Hydro Cooling Server-attentions V1.0

1. Heat dissipation system

Server inlet water temperature control

1) Requirement:Inlet water temperature constant control

2) Range: **20℃~50℃ @normal mode; 20℃~40℃ @high mode**

Mark: If the temperature of input liquid is too high, the frequency and hash rate will be reduced.

2. Server inlet flow control

1) Requirement: Inlet flow constant control

2) Range: Single server flow**≥10L/min**, 10L/min temperature difference with inlet and out let is 10℃@normal mode, 14℃@high mode

Mark: If the flow is less, then the temperature of outlet liquid will be increased, the frequency and hash rate will be reduced.

3. Inlet pressure control

1) Range: **≤350kpa**

Mark: If the pressure is too high, there is a risk of deformation of the cold plate , the device will lose warranty accordingly.

4. liquid media control

1) Primary liquid medium: primary deionized water: meet the requirements of national standard GB / T 6682-2008 primary deionized water;电导率控制范围：**≤100us/cm;**

1) PH range：**6~8**;

mark: If the conductivity or pH of liquid medium exceeds the standard, the cold plate has the risk of corrosion and blockage. Long-term operation will reduce the frequency and calculation force of the machine, and the damaged machine will not be guaranteed.

5. Circulating system

1) Pipe: Anti-rust and anti-corrosion, stainless steel is recommended

mark: There are many welding slag at the welded junction of carbon steel pipe, which is not easy to clean, and is easy to rust and corrosion. The cold plate has the risk of corrosion and blockage. Long-term operation will reduce the frequency and calculation force of the machine, and the damaged machine will not be guaranteed;

2) Filter: Configure 270 mesh filter;

mark: The mesh number of the filter is too low, the impurities of large particles in the system cannot be filtered, and there is a risk of blockage of the cold plate joint, which will reduce the frequency and calculation force of the machine, so the damaged machine will not be guaranteed.

3) Temperature resistance of system components: **≥85℃;**

mark: If the temperature resistance of the cooling system components is lower than 85 ℃, it is easy to cause damage to the system components or even leakage of liquid media, affecting the normal operation of the server.

4) Circulating pump: It is suggested that one for use and one for standby to improve the reliability of the system;

5) Pressure test and leak detection of system pipeline: It is recommended to use air compressor for gas inspection and soap bubble method to detect the sealing of welded

junction;

mark：If water inspection is adopted in winter, the drainage of system equipment needs to be antifreezed, and the equipment that is not easy to be drained is at risk of freezing damage. The efficiency of gas detection is high, and the cumbersome work of drainage and antifreeze of system equipment is saved during leak detection in winter;

6) Exhaust and drain valve：Automatic exhaust valve shall be installed at local high level and drainage valve shall be installed at local low level. In addition, it is recommended to install manual exhaust valves in multiple places of the system to improve the first liquid injection efficiency of the system;

7) Others：

- **To prevent the system pressure from being too high, the system needs to be equipped with a 4bar safety relief valve;;**

  mark：Please ensure that the pressure relief value has been adjusted before operation, otherwise, the water inlet pressure of the server is greater than 350kPa, and the damaged machine will not be guaranteed;

- To prevent system pressure fluctuation, the system is equipped with constant pressure expansion tank;

  mark：Please ensure that the pressure value of the expansion tank has been adjusted before operation, otherwise the constant pressure expansion tank cannot work, which is likely to cause the water inlet pressure of the server > 350kPa, and the damaged machine is not guaranteed;

- Before the cabinet is connected to the heat dissipation system, the system pipeline shall be cleaned and filtered with deionized water to remove dust, welding slag and other impurities; Prevent impurities from blocking the water inlet and outlet connector of the server;

  mark：Impurities block the water inlet and outlet joints of the server, resulting in too small water flow in the server, and then the frequency and computing power of the machine are reduced. The damaged machine is not guaranteed.

- The circulating system is recommended to be equipped with ultraviolet lamp sterilization device to avoid the breeding of bacteria in the liquid and the attenuation of the heat dissipation capacity of the system.

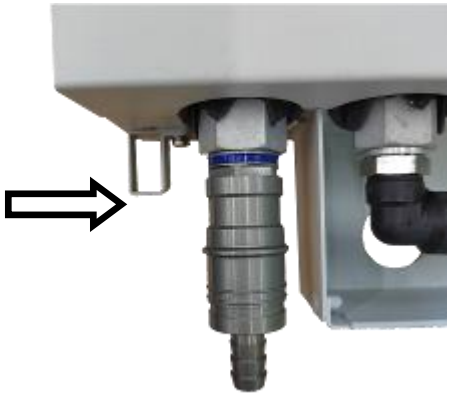
Server up to and down from shelves

1. The female head and power cord of quick connector must be original accessories, and the damaged machine is not guaranteed.
2. Plug and unplug the quick connector as shown in the picture. After normal plug-in, the male and female heads are connected, the liquid can flow, and the quick connector will lock itself. After unplugging, the male and female heads will be cut off in both directions without liquid leakage. After the plug-in is completed, check whether there is virtual plug-in of the quick connector by pulling the hose at the head of the pagoda;

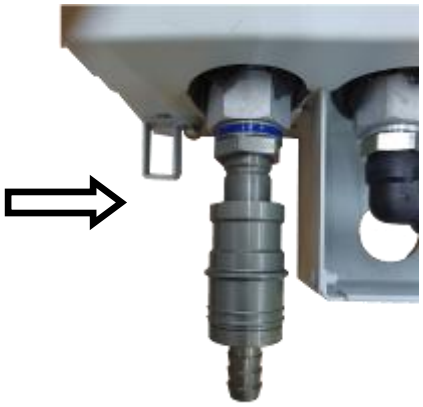
   mark：If the server is falsely plugged in, the over temperature protection will fail to work, and even the water cooling board will be damaged. The damaged machine will not be guaranteed.

   Plug in diagram：Hold the pagoda head end of the quick connector (female

head) (the pagoda head marked in the figure) and push it forward in place. Be careful not to hold the movable ring.

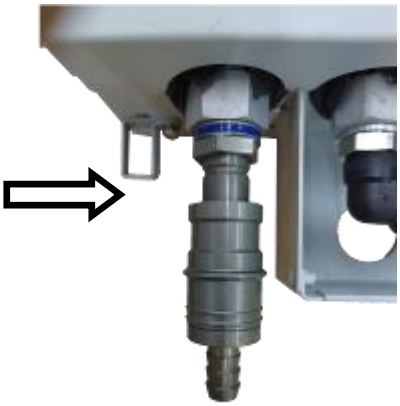


Correct Diagram (The connector is pushed into place) ✔



Wrong Diagram (The connector is not pushed into place) ✘

Disconnection Diagram: Hold the movable ring in the middle of the quick connector (female head) and pull it back to disconnect it.



3. Press and hold the connector spring when the power cord is disconnected;

Server Power on and off

1. Before the server is powered on, confirm that the cooling system works normally, that is, confirm whether the air in the pipeline has been drained and whether the system has no leakage.
   mark：If there is air in the pipe, there is a risk of damage to the circulating pump. The inlet and outlet joints and intermediate connecting pipes of the server need to be checked. If there is slight leakage, it needs to be handled in time. Otherwise, the servers around the leakage point are at risk of damage, and the normal operation of the cooling system will be affected for a long time. The damaged machine is not guaranteed.
2. When all servers of the same cooling system are started up at the same time, in order to avoid overheating protection of the server caused by out of control water temperature control of the cooling system, it is recommended that the cooling capacity of the cooling system be fully opened before all servers are started up (that is, the components of the system temperature control are fully opened, such as fans, circulating pumps, electric valves, etc.). After the server power rises close to the rated power, the cooling system will enter the automatic control and regulation state of water temperature.
3. Circulate water before the server is put on the shelf, empty the air in the server water-cooling board and fill the cold board with water; Or install one server at a time, and then install the next server after the water replenishment is completed.
   mark：Generally, there is no cooling water in the server water-cooling board. When the server is connected to the cooling system, air will enter the pipeline system and cause water shortage in the system. Therefore, the pipeline system needs to be equipped with exhaust device and automatic liquid replenishment device. When the system is running, multiple servers without cooling water cannot be connected at the same time in a short time, because at this time, the system will suddenly lack a lot of water, make-up water is not timely, and air is mixed into the circulating system, which is easy to cause damage to the operation of the water pump with gas, and may lead to overheating of local chips of other servers, burning out servers or affecting computing power. The damaged machines are not guaranteed.

4. Confirm that there is no condensation on the server.
   mark：Because when the server is not working, if the ambient temperature rises from a lower temperature to a higher temperature, and the server itself cannot keep up with the change of ambient temperature, condensation may occur. In case of condensation, the server can be heated and dried by other heating methods such as sun irradiation. The damaged machine is not guaranteed.
5. After the server is shut down, when the inlet and outlet of the server are disconnected from the cooling system (that is, when the server has no water circulation), be sure to drain the cooling water inside the server to prevent the cold plate from being damaged.
   mark：The machine thus damaged is not warranted.