CLAIMS

1. An air-conditioning system for server room management including a first space and a second space separated from each other, a server being placed between the first space and the second space, supply air entering into the first space being heated by heat generation of the server and flowing out through the second space as return air, the air-conditioning system comprising:

an outside air introduction device that adjusts an amount of introduction of outside air, and introduces the outside air;

a return air introduction device that adjusts an amount of introduction of the return air flowing out from the second space of the server room, and introduces the return air;

a humidifier to~~capable of~~ humidify~~ing~~ at least one of the outside air and the return air;

a cooler to~~capable of~~ cool~~ing~~ at least one of the outside air and the return air;

a blower that causes the return air and the outside air from the humidifier and the return air and the outside air from the cooler to enter the first space as the supply air, and causes the return air to flow out from the second space;

a return air temperature measuring instrument that measures return air temperature; and

an air-conditioning control device including:

a measured outside air temperature and humidity acquisition unit that acquires a measured outside air temperature and a measured outside air humidity;

an air-conditioning control content setting unit that sets an air-conditioning control content for

generating supply air at a temperature, an absolute humidity, and a relative humidity within a preliminarily set target range, based on the measured outside air temperature and the measured outside air humidity acquired by the measured outside air temperature and humidity acquisition unit as well as a measured return air temperature acquired from the return air temperature measuring instrument; and

a device control unit that controls the amount of introduction of the outside air, the amount of introduction of the return air, a control amount of the humidifier, a control amount of the cooler, and an amount of air blown by the blower, based on the air-conditioning control content set by the air-conditioning control content setting unit, wherein,

when~~if it is determined that an air state of the outside air is within an air state range greater than an upper limit of the target range of the absolute humidity, or if~~ it is determined that an~~the~~ air state of the outside air is within an air state range greater than an upper limit of an enthalpy range corresponding to an air state within the target ranges of the temperature and the absolute humidity and greater than the upper limit of the target range of the temperature, the air-conditioning control content setting unit compares the air state of the outside air and an air state of the return air, and

the air-conditioning control content setting unit determines, in accordance with a result of the comparison, whether to set the air-conditioning control content so that the cooler performs cooling processing by minimizing the amount of introduction of the outside air or whether to set the air-conditioning control content so that the cooler performs cooling processing by maximizing the amount of

introduction of the outside air.

2. The air-conditioning system for server room management of Claim 1,

wherein, when~~if~~ it is determined that the air state of the outside air is within the air state range, the air-conditioning control content setting unit compares an enthalpy of the outside air and an enthalpy of the return air with each other,

wherein, as a result of the comparison, when~~if~~ it is determined that the enthalpy of the return air is smaller than the enthalpy of the outside air, the air-conditioning control content setting unit sets the air-conditioning control content so that the cooler performs cooling processing by minimizing the amount of introduction of the outside air,

and wherein, as a result of the comparison, when~~if~~ it is determined that the enthalpy of the outside air is smaller than the enthalpy of the return air, the air-conditioning control content setting unit sets the air-conditioning control content so that the cooler performs the cooling processing by maximizing the amount of introduction of the outside air.

3. The air-conditioning system for server room management of Claim 1,

wherein, when~~if~~ it is determined that the air state of the outside air is within the air state range, the air-conditioning control content setting unit compares ~~an~~ temperature of the outside air and a temperature of the return air with each other,

wherein, as a result of the comparison, when~~if~~ it is determined that the temperature of the return air is lower

than the temperature of the outside air, the air-conditioning control content setting unit sets the air-conditioning control content so that the cooler performs cooling processing by minimizing the amount of introduction of the outside air,

and wherein, as a result of the comparison, when~~if~~ it is determined that the temperature of the outside air is lower than the temperature of the return air, the air-conditioning control content setting unit sets the air-conditioning control content so that the cooler performs cooling processing by maximizing the amount of introduction of the outside air.

4. The air-conditioning system for server room management of Claim 1,

wherein, when~~if~~ it is determined that the air state of the outside air is within the air state range, the air-conditioning control content setting unit compares energy required for cooling the outside air and energy required for cooling the return air, the energies being for generating the supply air at the temperature, the absolute humidity, and the relative humidity within the preliminarily set target range and being consumed by the cooler,

wherein, as a result of the comparison, when~~if~~ it is determined that the energy required for cooling the return air is smaller than the energy required for cooling the outside air, the air-conditioning control content setting unit sets the air-conditioning control content so that the cooler performs cooling processing by minimizing the amount of introduction of the outside air,

and wherein, as a result of the comparison, when~~if~~ it is determined that the energy required for cooling the

outside air is smaller than the energy required for cooling the return air, the air-conditioning control content setting unit sets the air-conditioning control content so that the cooler performs cooling processing by maximizing the amount of introduction of the outside air.

5. An air-conditioning control method for server room management, wherein

———an air-conditioning control device of an air-conditioning system for server room management in which a return air introduction device and a supply air introduction device are connected to a server room including a first space and a second space separated from each other, in which a server is placed between the first space and the second space, and in which supply air entering into the first space is heated by heat generation of the server and flows out through the second space as return air, performs:

acquiring, by an outside air and humidity acquisition unit of the air-conditioning control device, a measured outside temperature and a measured outside humidity;

acquiring, by an air-conditioning control content setting unit of the air-conditioning control device, a measured return air temperature from a return air temperature measuring instrument;

comparing, by the air-conditioning control content setting unit of the air-conditioning control device, when~~if it is determined that an air state of the outside air is within an air state range greater than an upper limit of the target range of the absolute humidity, or if~~ it is determined that an~~the~~ air state of the outside air is within an air state range greater than an upper limit of an enthalpy range corresponding to an air state within the

target ranges of the temperature and the absolute humidity and greater than the upper limit of the target range of the temperature, the air state of the outside air and an air state of the return air;

determining, by the air-conditioning control content setting unit of the air-conditioning control device, in accordance with a result of the comparing, whether to set the air-conditioning control content so that the cooler performs cooling processing by minimizing the amount of introduction of the outside air or whether to set the air-conditioning control content so that the cooler performs cooling processing by maximizing the amount of introduction of the outside air;

setting, upon determination of the determining, the air-conditioning control content; and

controlling, by a device control unit of the air-conditioning control device, an amount of introduction of the outside air, an amount of introduction of the return air, a control amount of the humidifier, a control amount of the cooler, and an amount of air blown by the blower, based on the set air-conditioning control content.