

Antminer S9 Hydro Hash Board Repair Guide

Contents of this article: It mainly describes the disassembly and assembly of the S9 Hydro miner. For the maintenance method of the hash board, please refer to the [T9+ hash board repair guide](#).

Scope: Applicable to all Antminer S9 Hydro models after-sales, outsourced maintenance site.

1. Requirements for maintenance platform:

1. [Electric soldering iron](#) (350 °C - 400 °C), the pointed soldering iron tip is used for soldering small patches such as chip resistors and capacitors.
2. The [desoldering gun](#) is used for chip disassembly and soldering. Be careful not to heat for a long time to avoid PCB foaming.
3. APW5 power supply (output 12V, 180A Max), used for hash board testing.
4. Multimeter, [tweezers](#), [screwdrivers](#), T9+ test fixture, or [oscilloscope](#).
5. Flux solder paste, board washing water, and anhydrous alcohol; board washing water is used to clean the flux residue and appearance after maintenance.
6. [Antminer ASIC BM1387 tin tool](#), tin tool steel mesh, solder paste; when [replacing a new chip](#), it is necessary to plant tin for the chip.
7. Thermally conductive silicone sheet and thermosetting adhesive are used to re-attach the heat sink after maintenance.

II. Job requirements:

1. Maintenance personnel must have specific electronic knowledge, more than one year of maintenance experience, and proficiency in QFN packaging welding technology.
2. After the repair, the hash board must be tested more than twice, and all are OK before passing!

3. Pay attention to the operation method when replacing the chip. After replacing any accessories, the PCB board has no obvious deformation. Check the replacement parts and the surrounding parts for open and short circuits problems.
4. Determine the maintenance station object and the corresponding test software parameters and test tools.
5. Check whether the tools and [T9+ test fixtures](#) can work normally.

III. Miner structure:

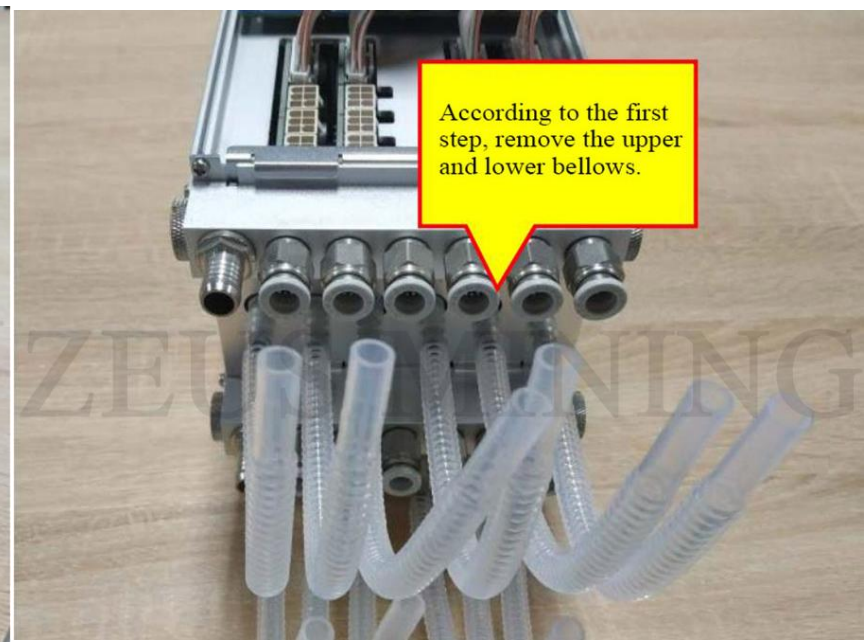
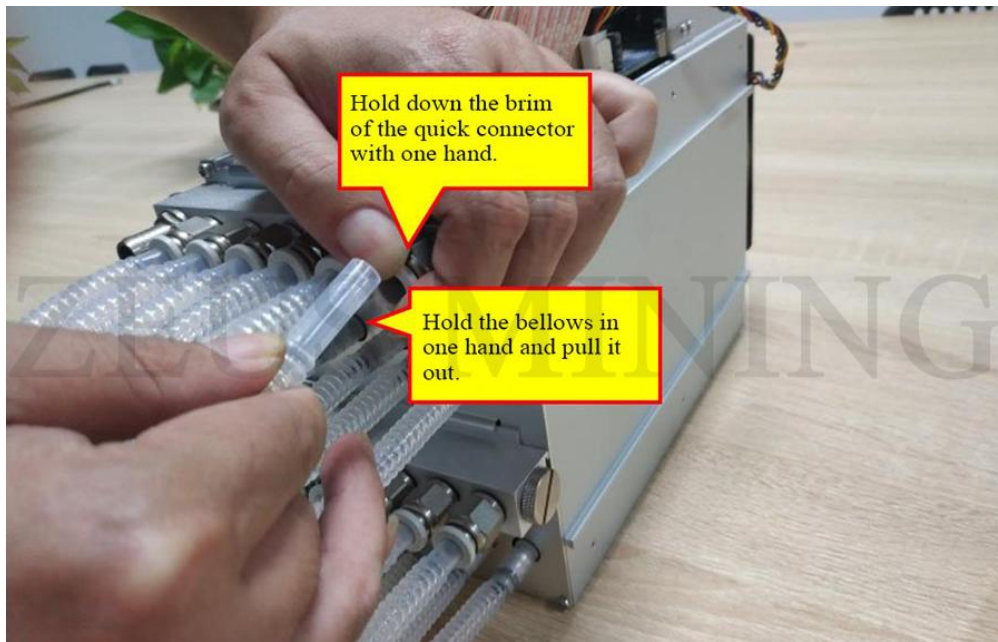
●Overview of water cooling principle

1. Composition of the Antminer S9 Hydro miner:

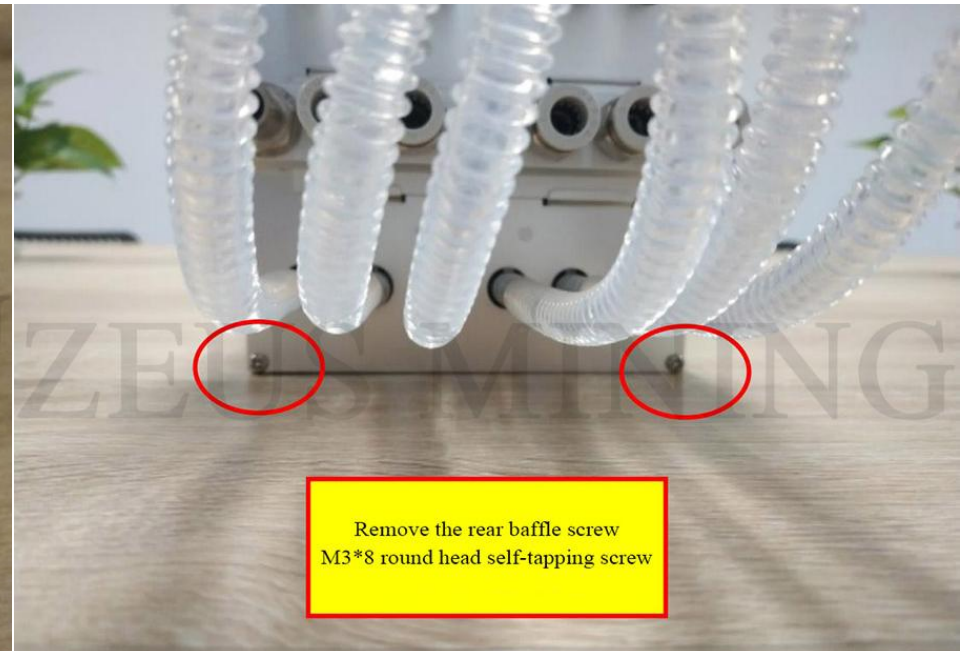
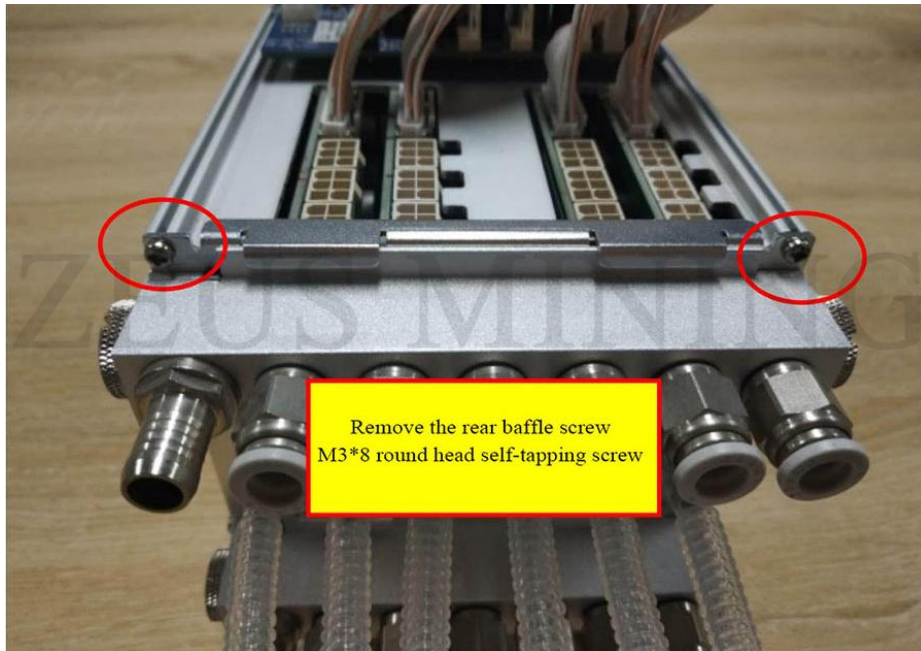
The [S9 Hydro miner](#) is composed of 4 pieces of the hash board; every 2 pieces of hash board form a water-cooling module, each water-cooling module is composed of 3 pieces of water cooling plate through the [thermosetting adhesive](#) and [thermally conductive silicone sheet](#), and water drainage cooling components, to achieve the heat dissipation of the hash board.

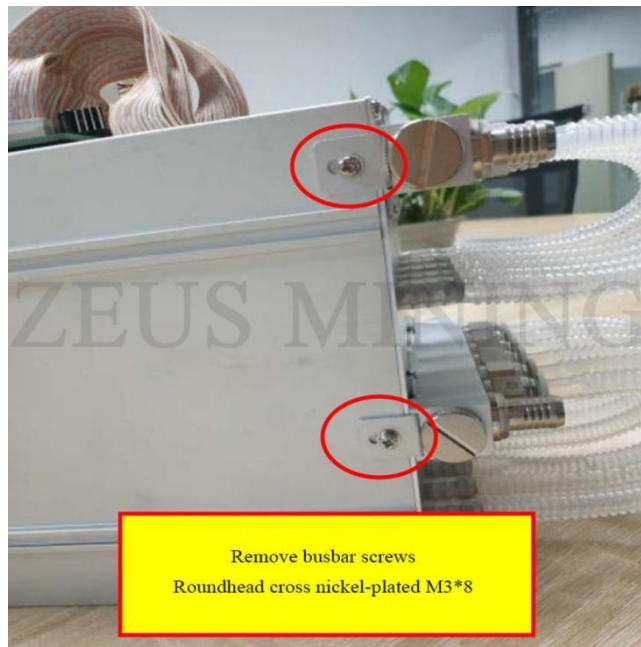
2. Antminer S9 Hydro miner disassembly process:

- 1) Remove the bellows



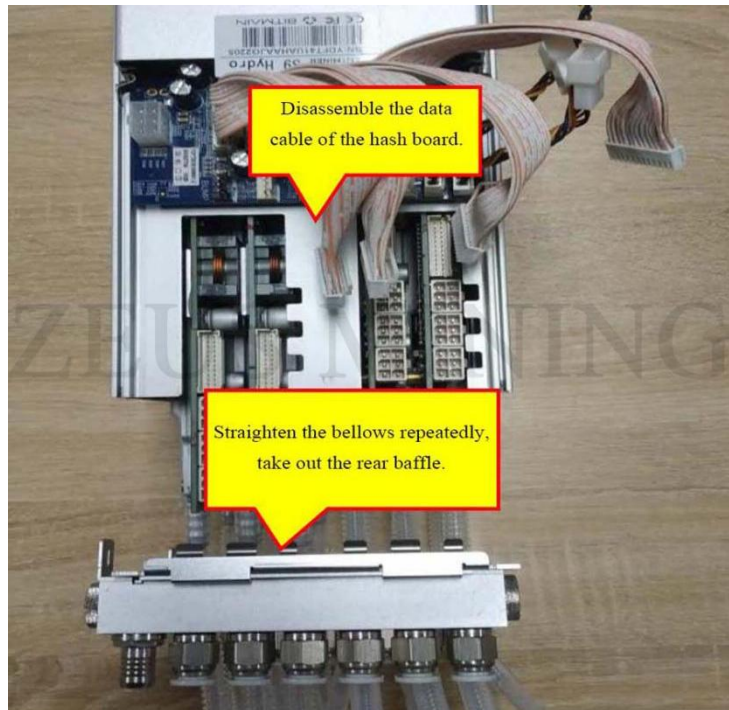
2) Remove the screws:





Remove busbar screws
Roundhead cross nickel-plated M3*8

3) Remove the rear baffle:



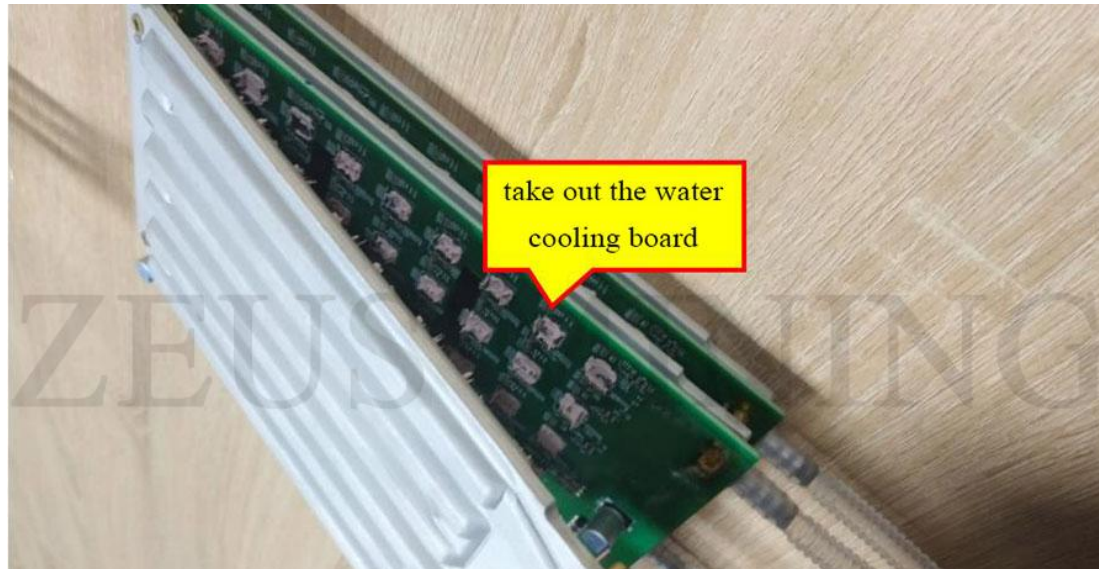
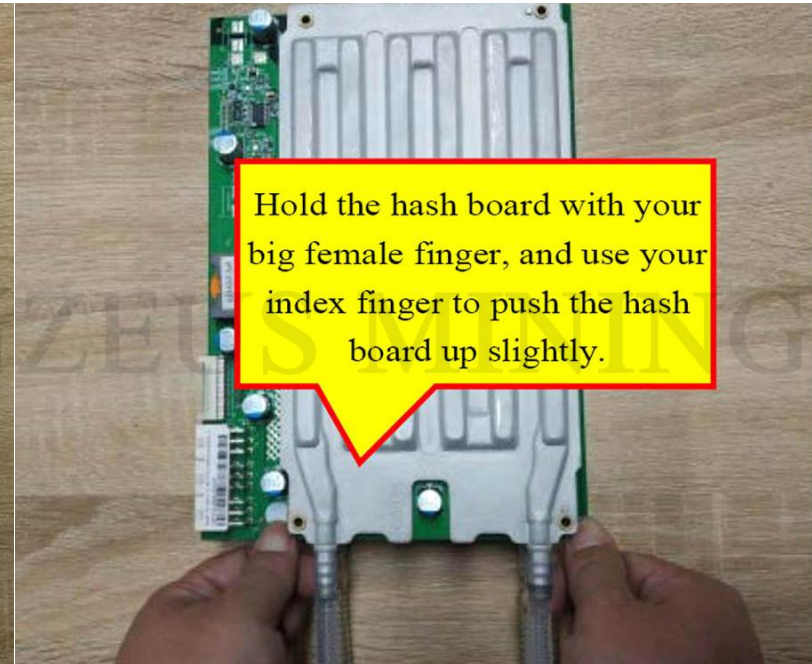
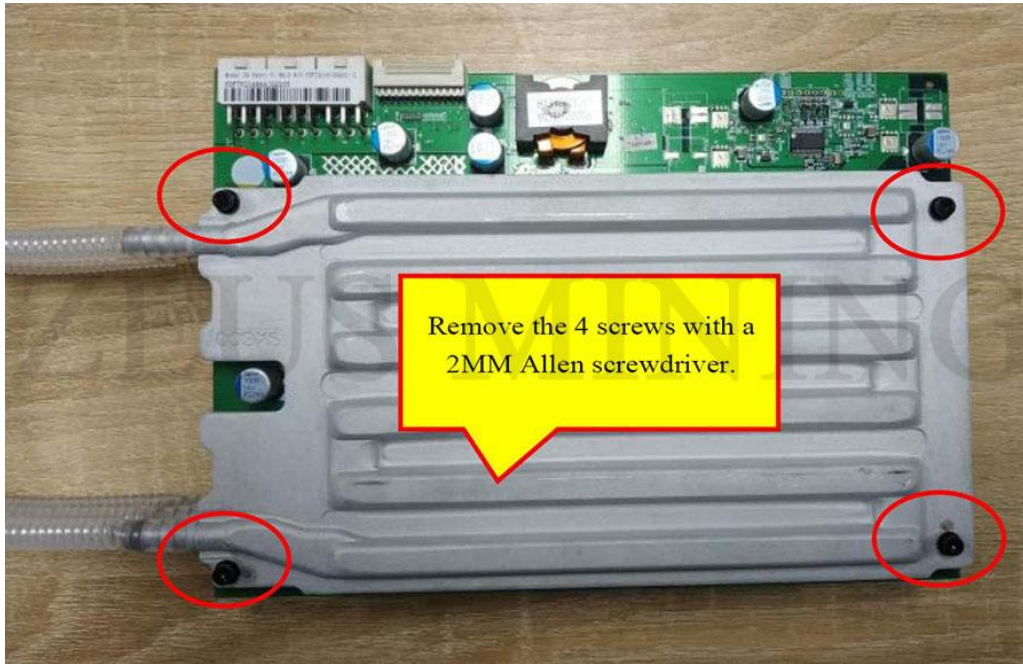
Disassemble the data
cable of the hash board.

Straighten the bellows repeatedly,
take out the rear baffle.



Remove the rear baffle.

4) Remove the bad hash board:





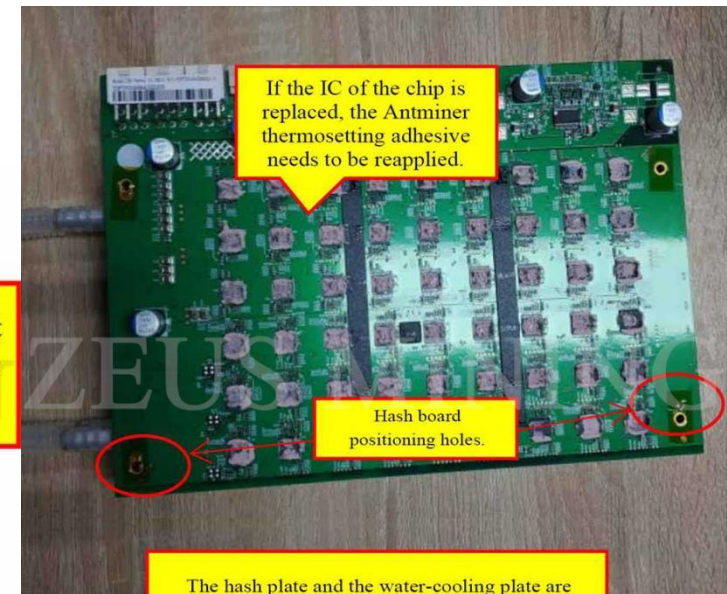
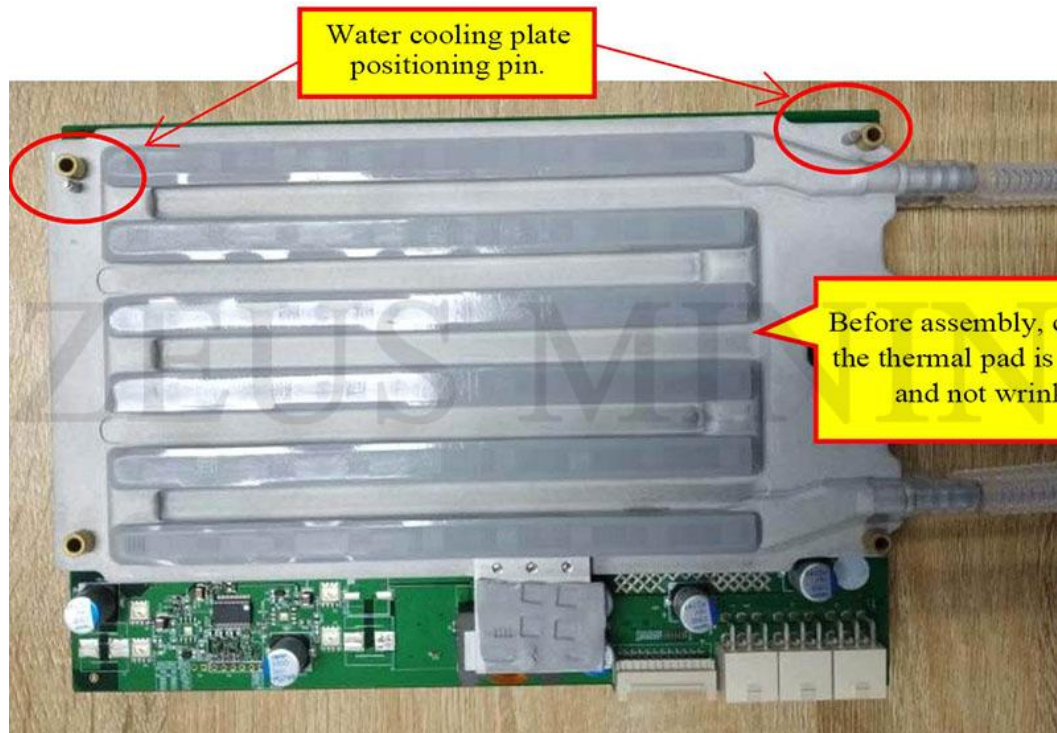
3. Antminer S9 Hydro Hash board repair:

1) The S9 Hydro hash board consists of 3 18 voltage domains connected in series, each voltage domain has 1 BM1387 chip, and the whole board has a total of 54 [BM1387 chips](#) (same as T9+, but uses Bin1 chip). Please pay attention when repairing because the water - cooling plate dissipates both sides of S9 Hydro; during maintenance and testing, the water - cooling plate is disassembled, so there is no way to dissipate heat by water - cooling, so you need to add two 6000 rpm fans and modify the config file to fix it. The frequency is adjusted to 200M, and the voltage is adjusted to 7.6V for testing. The modification method is as shown in the figure below, and the hash board maintenance method refers to the T9+ hash board repair guide (the fixture is shared with T9+);

```
D:\生产文件\S9 Hydro\Config.ini - Notepad++ [Administrator]
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
Config.ini
1 [Config]
2 Name=T9+ HASH board
3
4 # test data
5 TestDir=/mnt/mmc1/minertest64/minertest64_
6
7 # about ASIC
8 ASICType=1387
9 ASICNum=18
10 CoreNum=114
11 # CommandMode 0:rvl 1:rfl
12 CommandMode=0
13 TestMode=1
14 CheckChain=1
15 Timeout=0
16 OpenCoreGap=50000
17
18 # about test benchmark
19 DataCount=912
20 PassCount1=912
21 PassCount2=912
22 PassCount3=912
23 PassCount4=912
24 PassCount5=912
25 PassCount6=912
26 PassCount7=912
27 PassCount8=912
28 PassCount9=912
29
30 ValidNonce1=16416
31 ValidNonce2=16416
32 ValidNonce3=16416
33
34 # about voltage
35 Voltage1=760
36 Voltage2=0
37 Voltage3=0
38
39 # about frequency
40 Freq1=200
41 Freq2=300
42 Freq3=200
43 Freq4=550
44 Freq5=550
45 Freq6=550
46 Freq7=550
47 Freq8=550
48 Freq9=550
49
50 # about nonce
51 Nonce1=16416
52 Nonce2=16416
53 Nonce3=16416
54
```

2) When replacing the repaired hash board, you should pay attention to it. After replacing the chip, you need to apply thermosetting

adhesive on the chip, and the thermally conductive silicone sheet on the hash board must be complete and not wrinkled;



The hash plate and the water-cooling plate are positioned by the positioning hole of the hash plate and the positioning pin of the water-cooling plate. Therefore, make sure that these two places are installed before assembling.



3) Assemble the water-cooled plate mold to the miner's chassis, install the back baffle, lock the back baffle screws, lock the busbar screws, install the corrugated pipe, insert the cable, and complete the miner's assembly.