Claims

[Claim 1]

An air conditioning system control device, comprising:

a setting unit configured to set a water supply temperature of cold water obtained by a heat source machine;

a total load acquisition unit configured to acquire a total load amount in a load including an air-conditioned space;

a first calculation unit configured to calculate, for a candidate value to be set for the water supply temperature, an amount of air supplied into a room by referring to a heat exchange amount exchanged by a cooling coil in which the cold water flows, an indoor target temperature, and the total load amount;

a second calculation unit configured to calculate a water supply flow rate of the heat source machine by referring to the candidate value of the water supply temperature and the the total load amount; and

an estimation unit configured to estimate total power consumption on a heat source machine side and a load side according to the candidate value of the water supply temperature, the amount of air supplied into the room, and the water supply flow rate, wherein

the setting unit sets the water supply temperature at which the estimated total power consumption is minimized,

the total load amount is a sum of an outside air introduction load which is a load caused by introducing the outside air to the air-conditioned space, and an indoor load which is a load exists within the air-conditioned space,

the total load acquisition unit calculates the outside air introduction load based on the outside air introduction amount according to the concentration of CO_2 within the air-conditioned space, and outside temperature and humidity, and

the total load acquisition unit calculates the indoor load based on at least referring to entry and exit management information of the air-conditioned space.

[Claim 2]

The air conditioning system control device according to claim 1, wherein

the first calculation unit calculates the amount of air supplied into the room, within a range where a concentration of CO_2 does not exceed a specified upper limit value.

[Claim 3]

The air conditioning system control device according to claim 1 or 2, wherein

the first calculation unit calculates the amount of air supplied into the room, within a range where a relative humidity of indoor air does not exceed a specified upper limit value.

[Claim 4]

The air conditioning system control device according to any one of claims 1 to 3, wherein

the estimation unit calculates power consumption of fans according to at least the amount of air supplied into the room as the power consumption on the load side, and calculates power consumption of an auxiliary machine according to at least the water supply flow rate as the power consumption on the heat source machine side.

[Claim 5]

An air conditioning system, comprising:

the air conditioning system control device according to any one of claims 1 to 4; and

a heat storage tank in addition to the heat source machine, as a device included in the heat source machine side.

[Claim 6]

A method for controlling an air conditioning system, the method comprising:

setting a water supply temperature of cold water obtained by a heat source machine;

acquiring a total load amount in a load including an air-conditioned space;

calculating, for a candidate value to be set for the water supply temperature, an amount of air supplied into a room by referring to a heat exchange amount exchanged by a cooling coil in which the cold water flows, an indoor target temperature, and the total load amount;

calculating a water supply flow rate of the heat source machine by referring to the candidate value of the water supply temperature and the total load amount; and

estimating total power consumption on a heat source machine side and a load side according to the candidate value of the water supply temperature, the amount of air supplied into the room, and the water supply flow rate, wherein

in the setting of the water supply temperature of the heat source machine, the water supply temperature at which the estimated total power consumption is minimized is set,

the total load amount is a sum of an outside air introduction load which is a load caused by introducing the outside air to the air-conditioned space, and an indoor load which is a load exists within the air-conditioned space,

in the acquiring of the total load amount, calculating the outside air introduction load based on the outside air introduction amount according to the concentration of CO_2 within the air-conditioned space, and outside temperature and humidity, and

in the acquiring of the total load amount, calculating the indoor load based on at least referring to entry and exit management information of the air-conditioned space.

[Claim 7]

A program causing a computer of an air conditioning system control device to execute:

setting a water supply temperature of cold water obtained by a heat source machine;

acquiring a total load amount in a load including an air-conditioned space;

calculating, for a candidate value to be set for the water supply temperature, an amount of air supplied into a room by referring to a heat exchange amount exchanged by a cooling coil in which the cold water flows, an indoor target temperature, and the total load amount;

calculating a water supply flow rate of the heat source machine by referring to the candidate value of the water supply temperature and the total load amount; and

estimating total power consumption on a heat source machine side and a load side according to the candidate value of the water supply temperature, the amount of air supplied into the room, and the water supply flow rate, wherein

in the setting of the water supply temperature of the heat source machine, the water supply temperature at which the estimated total power consumption is minimized is set,

the total load amount is a sum of an outside air introduction load which is a load caused by introducing the outside air to the air-conditioned space, and an indoor load which is a load exists within the air-conditioned space,

in the acquiring of the total load amount, calculating the outside air introduction load based on the outside air introduction amount according to the concentration of CO_2 within the air-conditioned space, and outside temperature and humidity, and

in the acquiring of the total load amount, calculating the indoor load based on at least referring to entry and exit management information of the air-conditioned space.