



**WhatsMiner Immersion Cooling Server
Operation Guide**

V1.1

Content

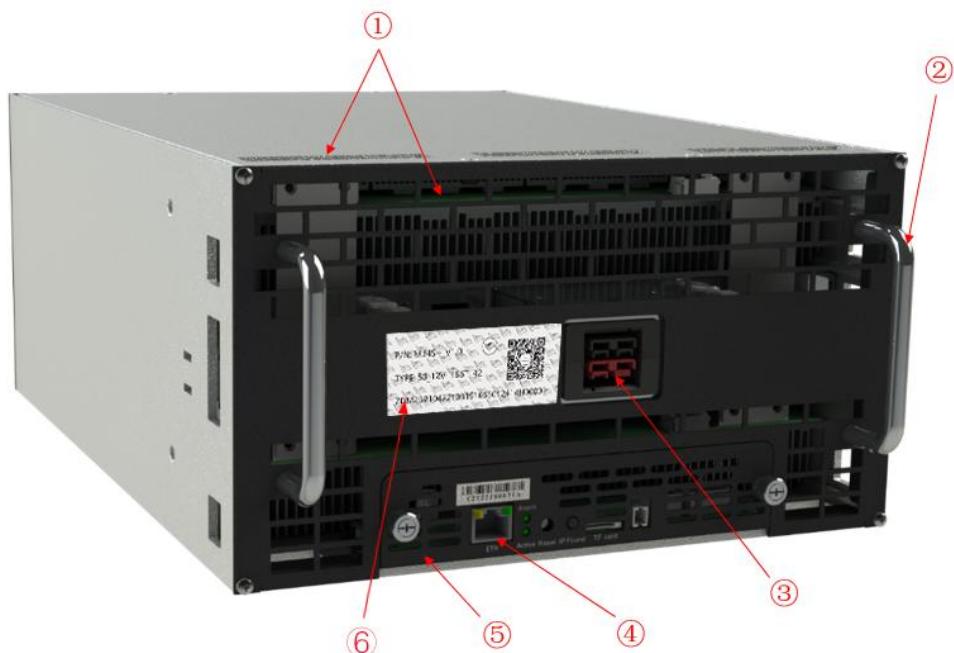
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1. Product Description



Whatsminer Immersion Cooling Server host model: M36S+、M36S++、M56、M56S、
M56S+、M56S++...

This guide takes M56S++ as an example to introduce various operations in detail, and
the operations of other models are similar



Upper panel



Bottom panel

①Liquid outlet ②Handle ③Power interface ④Network cable port ⑤Control board ⑥SN ⑦Liquid inlet

The single-phase liquid-cooled miner adopts the liquid circulation flow method of bottom-in and top-out for heat dissipation. Its control panel, network cable interface, and power line interface are all on the upper panel of the miner, which is convenient for maintenance.

2. Product parameters

Category	Item	Specifications
Parameter	Dimensions (Height X Width X Depth)	267.5mmX147mmX401mm
	Color	Top panel: black Shell: gray
	Weight	Net weight: : 16kg Weight with packaging materials:17kg
Environmental parameters	Liquid temperature	Working temperature (water intake): 20°C~45°C @normal mode; 20°C~40°C@high performance mode; Inlet temperature control accuracy ±2°C

		Storage and transportation temperature: - 40~70°C;
	Liquid flow	Rated flow: $\geq 24\text{L/min}$: Shell S3X Flow control accuracy $\pm 10\%$ Remarks: 24L/min corresponds to a temperature difference between the inlet and outlet liquids close to 7°C @normal mode, 10°C@high performance mode;
	Liquid pressure drop	The pressure drop characteristics of different areas inside the server are different. See Table 3 for details.
	Liquid medium	insulating liquid (Shell S3X) Remarks: See Part 4 for liquid performance and safety requirements. The coolant needs to be tested regularly. Please refer to Table 4 for the test indicators and test cycles. When the test data exceeds or falls below the test indicators, its performance will not meet the requirements and the coolant must be replaced.
	Liquid circulation system	<p>System piping: It is recommended that the hard pipe part of the circulation pipeline should be made of sanitary stainless steel, and it should be installed on site after prefabrication in the factory. No cutting, grinding, welding and other processes will be performed on site; the hose part should consider compatibility with the coolant to prevent leakage caused by liquid corrosion.</p> <p>System component compatibility selection: For different coolants, the system components that need to consider liquid corrosion mainly include circulation pumps, pipeline seals, network cables, power cables, etc.</p> <p>Filter selection: It is recommended that the main circulation line of the system be equipped</p>

	<p>with a filter of more than 100 mesh, and the bypass be equipped with a 5µm filter element filter;</p> <p>System component temperature resistance selection: It is recommended to use components with a temperature resistance of $\geq 85^{\circ}\text{C}$;</p> <p>Circulation pump configuration: It is recommended to use one for use and one for backup to improve system reliability;</p> <p>Tank design: It is recommended that the inner tank be made of stainless steel. In addition, the tank design of multiple positions is recommended to consider the design of equalizing the liquid in each position and different areas of the server itself, so as to ensure the balance of the coolant flow in each position and different areas of the server itself, so as to avoid overheating of the server in some areas;</p> <p>System cleanliness control: To ensure the cleanliness of the entire coolant circulation system, it is recommended to first ensure the cleanliness of the finished products of each key component, including the circulation pump, tank, radiator, prefabricated pipelines and pipe fittings; secondly, when designing the system, it is recommended to reserve a bypass interface for the main pipeline system, which can be connected to an additional system circulation cleaning device with booster, which is equipped with a high-precision filter of 5µm or more.</p> <p>Bypass valve configuration: It is recommended to add a bypass valve on the cold source side of the system to prevent the liquid supply temperature from being too low;</p> <p>Note: For detailed explanation, please refer to the</p>
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		"Precautions for Cooling System Design" section
	Humidity	Storage humidity: 5%RH~95%RH (non-condensing) Long-term storage humidity: 30%RH~69%RH (no condensation)

Remarks: The above liquid flow parameters are based on Shell S3X as the liquid medium. If the liquid medium uses other types of coolant, the liquid flow parameters need to be calculated separately. Calculation method: In the case of the same calorific value of the mineral, the product of liquid specific heat, density, and flow is a fixed value, that is, the flow is inversely proportional to the product of density and specific heat.

Coolant EC110 flow parameter calculation example

Type of coolant	specific heat capacity (J/kg • °C)	density (kg/m³)	flow (L/min)
Shell S3X	2274	806	24
EC110	2231	778	= $(2274 * 806 * 24) / (2231 * 778) = 25.35$

Table 3 Pressure drop characteristics of different areas inside the server

Area	Flow (m³/h)	Section Average Flow (m/s)	Pressure Drop (pa)
PCB Bottom heat sink (Section size: 33.5x265mm)	0.122	0.00381739	25.6
	0.173	0.00541319	36.4
	0.226	0.00707156	47.9
	0.281	0.00879252	59.9
	0.337	0.01054476	72.8
	0.396	0.01239088	86.1
PCB Top heat sink (Section size: 17.5x265mm)	0.034	0.002036538	25.5
	0.048	0.002875112	36.5
	0.064	0.003833483	47.9
	0.08	0.004791854	60

	0.096	0.005750225	73
	0.114	0.006828392	86.4
PSU (Section size: 17.5x265mm)	0.433	0.010555312	24.8
	0.55	0.01340744	35.2
	0.661	0.016113305	46.2
	0.767	0.018697284	57.8
	0.868	0.021159378	70.2
	0.965	0.023523963	82.9

3.Properties and safety requirements of insulating liquid

- 1) It has good thermodynamic properties (relatively high thermal conductivity, high liquid specific heat value, and low viscosity among similar substances);
- 2) It should have good chemical and thermal stability relative to the life cycle of the electronic system and the specified working temperature;
- 3) Appearance and smell: transparent and no odor;
- 4) Boiling point (°C) >150°C;
- 5) Flash point ≥140°C or no flash point, Autoignition point ≥300°C;
- 6) pour point (°C), <-40;
- 7) Purity (Wt%) ≥ 99.5%;
- 8) Non-volatile residues (Wt ppm) ≤ 10ppm
- 9) Water content (Wt ppm) ≤ 50ppm
- 10) Acidity (mg KOH/g) ≤ 0.05
- 11) Withstand voltage breakdown (KV/2.5mm), initial ≥ 30, saturated water state > 10;
- 12) Volume resistivity (40°C, Ω • cm) ≥ 1*10¹²; dielectric constant (40°C, 0.1-32GHz) < 2.5, dielectric loss factor(40°C, 0.1-32GHz) < 0.005;
- 13) The particle size limit in oil, after hot oil circulation, the number of particles larger than 5um in 100ml of oil is ≤2000, and there are no particles larger than 50um.
- 14) Stability: It should have good antioxidant stability and thermal stability relative to the life cycle of the electronic system and the specified operating temperature; (for hydrocarbon single-phase coolant) RPVOT ≥ 300 (ASTM D2272); Thermal stability: liquid chemical decomposition temperature ≥ 120°C.
- 15) Material compatibility, it should be compatible with most metals and hard inorganic substances, including stainless steel, copper, aluminum, silica, alumina, etc. commonly used in electronic systems, to ensure the appearance, volume and physical properties (mechanical properties). electrical) impact <1%. For organic substances

and elastomers, it should be confirmed by the Soxhlet extraction test, and it should be ensured that after extraction with organic substances in the system, the volume and weight change of organic substances is less than 3%, and the extracted products have no effect on liquid media and other devices that can reach the site through liquid transfer. The liquid itself should not react chemically with any material it may come into contact with, resulting in the modification or decomposition of the liquid.

16) The physical reaction of the liquid with the contact materials, including dissolution, extraction, etc., should not affect the corresponding functions of the liquid and system materials. For example, the liquid extracts the plasticizer of the cable insulation layer, causing the cable to harden and crack. Or the substances in the system are dissolved in the contact liquid, resulting in an increase in the viscosity of the liquid or deterioration in performance.

17) Dissolved substances caused by liquid convection or driving flow should not affect other materials or devices in contact with the liquid. For example, the plasticizer precipitated from the cable will reduce the heat exchange efficiency on the surface of the heating device through accumulation.

18) The liquid chemical decomposition temperature should be much higher than the system working temperature and potential local overheating temperature.

19) It belongs to the non-toxic category. It is non-irritating to the eyes, non-irritating to the skin, and does not have mutagenic cell mutations or heart diseases.

20) During the operation of the coolant, it is recommended to regularly monitor the changes in its typical conventional physical and chemical properties to understand its degree of oxidation, moisture absorption and the impact of particulate contaminants, so that the quality of the coolant is within an acceptable range of variation and ensure the normal operation of equipment such as servers. When there are abnormalities in the test items, the coolant should be maintained or replaced; the monitoring parameters that can be used and the recommended test frequency are shown in Table 4 below:

Table 4

Test Description	Specification	Suggested Test Cycle	Test Method
Visual Examination	Clear and Bright, No impurities and suspension	Several times a year	Visual inspection ASTM D1524
Color	≤0.5	Once a year	ASTM D1500

Acid Number, mgKOH/g	≤ 0.1	Once a year	GB/T 264 ASTM D2440
Flash Point, °C	$\geq A-8$ (Suppose original value is A)	Once a year	GB/T 261 GB/T 3536 ASTM D92
Dielectric constant(40°C or the temperature as specified by the customer , 0.1-32Ghz)	$\leq A+0.05$ (Suppose original value is A)	Once a year	GB/T 1409-2006 ASTM D924
Water Content, mg/L	\leq Saturated water absorption	Once a year	GB/T 7600 ASTM D1533
Dissipation Factor(40°C or the temperature as specified by the customer , 0.1-32Ghz)	≤ 0.005	Once a year	GB/T 5654 ASTM D924
Dielectric Breakdown Voltage, 2.5 mm gap,KV	≥ 15	Once a year	GB/T 507 ASTM D1816
Volume resistivity (40°C or the temperature as specified by the customer) , $\Omega \cdot cm$	$\geq 1 \times 10^{12}$	Once a year	GB/T 5654
Viscosity, mm ² /s 或 cst	$\leq A^*$ (1+5%) (Suppose original value is A)	Once a year	GB/T 10247 GB/T 265 ASTM D445
Corrosive Sulfur	Not Corrosive	Every two years	SH/T0804 ASTM D1275

Notes:

- 1) In the early stage of system operation, the frequency of coolant testing can be appropriately increased, such as once every three months or half a year. After stable

operation, the frequency of coolant testing should be at least once a year.

2) Regarding the sampling point, due to the different coolant densities, when the liquid density is greater than the water density, the water is in the upper layer, so the sampling point should be biased towards the upper layer, and when the liquid density is less than the water density, the water is in the lower layer, so the sampling point should be biased towards the lower layer.

4. Cooling System Design Considerations

1. System piping: It is recommended that the hard pipe part of the circulation pipeline be made of sanitary stainless steel, and it should be prefabricated in the factory and then installed on site. No cutting, grinding, welding and other processes will be performed on site. The hose part should consider compatibility with the coolant to prevent leakage due to corrosion by the liquid.

Note: To ensure the cleanliness of the system, it is recommended to use easy-to-clean sanitary stainless steel pipes for the pipeline. The various pipe components can be prefabricated in advance and pressure tested, pickled, passivated, flushed, dried, sealed and packaged in the factory to ensure cleanliness. Carbon steel pipes or galvanized steel pipes are not recommended because they have poor cleanliness, and large particles of welding slag and oxides are easily generated at the weld position during the welding process. They are difficult to clean inside the pipe and are prone to rust before being put into use.

2. Compatibility selection of system components: For different coolants, the system components that need to consider liquid corrosion mainly include circulation pumps, pipe seals, network cables, power cables, etc.

Note: Different coolants have different compatibility with materials. The system circulation pump shaft seal, pipe fittings, seals for pipe fitting connections, network cables and power cables must all be selected and designed for specific coolants. Otherwise, system components may be damaged or even liquid media may leak or the server may malfunction. The damaged server will not be covered by warranty.

3. Filter: It is recommended to configure a filter with a mesh size of 100 or above in the main circulation of the system and a 5μm filter element in the bypass;

Note: Both filters need to be connected for the normal operation of the system; if the system impurities cannot be filtered, it may cause damage to the server, and the damaged server will not be covered by warranty.

4. Temperature resistance of system components: It is recommended to use

components with a temperature resistance of $\geq 85^{\circ}\text{C}$;

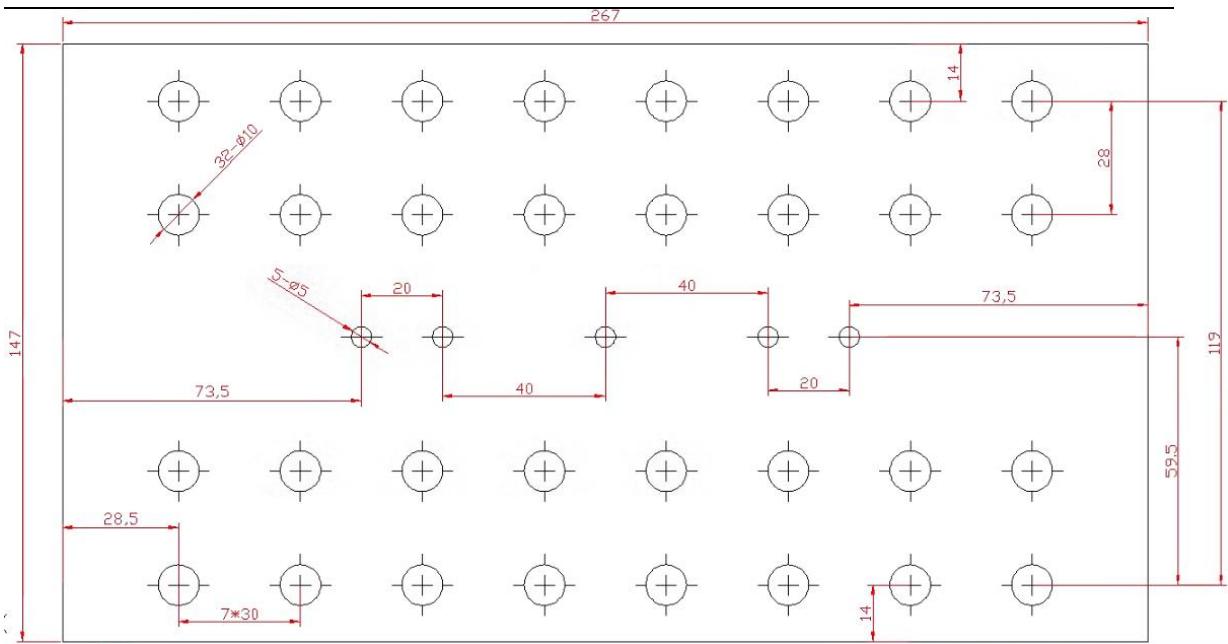
Note: If the temperature resistance of the cooling system components is lower than 85°C , it is easy to cause damage to the system components or even leakage of liquid media, which may cause damage to the server. The damaged server will not be covered by warranty.

5.Circulation pump configuration: It is recommended to use one in use and one as a backup to improve system reliability;

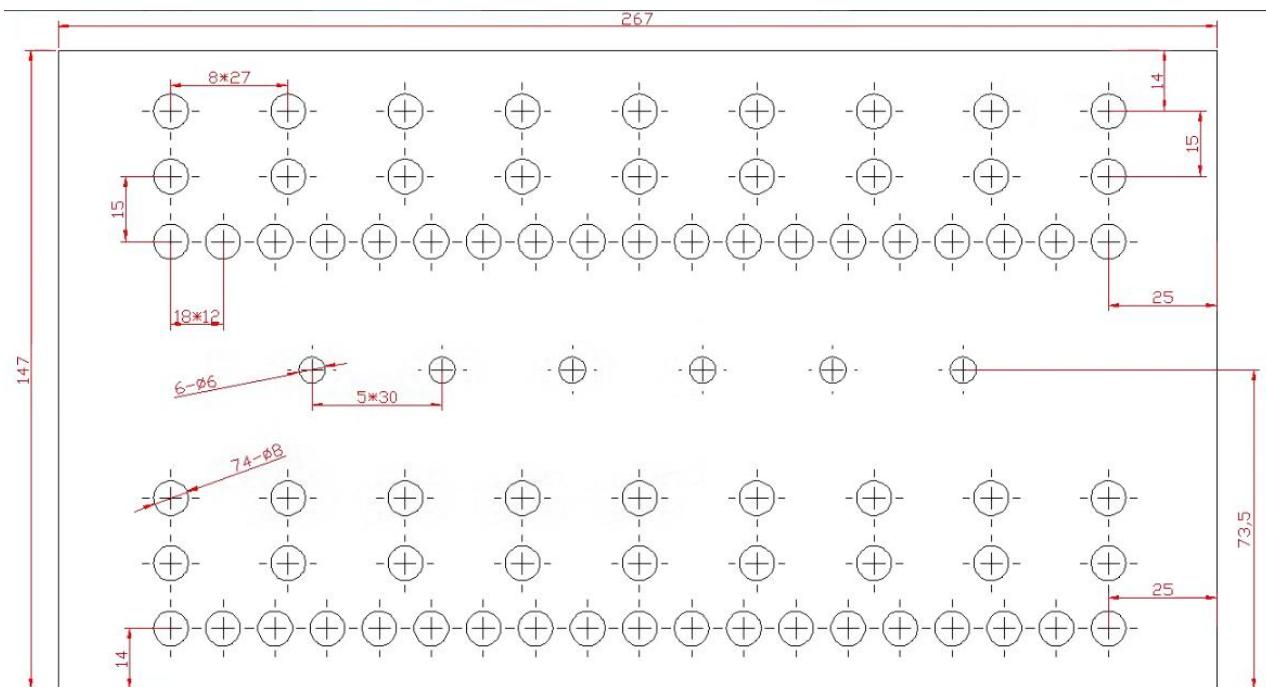
6.Tank: It is recommended that the inner tank be made of stainless steel. In addition, the multi-station tank design recommends considering the equalization design of each station and different areas of the server itself to ensure that the coolant flow of each station and different areas of the server itself is balanced to prevent overheating of the server in a local area.

Note: ① If the tank liner is made of stainless steel, spraying is also recommended to ensure cleanliness. If spraying is not performed, pickling, passivation, cleaning, drying and other cleaning treatments must be performed. If carbon steel is used, spraying must be performed after welding to ensure cleanliness. Generally, after welding, the tank liner is first polished to remove burrs, sharp edges, and welding slag, and then pressure tested for leaks (filled with water or kerosene for leak detection). After confirming that there is no leakage, spraying or cleaning is performed. Note that spraying should use a coating that is compatible with the coolant used. ② Since the pressure drop from the outlet of the tank supply pipe to the inlet of different machine positions is different, different machine positions will obtain different flows of coolant. Therefore, the tank design needs to adjust this part of the pressure drop to ensure that the inlet pressure of the machine positions in different areas is uniform, so that the flow between the machine positions is balanced. ③ Since the pressure drop characteristics of different areas of the server itself are different (see Table 3 for details), the opening design of the tank internal liquid equalization support plate needs to reasonably distribute the coolant flow according to the heat generation of different areas of the server itself. (It is mainly used to distinguish between the PCB area and the power area, with the power area accounting for 5-10% of the flow). The following four types of opening diagrams of the liquid-distributing support plate are used as reference:

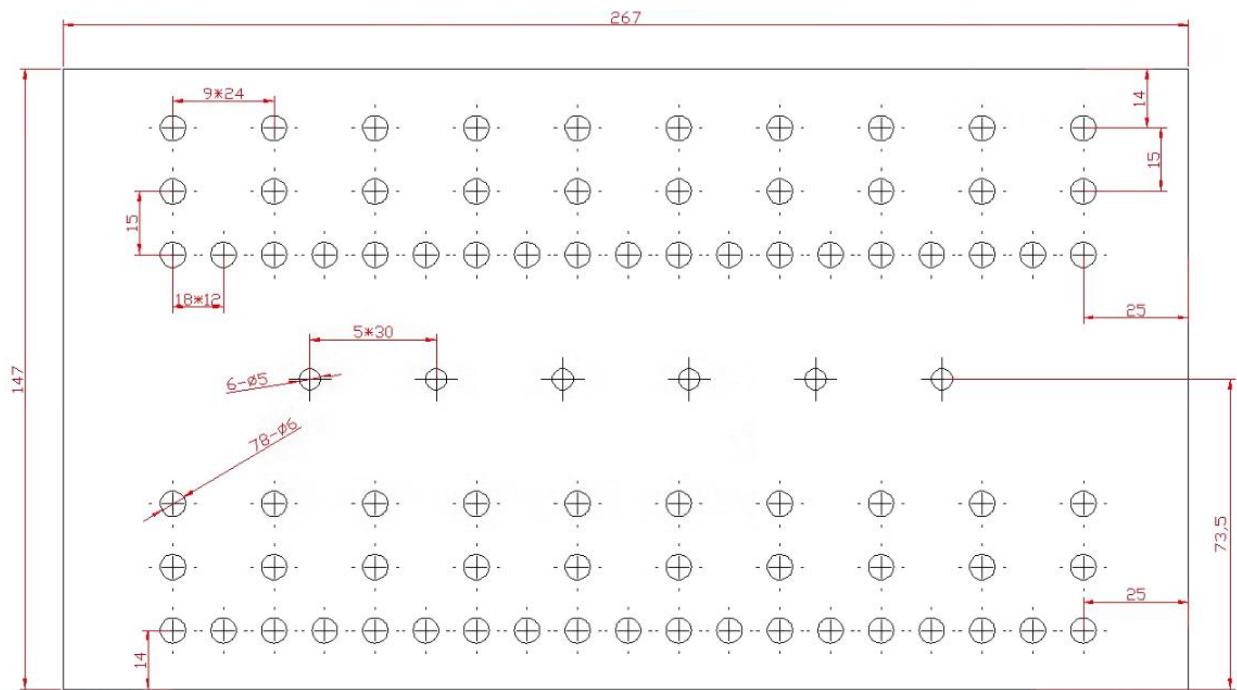
The first type: As below, 8* $\Phi 10$ holes facing the large PCB heat sink area & 8* $\Phi 10$ holes facing the small PCB heat sink area & 5* $\Phi 5$ holes facing the power supply area.



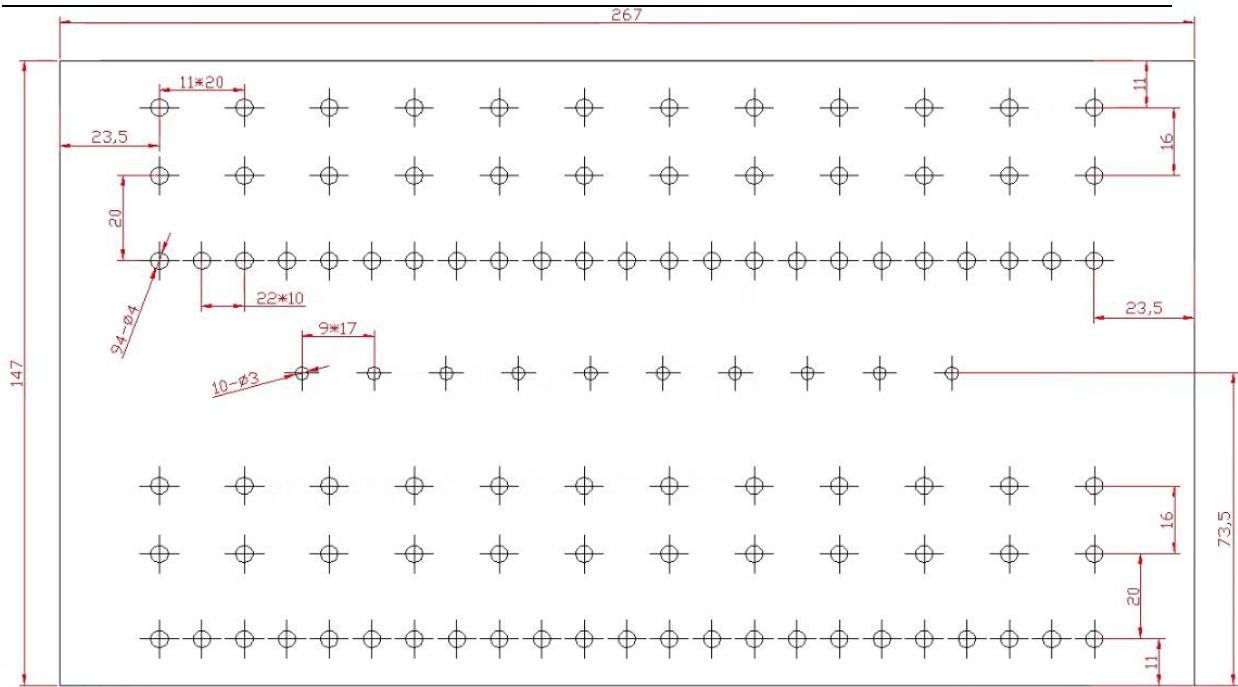
The second type: As below, 18*Φ8 holes facing the large PCB heat sink area & 19*Φ8 holes facing the small PCB heat sink area & 6*Φ6 holes facing the power supply area.



The third type: As below, 20* $\Phi 6$ holes facing the large PCB heat sink area & 19* $\Phi 6$ holes facing the small PCB heat sink area & 6* $\Phi 5$ holes facing the power supply area.



The fourth type: As below, 24* $\Phi 4$ holes facing the large PCB heat sink area & 23* $\Phi 4$ holes facing the small PCB heat sink area & 10* $\Phi 3$ holes facing the power supply area.



7. System cleanliness control: To ensure the cleanliness of the entire coolant circulation system, it is recommended to first ensure the cleanliness of the finished products of each key component, including circulation pumps, tanks, radiators, prefabricated pipes and pipe fittings, etc.; secondly, when designing the system, it is recommended that the main pipeline system reserve a bypass interface to connect an additional system circulation cleaning device with booster, which is equipped with a high-precision filter of 5 μm or more.

Note: ① The new circulation pump will be tested before leaving the factory, so there will be residual water inside. It is recommended to clean the residual water before leaving the factory or before use; ② Prefabricated pipes and pipe fittings, tanks and radiators processing technology: It is recommended to have a cleaning and drying process to ensure that there are no water stains, dust, metal chips, welding slag impurities, etc. The requirements for water washing and drying of finished parts refer to Table 5. After cleaning and drying, seal as soon as possible to prevent internal contamination by dust and impurities; Prefabricated pipes and pipe fittings, tanks and radiators finished product packaging and transportation: It is recommended to do a good job of internal dust prevention; ③ The system circulation cleaning device with booster here refers to an independent cleaning device with a booster pump, which is only used when the system needs circulation cleaning, and the device does not need to be connected during normal operation of the system.

Table 5 Reference requirements for cleaning and drying of prefabricated pipelines, tanks and radiators

Process	Purpose	Operation	Inspection Standard	Note
Water flushing	The number of particles should meet the requirements	Flush with pure water	Take 100ml of flushing water from the equipment. The number of particles larger than or equal to 5µm shall not exceed 500, and the number of particles larger than or equal to 15µm shall not exceed 100.	Particle number test method (5µm particle number): Take 100ml of coolant or flushing water sample and let it pass through filter paper with a diameter of 39mm, a mesh of 3mm*3mm, and a mesh of 5µm. Observe under a microscope, select 12 grids at random, count the number of particles on them, and calculate the average number of particles on each grid δ , $\delta \leq 500 * 3^2 / (\pi * 39^2 / 4) = 4;$
Drying	Remove residual water in the	Use a drying furnace or drying fan, control the temperature at 120-	The equipment should be dry	

	equipment	140°C, dry the inner surface of the tube, and continue drying for 15 minutes after there is no obvious residual water in the equipment.		
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Due to the unclean system, the coolant may be mixed with water, metal chips or welding slag impurities, which may cause damage to the server. The damaged server will lose the warranty.

8. Bypass valve: It is recommended to add a bypass valve on the cold source side of the system to prevent the liquid supply temperature from being too low;

Note: If there is no bypass valve, when the system has a sufficiently large heat dissipation temperature difference (difference between the target liquid inlet temperature and the ambient temperature), even if the fan on the cold source side does not rotate, the target liquid inlet temperature may be too low, and thus cannot rise to the minimum target value of 20°C, and the server may not meet the computing power standard. Adding a bypass valve can bypass part of the server's higher temperature return liquid and mix it with the lower temperature cold source side outlet liquid to prevent the server's liquid supply temperature from being too low.

5.Server installation precautions

1. System installation

Before assembling, all equipment in the system must be confirmed to be clean. If the equipment is not clean enough, please clean it before installing it.

During the installation of each equipment in the system, the cleanliness of the equipment must also be ensured, including pipes, pipe fittings, tanks and radiators. For example, when installing a certain equipment A, only remove the packaging of the equipment A, and do not remove the packaging protective film of other equipment. If foreign particles are accidentally mixed into a certain equipment during the installation process, please clean it with a clean cloth or vacuum cleaner in time. Moreover, during the construction suspension period, please seal and protect the equipment that has been unpacked but not yet installed or put into use.

If the impurities in a certain link are not handled cleanly, there will be heavy losses,

because after the system is put into use, the uncleanness of a certain component will contaminate the entire system equipment and coolant, resulting in the reduction of the insulation performance of the coolant and damage to the server, or the flow of particulate impurities will wear the server, and once the system is contaminated, it is very difficult to clean.

2. System pipeline pressure test

After the installation of all system components, it is recommended to perform pressure tests and leak tests to ensure that there are no leaks in the connections of all system components. It is recommended to use water testing on the water circulation side circuit, and there is no leakage under the water testing pressure of 6bar; it is recommended to use nitrogen gas testing on the coolant circulation side, and use the soap bubble method to test the sealing position of the connector, and there is no leakage under the gas testing pressure of 4bar. If an air compressor is used for gas testing, there is a risk of condensation in the air, which may cause water to mix into the system. There are risks in directly injecting coolant for pressure testing. Once a leak occurs, it is difficult to collect the coolant.

3. Reconfirmation of system cleanliness

Before injecting coolant into the system, please confirm again whether the entire coolant circulation system is clean, including the circulation pump, pipes, tank and radiator, etc.; make sure there are no obvious water stains, no obvious dust, no obvious metal chips, no obvious welding slag impurities, etc.;

4. System injection liquid

If it is a dual-circulation system, first fill the water circulation system and test the pressure, observe whether there is water flowing out of the tank side, and confirm that the hot and cold sides of the heat exchanger are completely isolated and there is no collusion. After the system is injected with coolant, the circulation pump starts the circulation at a low frequency and intermittently to evacuate the air from the system. After the air in the system is evacuated, the coolant circulates stably for 1-2 hours and then confirms whether the filter is clean. After confirming that the filter is clean, put the server into the tank and collect the excess coolant. The coolant level needs to be high enough to ensure that the return port does not inhale air.

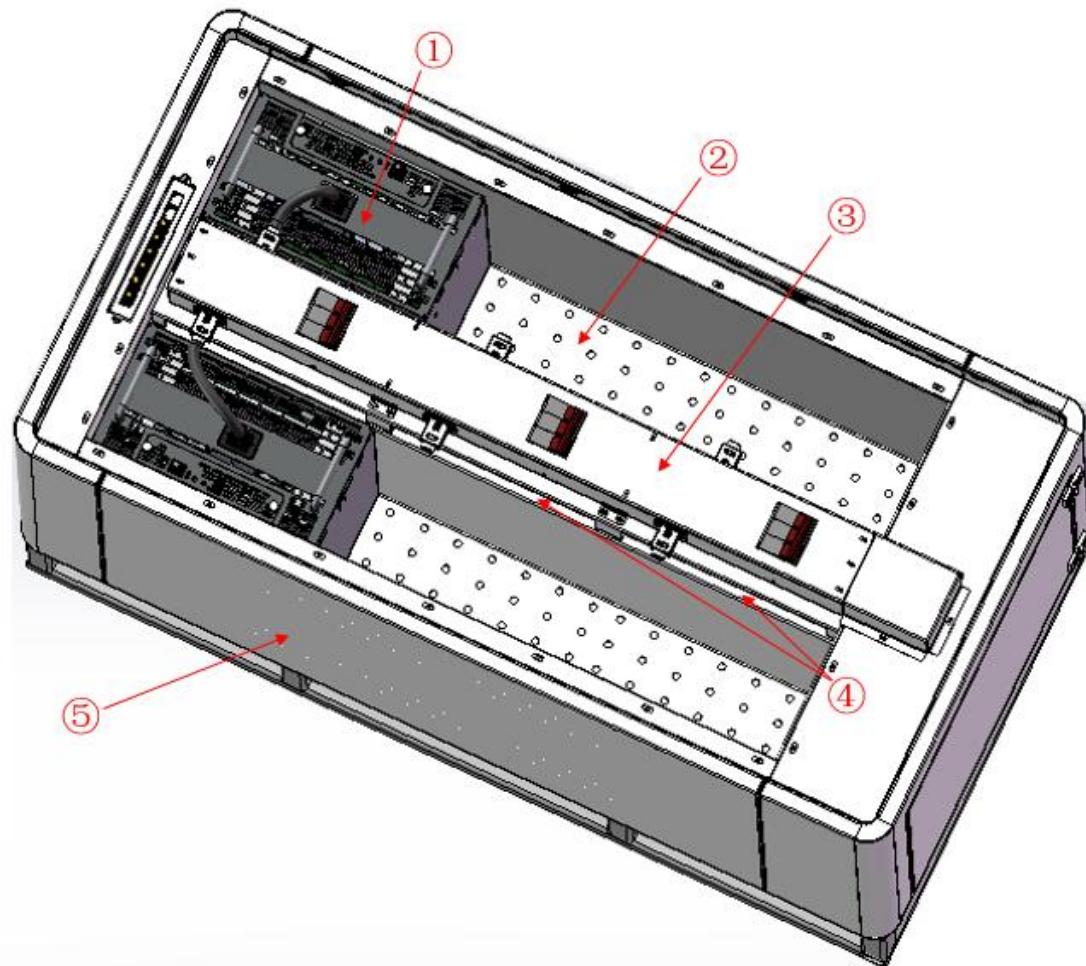
5. System DEMO verification

Before putting the servers on the shelves in batches, if it is a newly built system, it is recommended to use the DEMO system for trial operation for more than one week to verify the system design to a certain extent before large-scale application. At the same time, it is recommended to test the various indicators of the coolant in the system to ensure that the indicators of the coolant are qualified (refer to Table 4) to avoid batch failure problems.

6. Servers deployment

Before the servers are deployed, after the system is installed and filled, the cooling oil should be circulated for 1 hour. Then, 100 ml of oil samples are taken from the tank return port, tank drain port, and other areas where impurities may be the most. The number of particles greater than or equal to 5 μm in 100 ml of oil is ≤ 500 , the number of particles greater than or equal to 15 μm is less than or equal to 100, and there are no particles larger than 50 μm (based on the cleanliness level NAS 3 of NAS 1638 standard). If the cleanliness level does not meet the standard, the system is connected to a 5 μm high-precision filter device with an independent booster pump for coolant circulation filtration until the cleanliness level meets the standard. (Note: Particle count test method (5 μm particle count): Take 100ml of coolant or flushing water sample and let it pass through filter paper with a diameter of 39mm, a mesh of 3mm*3mm, and a mesh of 5 μm . Observe under a microscope, select 12 grids at random, count the number of particles on them, and calculate the average number of particles on each grid δ , $\delta \leq 500 * 3^2 / (\pi * 39^2 / 4) = 4$)

The server uses a bottom-in-top-out liquid circulation flow method to dissipate heat. Therefore, the server needs to be placed in a liquid cooling tank that allows liquid to flow in and out from the inside of the server. The flow plate at the bottom of the liquid cooling tank needs to support the server. The coolant passes through the flow plate and the bottom panel of the server and directly enters the server, and flows out from the top side or upper panel of the server, as shown in Figure 7. The server can be mounted and unmounted by one person.



Schematic diagram of Immersion Cooling Server Miner and cabinet assembly

①Immersion Cooling Miner ②Flow equalizing plate ③PDU ④Tank overflow ⑤Tank

7. Other considerations

- 1) Check whether the PDU voltage is normal before powering on. If the PDU voltage is abnormal, the corresponding tank needs to be powered off for inspection;
- 2) During the operation of the dual-circulation system, pay attention to whether the coolant in the tank is mixed with water droplets. If there are water droplets, the board may leak, causing water to enter the oil side, and the tank needs to be shut down immediately;
- 3) When the server failure rate of a single system reaches 10% or more, shut down and check immediately;
- 4) It is recommended to power on the server in batches when powering on to prevent surge damage to the server;
- 5) During operation, check all materials in contact with the coolant from time to time for compatibility, such as sealing rings, network cables, power cables, etc. If there

are any abnormalities, replace them in time;

6) The server must be powered on and turned on after the coolant circulation of the server is normal;

7) Removing the server from the tank will cause the tank liquid level to decrease. Please pay attention to the liquid level to ensure that the return port does not inhale air;

8) The power cord must use original accessories, and the server damaged by this is not covered by warranty;

9) Please press the connector spring when unplugging the power cord, as shown below;



6. Network Configuration

Tool	Num	Use	Remark
PC	1	Miner configuration	
Switch	1	Configuring miner and configuration computer	The switch can connect to the Internet
DHCP/NTP Server/Router	1	1、 Provide a dynamic IP address for the initial power up of the miner	It defaults to DHCP to obtain a dynamic IP address, when the miner leaves the factory.

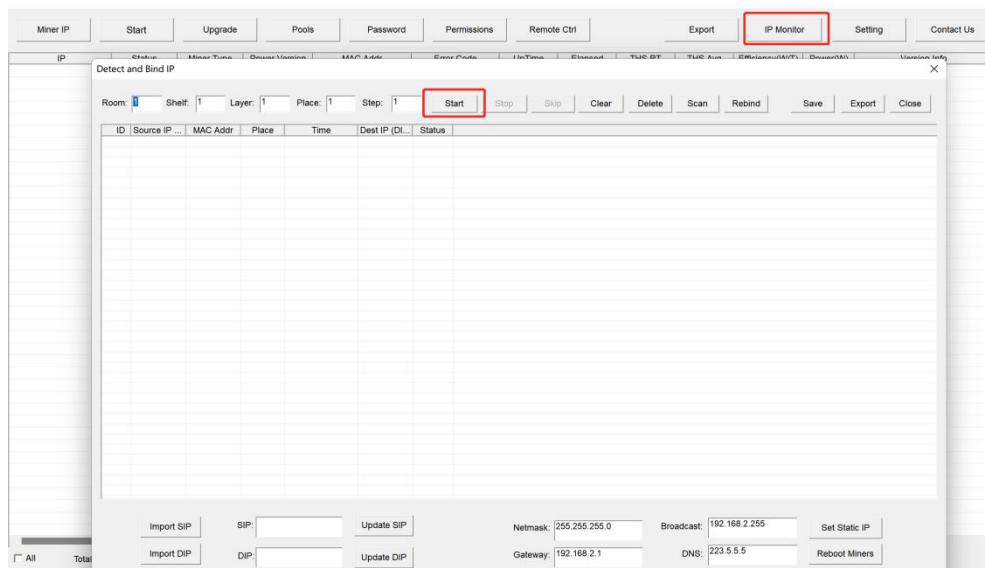
The miner defaults to DHCP to obtain dynamic IP. Therefore, the mine network must be configured with a DHCP server, or the router can enable DHCP to dynamically allocate the IP address service. The running time of the miner, the correctness of the calculation statistics, etc. depend on the network NTP time. The mining miner itself is

configured with multiple NTP server addresses of the public network by default. In order to speed up the acquisition of network time and improve the time precision, it is recommended to mine the network. Configure a local NTP server.

7.Data Configuration (Configuration on the web page)

7.1 Query the dynamic IP address obtained by the miner

Miner Data Configuration: Connect PC to the same network the miner is located, run WhatsMinerTools software on the PC, select the “IP Monitor” tab, set the room number, rack number and layer number of the rack where the mining miner is located, the location number of the layer, click "Start".



After the miner is powered on for about 30s, under normal circumstances, the yellow light of the network port is always on and the green light is blinking. Press the IPFOUND button (long button highlighted) on the miner control panel for more than 5s, the two LEDs on the right will flash a few times, indicating that the miner has broadcast the IP and MAC address of the unit to the network.



View the dynamically obtained IP, MAC address, and miner position reported by the miner in WhatsMinerTools software.

ID	Source IP ...	MAC Addr	Place	Time	Dest IP (D...)	Status
1	192.168.2.7	C6:07:20:0...			192.168.2.7	
2	192.168.2.30	C8:06:22:0...			192.168.2.30	

Below the table are several control buttons: Import SIP, SIP: 192.168.2.38, Update SIP; Import DIP, DIP: 192.168.2.38, Update DIP; Netmask: 255.255.255.0, Broadcast: 192.168.2.255, Set Static IP; Gateway: 192.168.2.1, DNS: 223.5.5.5, Reboot Miners.

Notes:

- (1) If all the lights on the panel of the control board are not lit after power-on, please check whether the PSU of the 220V power cable and the 16A power cable are reliable and the connection is correct.
- (2) If the indicator on the right side of the panel of the control board is on, but the network port is not lit, or the green light is not flashing, check whether the switch is normal, the whether network cable connection is reliable.
- (3) The computer and miner running the WhatsMinerTools software must be on the same network segment. Otherwise, the software may not receive the broadcast message from the miner, so the IP Address and

MAC Address information reported by the miner IPFOUND button cannot be queried.

- (4) If the computer and the miner miner are on the same network segment, and the DHCP service is enabled in the network, after the mining miner IPFOUND button is pressed, and WhatsMinerTools software does not query the IP of the miner, long press the reset button on the miner panel for more than 5s to recover Factory default configuration, then power off the miner miner. Power on to restart, power on for 30s and then press the IPFOUND button to detect the miner IP address.
- (5) If the computer is running WhatsMinerTools software, and after clicking "Start", without manually pressing the IPFOUND button, the software automatically finds the IP Address and MAC address of the miner, the IPFOUND button of the miner may be stuck by the panel. Find the software. Display the miner corresponding to the MAC address (the MAC address bar code is attached to the miner panel), power off the corresponding miner, and then re-install the control board to ensure that the control panel buttons and indicators are exposed to the mounting holes, and are not stuck.

7.2 Configuration Pool & Worker

- (1) After logging in, go to the Configuration - BTMiner Configuration page.
- (2) In the Configuration - BTMiner Configuration page, modify the mine pool address, mine worker name, and after modifying click “Save & Apply” in the lower right corner to save the modified configuration.

Pool

Power

[Interfaces](#)
[Miner Configuration](#)

Configuration

Coin Type	BTC
Pool 1	stratum+tcp://stratum.f2pool.com
Pool1 worker	microbtinit
Pool1 password	1234
Pool 2	stratum+tcp://btc.vip-3dcoa7jxu
Pool2 worker	microbtinitial
Pool2 password	1234
Pool 3	stratum+tcp://btc.ss.poolin.com:
Pool3 worker	microbtinitial
Pool3 password	1234

After the configuration of the mining pool is modified, the modified configuration must be restarted after the BTMiner program is restarted or the control panel is restarted.

- (3) Restart BTMiner to check whether the configuration modification takes effect

In the miner interface, select: Status - "BTMinerStatus" to enter the BTMiner running status interface.

WhatsMiner_0d10 Status ▾ System ▾ Configuration ▾ Logout

Miner Status

- [Miner Status](#)
- [Miner API Log](#)
- [System Log](#)
- [Miner Log](#)
- [Processes](#)
- [Overview](#)

Elapsed	GHSav	Accepted	Rejected	Liquid Cooling	Voltage	Power	Power Mode
19h 6m 48s	323829.54	79,046	0	true	2,958	7,034	High

In the BTMiner Status interface, click "Restart BTMiner" to restart the BTMiner process.

WhatsMiner_0d10 Status ▾ System ▾ Configuration ▾ Logout

Miner Status

Please visit <https://www.whatsminer.com> for support.

Summary

Elapsed	GHSav	Accepted	Rejected	Liquid Cooling	Voltage	Power	Power Mode
19h 6m 48s	323829.54	79,046	0	true	2,958	7,034	High

- (4) Restart the control board and check whether the configuration modification takes effect. (If you do not choose to restart BTMiner, after the configuration is modified and saved, you can also restart the control board to make the configuration take effect.)

The screenshot shows the 'Miner Status' section with a red box highlighting the 'System' dropdown menu. Inside the menu, the 'Reboot' option is also highlighted with a red box.

Elapsed	GHSav	Accepted	Rejected	Liquid Cooling	Voltage	Power	Power Mode
19h 6m 48s	323829.54	79,046	0	true	2.958	7,034	High

In the System interface, click "Reboot".

The screenshot shows a 'Reboot' page with a red box highlighting the 'Perform reboot' button.

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In the Restart interface, click "Perform reboot" to confirm the restart.

7.3 Modify the NTP Synchronization Server Address (optional)

- (1) After logging in, select System - System Configuration in the interface to enter the BTMiner configuration page.

The screenshot shows the 'System' configuration page with a red box highlighting the 'NTP server candidates' list. The list contains four entries: '0.cn.pool.ntp.org', '0.openwrt.pool.ntp.org', '0.asia.pool.ntp.org', and '0.pool.ntp.org'. The last entry has a small file icon next to it.

Enable NTP client

Save & Apply

(2) In the BTMiner configuration interface, add or modify the NTP server address.

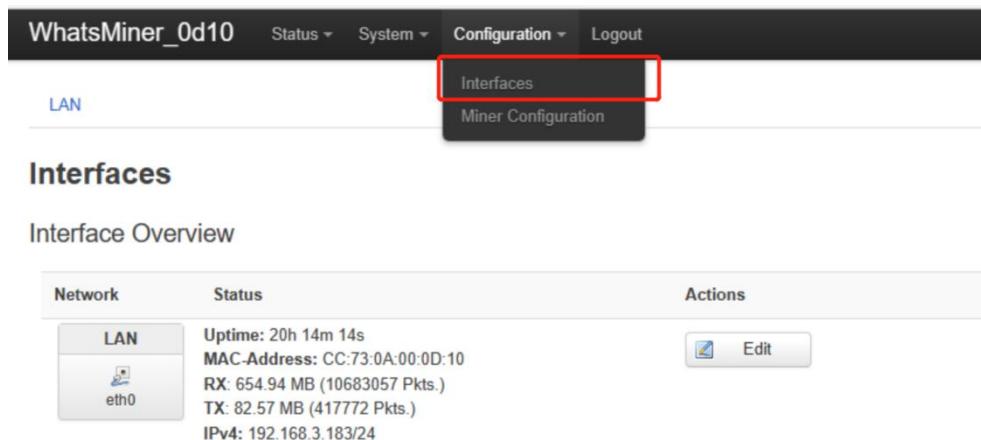
The miner has been configured with four NTP server addresses by default. You can modify or add the NTP server address to the local NTP server address according to the mine situation.Miner.

(3) After modifying the NTP server address, click "Save & Apply" in the lower right corner.

7.4 Configuration the Static IP Address (optional)

(1) After logging in to the miner, in the miner interface, select: Configuration->Interfaces to enter the network interface configuration interface.

(3) In the "Configuration" interface, click "Edit".



Interfaces

Interface Overview

Network	Status	Actions
LAN	Uptime: 20h 14m 14s MAC-Address: CC:73:0A:00:0D:10 RX: 654.94 MB (10683057 Pkts.) TX: 82.57 MB (417772 Pkts.) IPv4: 192.168.3.183/24	Edit
eth0		

(4) In the interface modification page, select "Static address" for the protocol and click "Switch protocol".

LAN

Interfaces - LAN

On this page you can configure the network interfaces.

Configuration

Status		Uptime: 20h 14m 38s MAC-Address: CC:73:0A:00:0D:10 RX: 655.16 MB (10686567 Pkts.) TX: 82.62 MB (418035 Pkts.) IPv4: 192.168.3.183/24
Protocol	<input type="button" value="DHCP client"/> <input type="button" value="Static address"/> <input checked="" type="button" value="DHCP client"/>	
Hostname to send when requesting DHCP		

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- (5) In the static address configuration interface, change the IP address, mask, gateway, broadcast address, and DNS address to the actual planned address of the mine. After editing, click "Save & Apply" in the lower right corner.

WhatsMiner_0d10 Status ▾ System ▾ Configuration ▾ Logout UNSAVED CHANGES: 2 AUTO REFRESH ON

LAN

Interfaces - LAN
 On this page you can configure the network interfaces.

Configuration

Status		Uptime: 20h 15m 54s MAC-Address: CC:73:0A:00:0D:10 RX: 655.79 MB (10696525 Pkts.) TX: 82.76 MB (418765 Pkts.) IPv4: 192.168.3.183/24
Protocol	<input type="button" value="Static address"/> <input type="button" value="DHCP client"/>	
IPv4 address	<input type="text" value="192.168.3.183"/>	
IPv4 netmask	<input type="text" value="255.255.255.0"/>	
IPv4 gateway	<input type="text" value="192.168.3.1"/>	
IPv4 broadcast	<input type="text" value="192.168.3.255"/>	
Use custom DNS servers	<input type="text" value="8.8.8.8"/>	

After saving the application, you need to re-use the newly set static IP address to log in to the mining miner (otherwise the page will display as loading until the loading fails).

8. Miner Operation Status Check

After the mine is connected to the operation network, log in to the miner and check the running status of the miner.

Miner Status

[Restart Miner](#)

Please visit <https://www.whatsminer.com> for support.

Summary

Elapsed	GH Sav	Accepted	Rejected	Liquid Cooling	Voltage	Power	Power Mode
19h 11m 47s	323830.18	79,409	0	true	2,952	7,011	High

Devices

Device	Frequency	GH Sav	GH S5s	GH S1m	GH S5m	GH S15m
SM0	574	80464.35	80386.25	80322.83	80462.03	80428.95
SM1	575	80667.72	80373.62	80725.18	80636.11	80703.58
SM2	579	81273.69	80563.95	81325.68	81346.16	81214.21
SM3	580	81420.69	81281.32	81566.07	81528.72	81436.16
Total	577	323826.45	322605.15	323939.78	323973.01	323782.90

Device	Status	UpfreqCompleted	EffectiveChips	Temperature
SM0	Alive	1	192	69.31
SM1	Alive	1	192	69.31
SM2	Alive	1	192	69.88
SM3	Alive	1	192	69.88

Pools

Pool	URL	Active	User	Status	Difficulty	GetWorks	Accepted	Rejected	Stale	LST
1	stratum+tcp://192.168.31.65:3334	true	microbtinitial	Alive	65536	3455	79409	0	2	Thu Jul 6 10:44:03 2023

The server is connected correctly and the network is normal. After the server is powered on, it will automatically perform a frequency search test. The frequency search test phase takes about 40 minutes. After the frequency search is completed, it enters the formal working stage. Computing power for normal operation. If the frequency search is not over, the computing power seen will be lower than the normal operating computing power

9.Batch configuration

You can use the WhatsMinerTool software to carry out batch data configuration, status check and firmware upgrade of the mining miner. For details, please refer to the "Whats Miner WhatsMinerTool Operation Guide".

10.Removal and installation

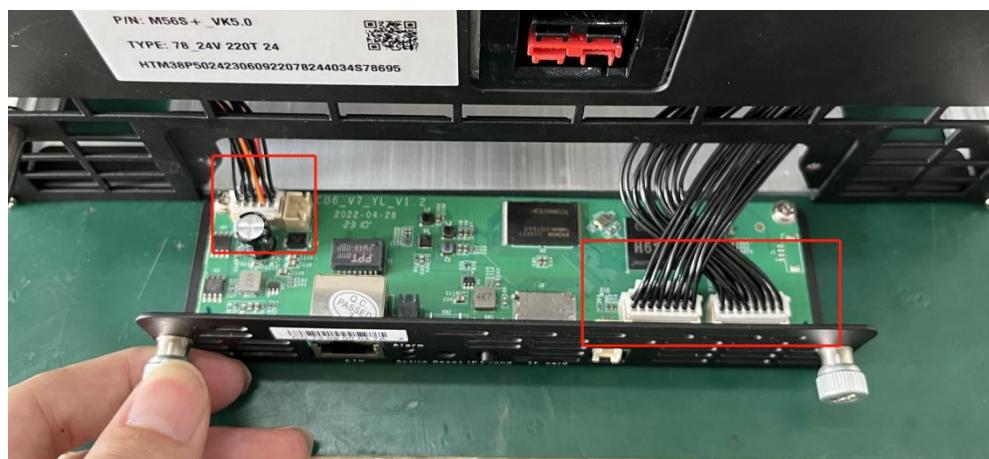
10.1Control board removal and installation

- (1) Power off the device first, then unscrew the two screws in the figure below, and

pull the control board out.



(2) After pulling out the 3 cables, you can pull out the entire control board



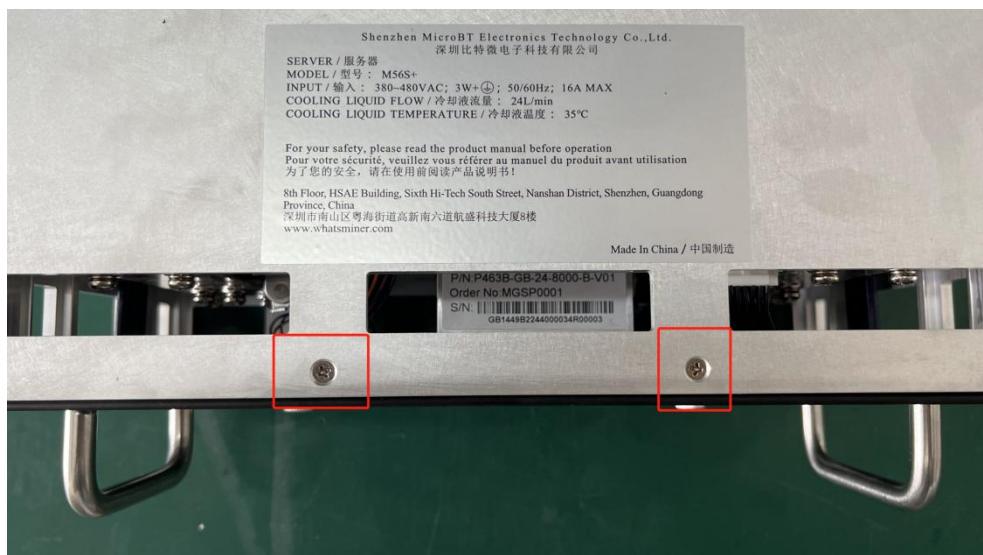
(3) Unscrew 4 more screws to remove the control board from the board.



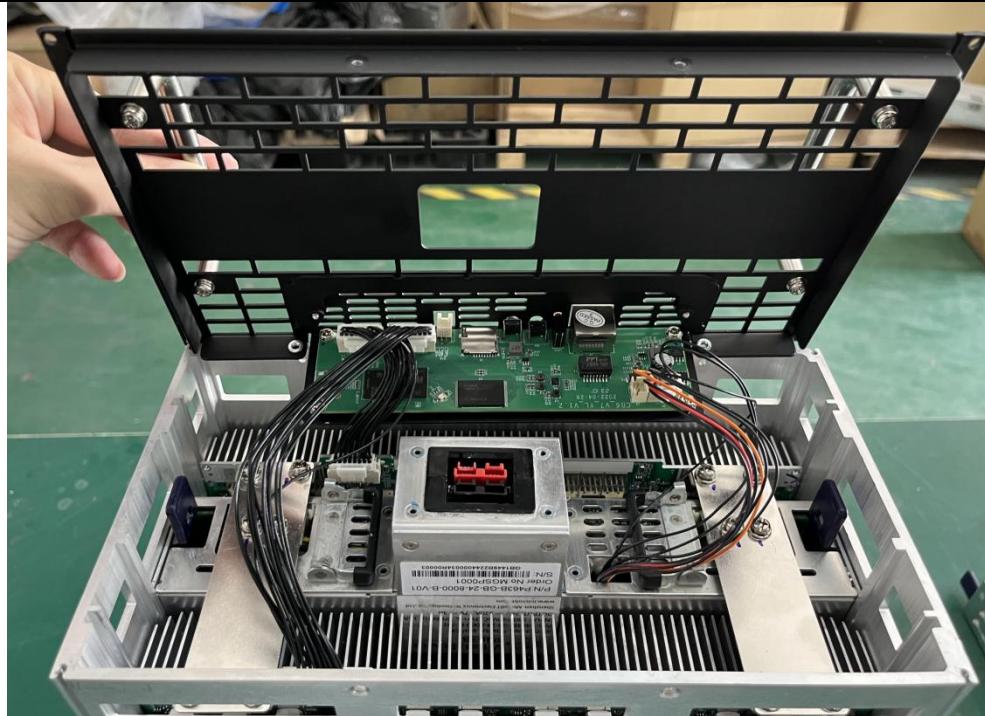
(4) The installation of the control board can be reversed according to the removal steps

10.2 PSU removal and installation

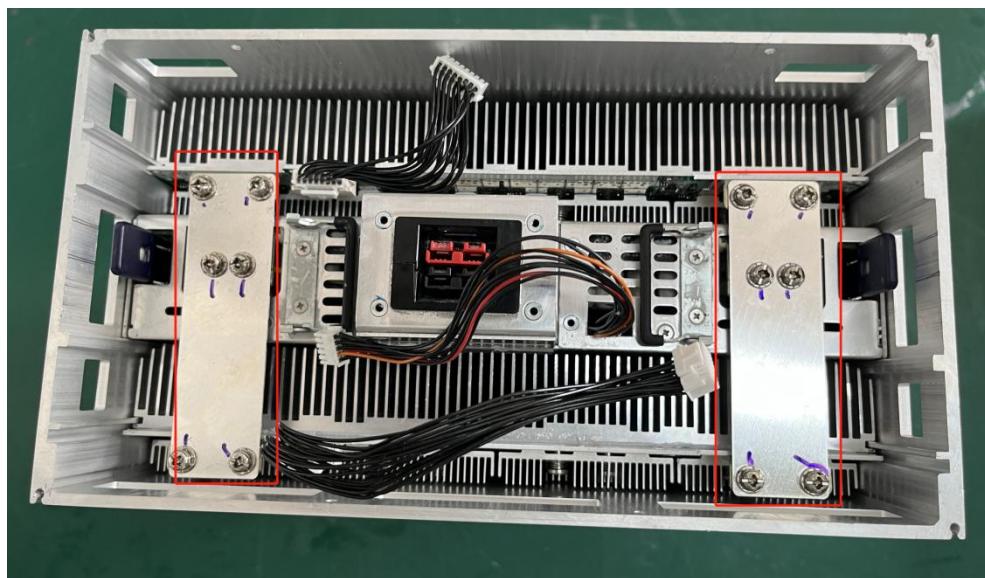
- (1) Power off the device first, Unscrew the four screws on the panel, and then unscrew the four screws on the side;



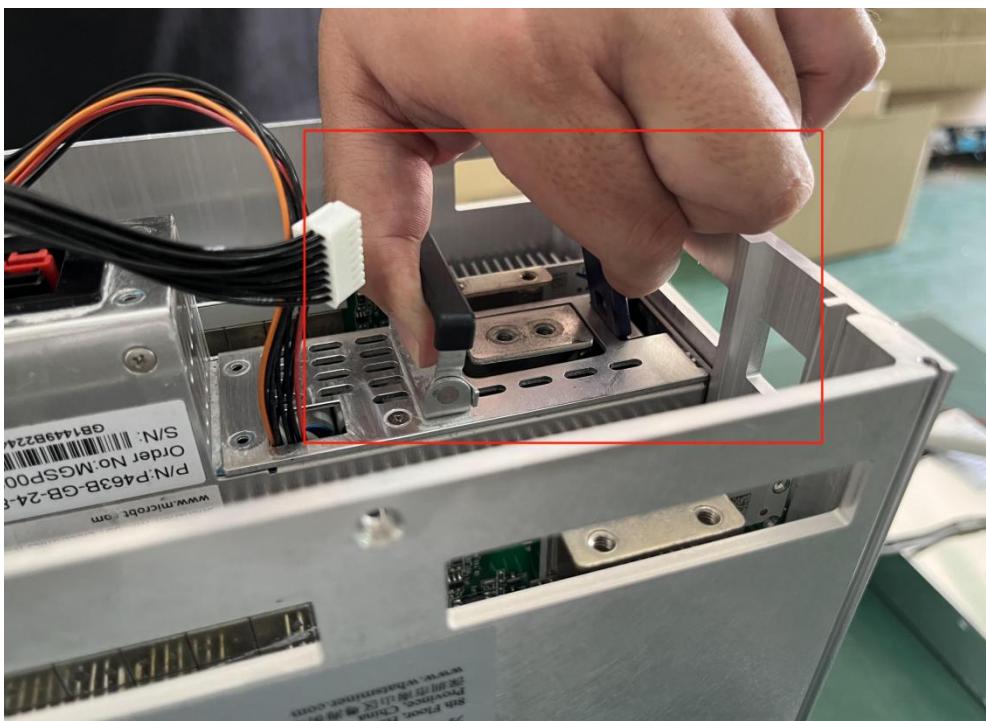
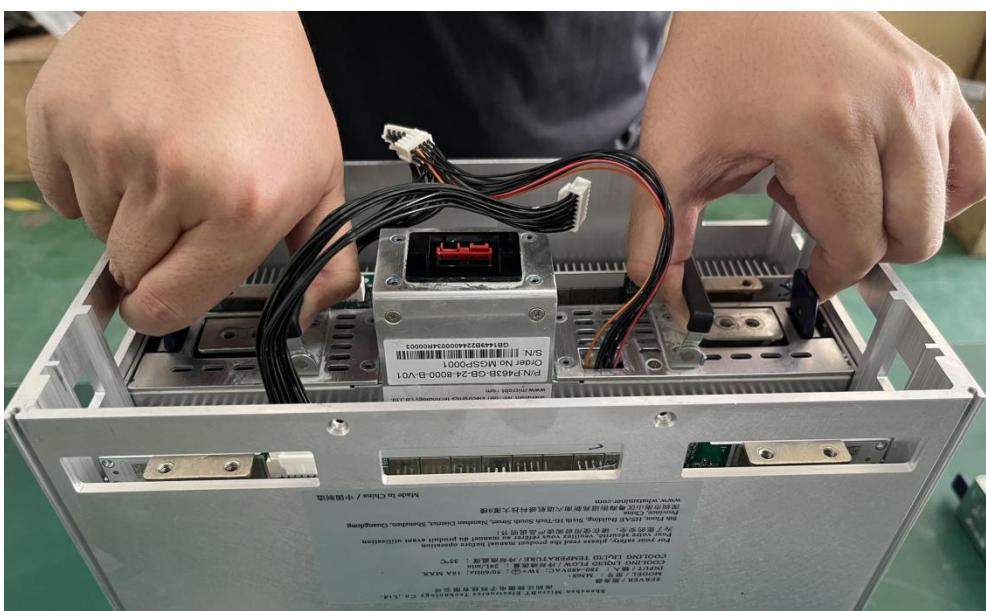
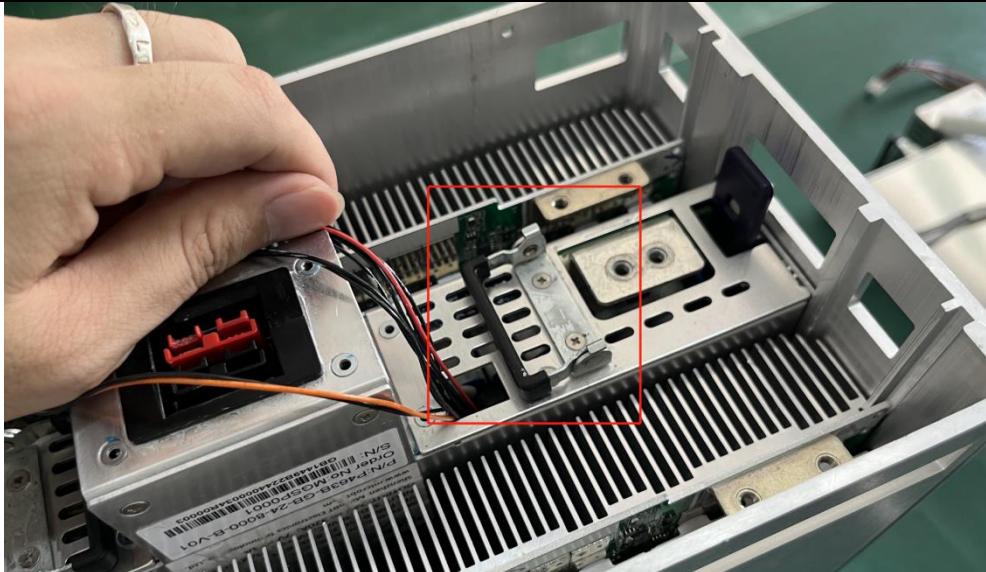
- (2) Open the panel, unplug the power cable and the black ribbons

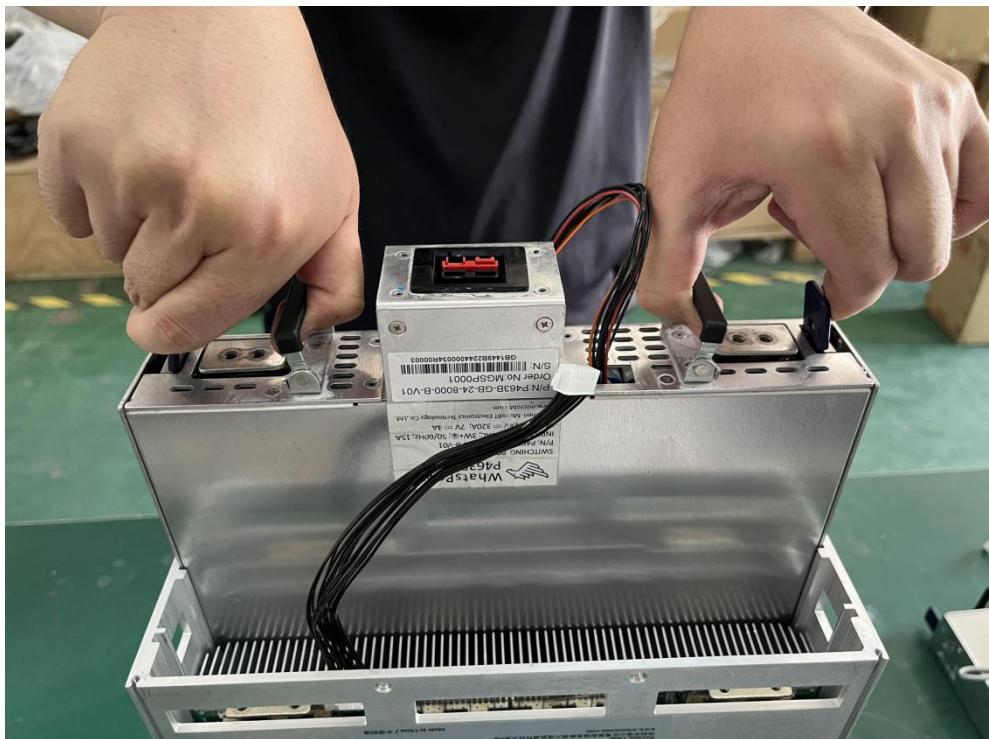


(3) Unscrew the screw on the copper plate of the PSU



Pull up the handle of the PSU, buckle the buckle of the PSU, lift up with both hands, and the PSU can be disassembled





(5) The installation of the psu can be reversed according to the removal steps

11.Optional accessories

For different demand scenarios, customers can contact us to purchase the required accessories. The list of optional accessories is detailed as below.

name	Specification	legend	Remark
power cable	L=400mm, Double head with plug, 4*2mm ² ;		<p>This power cord is used to connect the power supply of the miner to the PDU on the tank, and the plugs at both ends of the power cord match the power interface (socket) of the miner.</p> <p>Note: The interface of the PDU on the tank needs to be a socket interface that matches the plug of the power cord.</p>
power cable	L=1000mm,Single head with socket, 4*2mm ² ;		<p>The socket interface of this power cord is of the same specification as the power socket interface on the miner</p>
power cable	L=1000mm,single head with plug, 4*2mm ² ;		<p>The plug of this power cord matches the power interface (socket) of the miner</p>