Claims

1. An immersion liquid cooling system, comprising: a liquid cooling device, a first pump, a first condenser, a first solenoid valve, a second pump, a liquid storage device and a third solenoid valve;

wherein, a gas area outlet of the liquid cooling device is connected to one end of the first pump, the other end of the first pump is connected to an inlet of the first condenser, and an outlet of the first condenser is connected to the first solenoid valve; the first solenoid valve is connected to an air discharge port for controlling an on/off state of the air discharge port;

a liquid area inlet of the liquid cooling device is connected to one end of the second pump, and the other end of the second pump is connected to the liquid storage device;

one end of the third solenoid valve is connected to the outlet of the first condenser, and the other end of the third solenoid valve is connected to a second inlet of the liquid storage device, the third solenoid valve is to control connection/ disconnection of a pipeline between the first condenser and the second inlet of the liquid storage device.

2. The system according to claim 1, wherein the system further comprises a second solenoid valve;

a first inlet of the liquid storage device is connected to the second solenoid valve, and the second solenoid valve is connected to a liquid supplementing port for controlling an on/off state of the liquid supplementing port.

3. The system according to claim 2, wherein a second condenser is provided in a gas area of the liquid cooling device, the first condenser and the second condenser share a coolant outlet and a coolant inlet;

the coolant inlet is provided with an opening control valve, and a fourth solenoid valve is provided between the opening control valve and the first condenser, the fourth solenoid valve is to control connection/disconnection of a pipeline between the opening control valve and a condenser pipe inlet of the first condenser;

the opening control valve is further connected to a condenser pipe inlet of the second condenser.

4. The system according to claim 3, wherein the system further comprises a first liquid discharge pipeline, a second liquid discharge pipeline, a first three-way valve and a second three-way valve;

the first three-way valve is located between the second pump and the liquid storage device, and the first three-way valve is connected to the first liquid discharge pipeline;

the second three-way valve is located between the liquid area inlet of the liquid cooling device and the second pump, and the second three-way valve is connected to the second liquid discharge pipeline.

5. The system according to claim 3, wherein the system further comprises a third liquid discharge pipeline, a fourth liquid discharge pipeline, a first three-way valve, a second three-way valve and a fifth solenoid valve;

the first three-way valve is located between the second pump and the liquid storage device, and the second three-way valve is located between the liquid area inlet of the liquid cooling device and the second pump;

one end of the third liquid discharge pipeline is connected to an outlet of the second pump, and the other end of the third liquid discharge pipeline is connected to a liquid discharge port, and the fifth solenoid valve is provided between the third liquid discharge pipeline and the second pump;

one end of the fourth liquid discharge pipeline is connected to the first three-way valve, and the other end of the fourth liquid discharge pipeline is connected to the second three-way valve.

6. The system according to any one of claims 1 to 5, wherein a pressure gage is provided between the gas area outlet of the liquid cooling device and the first pump.

7. The system according to any one of claims 1 to 5, wherein a liquid level sensor is provided in the liquid cooling device, or

wherein a liquid level sensor is provided in a liquid storage tank.

8. The system according to claim 4 or 5, wherein a control apparatus is provided in the liquid cooling device, and the control apparatus is to control the opening control valve, the first solenoid valve, the second solenoid valve, the third solenoid valve, the fourth solenoid valve, the first pump, the second pump, the first three-way valve and the second three-way valve.

9. A control method for an immersion liquid cooling system, wherein the immersion liquid cooling system is the system according to any one of claims 1 to 8, and the method is applied to a control apparatus of a liquid cooling device, and the method comprises:

when a device to be heat-dissipated in the liquid cooling device is started, turning on a first pump, a first solenoid valve, a third solenoid valve and a fourth solenoid valve, and turning off a second solenoid valve, so that the first pump extracts air and immersion liquid vapor from the liquid cooling device, allowing the air and immersion liquid vapor to enter a first condenser, immersion liquid condensed by the first condenser flows into a liquid storage device through the third solenoid valve with the air being discharged through the first solenoid valve and an air discharge port;

adjusting a first three-way valve to connect a second pump and the

liquid storage device;

adjusting a second three-way valve to connect a liquid area inlet of the liquid cooling device and the second pump;

adjusting an opening degree of an opening control valve, to adjust pressure inside the liquid cooling device until the air discharging is completed.

10. The method according to claim 9, wherein adjusting the opening degree of the opening control valve, to adjust the pressure inside the liquid cooling device until the air discharging is completed, comprises:

obtaining a pressure value collected by a pressure gage once every first preset time duration;

if pressure values collected after consecutive collections for a preset number of times show an increasing trend, reducing the opening degree of the opening control valve by a preset opening degree value;

after a second preset time duration, turning off the first pump, the first solenoid valve, the third solenoid valve and the fourth solenoid valve, and turning on the first pump, the first solenoid valve, the third solenoid valve and the fourth solenoid valve again;

returning to the obtaining a pressure value collected by the pressure gage once every first preset time duration, until pressure values collected after consecutive collections for the preset number of times show a decreasing trend, determining that the air discharging is completed,

preferably, wherein after the determining that the air discharging is completed, the method further comprises:

turning off the first pump, the first solenoid valve, the third solenoid valve and the fourth solenoid valve;

obtaining a pressure value collected by the pressure gage once every first preset time duration;

if the pressure value is greater than a first pressure threshold, then increasing the opening degree of the opening control valve by the preset opening degree value;

if the pressure value is less than a second pressure threshold, then reducing the opening degree of the opening control valve by the preset opening degree value,

more preferably, wherein the method further comprises:

if the opening degree of the opening control valve reaches a maximum opening degree value, and if the pressure values collected after consecutive collections for the preset number of times show an increasing trend, turning on the third solenoid valve, the fourth solenoid valve, and the first pump;

if it is determined that a liquid level value recognized by a liquid level sensor in the liquid storage device is greater than or equal to a first preset height, turning on the second pump, and extracting immersion liquid in the liquid storage device through the second pump, so that the immersion liquid enters the liquid cooling device along a pipeline through the liquid area inlet of the liquid cooling device,

even more preferably, wherein the method further comprises:

increasing a power of the first pump by a preset power value if the pressure values collected after consecutive collections for the preset number of times show an increasing trend.

11. The method according to claim 9 or 10, wherein the method further comprises:

if it is determined that a liquid level value recognized by the liquid

level sensor of the liquid cooling device is less than a second preset height value, turning off the third solenoid valve and turning on the second solenoid valve, so that the immersion liquid entered from a liquid supplementing port flows into the liquid storage device;

using the second pump to extract the immersion liquid in the liquid storage device, so that the immersion liquid enters the liquid cooling device along the pipeline through the liquid area inlet of the liquid cooling device,

preferably, wherein the method further comprises:

during the process of supplementing liquid for the liquid cooling device, obtaining a pressure value collected by the pressure gage once every first preset time duration;

if the pressure values collected after consecutive collections for the preset number of times show an increasing trend, turning on the first pump, the first solenoid valve and the fourth solenoid valve;

if a change amplitude of the pressure values collected after consecutive collections for the preset number of times is less than a preset threshold, turning off the first pump, the first solenoid valve and the fourth solenoid valve.

12. The method according to claim 9 or 10, wherein when the immersion liquid cooling system comprises a first liquid discharge pipeline and a second liquid discharge pipeline, the method further comprises:

after the device to be heat-dissipated in the liquid cooling device is closed, adjusting the first three-way valve so that the first liquid discharge pipeline is connected to the second pump;

adjusting the second three-way valve, so that the second pump is connected to the second liquid discharge pipeline;

opening a cover of the liquid cooling device, so that the immersion liquid in the liquid cooling device flows into the first liquid discharge pipeline, and turning on the second pump, using the second pump to extract the immersion liquid in the first liquid discharge pipeline, so that the immersion liquid flows out of a liquid discharge port through the second liquid discharge pipeline.

13. The method according to claim 9 or 10, wherein when the immersion liquid cooling system comprises a third liquid discharge pipeline and a fourth liquid discharge pipeline, the method further comprises:

after the device to be heat-dissipated in the liquid cooling device is closed, adjusting the second three-way valve so that the liquid cooling device is connected to the fourth liquid discharge pipeline;

adjusting the first three-way valve so that the fourth liquid discharge pipeline is connected to an inlet of the second pump;

turning on a fifth solenoid valve so that an outlet of the second pump is connected to the third liquid discharge pipeline;

opening a cover of the liquid cooling device so that the immersion liquid in the liquid cooling device flows into the fourth liquid discharge pipeline, and turning on the second pump, using the second pump to extract the immersion liquid in the fourth liquid discharge pipeline so that the immersion liquid flows out of a liquid discharge port through the third liquid discharge pipeline.

14. A machine-readable storage medium, having stored therein machine-executable instructions that, when called and executed by a processor, cause the processor to carry out the method according to any one of claims 9 to 13.

15. A computer program product, which causes a processor to carry out the method according to any one of claims 9 to 13.