

CLAIMS

What is claimed is:

1. A liquid cooling system, characterized by comprising a heat exchange unit and a cooling unit, wherein the cooling unit comprises at least two cavities separated from each other, the cooling unit is provided thereon with at least two liquid inlets and at least two liquid outlets, one of the liquid inlets and one of the liquid outlets both correspond to one cavity and are communicated with each other;

each of the cavities is communicated with the heat exchange unit through the corresponding liquid inlet and liquid outlet to form a cooling loop;

each of the liquid inlets and each of the liquid outlets are provided with a first regulating valve, and a liquid inlet end of the heat exchange unit is provided with a second regulating valve.

2. The liquid cooling system according to claim 1, characterized in that the heat exchange unit comprises a first liquid pump and a heat exchanger, a liquid inlet end of the first liquid pump forms a liquid inlet end of the heat exchange unit, the first liquid pump is connected to the heat exchanger, and the first liquid pump is connected to each of the liquid outlets while the heat exchanger is connected to each of the liquid inlets.

3. The liquid cooling system according to claim 2, characterized by further comprising a filter, wherein a liquid inlet end of the filter is connected to a liquid outlet end of the first liquid pump, and a liquid outlet end of the filter is connected to the liquid inlet end of the first liquid pump, or

the liquid inlet end of the filter is connected to the cooling unit, and the liquid outlet end of the filter is connected to the liquid inlet end of the first liquid pump.

4. The liquid cooling system according to claim 2, characterized in that a liquid inlet end of the second regulating valve is connected to a liquid outlet end of the first liquid pump, and

a liquid outlet end of the second regulating valve is connected to the liquid inlet end of the first liquid pump.

5. The liquid cooling system according to any one of claims 1 to 4, characterized in that the cooling unit comprises at least two first subunits, and the first subunit has one said cavity.

6. The liquid cooling system according to any one of claims 1 to 4, characterized in that the cooling unit comprises at least one second subunit, and the second subunit has at least two said cavities.

7. The liquid cooling system according to claim 6, characterized in that the second subunit comprises a cabinet, a liquid inlet pipe, and a liquid outlet pipe, an inner cavity of the cabinet is provided with at least one partition which separates the inner cavity into at least two cavities, both the liquid inlets and the liquid outlets are arranged on the cabinet;

the liquid inlet pipe and the liquid outlet pipe are located on two opposite sides of the cabinet, the liquid inlets are each communicated with the liquid inlet pipe, and the liquid outlets are each communicated with the liquid outlet pipe.

8. The liquid cooling system according to any one of claims 1 to 4, characterized in that both the liquid inlets and the liquid outlets are close to a top of the cooling unit; or

one group of the liquid inlets and the liquid outlets is close to the top of the cooling unit, and the other group of the liquid inlets and the liquid outlets is close to a bottom of the cooling unit.

9. The liquid cooling system according to any one of claims 1 to 4, characterized by further comprising a fluid distributor located between the cooling unit and the heat exchange unit, which are both connected to the fluid distributor.

10. The liquid cooling system according to any one of claims 2 to 4, characterized by further comprising a liquid replenishing unit, which comprises a liquid storage tank and a second liquid pump, the second liquid pump being connected to the liquid storage tank, and the second liquid pump being connected to the first liquid pump.

11. A control method for a liquid cooling system, characterized in that it is used to control the liquid cooling system according to claim 2, the control method comprising:

acquiring an operating parameter of the liquid cooling system;

adjusting a rotation speed of the first liquid pump and/or an opening degree of the second regulating valve in a case where the operating parameter does not fall within a preset range.

12. The control method for a liquid cooling system according to claim 11, characterized in that the acquiring of an operating parameter of the liquid cooling system comprises:

acquiring a first pressure of a coolant at the liquid inlet end of the first liquid pump and a second pressure of a coolant at a liquid outlet end of the first liquid pump to obtain a difference value between the second pressure and the first pressure.

13. The control method for a liquid cooling system according to claim 11, characterized in that the acquiring of an operating parameter of the liquid cooling system comprises:

acquiring a first flow rate of a coolant at the liquid inlet end of the first liquid pump and a second flow rate of a coolant at a liquid outlet end of the first liquid pump to obtain a difference value between the second flow rate and the first flow rate.

14. The control method for a liquid cooling system according to claim 11,

wherein the acquiring of an operating parameter of the liquid cooling system comprises:

acquiring a first temperature of a coolant at the liquid inlet end of the first liquid pump; and

the adjusting of a rotation speed of the first liquid pump and/or an opening degree of the

second regulating valve in a case where the operating parameter does not fall within a preset range comprises:

in a case where the first temperature is less than a minimum value of a third preset range, decreasing the rotation speed of the first liquid pump; in a case where the first temperature is greater than a maximum value of the third preset range, increasing the rotation speed of the first liquid pump; or

in a case where the first temperature is less than the minimum value of the third preset range, increasing the opening degree of the second regulating valve; in a case where the first temperature is greater than the maximum value of the third preset range, decreasing the opening degree of the second regulating valve; or

in a case where the first temperature is less than the minimum value of the third preset range, decreasing the rotation speed of the first liquid pump; in a case where the rotation speed of the first liquid pump is decreased to a threshold value and the first temperature is still less than the minimum value of the third preset range, increasing the opening degree of the second regulating valve;

in a case where the first temperature is greater than the maximum value of the third preset range, decreasing the opening degree of the second regulating valve; in a case where the second regulating valve is closed and the first temperature is still greater than the maximum value of the third preset range, increasing the rotation speed of the first liquid pump.

15. The control method for a liquid cooling system according to claim 12, characterized in that the adjusting of a rotation speed of the first liquid pump and/or an opening degree of the second regulating valve in a case where the operating parameter does not fall within a preset range comprises:

in a case where the difference value between the second pressure and the first pressure is greater than a maximum value of a first preset range, decreasing the rotation speed of the first liquid pump; in a case where the difference value between the second pressure and the first pressure is less than a minimum value of the first preset range, increasing the rotation speed of the first liquid pump; or

in a case where the difference value between the second pressure and the first pressure is greater than the maximum value of the first preset range, increasing the opening degree of the second regulating valve; in a case where the difference value between the second pressure and the first pressure is less than the minimum value of the first preset range, decreasing the opening degree of the second regulating valve; or

in a case where the difference value between the second pressure and the first pressure is greater than the maximum value of the first preset range, decreasing the rotation speed of the first liquid pump; in a case where the rotation speed of the first liquid pump is decreased to a threshold value and the difference value between the second pressure and the first pressure is still greater than the maximum value of the first preset range, increasing the opening degree of the second regulating valve;

in a case where the difference value between the second pressure and the first pressure is less than the minimum value of the first preset range, decreasing the opening degree of the second regulating valve; in a case where the second regulating valve is closed and the difference value between the second pressure and the first pressure is still less than the minimum value of the first preset range, increasing the rotation speed of the first liquid pump.

16. The control method for a liquid cooling system according to claim 13, characterized in that the adjusting of a rotation speed of the first liquid pump and/or an opening degree of the second regulating valve in a case where the operating parameter does not fall within a preset range comprises:

in a case where the difference value between the second flow rate and the first flow rate is greater than a maximum value of a second preset range, decreasing the rotation speed of the first liquid pump; in a case where the difference value between the second flow rate and the first flow rate is less than a minimum value of the second preset range, increasing the rotation speed of the first liquid pump; or

in a case where the difference value between the second flow rate and the first flow rate is greater than the maximum value of the second preset range, increasing the opening degree of the second regulating valve; in a case where the difference value between the second flow rate and the first flow rate is less than the minimum value of the second preset range,

decreasing the opening degree of the second regulating valve; or

in a case where the difference value between the second flow rate and the first flow rate is greater than the maximum value of the second preset range, decreasing the rotation speed of the first liquid pump; in a case where the rotation speed of the first liquid pump is decreased to a threshold value and the difference value between the second flow rate and the first flow rate is still greater than the maximum value of the second preset range, increasing the opening degree of the second regulating valve;

in a case where the difference value between the second flow rate and the first flow rate is less than the minimum value of the second preset range, decreasing the opening degree of the second regulating valve; in a case where the second regulating valve is closed and the difference value between the second flow rate and the first flow rate is still less than the minimum value of the second preset range, increasing the rotation speed of the first liquid pump.

17. The control method for a liquid cooling system according to claim 14, characterized in that in a case where the operating parameter does not fall within the preset range, the method further comprises:

acquiring a second temperature of a coolant at a liquid outlet corresponding to each cavity;

regulating a corresponding first regulating valve according to the second temperature.

18. A control system for a liquid cooling system, characterized by comprising:

a first pressure detection unit being used to detect a first pressure of a coolant at a liquid inlet end of a first liquid pump;

a second pressure detection unit being used to detect a second pressure of a coolant at a liquid outlet end of the first liquid pump;

a control unit to which both the first pressure detection unit and the second pressure detection unit are electrically connected, the control unit being used to adjust a rotation speed of the first liquid pump and/or an opening degree of a second regulating valve in a case where

a difference value between the second pressure and the first pressure does not fall within a first preset range.

19. A control system for a liquid cooling system, characterized by comprising:

a first flow rate detection unit being used to detect a first flow rate of a coolant at a liquid inlet end of a first liquid pump;

a second flow rate detection unit being used to detect a second flow rate of a coolant at a liquid outlet end of the first liquid pump;

a control unit to which both the first flow rate detection unit and the second flow rate detection unit are electrically connected, the control unit being used to adjust a rotation speed of the first liquid pump and/or an opening degree of a second regulating valve in a case where a difference value between the second flow rate and the first flow rate does not fall within a second preset range.

20. A control system for a liquid cooling system, characterized by comprising:

a temperature detection unit being used to detect a first temperature of a coolant at a liquid inlet end of a first liquid pump;

a control unit to which the temperature detection unit is electrically connected, the control unit being used to adjust a rotation speed of the first liquid pump and/or an opening degree of a second regulating valve in a case where the first temperature does not fall within a third preset range.