- most of the load is sensible heat load;

- the set temperature and humidity fall within a certain range; and

- ventilation for preventing an increase in CO_2 concentration is unnecessary since the load does not generate CO_2.

However, the conventional data center wastes energy because of not performing air conditioning control adapted for these features.

[0007] An object of the present invention is to provide an air conditioning system and an air conditioning control method for a server room, capable of performing air conditioning control having a great energy-saving effect with efficiency and reliability.

SUMMARY

[0007a] According to one aspect, there is provided an air conditioning system for a server room, comprising:

means for adjusting the amount of admission of return air flowing out of the server room as an object to be subject to air conditioning control;

means for adjusting the amount of admission of outside air;

an air conditioning control setting unit configured to make air conditioning control settings for generating supply air in a state which lies within a target state and falls under a preset first specific enthalpy in order to generate the supply air in the target state from at least any one of the admitted return air and outside air, the target state being a state falling within a preset target range of supply air temperature, within a preset target range of supply air absolute humidity, and within a preset target range of supply air relative humidity; and configured to make air conditioning control settings for generating supply air in a state which lies

within the target state and falls under a second specific enthalpy higher than the first specific enthalpy, when absolute humidity of the outside air is equal to or lower than an upper limit value of the target range of supply air absolute humidity, relative humidity of the outside air is higher than an upper limit value of the target range of supply air relative humidity, specific enthalpy of the outside air is equal to or higher than the first specific enthalpy, and specific enthalpy of the return air is equal to or higher than the first specific enthalpy, or when relative humidity of supply air obtained by mixing together the outside air and the return air is higher than the upper limit value of the target range of supply air relative humidity; and

an equipment controller configured to generate control signals for controlling the amount of admission of the outside air and the amount of admission of the return air, based on the air conditioning control settings made by the air conditioning control setting unit, thereby to control the means for adjusting the amount of admission of the return air and the means for adjusting the amount of admission of the outside air.

[0007b] According to another aspect, there is provided an air conditioning control method for a server room, comprising:

admitting at least any one of outside air and return air flowing out of the server room,

making air conditioning control settings for generating supply air in a state which lies within a target state and falls under a preset first specific enthalpy, in order to generate the supply air in the target state, the target state being a state which falls within a preset target range of supply air temperature, within a preset target range of supply air absolute humidity,

and within a preset target range of supply air relative humidity;

making air conditioning control settings for generating supply air in a state which lies within the target state and falls under a second specific enthalpy higher than the first specific enthalpy, when absolute humidity of the outside air is equal to or lower than an upper limit value of the target range of supply air absolute humidity, relative humidity of the outside air is higher than an upper limit value of the target range of supply air relative humidity, specific enthalpy of the outside air is equal to or higher than the first specific enthalpy, and specific enthalpy of the return air is equal to or higher than the first specific enthalpy, or when relative humidity of supply air obtained by mixing together the outside air and the return air is higher than the upper limit value of the target range of supply air relative humidity; and

controlling air conditioning equipment configured to generate control signals for controlling the amount of outside air admission and the amount of return air admission, based on the air conditioning control settings made, thereby to control air conditioning in the server room.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Fig. 1 is a general drawing showing a configuration of an air conditioning system according to one embodiment;

Fig. 2 is a block diagram showing a configuration of an air conditioning controller of the air conditioning system according to one embodiment;

Fig. 3 is a psychrometric chart showing ranges into which the state of outside air is classified by the air conditioning controller of the air conditioning system according to one embodiment;

Fig. 4 is a flowchart showing operation of the air conditioning controller of the air conditioning system according to one embodiment; and

Fig. 5 is a block diagram showing a configuration of an air conditioning control setting unit of the air conditioning controller according to one embodiment.

DETAILED DESCRPTION

[0009] An air conditioning system for a server room, according to the