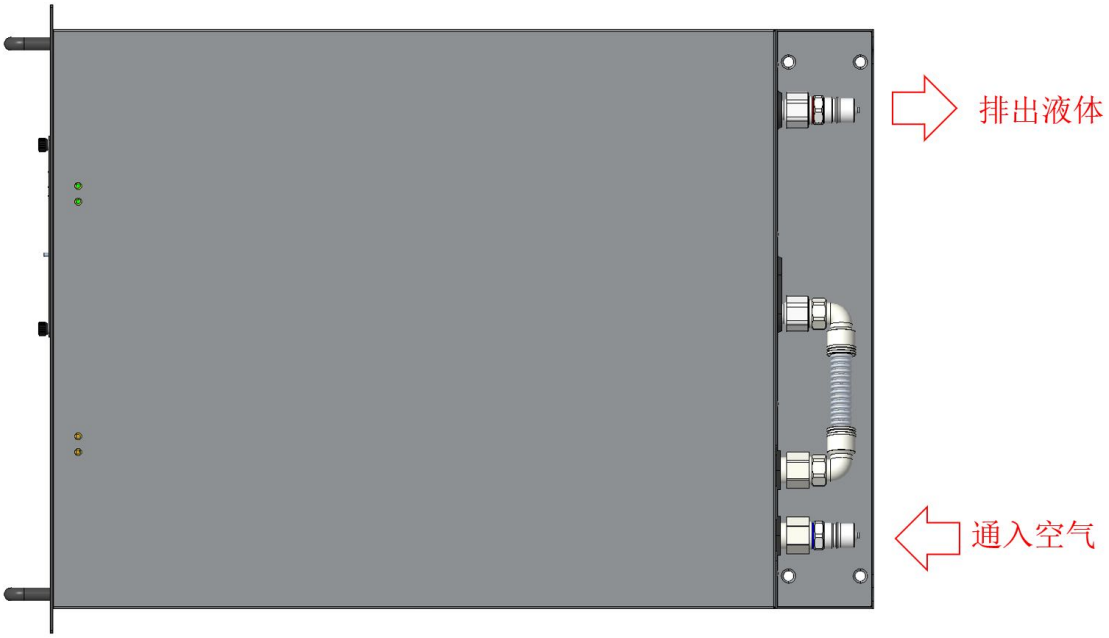


(4)将服务器前面板与机柜固定螺钉松开(机柜带浮动螺母)，如下图所示。



(5)取出服务器，建议双人操作，左右各一人，如下图所示。

(6)服务器排水。服务器下架之后，若储运 2 小时以上或环境温度低于冷却液冰点，则一定要将内部的液体排出来。排空服务器内部的液体，可使用两个快速接头母头分别连接两段水管，然后分别接到服务器的进出水口，其中一个接口通入具有一定压力的空气，通过气压将冷却液排出，如下图所示。



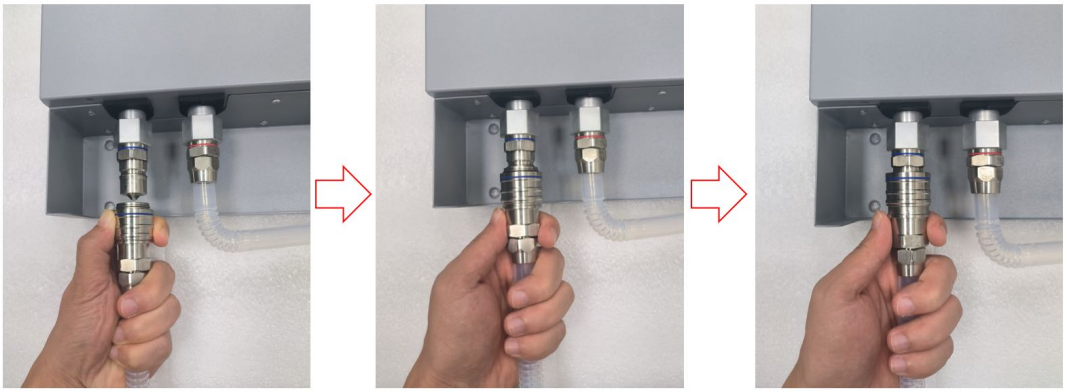
4.4 注意事项

(1)快速接头母头和电源线必须采用原厂的配件，否则可能会导致机器损坏。

(2)快速接头插拔如图示，正常插接后，公母头连通，液体可流通，且快速接头会自锁，拔开后，公母头双向截止，不会漏液。插接完成后可通过拔拉母头端软管的方式检查是否存在快速接头虚插情况；

备注:若虚插，服务器则会过温保护无法工作甚至损坏水冷板。

插接示意:手握快速接头(母头）的活动环向后拉，同时将整个快接头向前推到位，活动环自动复位表示已推到位。



①手握接头根部，将活动环后拉　②将整个接头向前插　③前插到位后，活动环自动复位

(3)若由于服务器上下电操作不当等情况会导致服务器内部压力过大，此时，快速接头会由于服务器内部压力过高而无法完成对插。此情况下，需要使用工具按压进水口或出水口快插接头的活动部分，以释放服务器内部的压力。

(4)电源线拔开时请按住接头上下两侧的弹片。


弹片
ANEN

5.产品开关机注意事项

5.1 开机前检查事项

(1)检查散热系统:服务器开机上电前，需确认整体的散热循环系统是否正常工作，确认管路内空气是否已排空以及系统有无泄漏。

注意:若系统内存在空气，会影响散热能力且有循环泵损坏的风险。若存在系统泄漏或微渗，其附近的服务器散热不良有损坏风险，且长时间会影响整体散热系统运行，需重点排查管道连接处、服务器的进出水口接头与中间连接管路。

(2)检查充水状态:服务器上架开机前，需通水循环将服务器内空气排净并保证水冷板充满水。建议一次上架一台，补水完成后换下一台。

注意:水冷服务器上架前水冷板通常都没有水，需要在管路系统中接通循环水，此时会有空气排进系统且引起管路系统缺水，因此管路系统需要配备排气装置和自动补液装置。在系统运行状态，如果短时间同时接入多台不含冷却液的机器，会引起系统短暂缺水且空气排入系统中未及时排出还会对循环泵有损坏风险，还有可能导致其他服务器局部芯片过热、烧坏或算力影响等风险。

(3)检查服务器在开机前是否有凝露情况。

注意:服务器在没有工作时，当周围环境温度从较低温度升到较高温度，服务器本身升温速度跟不上环境温度变化则可能会出现凝露。若出现凝露，可通过太阳照射、通热水等其他加热方式将服务器升温烘干处理。

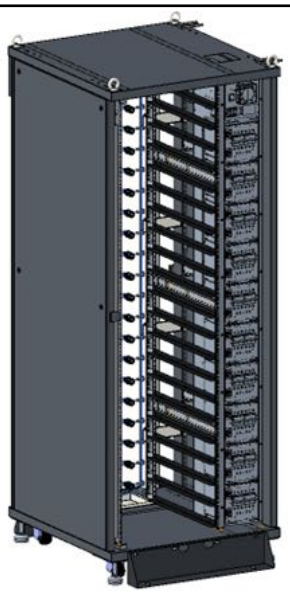
5.2 开机时注意事项

在同一个散热系统中，若所有服务器同时开机，为避免散热系统水温调控失控导致服务器高温保护，建议所有服务器开机前先将散热系统的散热能力开满(即系统控温的部件满载运行，如风机、循环泵、电动阀等全开)，待服务器运行接近额定功率后，散热系统再进入水温自动控制调节状态。

5.3 关机注意事项

服务器关机后，将其进出水口与散热系统断开时(即服务器没有通水循环)，一定要将服务器内部的冷却水排空，防止水冷板损坏。

6. 产品配件规格

名称	规格	图示	备注
水冷机柜	有效空间:43U 外形尺寸(高 X 宽 X 深):2100*800*850mm 供回水侧接口尺寸:G3/8螺纹		机柜集成了交换机、供回水分集水器及PDU，可供20台 2U 服务器同时工作
快速接头(公头)	接口尺寸: M16X1.0 螺纹; 接口密封方式: 密封圈端面密封; 颜色标识:蓝色		此接头为服务器原装进水接口使用的接头
快速接头(公头)	接口尺寸: M16X1.0 螺纹; 接口密封方式: 密封圈端面密封; 颜色标识:红色		此接头为服务器原装出水接口使用的接头

快插弯头	接口尺寸: M16X1.0 螺纹，匹配外径16mm的FEP管； 接口密封方式: 密封圈端面密封		此接头为服务器原装电源与水冷板连接接头
快速接头(母头)	接口尺寸: φ13宝塔头，匹配内径12mm外径15mm的 FEP管； 颜色标识:蓝色		此接头与服务器原装进水接头匹配使用。客户自备的机柜供水侧需要采用该接头与我司服务器进水接头匹配。 **注意:客户不能采用其他规格或其他品牌的接头替换此接头与服务器上原装的进水接头强制匹配使用。**

快速接头(母头)	接口尺寸: φ13宝塔头，匹配内径12mm外径15mm 的 FEP管; 颜色标识:红色		此接头与服务器原装出水接头匹配使用。客户自备的机柜回水侧需要采用该接头与我司服务器进水接头匹配。 **注意:客户不能采用其他规格或其他品牌的接头替换此接头与服务器上原装的出水接头强制匹配使用。**
波纹管	接口尺寸: φ16*100mm		此软管为服务器原装连接电源与水冷板的管道

电源线	L=360mm，双头 SA2-30插头， 4*2.5mm²;		此电源线用于连接服务器电源与服务器机柜上的PDU,电源线两端的插头与服务器电源接口（插座）匹配。 **注意：机柜上PDU 的接口需要为与此电源线插头匹配的插座接口。此电源线适用于我司提供的服务器机柜使用场景。**

7.网络配置

7.1 服务器配置设备列表

序号	工具名称	数量	用途	备注
1	计算机	1 台	配置服务器操作	
2	网络交换机	1 台	配置服务器和配置操作计算机网络通讯	网络交换机能连接外网
3	DHCP/路由器	1 台	为服务器初始上电时提供动态 IP 地址	服务器出厂时默认是 DHCP 获取动态 IP地 址

7.2 服务器网络环境

服务器出厂默认是DHCP获取动态IP，因此网络中必须配置有DHCP服务器，或路由器开启DHCP动态分配IP地址服务。

8. 数据配置

8.1 查询服务器获取的动态ip地址

电脑连上与服务器所在的同一网段网络，使用Sealminer管理工具探测，点击探测”打开IP探测窗口

点击窗口上的”开始”开始探测（注:下图中矿池地址，矿工名称以及密码为SEALMINER　Demo样例，实际操作以客户自己的矿池地址，矿工名称以及密码为准）

上报 IP 方法:启动矿机后，长按 5 秒矿机上的 IP Report 按钮，等待几秒软件上会显示出当前设备的IP(注意:管理工具的PC与矿机需在同一局域网内)。

在Sealminer管理工具查看服务器上报的动态获取的IP、MAC地址

注意：
(1)如果上电后服务器控制板面板的所有灯都不亮，请检查电源线连接是否可靠，连接是否正确。

(2)如果服务器控制板面板右边的指示灯亮，但网口灯不亮，或绿灯不闪，请检查交换机是否正常、网线连接是否可靠，网线质量是否有问题。

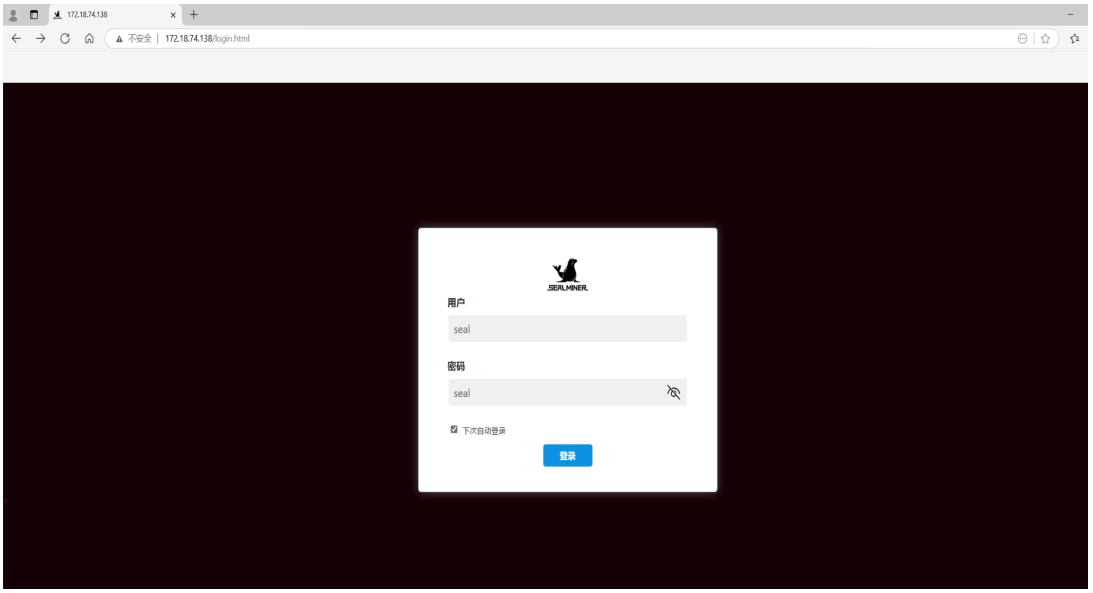
(3)运行Sealminer管理工具的电脑和服务器必须在同一个网段下，否则有可能软件接收不到服务器发出的广播报文，从而查询不到服务器IP Report按键上报的IP地址和 mac 地址信息。

(4)如果电脑和服务器在同一个网段下，并且网络中开启了dhcp服务，按服务器 IP Report 按键后Sealminer管理工具没有查询到服务器的 IP，长按服务器面板上的 Reset 按 键 5s 以上，恢复出厂默认配置， 再将服务器下电再上电重启，服务器正常启动后再按 IP Report按键5s检测服务器 IP 地址。

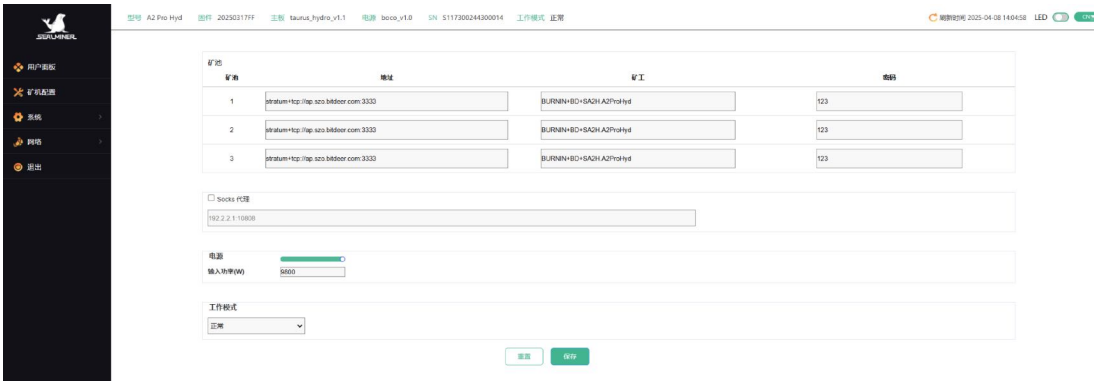
8.2 矿池&矿工数据

(1)登录web页面

账号:seal,密码:seal



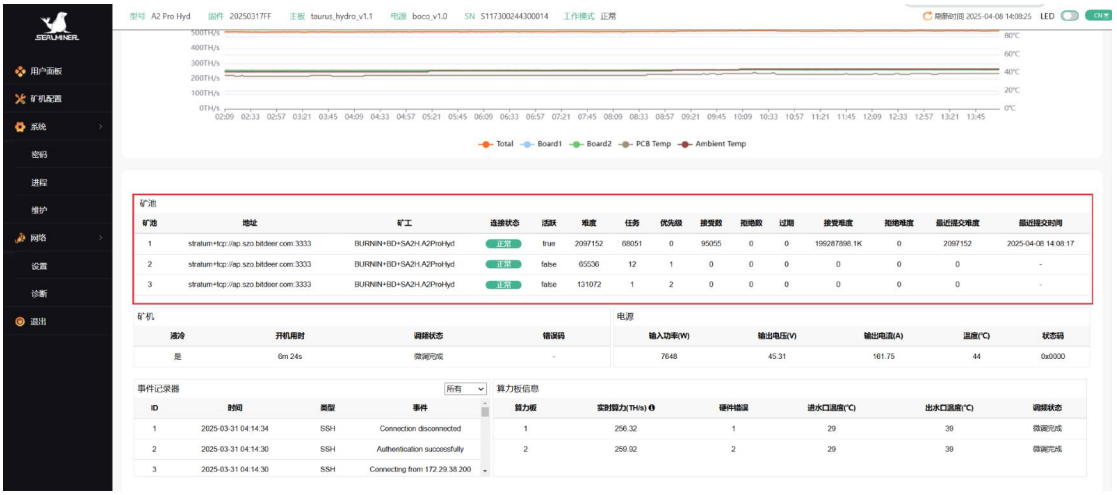
(2)在矿机配置界面中，修改矿池地址，矿工名称，修改完后，点击下面的”Save”，保存修改的配置。（注：下图中矿池地址，矿工名称以及密码为SEALMINER　Demo样例，实际操作以客户自己的矿池地址，矿工名称以及密码为准）



矿池配置修改后，立即生效，不需要重启Miner程序或者矿机。

(3)检查配置修改是否生效

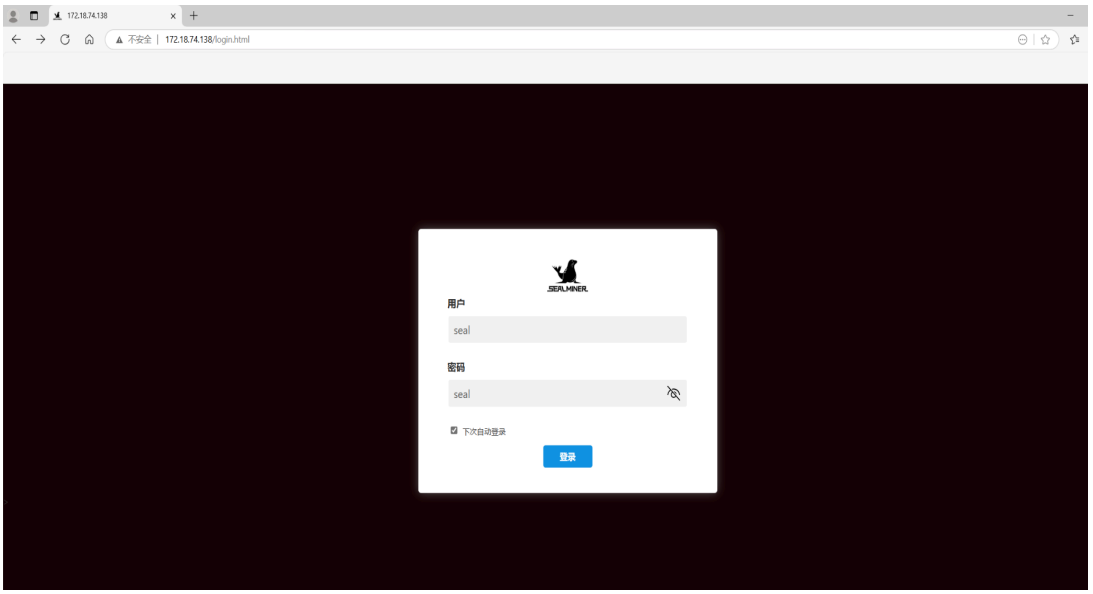
在用户面板界面，查看配置的矿池和矿工数据是否生效（注：下图中矿池地址，矿工名称以及密码为SEALMINER　Demo样例，实际操作以客户自己的矿池地址，矿工名称以及密码为准）



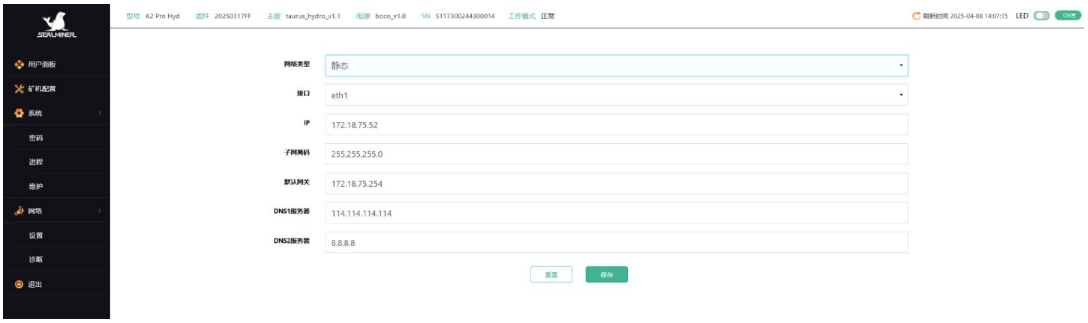
8.3 配置服务器静态IP地址

(1)登录web页面

账号：seal,密码：seal



(2)在网络->设置页面中，在网络类型选项中选择”静态”，将IP地址、掩码、网关、DNS地址修改为矿场实际规划的地址，点击”保存”保存配置。



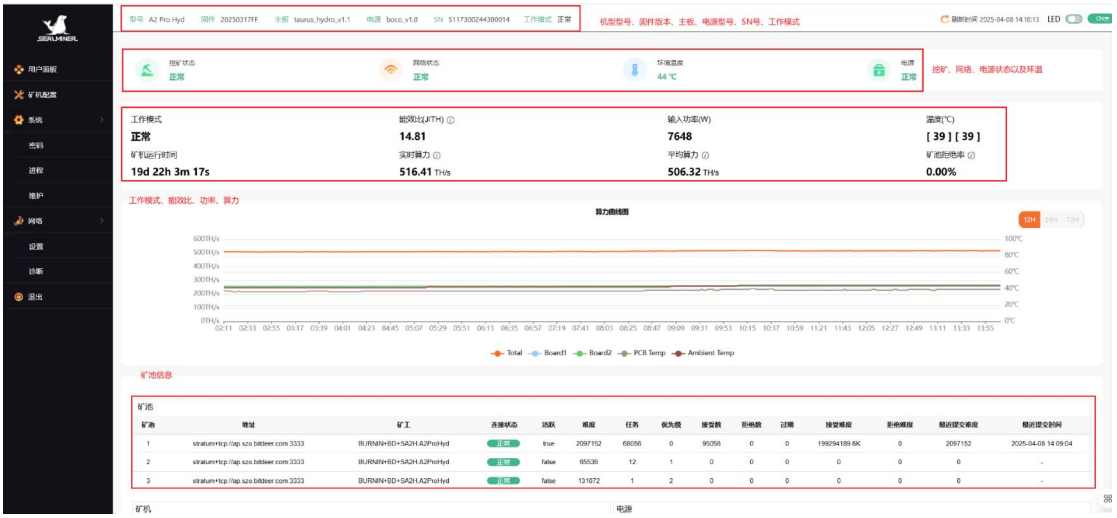
注意：保存配置后，需要重新用新设置的静态IP地址才能登录服务器（否则一直页面显示加载中直到加载失败）

9.状态检查

服务器接入运行网络后，登录服务器，检查服务器运行状态。

(1)在服务器界面中，选择用户面板选项，进入Miner运行状态界面。

(2)查看服务器整体算力、连接矿池、单板算力，单板温度等运行状态（注：下图中矿池地址，矿工名称以及密码为SEALMINER Demo样例，实际操作以客户自己的矿池地址，矿工名称以及密码为准）



10.批量配置

可以用Sealminer管理工进行服务器批量数据配置、状态监测、固件升级，详细操作参见《Sealminer管理工具使用手册》

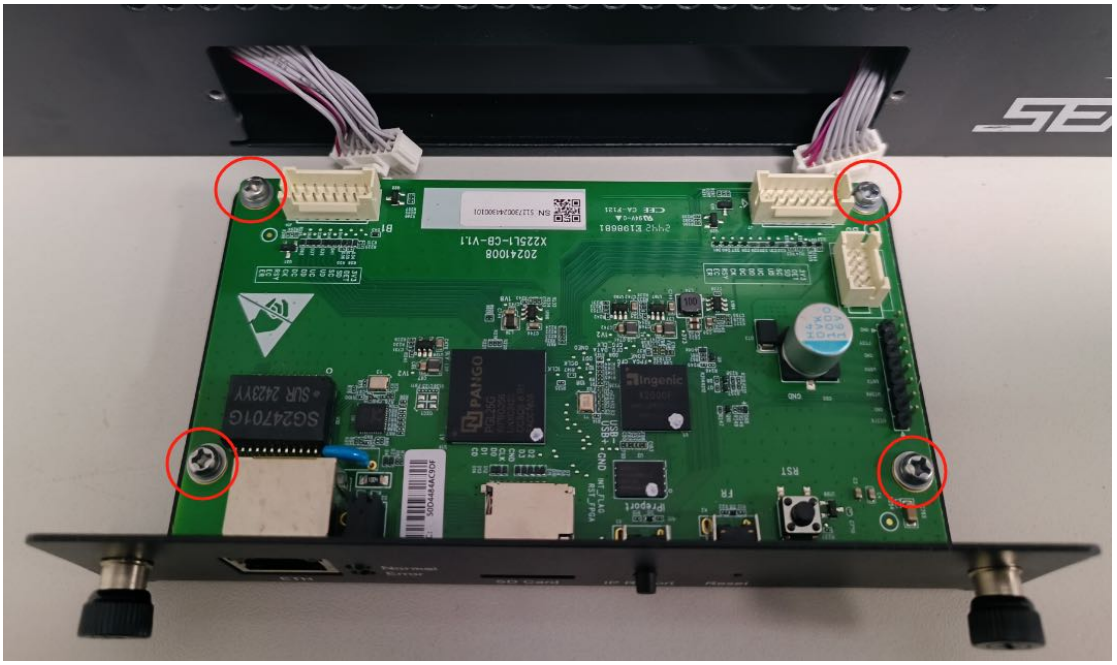
11.拆卸与安装

11.1 控制板拆卸

(1)先将服务器断电,拧松控制板面板的两颗松不脱螺钉后将面板抽出。

(2)将 3 根排线拔出。

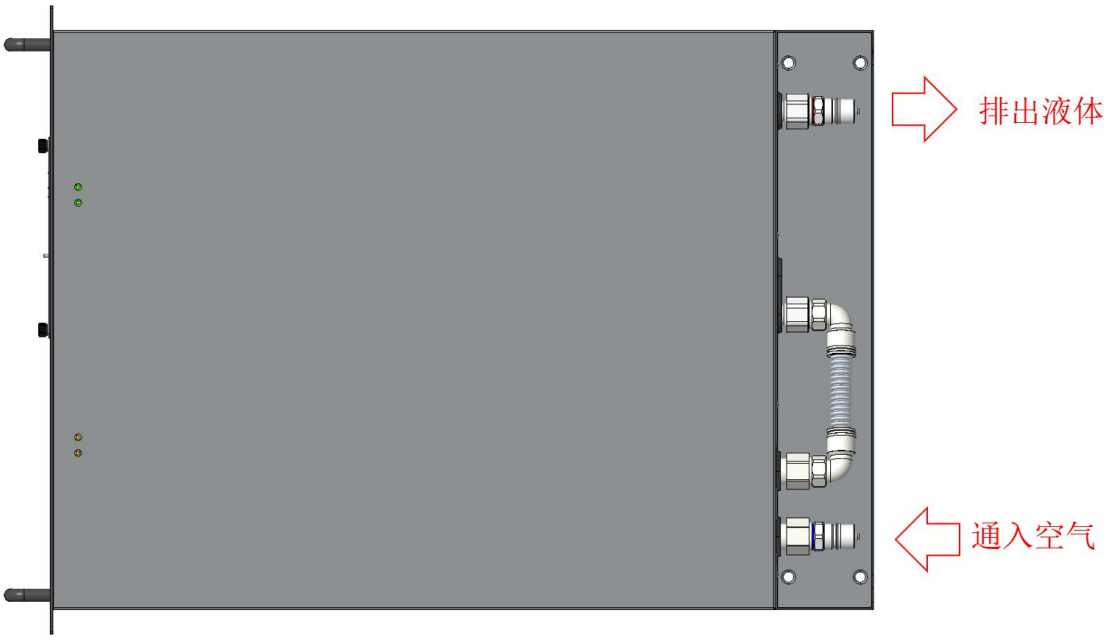
(3)拧下 4 颗螺钉，即可把控制板拆下。



11.2 算力板拆卸

(1)先将服务器断电并从机柜中取出。

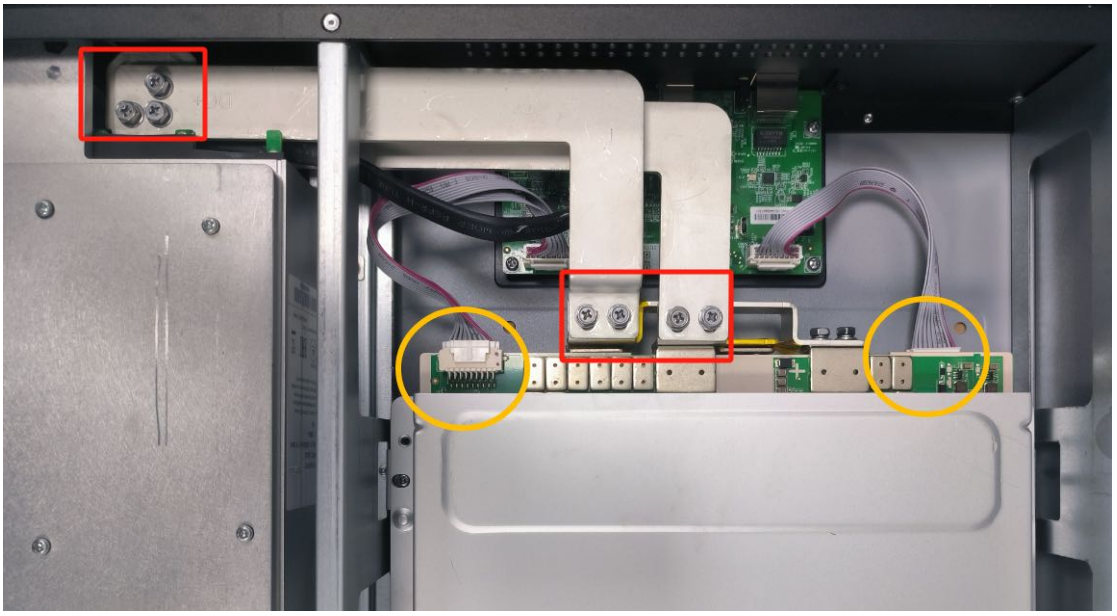
(2)将服务器内的冷却液排空。



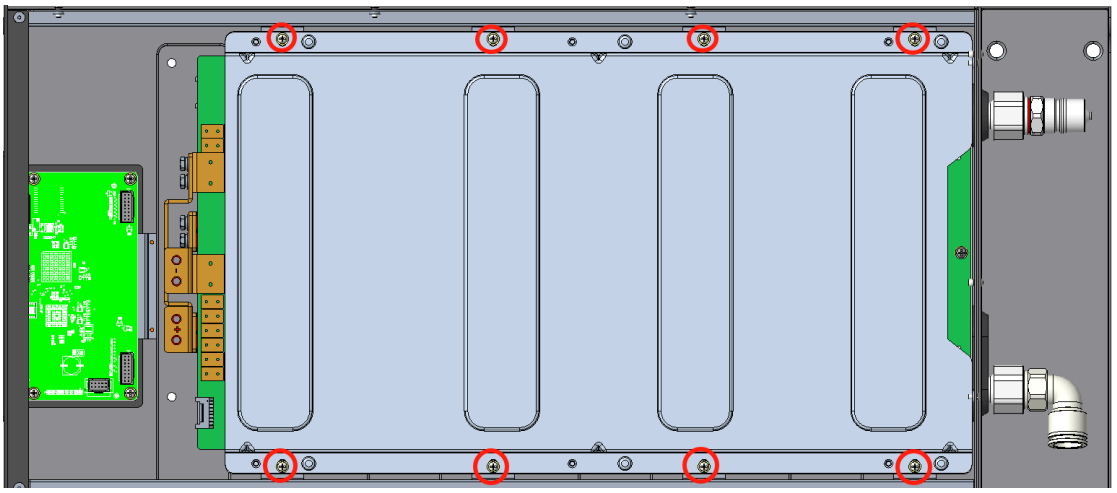
(3)使用工具按压进水口或出水口快插接头的活动部分，以释放服务器内部的压力。

(4)将算力板侧波纹软管拆除，注意先将一边将快插接头的活动环向内按压，再将波纹软管向外拔出。

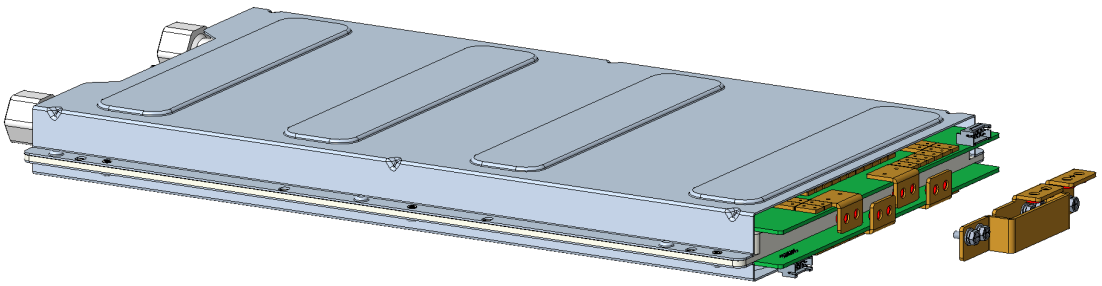
(5)打开服务器上盖后将算力板连接铜排及排线拆除。



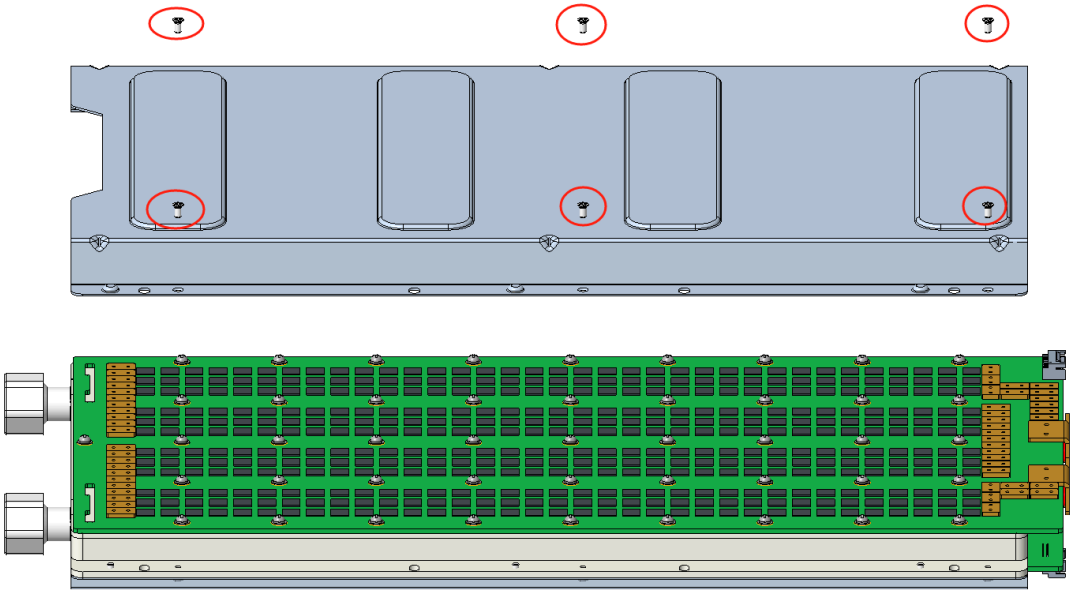
(6)将水冷板两侧共8颗螺钉取下，即可取下整块水冷板。



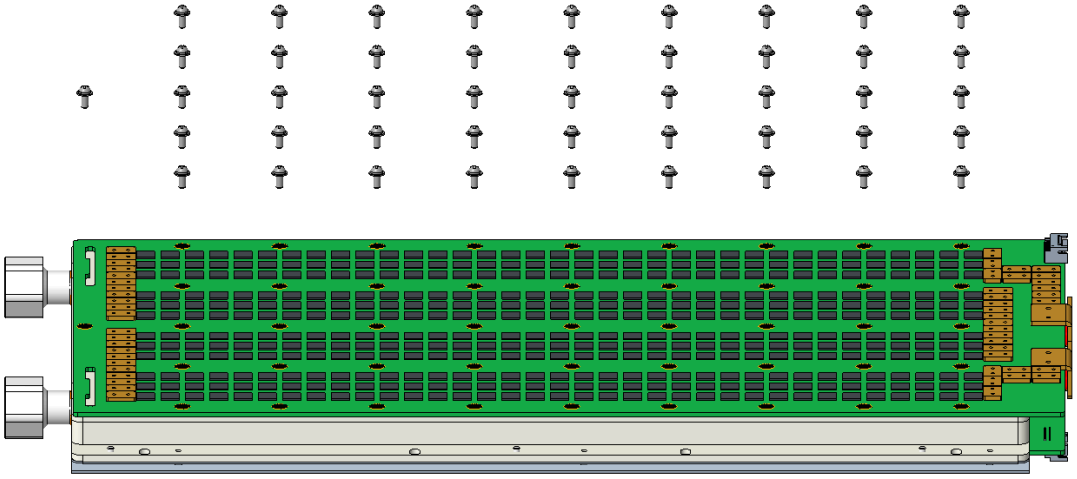
(7)将两块算力板的并接铜排拆除。



(8)将算力板保护盖螺钉拆除并取下保护盖。

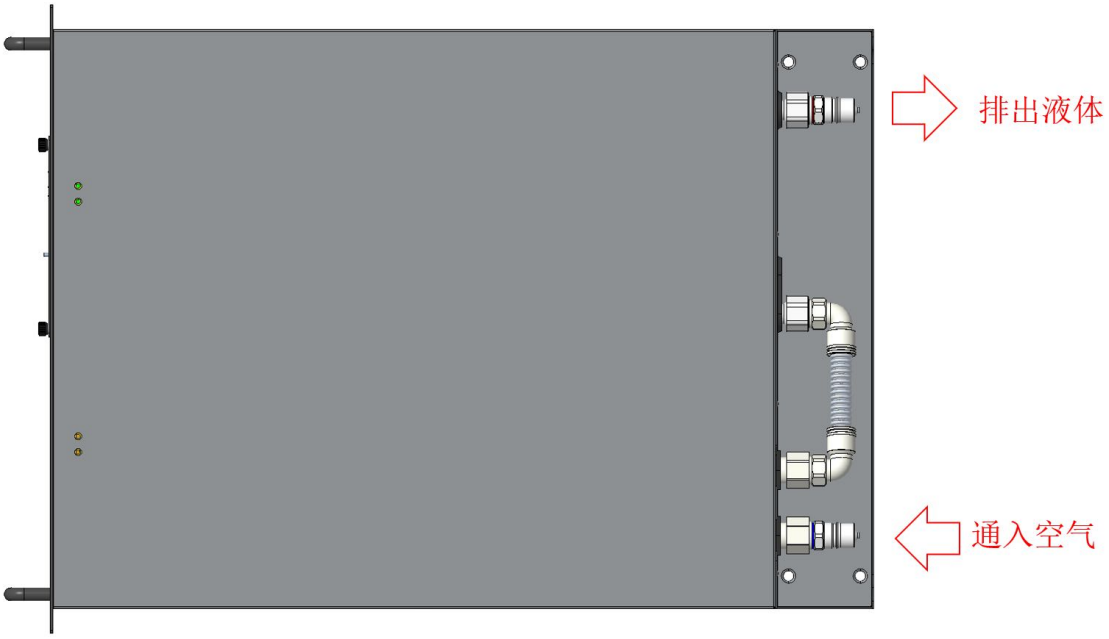


(9)将算力板固定螺钉拆除即可取下算力板。



11.3 电源拆卸

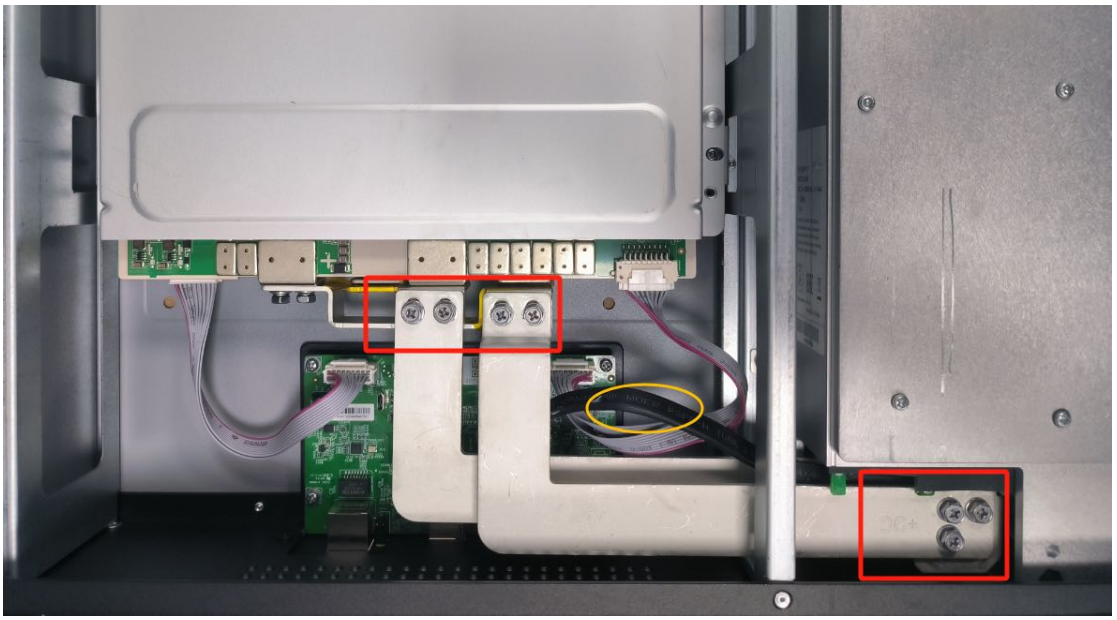
(1)将服务器内的冷却液排空。



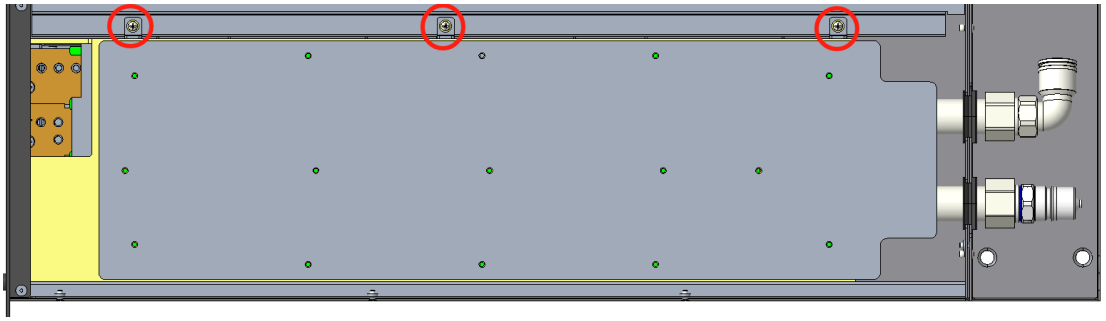
(2)使用工具按压进水口或出水口快插接头的活动部分，以释放服务器内部的压力。

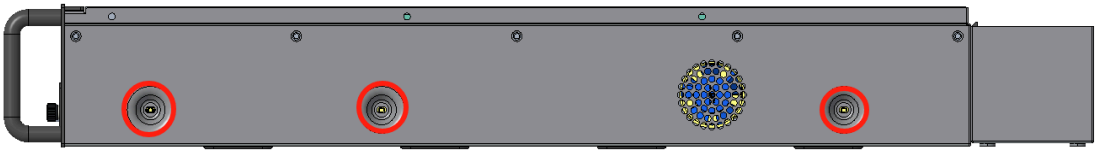
(3)将电源侧波纹软管拆除，注意先将一边将快插接头的活动环向内按压，再将波纹软管向外拔出。

(4)打开服务器上盖后将电源连接铜排及排线拆除。



(5)将电源两侧共6颗螺钉拆除即可取下电源。





12.售后服务

用户体验是Bitdeer每项工作的第一目标。我们会倾听客户的反馈，不断完善我们的客户服务，真诚的帮助客户解决问题。Bitdeer为A2-Hydro产品承诺1年保修期，在保修范围内提供免费的维修服务，购买即视为认同保修条款，但对于以下情况或故障，我们将不予维修您的产品：

1. 未按官方文件的要求安装、使用、维护、保养机器等导致机器损坏；
2. 未经官方书面或电子方式授权，擅自拆卸、改装、拼装或修理导致损坏的产品；
3. 因跌落、误用、滥用、误操作、安装不当等不符合规定的维护和储存等造成的损坏或损失；
4. 由于矿机在不符合要求的环境下运行造成的产品损坏，包括但不限于潮湿、腐蚀性环境、浪涌、极端度、异常电压电流(浪涌、冲击、不稳定)、交流电压过低或过高以及进水压力过大和未规范使用导致水冷产品管路内部结冰的挤压变形等等；
5. 整机或板件及板件上的元器件被压坏、摔坏、烧毁或因不当操作导致的坠落损伤等；
6. 过压或欠压、漏电引起的产品损坏；
7. 由于不可预见的自然灾害造成的产品损坏或损失，包括但不限于：洪水、火灾、地震、海啸、雷击等；
8. 非由我们或我们授权的服务机构拆卸机器或对机器进行过任何更改；
9. 使用任何与非我司产品或我们授权的机构生产且不满足我方要求参数的电源等配件、零部件或组件造成的产品故障或损害；
10. 使用未经授权的固件或驱动程序造成的故障或损坏，包括但不限于使用未经授权的超频固件 ；

11. SN 标签被更改，污损或去除；

12. 混板：机器中的部分或全部运算板、控制板、电源为非该机器原装产品或任何导致我们无法判断运算板、控制板、电源 是否为该机器原装的情况；

13. 任何非我司原因导致我们无法判断产品是否在质保期的情况。

因水冷产品对于系统环境、介质、机器电压、温度、流速等有一定规范性要求，因此除遵循上述通用不保修范围条款外，以下水冷产品也不属于我司产品保修范围：

1. 管路系统应配定压罐及机械泄压阀，若产品进水压力过大，压力大于350kpa而导致冷板变形，由此损坏的产品。
2. 使用不符合本文档要求的各项指标的冷却液，造成系统各部件腐蚀、堵塞等损坏的产品。
3. 产品冷板采用铝合金材质，若系统部件采用含铜、铸铁、碳钢等易发生电化学反应腐蚀的金属或材料，造成冷板或接头等腐蚀堵塞，由此损坏的产品。
4. 过滤器目数过低导致系统颗粒杂质进入产品，造成冷板或接头堵塞，由此损坏的产品。
5. 若散热系统部件耐温低于85℃，导致系统部件损坏甚至液体介质泄露，由此损坏的产品。
6. 在机柜连接散热系统之前，先使用去离子水（电导率≤5μS/cm）对系统管路进行多次循环清洗过滤，除去灰尘焊渣等杂质，清洗时间不宜超过8h，清洗水不得在系统中过夜；系统清洗后一定要将去离子水全部排空，然后注入冷却液进行循环使用（去离子水未完全排空时会影响冷却液各项指标参数），若系统中残留杂质过多，导致冷板或接头腐蚀堵塞，由此损坏的产品。
7. 若快速接头存在虚插的情况，导致漏水、服务器过温保护无法工作，由此损坏的产品。
8. 管路系统应配排气装置及自动补液装置,若空气混入循环系统，易导致水泵带气体运行而损坏，且可能导致其他服务器局部芯片过热，烧坏服务器或影响算力，由此损坏的产品。

9. 需确保服务器没有凝露，因为服务器在没有工作时，若周围环境温度从较低温度升到较高温度，服务器本身升温跟不上环境温度变化则可能会出现凝露，可通过太阳照射等其他加热方式将服务器升温烘干处理，若未及时处理，由此损坏的产品。

10. 服务器关机后 2 小时内，服务器进出口与散热系统断开时（即服务器没有通水循环时），务必将服务器内部的冷却水排空，防止冷板损坏，若未及时处理，由此损坏的产品。

11. 本保修赋予您特定的法律权利，您可能还拥有法律的其他权利，这些权利因国家/地区而异。本保修政策的解释权属于 Bitdeer。

13.售后保修费用的条款

1. 如您的产品属于不予维修的情形，或对于报废或存在混板的产品，您选择不修退回，您需承担该维修工单产品的往返运费。除上述情形外，对于需维修的产品，您承担将产品寄至我们指定地址的运费，我们承担将维修后或替换产品寄至您指定地址的运费。除此之外，我们不承担任何其它费用例如可能产生的关税等。
2. 请您以寄付方式将需维修的产品邮寄给我们指定地址。如您以到付方式邮寄，或您寄到其他非指定地址（包括物流自提点），我们将无法收到产品，所有后果将由您自行承担。
3. 我们将根据您或者您在工单中指定的联系人提供的收货信息寄出维修后或替换产品。如因您提供的收货信息不正确或不完全，您需承担由此产生的所有额外费用。
4. 对于DOA、二次返修的情形，如产品不属于不予维修或不予免费维修的情形，当您使用寄付方式将需维修的产品寄给我们后，可在本网站申请不高于物流官方收费标准的运费补贴（其中保价部分由客户自负）。对于可申请运费补贴的情形，您需向我们提供您支付运费的凭证。运费凭证不得造假、涂抹、修改，运费凭证上应显示总运费，总运费不得高于物流官方收费标准。否则我们有权拒绝向您提供您申请的部分或全部运费补贴。
5. 请您务必单独邮寄可获得运费补贴的产品。如您寄出的同一个包裹中既包含可获得运费补贴的产品，也包含不可获得运费补贴的产品，我们将无法单独核算可获得运费补贴产品的运费，因此对于此包裹，我们将无法发放任何运费补贴。
6. 返还产品毁损灭失的风险自我们将包裹投递至物流公司后转移至您，如物流过程中发生产品毁损灭失的，您应自行和物流公司解决此类纠纷。
7. 本条款未尽事宜,按照Bitdeer公司相关规定执行。本条款的最终解释权归Bitdeer所有。