[CLAIMS]

1. An equipment characteristics model learning device comprising:

an acquisition unit configured to acquire actual values of variables which are used to express characteristics of equipment in a characteristics model indicating the characteristics:

a model coefficient deriving unit configured to derive a value of a coefficient of a simple characteristic model using the acquired actual values, wherein the simple characteristic model indicates the characteristics using variables of the characteristic models decreased in the number of dimensions by generating from the characteristic model on the basis of a change factor variable which is a variable serving as a change factor for the characteristics among the variables of the characteristic model; and

a model coefficient correcting unit configured to correct the value of the coefficient when the value of the coefficient derived by the model coefficient deriving unit satisfies a predetermined condition, wherein

the predetermined condition is a condition that a sign of the value of the coefficient derived by the model coefficient deriving unit does not match a preset sign or does not match a sign of the value of the coefficient derived from another simple characteristics model corresponding to a value for the change factor variable different from that of the simple characteristics model from which the value of the coefficient has been derived.

2. The equipment characteristics model learning device according to claim 1, wherein the model coefficient correcting unit corrects the value of the coefficient using a value of the coefficient which was derived in the past, or the model coefficient correcting unit corrects the value of the coefficient using a value of a coefficient of the simple characteristics model which is derived for the change factor variable of a different value, or the model coefficient correcting unit corrects the value of the coefficient using the value of the coefficient which is derived by the model coefficient deriving unit using the actual values of which at least a portion are different from those when the value of the coefficient was derived.

3. An equipment characteristics model learning device comprising:

an acquisition unit configured to acquire actual values of variables which are used to express characteristics of equipment in a characteristics model indicating the characteristics:

a model coefficient deriving unit configured to derive a value of a coefficient of a simple characteristic model using the acquired actual values, wherein the simple characteristic model indicates the characteristics using variables of the characteristic models decreased in the number of dimensions by generating from the characteristic model on the basis of a change factor variable which is a variable serving as a change factor for the characteristics among the variables of the characteristic model; and

a setting value calculating unit configured to calculate an operation setting value which is used to control operation of a control target system including the equipment on the basis of an evaluation index value which is calculated using the simple characteristics model to which the value of the coefficient derived by the model coefficient deriving unit is applied

wherein the evaluation index value is a value of energy consumption of the equipment, and

the setting value calculating unit is configured to determine the values of the variables in the simple characteristics models such that a value of total energy consumption of the equipment which is operated in the control target system decreases and to acquire the operation setting value on the basis of the determined values of the variables.

4. The equipment characteristics model learning device according to claim 7, wherein the setting value calculating unit is configured to acquire a period elapsing after the equipment starts or stops operating on the basis of a date and time at which the actual values of the variables associated with the equipment are acquired and to determine whether to prohibit start or stop of the equipment on the basis of the acquired period.

5. An equipment characteristics model learning device comprising:

an acquisition unit configured to acquire actual values of variables which are used to express characteristics of equipment in a characteristics model indicating the characteristics:

a model coefficient deriving unit configured to derive a value of a coefficient of a simple characteristic model using the acquired actual values, wherein the simple characteristic model indicates the characteristics using variables of the characteristic models decreased in the number of dimensions by generating from the characteristic model on the basis of a change factor variable which is a variable serving as a change factor for the characteristics among the variables of the characteristic model; and

wherein the equipment is equipment constituting a heat source system, and

the change factor variable is one or more of a load factor of the equipment, a cold water temperature in the equipment, and a cooling water temperature in the equipment.

6. An equipment characteristics model learning method which is performed by an equipment characteristics model learning device, the equipment characteristics model learning method comprising:

an acquisition step of acquiring actual values of variables which are used to express characteristics of equipment in a characteristics model indicating the characteristics:

a model coefficient deriving step of deriving a value of a coefficient of a simple characteristic model using the acquired actual values, wherein the simple characteristic model indicates the characteristics using variables of the characteristic models decreased in the number of dimensions by generating from the characteristic model on the basis of a change factor variable which is a variable serving as a change factor for the characteristics among the variables of the characteristic model; and

a model coefficient correcting step of correcting the value of the coefficient when the value of the coefficient derived by the model coefficient deriving step satisfies a predetermined condition, wherein

the predetermined condition is a condition that a sign of the value of the coefficient derived by the model coefficient deriving step does not match a preset sign or does not match a sign of the value of the coefficient derived from another simple

characteristics model corresponding to a value for the change factor variable different from that of the simple characteristics model from which the value of the coefficient has been derived.

7. An equipment characteristics model learning method which is performed by an equipment characteristics model learning device, the equipment characteristics model learning method comprising:

an acquisition step of acquiring actual values of variables which are used to express characteristics of equipment in a characteristics model indicating the characteristics:

a model coefficient deriving step of deriving a value of a coefficient of a simple characteristic model using the acquired actual values, wherein the simple characteristic model indicates the characteristics using variables of the characteristic models decreased in the number of dimensions by generating from the characteristic model on the basis of a change factor variable which is a variable serving as a change factor for the characteristics among the variables of the characteristic model; and

a setting value calculating step of calculating an operation setting value which is used to control operation of a control target system including the equipment on the basis of an evaluation index value which is calculated using the simple characteristics model to which the value of the coefficient derived by the model coefficient deriving step is applied

wherein the evaluation index value is a value of energy consumption of the equipment, and

the setting value calculating step of determining the values of the variables in the simple characteristics models such that a value of total energy consumption of the equipment which is operated in the control target system decreases and to acquire the operation setting value on the basis of the determined values of the variables.

8. An equipment characteristics model learning method which is performed by an equipment characteristics model learning device, the equipment characteristics model learning method comprising:

an acquisition step of acquiring actual values of variables which are used to express characteristics of equipment in a characteristics model indicating the characteristics:

a model coefficient deriving step of deriving a value of a coefficient of a simple characteristic model using the acquired actual values, wherein the simple characteristic model indicates the characteristics using variables of the characteristic models decreased in the number of dimensions by generating from the characteristic model on the basis of a change factor variable which is a variable serving as a change factor for the characteristics among the variables of the characteristic model; and

wherein the equipment is equipment constituting a heat source system, and

the change factor variable is one or more of a load factor of the equipment, a cold water temperature in the equipment, and a cooling water temperature in the equipment.

9. A program for causing a computer to perform:

an acquisition step of acquiring actual values of variables which are used to express characteristics of equipment in a characteristics model indicating the characteristics:

a model coefficient deriving step of deriving a value of a coefficient of a simple characteristic model using the acquired actual values, wherein the simple characteristic model indicates the characteristics using variables of the characteristic models decreased in the number of dimensions by generating from the characteristic model on the basis of a change factor variable which is a variable serving as a change factor for the characteristics among the variables of the characteristic model; and

a model coefficient correcting step of correcting the value of the coefficient when the value of the coefficient derived by the model coefficient deriving step satisfies a predetermined condition, wherein

the predetermined condition is a condition that a sign of the value of the coefficient derived by the model coefficient deriving step does not match a preset sign or does not match a sign of the value of the coefficient derived from another simple characteristics model corresponding to a value for the change factor variable different

from that of the simple characteristics model from which the value of the coefficient has been derived.

10. A program for causing a computer to perform:

an acquisition step of acquiring actual values of variables which are used to express characteristics of equipment in a characteristics model indicating the characteristics:

a model coefficient deriving step of deriving a value of a coefficient of a simple characteristic model using the acquired actual values, wherein the simple characteristic model indicates the characteristics using variables of the characteristic models decreased in the number of dimensions by generating from the characteristic model on the basis of a change factor variable which is a variable serving as a change factor for the characteristics among the variables of the characteristic model; and

a setting value calculating step of calculating an operation setting value which is used to control operation of a control target system including the equipment on the basis of an evaluation index value which is calculated using the simple characteristics model to which the value of the coefficient derived by the model coefficient deriving step is applied

wherein the evaluation index value is a value of energy consumption of the equipment, and

the setting value calculating step of determining the values of the variables in the simple characteristics models such that a value of total energy consumption of the equipment which is operated in the control target system decreases and to acquire the operation setting value on the basis of the determined values of the variables.

11. A program for causing a computer to perform:

an acquisition step of acquiring actual values of variables which are used to express characteristics of equipment in a characteristics model indicating the characteristics:

a model coefficient deriving step of deriving a value of a coefficient of a simple characteristic model using the acquired actual values, wherein the simple characteristic model indicates the characteristics using variables of the characteristic models

decreased in the number of dimensions by generating from the characteristic model on the basis of a change factor variable which is a variable serving as a change factor for the characteristics among the variables of the characteristic model; and

wherein the equipment is equipment constituting a heat source system, and

the change factor variable is one or more of a load factor of the equipment, a cold water temperature in the equipment, and a cooling water temperature in the equipment.