INSTRUCTION MANUAL

•INSTALLATION •SETTING •OPERATING

Energy Manager for System Controller

UTY-PEGX Ver.2.6

PART NO. 9708871004-07

FUJITSU GENERAL LIMITED

Contents

Energy saving function

Electricity apportionment function (electricity meter used)

Appendix

1. How to use manual

1-1 Manual composition

This manual is consisted 2 chapters.

- Energy saving function
- Electricity apportionment function

This is the operation manual for optional functions of System Controller (UTY-PEGX) which includes energy saving function and electricity apportionment function with electricity meters.
Please refer to INSTRUCTION MANUAL (System Controller for VRF System) for standard function.
Some of the optional functions are premised on electricity meters installed.
Please refer to appendix for the conditions and limitations for electricity meter installation.

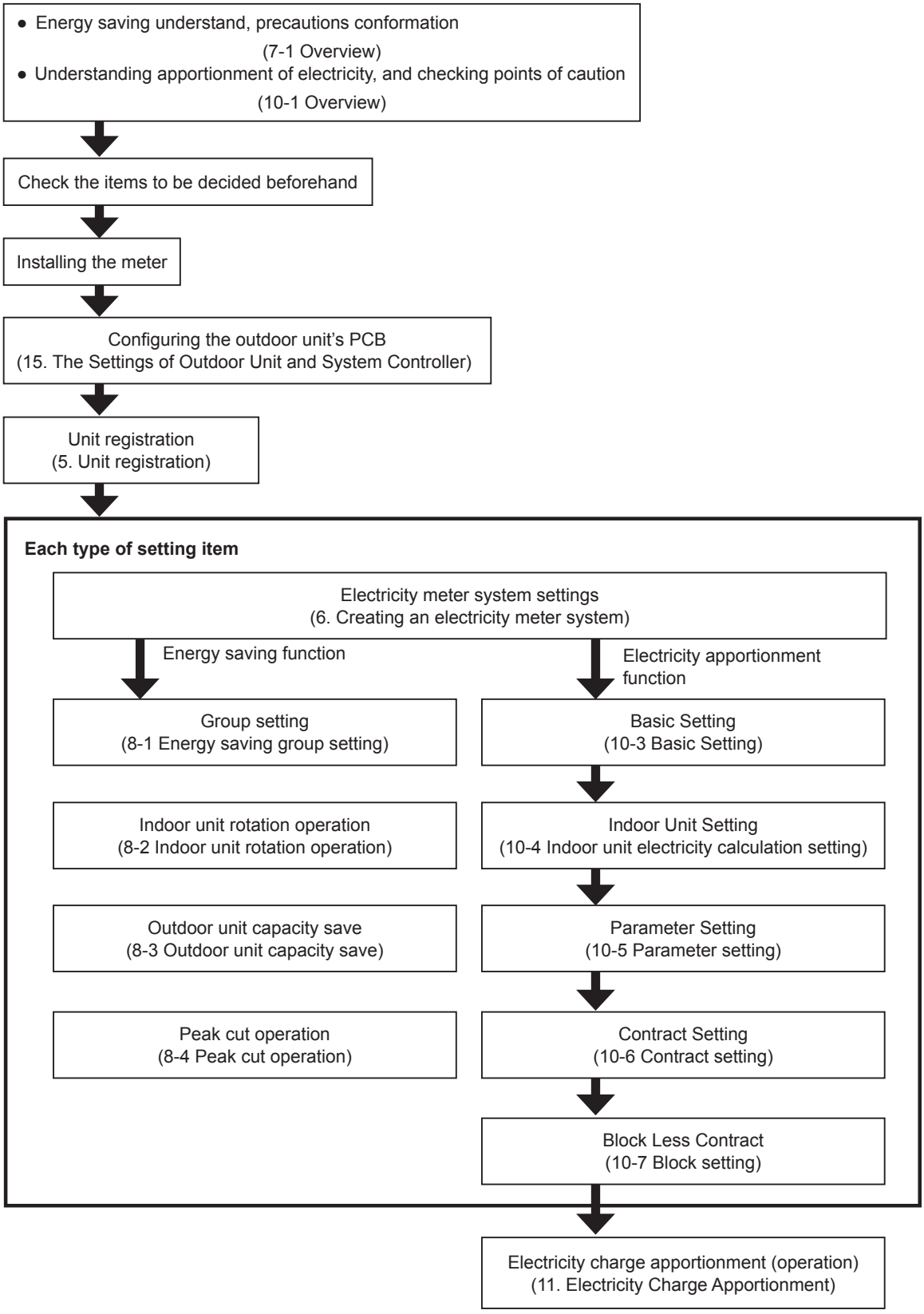
2. Preparation

Necessary thing when install it

- WIBU-KEY for option (product packing)
- Set up DVD for System Controller option (Please refer to INSTRUCTION MANUAL (System Controller for VRF System) for DVD contents)

3. The flow of the process up to operation

This process flow is from the configuration of the electricity meter until the configuration and operation of the system controller.



4. Installation

In order to make the installation easier, Energy Manager and the latest System Controller contain both functions of each product DVD, and the DVD content of both product are the same. So, there is no need to install System Controller and Energy Manager once again.
If you insert WIBU-Key attached in Energy Manager to server PC, you can use the Energy saving function.

According to the condition of the PC to be installed, the installation method for "Energy Manager for System Controller" can be any as following.

- **In the case that the PC in which System Controller has not installed.**
  Please use "Energy Manager for System Controller" DVD then install it.
  Please refer to the following for installation procedure.
  "INSTRUCTION MANUAL" for "System Controller for VRF System"
  • Server PC → 5-3. Software Installation
  • Client PC → 7-1. Installation flow

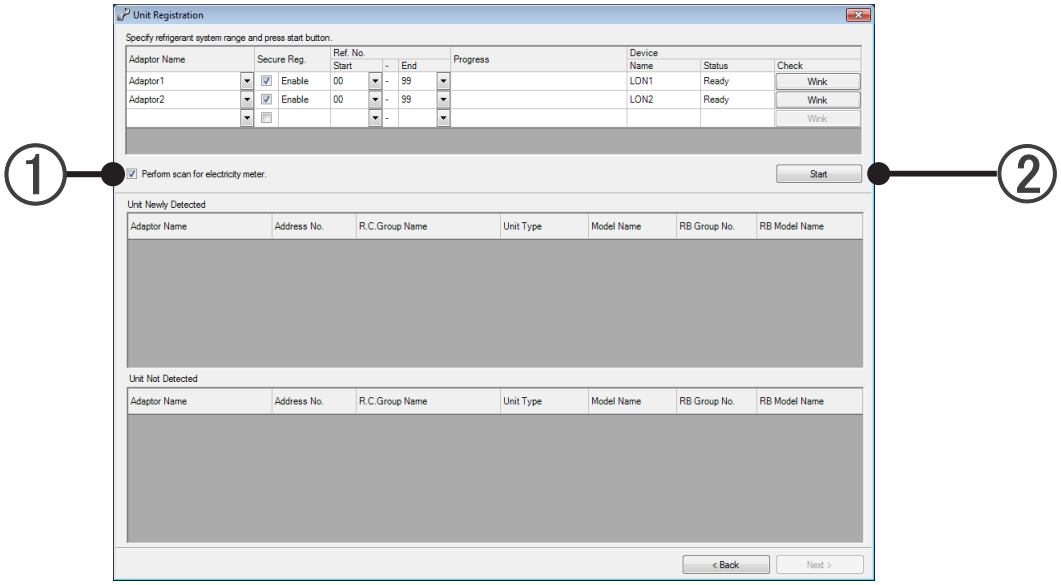
- **In the case that the PC in which the latest version of System Controller has installed.**
  There is no need to be installed.
  Please insert WIBU-Key attached in "Energy Manager for System Controller" to USB port of server PC then restart VRF Controller.
  Please refer to the following for the procedure of VRF Controller ending or starting
  "INSTRUCTION MANUAL" for "System Controller for VRF System"
  Server PC → 12. Starting and Ending the VRF Controller

- **In the case that the PC in which the old version of System Controller has installed.**
  Please use "Energy Manager for System Controller" DVD to update it.
  Please refer to the following for update procedure.
  "INSTRUCTION MANUAL" for "System Controller for VRF System"
  Server PC → 5-4. Uninstall and version upgrade
  Client PC → 7-2. Uninstall and version upgrade

5. Unit registration

Carry out a network scan and detect electricity meters. Electricity meters detected through the scan can be used.

To display this screen, select main screen menu → “Setting” → “Initial Setting” → “Unit Registration”



① Select the "Perform scan for electricity meter".
Put a check also in those adaptors connecting the electricity meters you want to scan.

② [Start] button:
Starts scanning. (Disabled when there is no scanning target.)

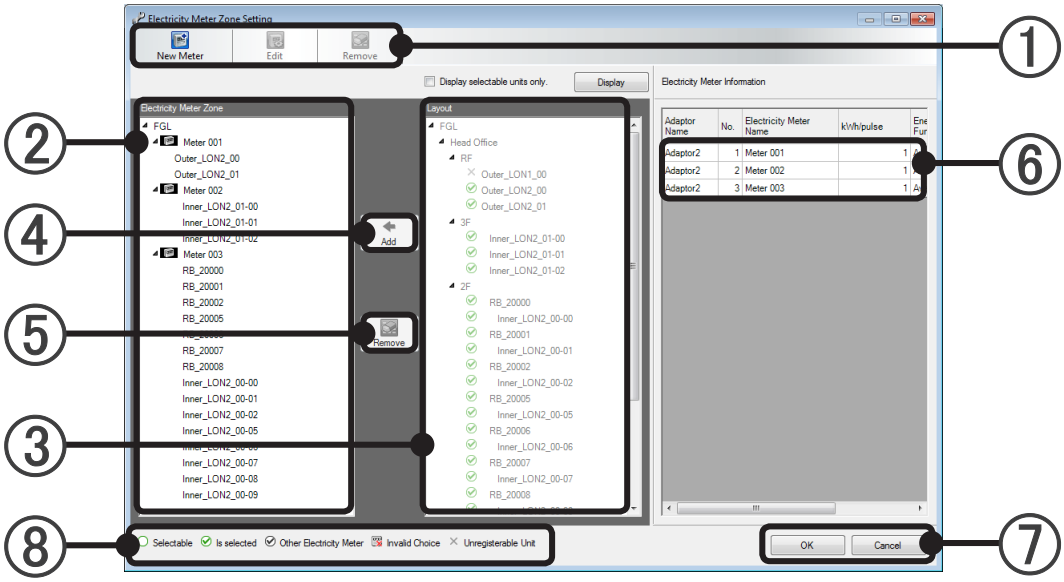
Note

If the following message is displayed after scanning is completed, the necessary information cannot be acquired.
Information was not acquired for some units. Perform unit registration again.
In this case, always perform scan again to acquire all the necessary information.
If advanced to next as is, normal operation will become impossible.
Especially, if there is a unit for which information could not be acquired when electricity charge apportionment is performed, the refrigerant system including that unit will not be handled by the electricity charge apportionment function.
When these information missing units are included in “Unit Newly Detected”, since they are displayed in red characters, treat them as the index of refrigerant system specification when rescanning.

6. Creating an electricity meter system

Configure the connection structure of the electricity meter and air-conditioner units connected to those underneath it. Configure according to the actual electricity meter installation condition.
Since the Electricity Charge Apportionment function has a function that uses and controls electricity consumption information from the electricity meter, it is necessary to configure the electricity meter system.

Select main screen menu → “Setting” → “Electricity Meter Zone Setting”



① Select work term from tool bar.

New Meter	Displays the “Create Electricity Meter Zone” screen. Up to 200 electricity meter systems can be created.
Edit	At electricity meter system selection, this button becomes active and the “Create Electricity Meter Zone” screen is displayed by pressing the button.
Remove	At electricity meter system selection, the electricity meter system is deleted and all the units allocated under it are removed. At unit selection, unit allocation is removed. Multiple electricity meters and units can be selected and deleted.

Note

- The action item on tool bar can be operated equally even right click mouse on the indoor units in ②.

② The currently set electricity meter system and the indoor, outdoor, and RB units registered under it will be displayed hierarchically.

③ The floor groups set in Layout Edit Screen will be displayed.
The indoor, outdoor, and RB units which is not registered in any floor will be displayed in "Undefined Group".

④ By pressing the [Add] button, the indoor, outdoor, and RB units selected at ③ will be added to the electricity meter system of the selection position of ②.

⑤ By pressing the [Remove] button, the indoor, outdoor, and RB units selected at ② will be removed .

⑥ All the electricity meter system data will be displayed in the data list and at electricity meter system selection (multiple selection is possible) by left side tree, the background color of the selected electricity meters will be changed.

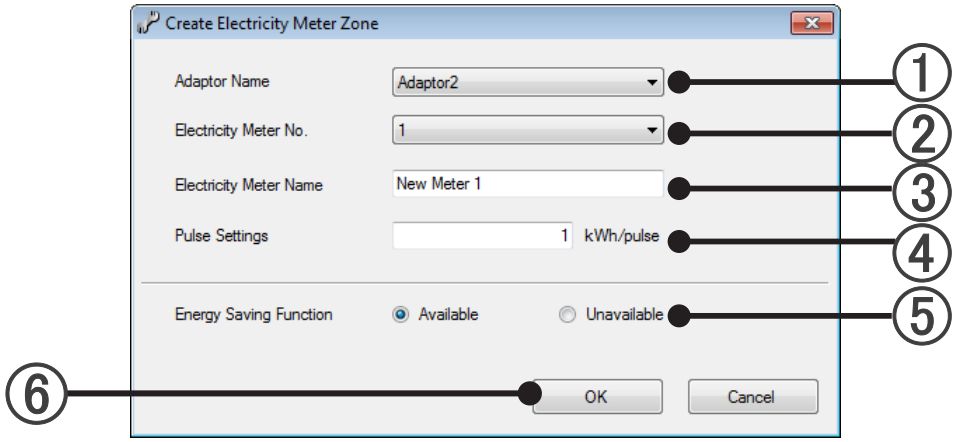
⑦ By pressing the [OK] button, the set electricity meter system and indoor, outdoor, and RB units will be saved and ends setting.
By pressing the [Cancel] button, if there is data being edited, it will be discarded and ends setting.

⑧ An icon will be assigned to the indoor, outdoor, and RB units of the right side tree and will be made reference at registration.

Selectable	When none or more than one electricity meter systems are selected, shows V-II/J-II/J-IIS/VR-II series units (including UTY-VGGX / UTY-VGGXZ1) that are not registered to any meter. When one electricity meter system is selected, shows units that can be registered at the selected meter. [Add] button can also be selected.
Is selected	When none or more than one electricity meter systems are selected, shows units registered to any meter. When one electricity meter system is selected, shows units registered to the selected electricity meter system.
Other Electricity Meter	When one electricity meter system is selected, shows units registered to the other meter systems.
Invalid Choice	When an electricity meter system is selected,shows units that cannot be registered to the selected meter,depending on type (whether or not the unit has an energy-saving function).
Unregisterable Unit	Units that are not assumed to be registered to a electricity meter system. S/V Series units, etc.

UTY-VGGX/UTY-VGGXZ1 :The V-II/J-II/J-IIS/VR-II series network converter

[New Meter] button or [Edit] button of Electricity Meter Zone Setting screen



① Select one from the list of adaptors on the adaptor setting screen.

② Select a number from the list of meter numbers for those connected to the adaptor selected in ①.

③ Enter the electricity meter name.
The maximum number of character you can enter is 20, or you can leave this blank or enter multiple numbers.

④ Set whether to handle by specifying how many kWhs correspond to one pulse from the electricity meter.
For the number value only enter 7 or fewer digits for whole numbers and 6 or fewer for digits after the decimal point.

Note

"1" is displayed as the initial value, however, set this to match the electricity meter you are using.

⑤ Select the type.
Select 'Available' if the meter measures V-II/J-II/J-IIS/VR-II series indoor/outdoor/RB units, because they can use the energy saving function.
Select 'Unavailable' if the meter measures air conditioning systems connected via UTY-VGGX or UTY-VGGXZ1 network converters, because they cannot use the energy saving function.

⑥ [OK]: Saves the edited contents and ends setting.
[Cancel]: Ends setting without saving the edited contents.

Energy saving function

7. Energy saving function
8. Energy saving setting

7. Energy saving function

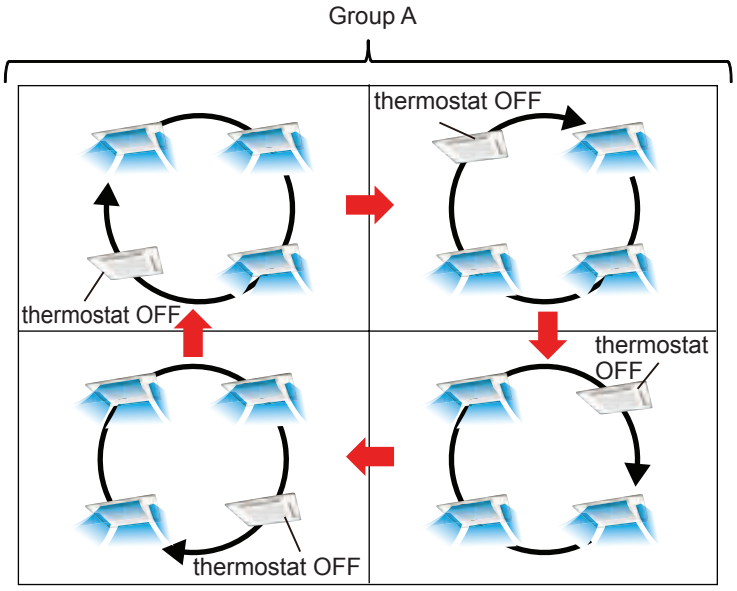
7-1 Overview

The energy saving option of System Controller has 4 functions as follow.

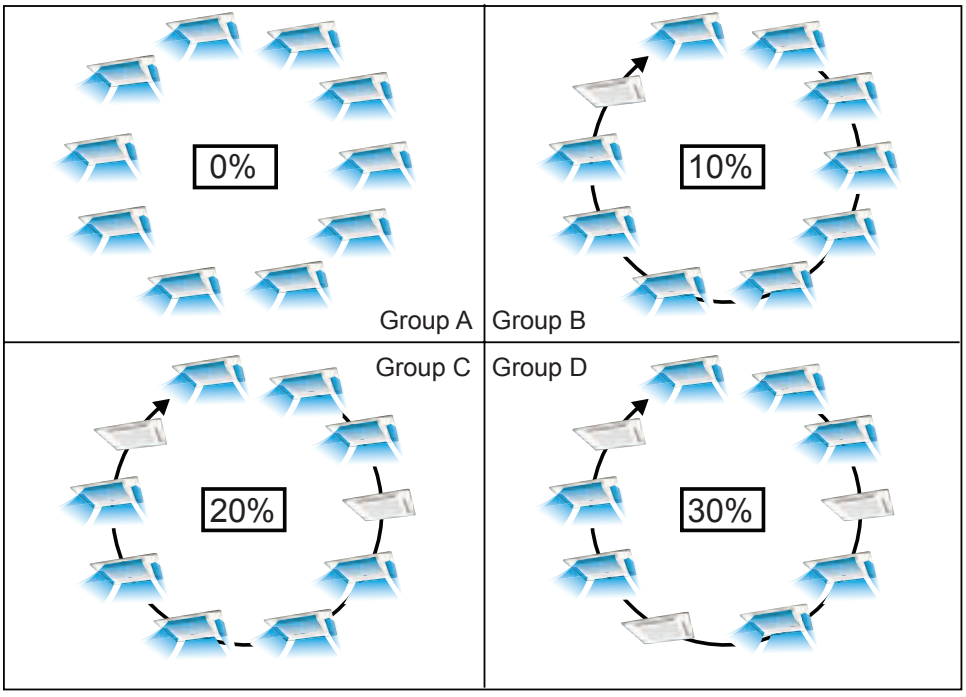
[Indoor unit rotation operation]

Reduces the power consumption by rotating the indoor units which are set to forced thermostat OFF.
Operating the air conditioner even in the spring and autumn when the load is comparatively light may have an energy saving effect.
Because it is an intermittent operation, it does not loose much comfort, and is a control which is difficult for use of the room to sense its operation.

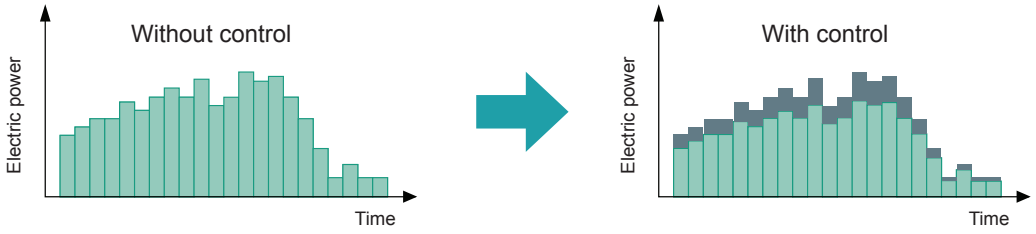
- The electric power consumed in the arbitrarily defined group is reduced by rotating indoor units which are set to forced thermostat OFF.



- Indoor units can be rotated by stoppage rate set for each group.



* The indoor unit operation stoppage rate can be selected from 10% to 30%.



Example of Use

Overview of Property:

Usage at own office building. Each floor are configured as rooms or blocks separated by partitions, and each room/block has multiple indoor units not linked with Remote Control Groups.

Objectives of Energy Saving:

You want to save energy consumed by air-conditioners that is large portion of energy consumption to reduce the running cost of the building. You have no specific numerical targets.

Recommended Settings:

Set Energy Saving Groups by each room/block and set Indoor Unit Rotation at thermostat-off rate of 10%. However, do not set anything for server rooms etc where air-conditioners need to be continuously operational, or for the room with high heat load due to direct exposure to sunlight.

When energy saving benefits are not adequate, increase the thermostat-off rate of Energy Saving Groups after verifying the impact on comfort.

Energy Saving Benefits:

Over the entire year, energy saving benefits are obtained according to the usage of air-conditioners. Especially, benefits during high heat load hours such as afternoons in summer are high.

[Out door unit capacity save]

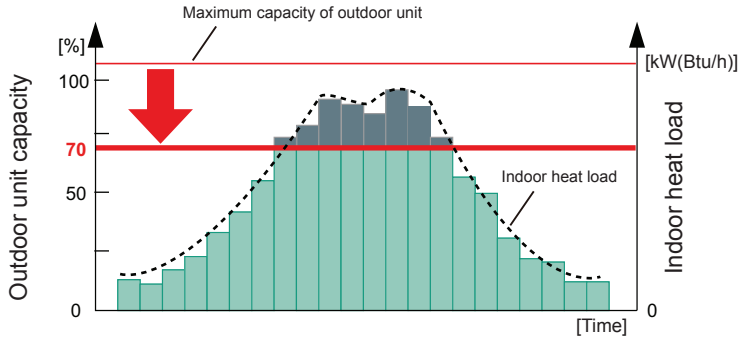
The power consumption is reduced by limiting the upper limit of the outdoor unit capacity for each refrigerant system.

This has a reducing effect especially in the summer, winter and other times when the heat load is high.

In addition, because the upper limit capacity of the outdoor units is limited directly, it is a control which easily exhibits an energy saving effect compared to rotation control.

However, because the outdoor unit does not operate above the limited capacity, there may be a loss of comfort, depending on the room heat load.

* The operation capacity upper limit rate [%] of the outdoor unit is specified for each refrigerant system.



Example of Use

Overview of Property:

Usage at a leased building. No separate air-conditioning charges are collected.

Refrigerating Systems are separated for each floor and electricity meters are installed for each Refrigerating System.

Objectives of Energy Saving:

As the electricity charges increase during high heat load times such as peak summer, you want to somehow limit such charges.

If possible, you want to reduce about 10% of energy.

Recommended Settings:

Set Outdoor Unit Capacity Save at operation rate of 90% for each Refrigerating System.

By setting a schedule, let this function operates only while the time or season when the heat load is high.

Set operation rate smaller if the energy saving benefits are not up to expected levels.

Using energy meters, monitor the power consumption for each Refrigerating System, and reduce the operation rate for the Refrigerating Systems having high power consumption compared to other locations.

On the other hand, increase the operation rate for places where heat is likely to accumulate such as higher floors.

Energy Saving Benefits:

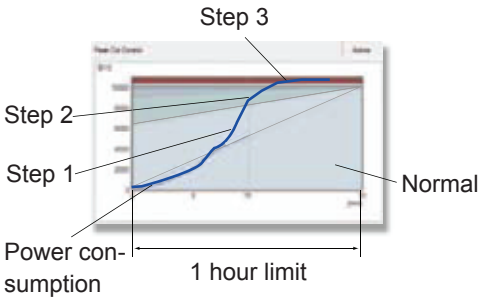
Energy saving benefits would be obtained for sure, resulting in the reduction of electricity charges.

[Perk cut operation]

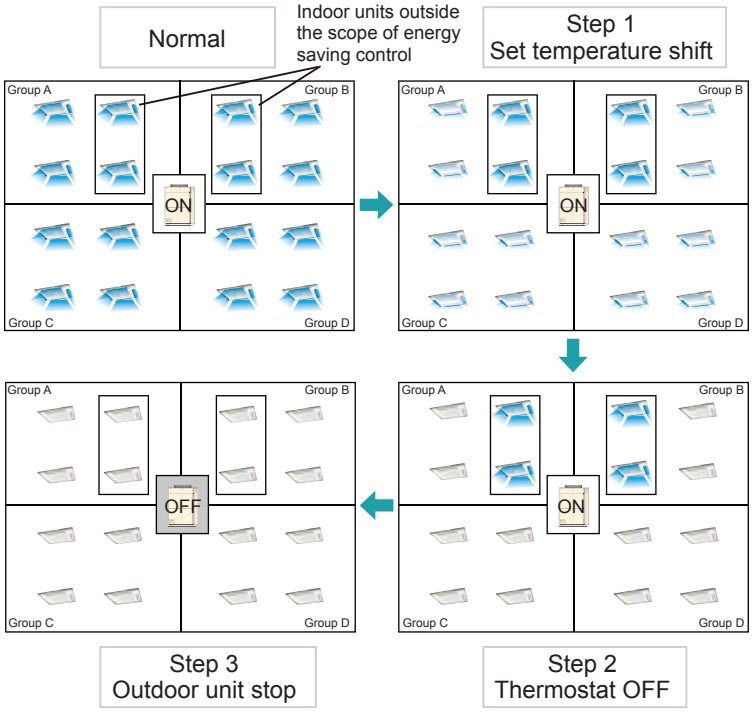
Reduces the power consumption by setting a specific target value (maximum average power [kW]) for the air conditioners and controlling operation to prevent the power consumption from exceeding this value.

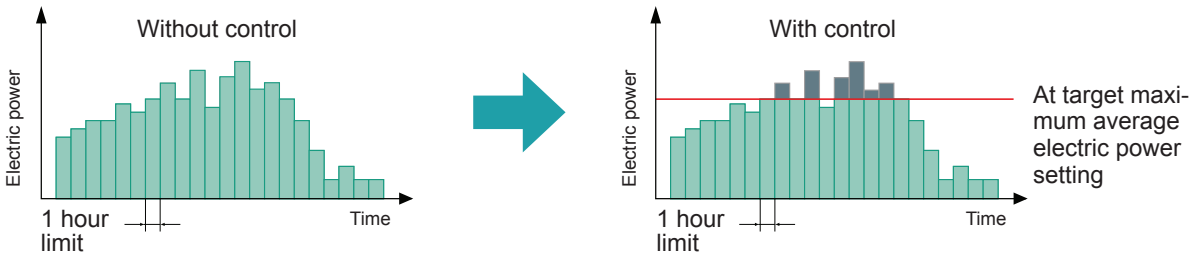
Limit control is performed in 3 steps of “Step 1: Set temperature shift” → “Step 2: Thermostat OFF” → “Step 3: Outdoor unit stop”.

To perform this control, an electricity meter must be installed.



*Specifies the maximum average electric power [kW] for the entire air conditioning system.





Example of Use

Overview of Property:

Usage at own office building.

Objectives of the Energy Saving:

As the electricity charges differ depending on to time, you want to reduce the power consumption during the time when electricity charges are high.

Especially, we would like to monitor and maintain the air conditioners that consume large proportion of electricity using Energy Saving Function.

Have specific numerical targets for power consumption (kW).

Recommended Settings:

Set an Energy Saving Group for each room/block; however, do not set the locations that need to be operational continuously such as server rooms as an Energy Saving Group.

Set the value mentioned in numerical targets as an upper power limit of the function, then set target power of the function.

Adjust the effect of energy saving by setting temperature shift pattern after considering the heat load and the requirement on comfort for each energy saving group.

Benefits of Energy Saving:

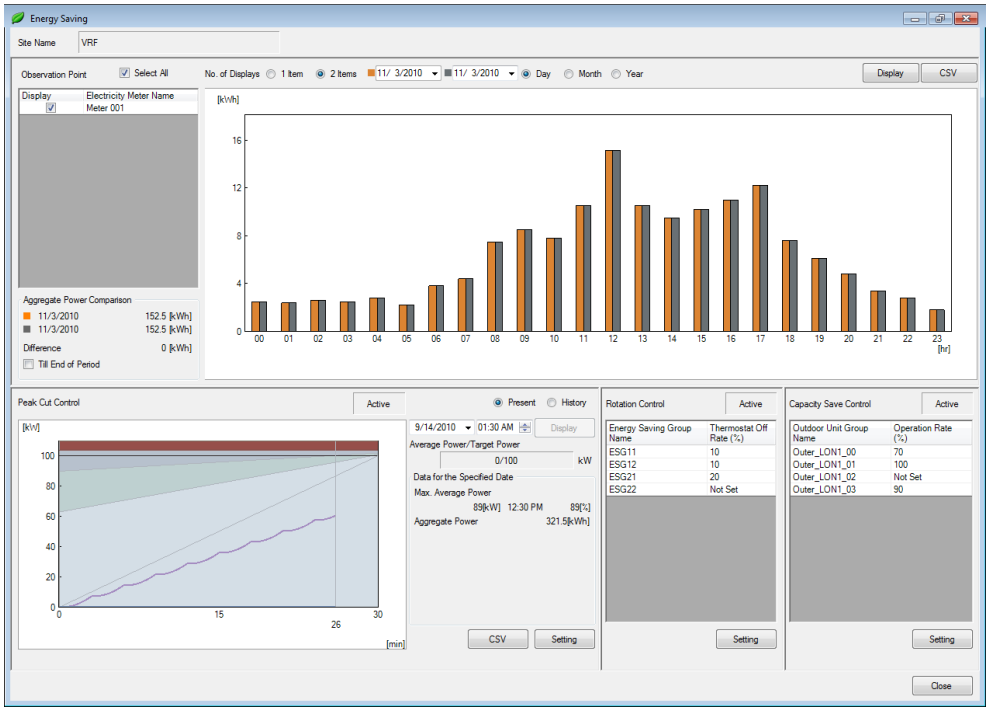
Limiting the power consumption during the time when electricity charges are high.

[Electricity energy graph display function]

Displays by bar graph the power consumption measured by the electricity meter connected to the air conditioner. Use it to grasp the power consumption usage conditions.

The power consumption for 3 years is saved and the past history can be referenced.

In addition, the data of an arbitrary 2 periods can be comparison displayed.



7-2 Precautions on use

The effect of energy saving function will be different by used device and use environment or installation environment etc. Energy saving function does not ensure that the stable effect or function can be brought out for the operation by specified setting. Please understand the follow precautions then operate it.

① How to use the energy saving function
Since the effect of the energy saving function depends on the devices used, usage environment, installation environment, and so forth, a different effect may appear according to the building and operating period even when operated at the same settings and schedule.
Gain an understanding of the features of each energy saving function and confirm the actual effect during operation and use while adjusting the settings, etc. as required.

② Target electric power at peak cut function
There are values used as target values from the standpoint of performing peak cut control.
These values do not always guarantee that the consumed power is the target value or less. For example, even if forced thermostat off and control which enters the outdoor unit stoppage region are each performed, since control is ineffective if the outdoor unit is performing a protective operation (oil recovery and defrosting), as a result the electric power consumed may exceed the target electric power.

③ Relationship between unit protection and energy saving function
For VRF, there are operations and restrictions for protecting units. The energy saving function operates within the range of these protection operations and restrictions. When the energy saving function performs control against these protection operations and restrictions, the protection operations and restrictions have priority and the energy saving function is restricted and may not operate. As protection operation of a specific device, there is oil recovery, defrosting, etc. which are automatically performed periodically or under specified conditions.

④ Failure, etc.
An energy saving function operates only when the related units are operating normally.
When the power of the electricity meter and the outdoor units connected to an electricity meter and the SYSTEM CONTROLLER is turned off due to a failure, etc. the energy saving function will not operate normally.

⑤ Explaining to the building tenants
During energy saving function operation, different control from the setting by remote controller may operate. For this reason, it is recommended that the building tenants be informed of this beforehand.

⑥ Since using the 3 functions of Indoor unit rotation operation Function, Outdoor Unit Capacity Save Function and Perk cut operation Function simultaneously can largely affect the comfort, it is recommended to use a single function.

⑦ Indoor Unit Rotation operation
- Heating operation when outside temperature is low can significantly lower the air-conditioning performance.
- If the total capacity of the indoor units stopped simultaneously in one room is large against the load of the room, it may significantly deteriorate the comfort.
- If the connecting capacity ratio is large, setting low stoppage rate would make it difficult to gain benefits of reduction in power consumption.
- In a system with a lot of indoor units of small capacity, comfort may be significantly lost or it may be difficult to gain benefits of reducing in power consumption.

⑧ Outdoor unit capacity save
- Benefits may vary according to indoor and outdoor heat load.
- If the operating rate is set very low, comfort may significantly deteriorate.
- No reduction benefits would be obtained if the unit is operated below the set operation rate.

⑨ Peak cut operation
- If the target electric power is set very low, comfort may significantly deteriorate due to the occurrence of Outdoor Unit Forced Stop every hour.
- If the time interval is set too short, Outdoor Unit Stop would easily occur as compared to longer time interval.
- If the energy meter is not set to appropriate pulse unit (or pulse factor), control will become rough.
- When the DX-Kit is controlled by DDC or some other external controller, the temperature shift control is not performed to the DX-Kit.

⑩ When cooling and heating operations are mixed at indoor rotation control, effect may be small.

⑪ Energy saving control for Outdoor Air Unit and DX-Kit
When energy saving control is performed for an Outdoor Air Unit or DX-Kit itself or outdoor units in the refrigerant system to which the unit belongs, the unit may be stopped if the desired capacity is not obtained or the energy saving function is limited.
When the Outdoor Air Unit and DX-Kit are used as an outdoor air introduction unit, perform the energy saving control after understanding the affect because the ventilation function required by facility design may not be satisfied.

7-3 Before Using Energy Saving Function

First of all, clearly define the purpose and goals of energy saving.

[How would you like to use it?]

(1) I want to try it and check the benefits.

(2) Although no clear targets, would like to reduce the electricity bill in a stepwise manner.

(3) Would like to reduce the electricity bill in a planned manner after setting numerical targets.

[What issues would you like to address with it?]

(4) Would like to reduce the power consumption during day time in summer.

(5) Would like to limit the power consumption of a specific unit.

(6) Would like to comply with energy consumption laws and regulations.

[What are your desired advantages?]

(7) Would like our building to be recognized as an environment friendly building by the external world.

(8) Would like to contribute to global environment.

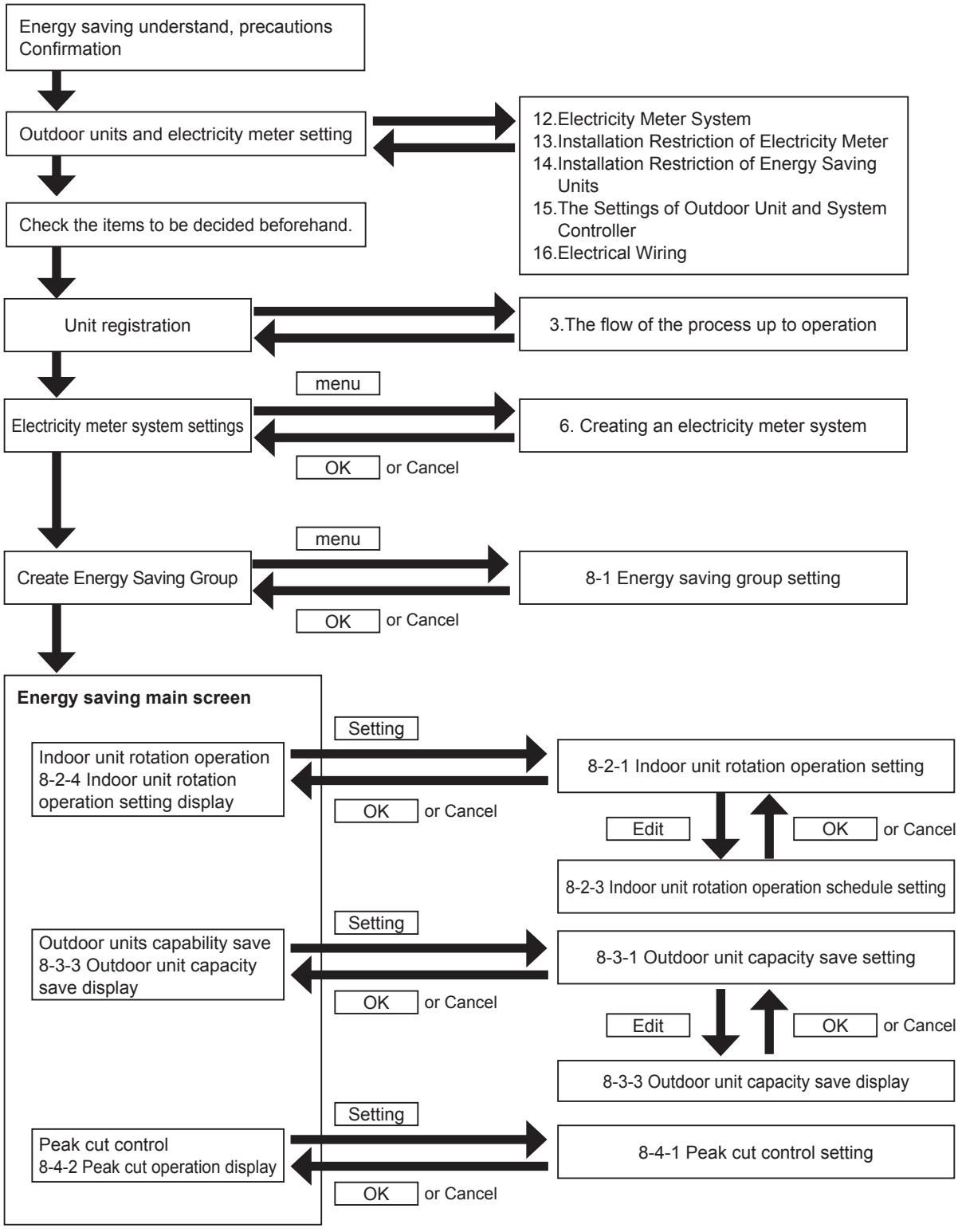
Refer to the following table based on the details provided above, find appropriate functions according to the requirements of each property and perform them.

Usage Scenarios	Supported Functions			
	Indoor unit rotation operation	Outdoor unit capacity save	Peak cut operation	Power Consumption Graph Function
Priority is energy saving.		○	○	
Want to save energy keep the comfort in mind.	○			
Want to save energy irrespective of heat load.	○			
Want to save energy when the heat load is high.		○	○	
Have a specific indoor unit as I do not want to save energy or want to reduce the amount of energy saved.	○		○	
Want to have uniform energy saving across all properties.	○	○	○	
No specific targets of energy saving.	○			
Specific targets of energy saving are relative compared to the current figures.		○	○	
Specific targets of energy saving are absolute figures.			○	
Do not want to increase the basic charges of electricity bill.			○	
Want to reduce volume-driven electricity charges.	○	○		
Want to give it a try and check the benefits of energy saving.	○			
Want to save energy without doing any complicated settings. Fine if the benefits are also marginal.	○			
Want to save energy without doing any complicated settings. However, want to achieve several benefits.		○		
Want to check the power consumption for each energy meter.				○
Want to compare daily, weekly and monthly power consumption.				○

8. Energy saving setting

Make a necessary basic setting related energy saving before operate it. And, the setting may be also renewed because of device or tenant changing.
Make a basic setting related necessary energy saving before operation.
Please set it according to the follow flow when you set first time after installation. AS the setting and changing from operation starting, please in according to the contents after chapter 8-2 when needed.

Flow at initial setting
Please set it in accordance with this flow when at first setting.



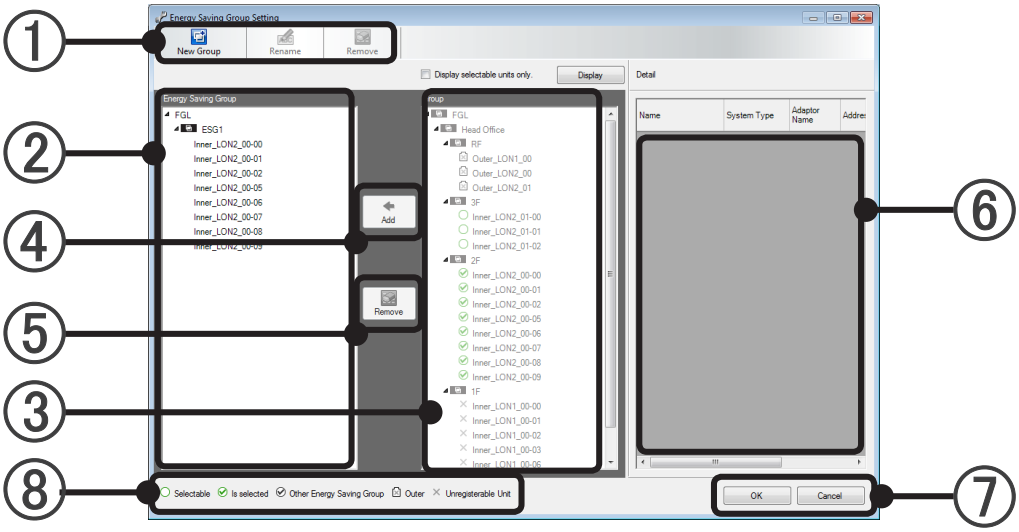
8-1 Energy saving group setting

Manage energy saving group.
Add or delete the indoor units for created energy saving group. (Multiple registration is not allowed)
Indoor units registered in energy saving group would be:

- An object of indoor unit rotation operation. It can set downtime ratio in each energy saving group.
- An object of temperature shift and forced thermostat-OFF of peak cut operation. Temperature shift pattern can be set for each energy saving group.
- Belonging refrigerant system would be an object of outdoor units stop by peak cut operation.

To the extent possible, set Energy Saving Group by room (or by separated spaces).
Make each Energy Saving Group includes as many indoor units as possible.
Do not include the indoor units that are out of the control scope of Peak Cut Function in an Energy Saving Function.

To display this screen, select main screen menu → "Setting" → "Energy Saving Group Setting".



① Select work term from tool bar.

New Group	Create a new energy saving group. (Max1600).
Rename	A new name can be input for a selected energy saving group. (20 characters or less, alphabet, digit, symbol)
Remove	Delete the selected energy saving group or release the selected indoor units from energy saving group. This function is the same with Remove button of ⑤.

Note

- The action item on tool bar can be operated equally even right click mouse on the indoor units in ②.

② Current energy saving groups and indoor units registered under them will be displayed hierarchically.

③ The groups set in Group Setting Screen will be displayed.
The indoor units which is not registered in any group will displayed in "Undefined Group".

④ Press [Add] button to add the indoor units selected at ③ to energy saving group selected in ②.

⑤ Press [Remove] button to delete selected energy saving group or release selected indoor units from energy saving group.

⑥ Energy saving group tree, or the address and model name of indoor unit group which included in a group being selected at group tree will be displayed information list.

⑦ Press [OK] button to save energy saving groups and indoor units, then exit.
Press [Cancel] button to throw away editing data, then exit.

⑧ Show an icon to the indoor unit in the tree on right and refer to it at the time of registration.

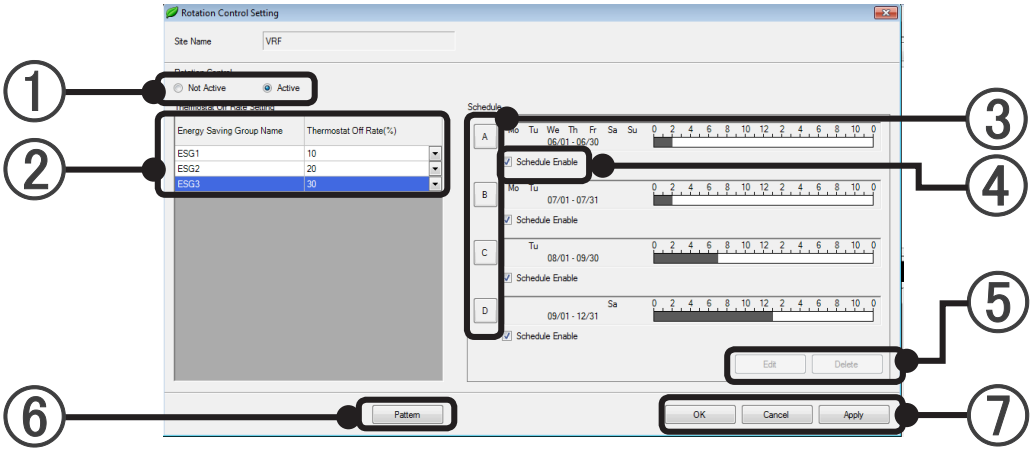
Selectable	This shows indoor units not registered in any Energy Saving Group. These can be added to a selected Energy Saving Group.
Is selected	When an Energy Saving Group is selected in ②, this shows indoor units registered to it. When none or multiple Energy Saving Groups are selected in ②, this shows indoor units registered to any Energy Saving Group.
Other Energy Saving Group	When an Energy Saving Group is selected in ②, this shows indoor units registered to the other Energy Saving Groups.
Outer	Outdoor units.
Unregisterable Unit	Units which cannot be registered to Energy saving Group. (S Series units, V Series units, UTY-VGGX or UTY-VGGXZ1).

8-2 Indoor unit rotation operation

8-2-1 Indoor unit rotation operation setting

Rotate the indoor units that thermostat OFF forcibly to reduce electricity consumption.
Set the thermostat-OFF for each energy saving group, select setting schedule and specify to enable or disable this function.

To display this screen, select main screen menu → "Operation" → "Energy Saving", and click the "setting" button on the Rotation Control area.



① Set the indoor units rotation operation to be "Active" or "Not Active".

② The list of energy saving group is displayed. Select thermostat-OFF rate (10~30) for each energy saving group.
Temporarily operate at 10% in the beginning, and select 20% or 30% as needed after checking the benefits and comfort.
Select “Not Set” for the Energy Saving Groups that are not controlled.

③ Button will be reversing displayed and the schedule will be selected by pressing schedule setting (A~D) button. It will be not selected if you press it once again.

A pattern of one day set based on schedule (A~D) is displayed.

The day of the week displaying	A set week day is displayed.
Period displaying	The applicable period of a set pattern is displayed.
Schedule pattern displaying (a day)	The time of up to 4 pattern is displayed within color bar.

④ Set correspond schedules to be enable or disable.
It is used when you have input setting only and want to change enable or disable.

⑤ Indoor Unit Rotation Schedule Setting Screen will be opened as you select schedule (A~D) and press [Edit] button.
A selected Schedule pattern will be deleted as you select schedule (A~D) and press [Delete] button.
If you select schedule, Edit button or Delete button will be enable.

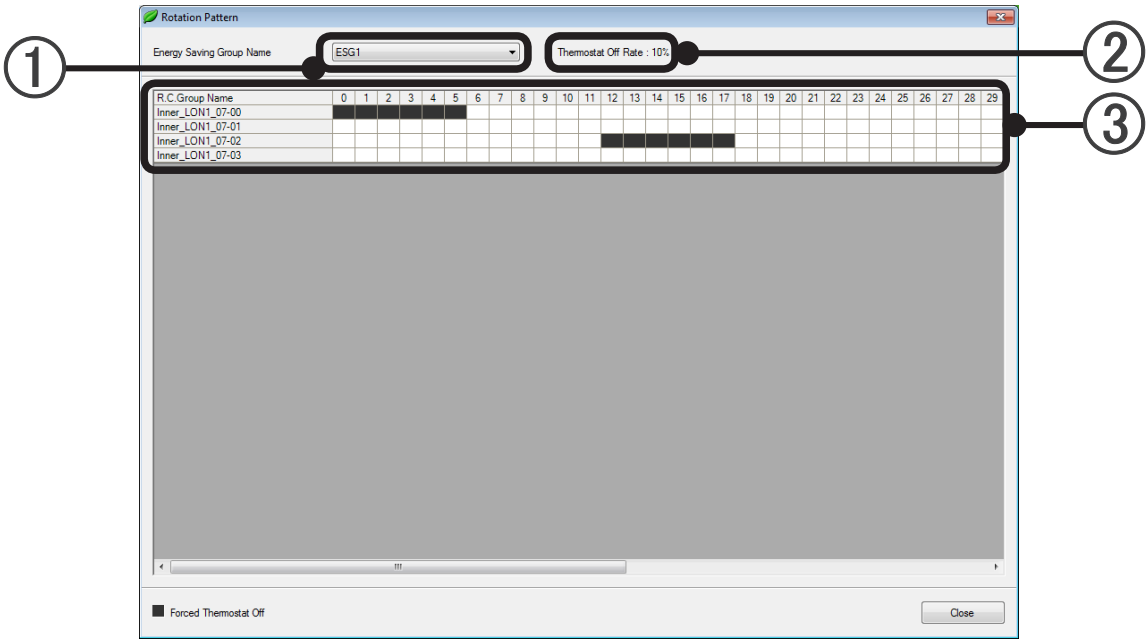
⑥ When [Pattern] button is pressed, the rotation pattern display screen is opened.
The display becomes Active when there are 1 or more energy saving groups.

⑦ Press [OK] button to save thermostat-OFF rate information of energy saving group list and rotation schedule information and exit.

Press [Apply] button to save thermostat-OFF rate information of energy saving group list and rotation schedule information, then continue setting.
Press [Cancel] button to throw away editing data, and exit.

8-2-2 Rotation pattern display

A 60 minutes rotation pattern of a specified energy saving group is displayed for each Remote controller group.



① Select the energy saving group.

② The thermostat off rate set at the selected energy saving group is displayed.

③ The forced thermostat OFF rotation pattern of all the Remote controller groups belonging to the energy saving group is displayed.
Each Remote Control Group is forced thermostat OFF at the black time band.

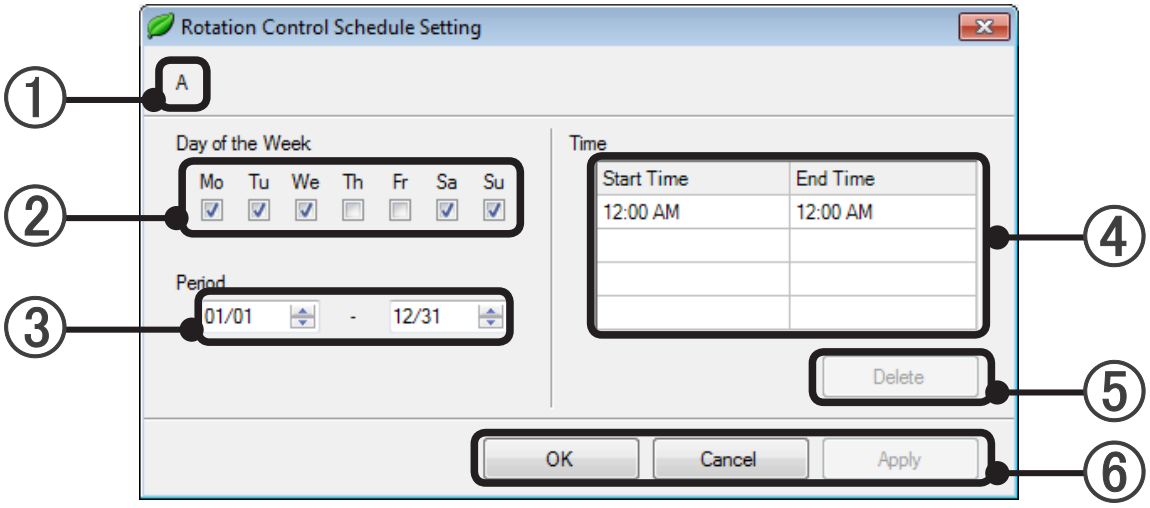
8-2-3 Indoor unit rotation operation schedule setting

Schedules selected at Indoor unit rotation operation setting screen and a schedule pattern is displayed.

In This schedule, up to 4 operation patterns can be defined annually.
For the regions that have distinct seasons such as spring, summer, autumn, winter, rainy season and dry season, set the schedule according to each season.

Disable the patterns that are not used.

To display this screen, click the "Edit" button on Indoor unit rotation operation setting screen.



① A pattern character (A~D) selected at Indoor unit rotation operation setting screen is displayed.

② Set a day of week day which apply to pattern. Multiple days of week can be selected. One or more days of week must be selected.

③ Set a period which apply to pattern. Period must be set.
When the start of the period was set to February 29, years that are not a leap year are controlled from March 1.
When the end of the period was set to February 29, years that are not a leap year are controlled up to February 28.

④ Set the time to create schedule pattern. One or more schedule pattern must be created more than 1.
Control is a setting of within 24 hours.
When you want to control up to the next day
(Example 22:00 to 05:00)
By entering the 2 periods 22:00 to 00:00 and 00:00 to 05:00 and setting them to consecutive days of the week, control is performed continuously without stopping even if the day of week is changed

⑤ Press [Delete] button to delete selected time.

⑥ Press [OK] button to save the information of weekday (②), period (③), time (④) and exit.
Press [Apply] button to save the information of weekday (②), period (③), time (④), then continue setting.
Press [Cancel] button to throw away editing data, and exit.

8-2-4 Indoor unit rotation operation setting display

To display this screen, select main screen menu → "Operation" → "Energy Saving".

① It displays that Indoor unit rotation operation is "Active" or "Not Active".

② It is displayed that the thermostat-OFF rate for each energy saving group as Indoor unit rotation operation object.
Energy Saving Group Name……It displays Energy Saving Group which has been registered.
Thermostat Off Rate (%)……it displays the Stopping rate for each energy saving group.

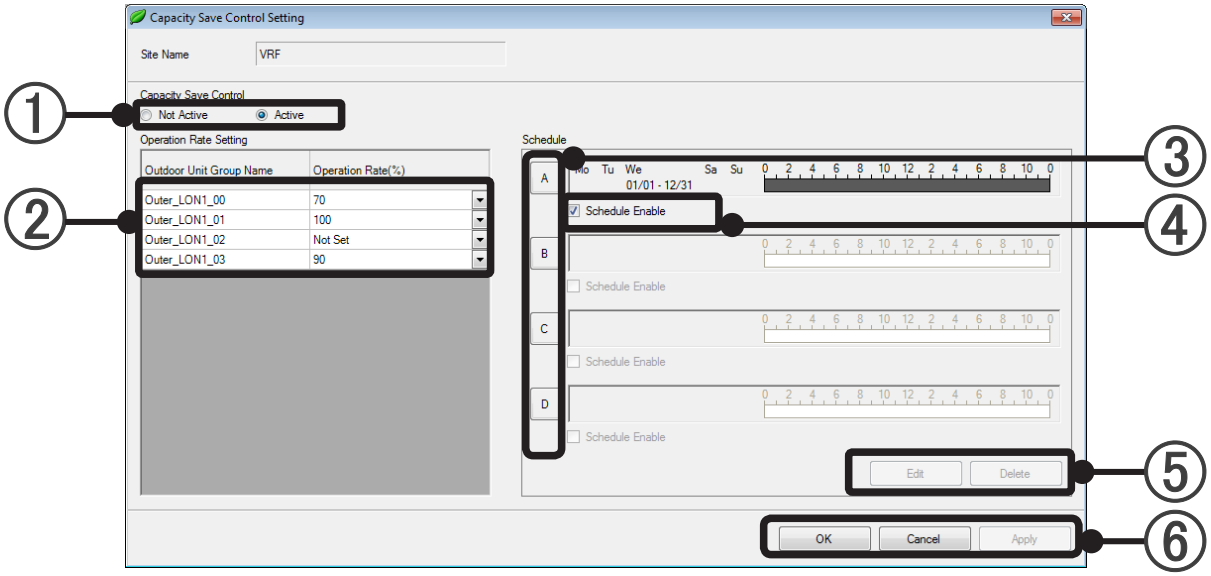
③ Press [Setting] button to change to Indoor unit Rotation Operation Setting screen.

8-3 Outdoor unit capacity save

8-3-1 Outdoor unit capacity save setting

It will limit the outdoor units capacity of each outdoor unit group to reduce used electricity.

To display this screen, select main screen menu → "Operation" → "Energy Saving", and click the "setting" button on the Capacity Save Control area.



① Set the outdoor unit capacity save to be "Active" or "Not Active".

② The list of outdoor unit group is displayed. Select operating rate for each outdoor unit group.
Temporarily operate at 90% in the beginning, and select other values as needed after checking the benefits and comfort.
Select “Not Set” for the outdoor unit groups that are not controlled.

Note

The operating rate of 100% limits the outdoor units not to operate at more than their rated capacity. When not set, an outdoor unit may operate at more than 100% capacity.

③ Button will be reversing displayed and the schedule will be selected by pressing schedule setting (A~D) button. It will be not selected if you press it once again.

A pattern of one day set based on schedule (A~D) is displayed.

The day of the week displaying	A set week day is displayed.
Period displaying	The applicable period of a set pattern is displayed.
Schedule pattern displaying (a day)	The time of up to 4 pattern is displayed within color bar.

④ Set correspond schedules to be enable or disable.

⑤ Capacity Save Control Schedule Setting screen will be opened by pressing [Edit] button.
A selected Schedule pattern will be deleted by pressing [Delete] button.
If you select schedule, Edit button or Delete button will be enable.

⑥ Press [OK] button to save operating efficiency information in outdoor unit group list, outdoor unit capacity save schedules information and exit.

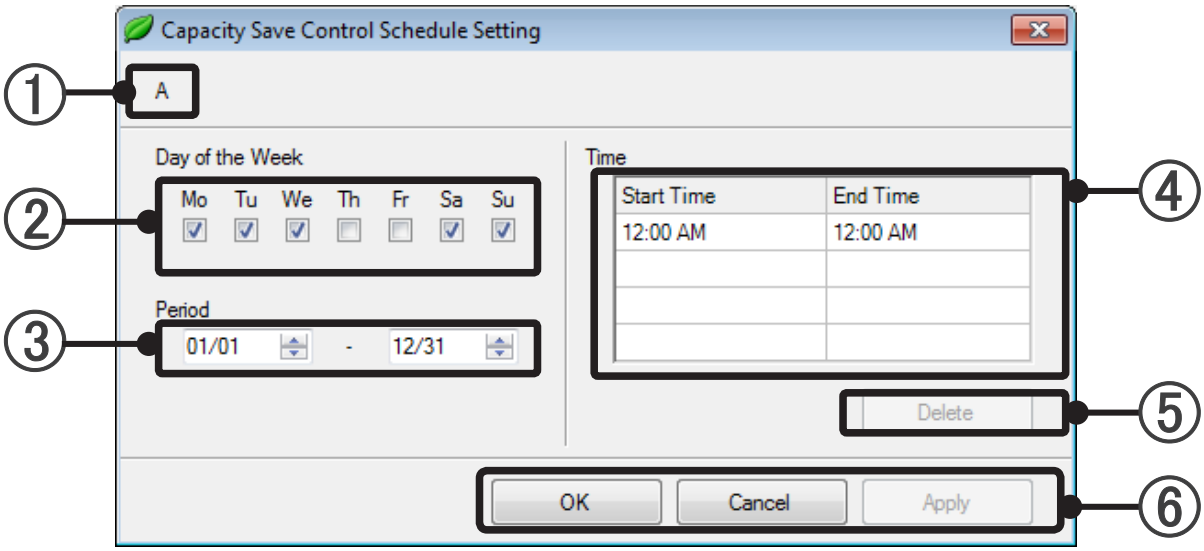
Press [Apply] button to save operating efficiency information in outdoor unit group list, outdoor unit capacity save schedules information, then continue to set it.
Press [Cancel] button to throw away editing data, and exit.

8-3-2 Outdoor unit capacity save schedule setting

Schedules selected at Outdoor unit capacity save setting screen and a schedule pattern is displayed.

In this schedule, up to 4 operation patterns can be defined annually.
For the regions that have distinct seasons such as spring, summer, autumn, winter, rainy season and dry season, set the schedule according to each season.
Disable the patterns that are not used.

To display this screen, click the "Edit" button on Outdoor Capacity Save Setting Screen.



① A pattern character (A~D) selected at Outdoor unit capacity save setting screen is displayed.

② Set a day of week which apply to pattern. Multiple days of week can be selected. One or more days of week must be selected.

③ Set a period which apply to pattern. Period be set must.
When the start of the period was set to February 29, years that are not a leap year are controlled from March 1.
When the end of the period was set to February 29, years that are not a leap year are controlled up to February 28.

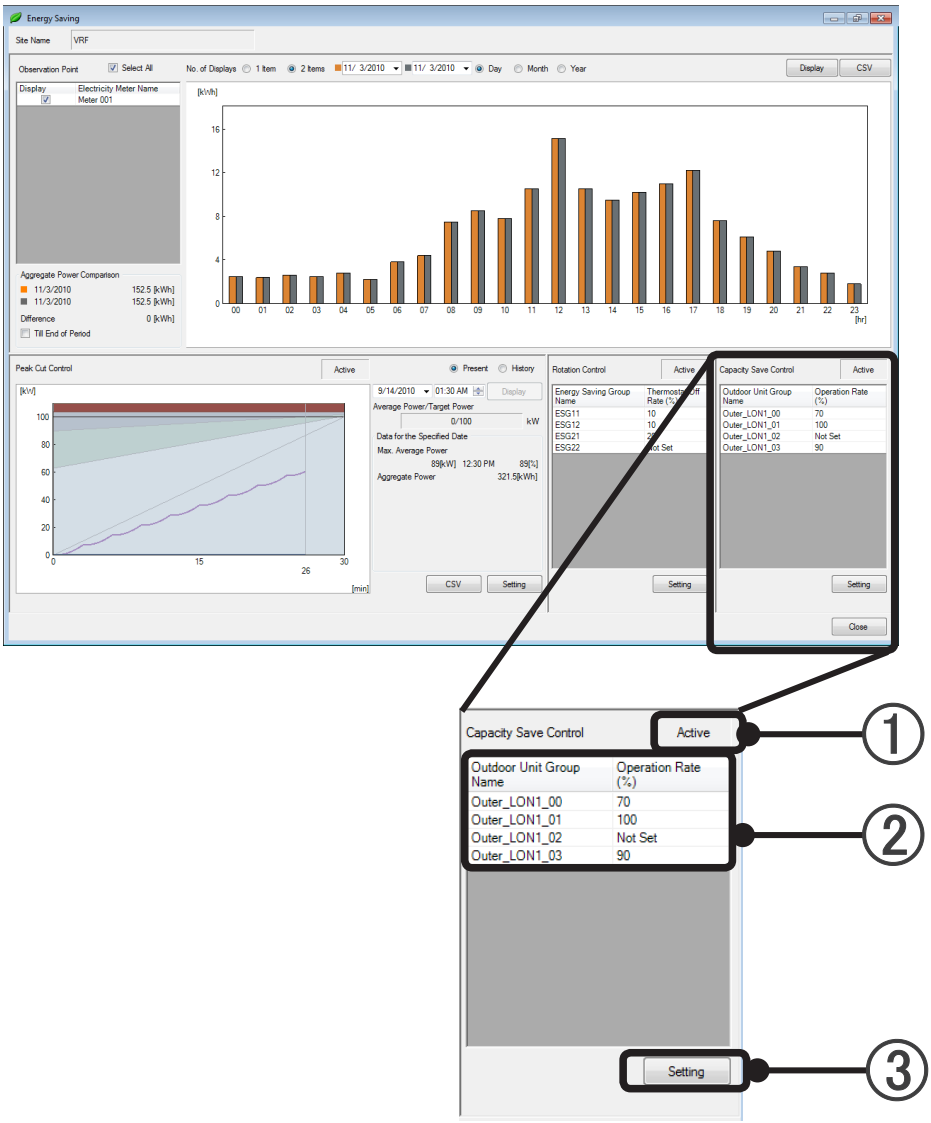
④ Set the time to create schedule pattern. One or more schedule pattern must be created more than 1.
Control is a setting of within 24 hours.
When you want to control up to the next day
(Example 22:00 to 05:00)
By entering the 2 periods 22:00 to 00:00 and 00:00 to 05:00 and setting them to consecutive days of the week, control is performed continuously without stopping even if the day of week is changed

⑤ Delete the selected time.

⑥ Press [OK] button to save the information of weekday (②), period (③), time (④) and exit.
Press [Apply] button to save the information of weekday (②), period (③), time (④), then continue setting
Press [Cancel] button to throw away editing data, and exit.

8-3-3 Outdoor unit capacity save display

To display this screen, select main screen menu → "Operation" → "Energy Saving".



① It displays that Outdoor unit capacity save is "Active" or "Not Active".

② It displays the set operation rate of each outdoor unit group which is a object of Outdoor unit capacity save.

Outdoor Unit Group Name……It displays the outdoor unit group which has been registered.
Operation Rate (%)……It displays the operating efficiency of each outdoor unit group.

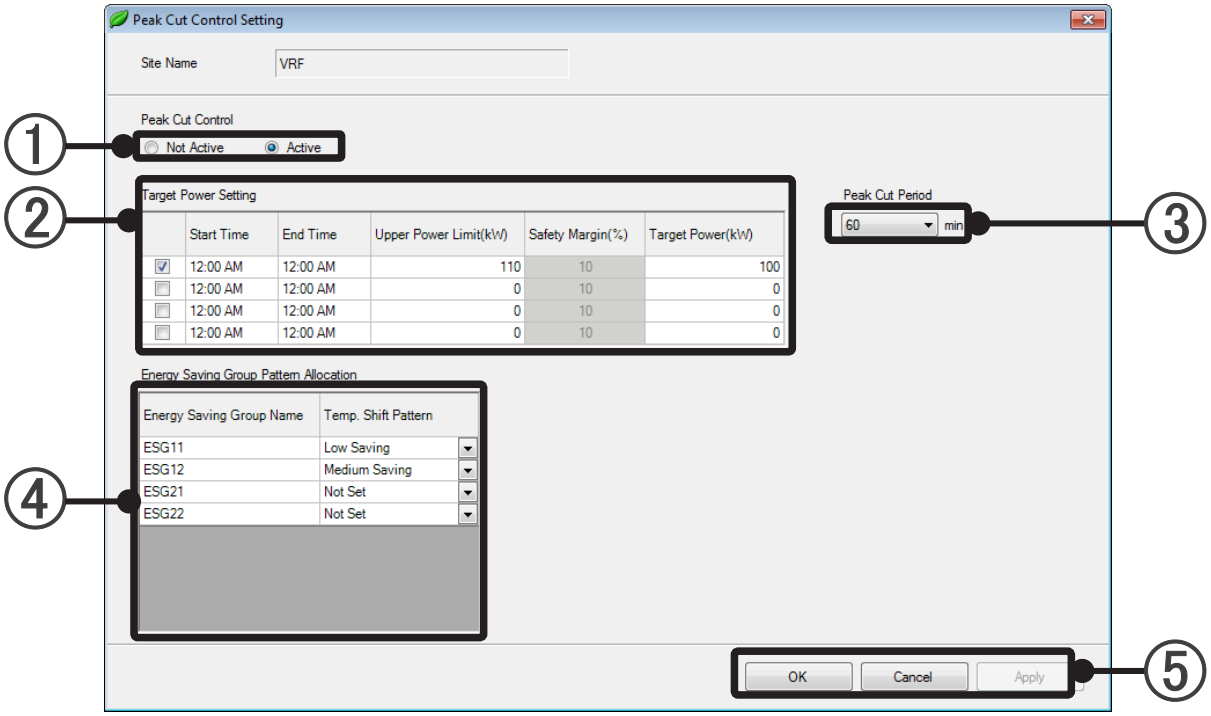
③ Press [Setting] button to change to capacity save Setting screen.

8-4 Peak cut operation

8-4-1 Peak cut operation setting

This function can reduce the electricity energy by setting a specific target value (maximum average power) at all units to limit operation, make the detail target value will not be exceed.
Set a target value of average electricity [kW]in 60 minutes, and control the air condition not to exceed the target value.
Set the upper limit power and the target power for up to 4 time period.
Temperature shift pattern is also set for each energy saving groups.

To display this screen, select main screen menu →"Setting" →"Energy Saving Group Setting".



① Set the peak cut control to be "Active" or "Not Active".

② Check the checkbox to decide a use target electricity. The checked items must be set.

Start Time, End Time	Set start time and end time for up to 4 time slots. The checked time slots must not overlap each other, and the total of the checked time slots must cover 24 hours of one day.
Upper Power Limit (kW)	The value to have added the safety ratio (10%~50%) on the target power.
Safety Margin (%)	Upper electricity will update automatically in accordance with input selected value of target electricity.
Target Power (kW)	The electricity of a target of peak cut control.0~10000kW.

Normally, the expected upper limit of power consumption of an air-conditioner according to the contract with the electric company should be set as upper power limit.
Or, if there is a target figure for power consumption with a time interval, set so that this figure becomes upper power limit.
For target power, set the value arrived after deducting an appropriate Safety Margin from the upper power limit.
Values of upper power limit and target power changes in conjunction according to the formula shown below.

Upper power limit = Target power x (100% + Safety Margin)

Peak Cut Function does not guarantee that power consumption would not exceed upper power limit and target power.
Taking larger Safety Margin would reduce the possibility of power consumption exceeding upper power limit.

Start/End Time can define up to 4 time slots dividing one day.
When electricity charges vary depends on the time, set upper power limit and target power according to each time slot.
Uncheck the rows that are not used.

③ Select a unit of time (10, 15, 30, 60) which control the air-conditioners by peak cut control to make the target electricity does not be exceed.
Normally, set the demand time according to the contract with the electric company.
If it is not specified, set 60 minutes.

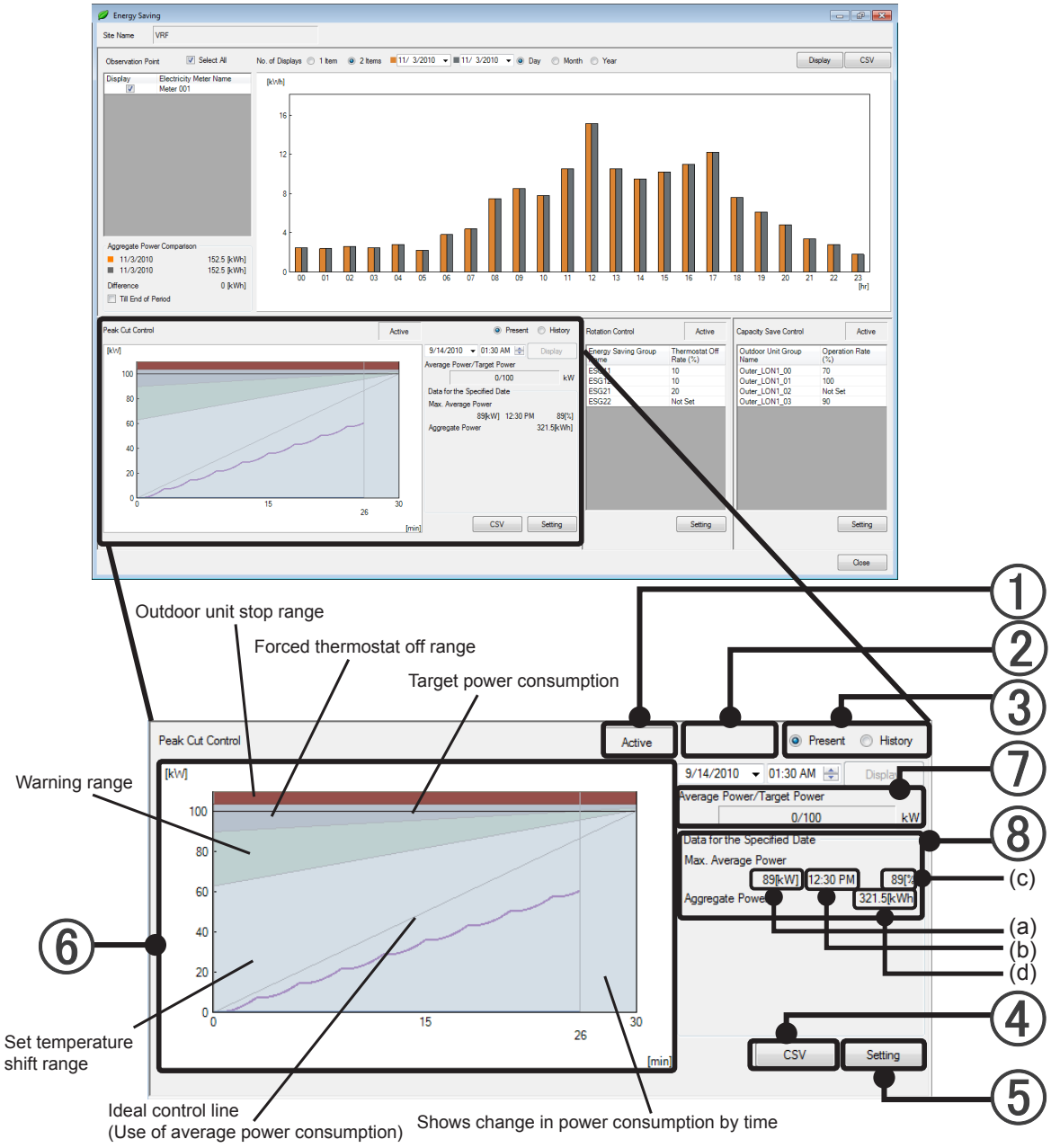
④ Select temperature shift pattern (High Saving, Medium Saving, Low Saving) for each energy saving group.
Shift value of the set temperature increases in the sequence of Low, Middle and High, and its impact on the reduction in power consumption and the comfort also increases.
Normally, the impact on comfort would be minimal if Low is selected.
In the areas where comfort is not important, benefits due to reduction in power consumption would increase at the temperature shift if it is set to Middle of High.
This would also make it unlike for the situation of Outdoor Unit Stop or Thermo OFF to occur.
Select “Not Set” for the Energy Saving Groups that are not controlled.
Even when “Not Set” is selected, Forced Thermo OFF and Outdoor Unit Stop would be performed.

- When the DX-Kit is controlled by DDC or some other external controller, the temperature shift control is not performed to the DX-Kit.

⑤ Press [OK] button to save current screen information, "Active", "Not Active" of peak cut control after input is checked, and exit it.
Press [Apply] button to save current screen information, "Active", "Not Active" of peak cut control after input is checked, then continue to set it.
Press [Cancel] button to throw away editing data, and exit.

8-4-2 Peak cut operation display

To display this screen, Select main screen menu →"Operation" →"Energy Saving".



① It displays that peak cut control is "Active" or "Not Active".

② The function of peak cut control icon is as follow. (This will be displayed only when the Peak Cut Operation is Active.).

Standby	The stand-by state before peak cut control beginning. The control will begin from the next period. The status will become the standby status when the System Controller is started, or the Peak Cut Period value is changed.
Warning	When peak cut control and average electricity reach a warning range of 5% from the lower limit line of forced thermostat off range.
Thermo Off	When peak cut control and average electricity reach forced thermostat off range and forced thermostat OFF control is started.
Forced off	When the Peak Cut Control/Average Electric Power has reached Forced thermostat off range and Outdoor Unit Stop Control has started.

③ Specify the display content on graph.
Present:It displays the state at current time.
History:The state of specified date and hour will be displayed by pressing [Display].

④ Press [CSV] button to display the dialogue which save the currently displayed graph data at CSV format.
Please save it in any folder.

⑤ Press [Setting] button to open Peak Cut Control Setting screen.

⑥ The peak cut control graph is displayed.
Peak cut control graph monitor what control is used and how much electricity energy is consumed in current peak cut control.
Display timing
• When peak cut control is changed from "Not Active" to "Active" at peak cut control screen.
• When graph display type (③) is changed from "Present" to "History" and "Display" button is pressed.
• When graph display type (③) is changed from "History" to "Present".
• The timer cycle (Default 20 seconds) in the case of peak cut control is effective and graph display type (③) is "Present".

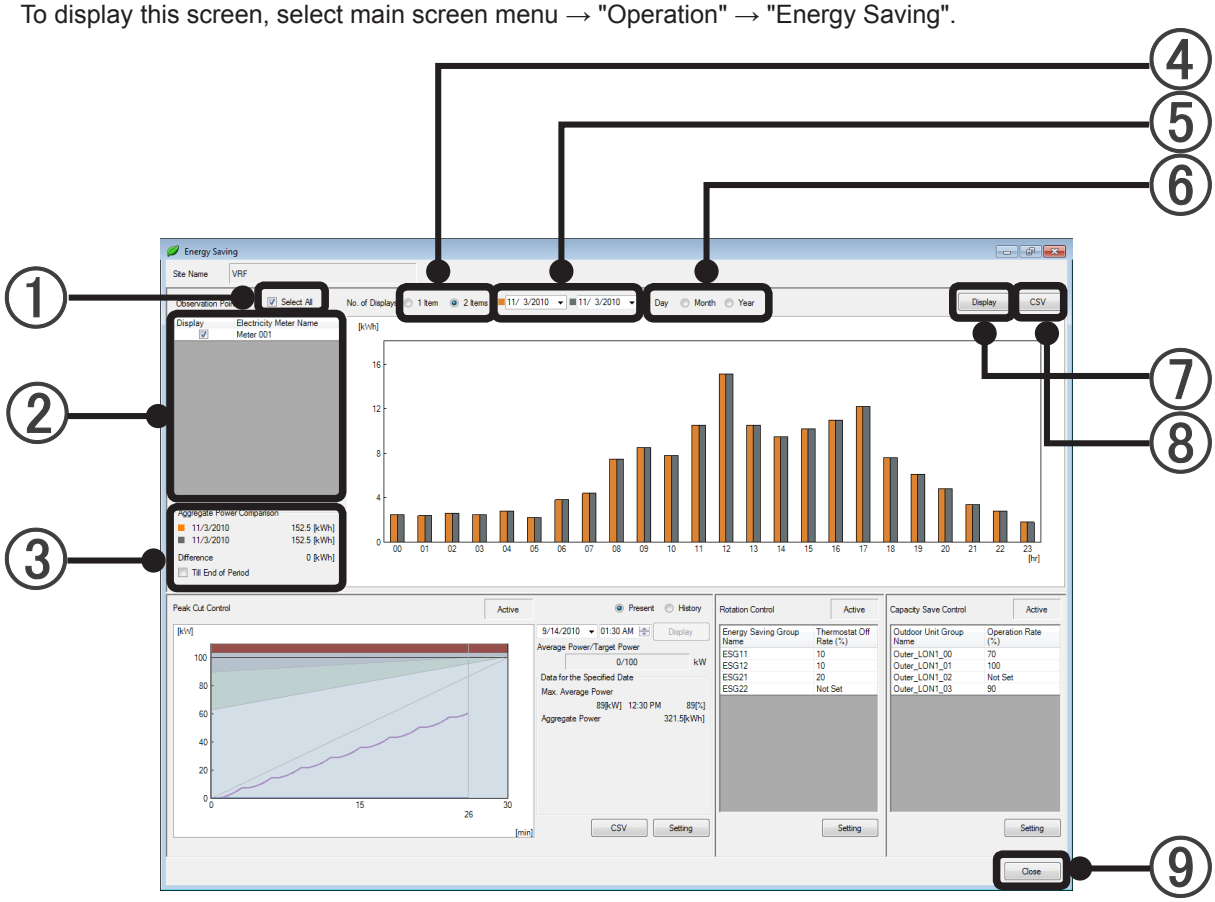
⑦ Average Power/Target Power is displayed.
Average power and target power is displayed.
In the case "present"graph, the current value is displayed. In the case of "History"graph, a value in exit time is displayed.

⑧ Data for the specified Date.
Max. Average Power information and Aggregate Power information on specified date is displayed.
(a) Max. Average Power: it means the maximum average power recorded on specified date.
(b) Max. Average Power recording time (display the end time): It displays the final time of recorded time limit.
(c) Max. Average Power recording ratio: it is a ratio of maximum average power recorded on specified date to target power.
(d) Aggregate Power: It displays the integrating power on specified date.

8-5 Electricity energy graph display

The effect of energy saving is displayed in electricity energy graph.
Graph will be refreshed at every set seconds (Default 300 seconds: 5 minutes) on the view of electricity meter.
It displays the operating condition of peak cut operation, indoor unit rotation operation and outdoor unit capacity save.
The peak cut control graph will be refreshed at every set seconds (Default 20 seconds).

To display this screen, select main screen menu → "Operation" → "Energy Saving".



① If you check "Select All", all display check box of electricity meter will be checked.
If the check is removed, all display check box of electricity meter will be removed.

② The selected electricity meter will be displayed on list. All will be displayed the electricity meter registered on electricity meter system setting screen.

③ It will be displayed that the integrating electricity energy at specified date on electricity meter selected at electricity meter list (①).
If you select "Till End of Period", it will integrate data and calculate difference until completion deadline in display bar graph to change label value automatically.

④ Select the number of periods to be displayed.
When "1 Item" selected, energy graph for a period specified at right date of ⑤ will be displayed.
When "2 Item" selected, energy graph for periods specified at both dates of ⑤ will be displayed.

⑤ Specify a period of total electricity energy displayed on graph with pulldown calendar.

⑥ Specify horizontal axis of the graph.

"day": It displays 0:00~24:00 on specified date. (It will display total value of each 60 minutes on bar graph.)

"Month": It displays from specified date to 1 month later. (It will display total value of everyday on bar graph.)

"Year": It displays from specified date to 12 months later. (It will display total value of every month on bar graph.)

⑦ Press [Display] button to update electricity energy graph using the specified information from electricity meter list and display period.

⑧ Press [CSV] button to display the dialogue which save the currently displayed graph data at CSV format.
Please save it in any folder.

⑨ Press [Close] button to exit this screen.

Electricity apportionment function (electricity meter used)

9. Electricity apportionment function
10. Electricity Charge Apportionment Setting
11. Electricity Charge Apportionment

9. Electricity apportionment function

9-1 Overview

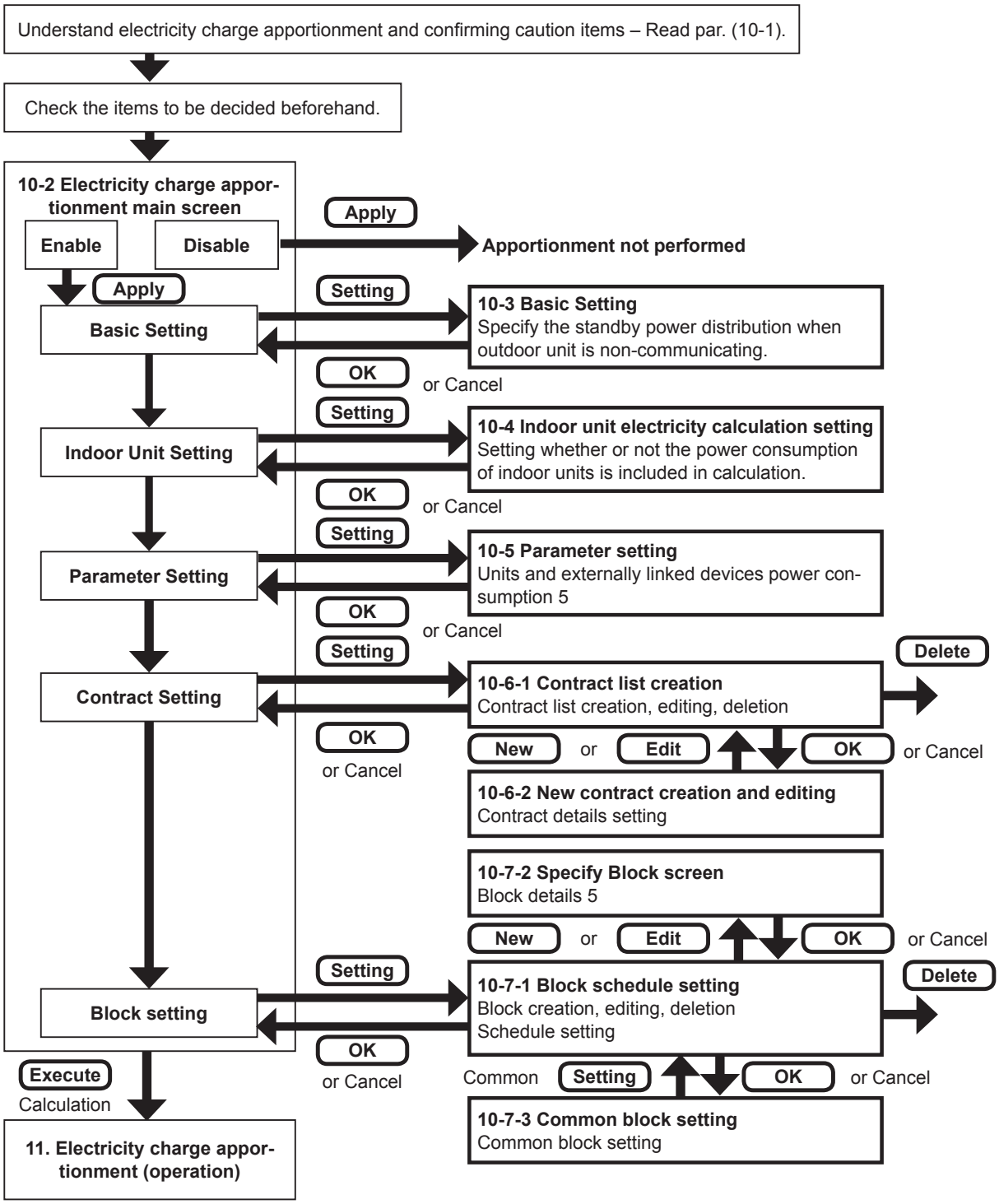
The proportional electricity allocation function apportions consumed electricity for air-conditioning (electricity cost) to each previously defined tenant's indoor unit, based on the usage results of the consumed electricity, after the consumed electricity is input into the system controller.
When implementing electricity apportionment with the VRF system, you can select to either a composition which uses the electricity meter or one that does not. The following explains the differences between these.
As the proportional electricity allocation function apportions consumed electricity for air-conditioning (electricity cost) to each previously defined tenant's indoor unit, based on the usage results of the consumed electricity, after consumed electricity is input to the system controller, it is possible to carry out electricity apportionment calculations starting with either consumed electricity or electricity cost input.
[In case of apportioning electricity using an electricity meter]
As it is possible to send consumed electricity information from the electricity meter to the system controller as required, it is basically possible to carry out electricity apportionment calculation at any time.
Since the system controller carries out aggregation in units of days, it is possible to carry out electricity apportionment in units of days.

10. Electricity Charge Apportionment Setting

Performs basic settings related to electricity charge apportionment necessary before operation. May also update the settings due to facility and tenant changes.
At initial starting after installation, perform setting in accordance with the following flow. For settings and changes after operation starts, perform the necessary settings in accordance with the contents of par. 10-1 and subsequent paragraphs.

Flow at initial setting

Perform initial setting in accordance with this flow.



10-1 Overview

1. Purpose of electricity charge apportionment

The electricity charge apportionment function apportions air conditioner electric charges to tenants. Generally, indoor units are divided among and used by each tenant, and calculation of the electricity charge for each tenant is easy. But since outdoor units are shared by multiple tenants, calculation of the electric charge for each tenant is not easy.

The electricity charge apportionment function is allows distribution of the electricity charges of outdoor units, which are a large part of the air conditioner power consumption, according to the air conditioner usage ability of each tenant.

2. Features of electricity charge apportionment of System Controller

(1) There is a method of carrying out apportionment calculations from the used electricity volume sent from the electricity meter and the unit price, and there is also a method of electricity apportionment calculation based on the amount on the invoice from the electricity company.
(2) Apportionment calculation is performed according to indoor unit usage ability.
(3) In addition to electric charge calculation of outdoor units only, electric charge calculation including indoor units is also possible.
(4) Flexible definition according to the electric charge contract configuration, block configuration, and usage period is possible.
(5) Since the data for 1 year is saved, recalculation of the past is possible.

3. Basic electricity charge apportionment terms

The terms related to electricity charge apportionment which appear in this section are defined below.

Apportionment	Distribution proportional to basic quantity.
Contract	Billing objective of electricity charge from electric power company.
Block	Aggregate of indoor units used by building tenants. A block used exclusively by a specific tenant is called a tenant block and a block shared by multiple tenants is called a common block.
Energy used	Energy used by indoor units and outdoor units to perform air conditioning.
Electricity charge	Electricity charge billed from an electric power company. Consists of basic charge billed without regard to amount used, metering charge billed only for the amount used, additional charge billed for special reasons, etc.
Undefined block	Special block which is allocated the power consumption, etc. of indoor units which are not allocated to a tenant block or common block. Generally, electric charges considered to be borne by the building owner or manager are apportioned to an undefined block.
Parameters	Detailed unit Information used in electricity charge calculation by the electric charge apportionment function.

4. Usage Precautions

(1) The electricity charge apportionment function requires correct setting and use in accordance with the descriptions in this manual.
If correct operation based on correct setting is not performed, a reasonable result may not be obtained.

(2) The electricity charge apportionment function does not calculate official electricity charges like those established by the laws and regulations of each country.

(3) Gaining an understanding of the descriptions, etc. in this manual and using the electricity charge apportionment function accordingly are the responsibility of the user.

(4) The electricity charges used in electricity charge apportionment calculation are only for the power consumed by the air conditioner.

(5) For the electricity charge apportionment function to function properly, the VRF Controller in the server PC must be operated continuously. If the VRF Controller is shut down or stopped by a power failure, etc. while the data needed by calculation is being acquired, correct electricity charge apportionment calculation may be impossible.

(6) Electricity charge apportionment is performed for units identified by scanning. When the unit configuration was changed, perform scanning to re-identify the objective units.

(7) Constantly maintain the units which are the objective of electricity charge apportionment calculation in the normal operating state.
If units are left in abnormal state (power not supplied or in error), data acquisition and calculation will not be correct.
The electricity charge apportionment function should not be performed during such period.

(8) When all the indoor units managed by the system controller are not allocated to a block, etc, the electric charges may be allocated to an undefined block. The electricity charges apportionment function cannot be used to reapportion the electricity charges allocated to an undefined block.
For cases which generate an undefined block, etc., see the later description.

(9) Electricity charge apportionment calculation identifies units by address. When the address of a unit was changed by automatic addressing function, etc., perform scanning to re-identify the correct address and update the block setting, if necessary.

(10) The electricity charge apportionment function of VRF system can only be performed from 1 controller or 1 gateway simultaneously.

(11) You cannot calculate the start day of data collection.

(12) Please correct the time periodically to make the date will not be changed.
The calculation of ECA will be as follow by correct time.
- In the case of set time back, ECA data will be deleted before returned time and collect data newly.
- In the case of set time ahead, ECA data will disappear during skip time.

In the case that set time back to change date, please scan for the apportionment can not be calculated accurately.

(13) When outdoor unit does not communicate, the apportionment calculation of the appropriate refrigerant system is not performed correctly because the data needed for apportionment is not obtained.

(14) Specifications of electricity charge apportionment are subject to change without prior notice.

(15) Specifications of electricity charge apportionment may be different depending on the series.

(16) With heat recovery, the apportionment result may be different even under the same operating condition, depending on the cooling/heating operation ratio, etc. of indoor units in the same refrigerant system.
For example, the case where there are both cooling units and heating units is more efficient than the case where all units operate in cooling mode within a refrigerant system.

(17) About fan for the DX-Kit.

When fan is controlled by DX-Kit, fans are presumed to have 1 fan level (ON or OFF) in terms of electricity charge apportionment calculation.

Power consumed by the external fan must be entered by the user from the "Parameter Setting" screen in order to perform ECA.

Calculation is performed using the entered value as power cosumed when the fan is ON.

When fan is controlled by external equipment, calculation is also performed using the ON/OFF status, but the status is estimated from the thermo-control status, acknowledged by DX-Kit.

5. Items Decided Before Use

Before using the electricity charge apportionment function, decide each of the items below and perform setting and operation correctly based on them.

(1)	Apportionment objective range	Whether or not indoor units are included in the apportionment objectives.
(2)	Basic/additional charges apportionment method	Select from among apportionment proportional to the number, capacity, and usage ability of indoor units or equal apportionment to blocks.
(3)	Common block apportionment method	Burden ratio of each block and building owner.
		When apportioning to blocks, select the apportionment method from the number of indoor units, capacity, equal, or individual.
(4)	Processing of undefined blocks	An undefined block is a block with an integrated electricity charge that could not be apportioned to a tenant block by the electricity charge apportionment function. The building owner or manager may have to process the electric charges apportioned to an undefined block separately from this electricity charge apportionment function. Decide beforehand the method of processing the undefined block when an undefined block was generated. See the later description so that undefined block electricity charges are not generated as much as possible.
(5)	Contents of contract	Contents of block division in contract, present/absence of basic/additional charges, nighttime, weekend charges time, etc.

6. Overview of apportionment method

Electricity charge apportionment is performed by a suitable method corresponding to the S/V Series and V-II/J-II/J-IIS/VR-II Series refrigerant control system.

The following outlines the V-II/J-II/J-IIS/VR-II Series electricity charge apportionment method, but the conceptual processing method is also the same for the S/V Series.

6.1 Fixed period processing

This processing is performed periodically for all the objective units when the electricity charge apportionment function is enabled.

(1) The energy used by and usage ability of each outdoor unit and indoor unit are calculated in accordance with the operation status of each unit.

(2) The energy used by outdoor units is apportioned to indoor units according to the usage ability of the indoor unit and the total energy used by each indoor unit is calculated for each refrigerant system.

6.2 Charge calculation processing

Electricity charge calculation is processed for the period for each block, based on either the used electricity amount from electricity meter and the unit price, or based on the invoice from the electricity company.

(1) Basic and additional charges

- Apportioned to each block in accordance with the selected apportionment method.
- Apportionment is performed in day units.
- Apportioned between real blocks.
- Not apportioned to common blocks.
- Since charges are not distributed when there are no real blocks, when using basic and additional charges, set an owner block, etc. so that blank period blocks are not generated.

(2) Meter rate charges

- The total energy used by each indoor unit calculated by fixed period processing is accumulated through the calculation period as the total energy used by each block. Indoor units not allocated to a block are integrated as an undefined block.
- Meter rate charges are apportioned to each block in accordance with the proportion of the calculated total energy used by each block.

(3) Common block

- The result of accumulation of meter rate charges above becomes the source of apportionment for common blocks.
- Charges are apportioned to blocks specified as distribution destinations in accordance with the selected apportionment method.
- Apportionment is performed in day units.
- Apportionment is apportioned among real blocks.
- The period when there are no real blocks is integrated at undefined blocks.

7. Cases for which Undefined Blocks are Generated

Cases for which undefined blocks are generated and measures to be taken when you do not want the undefined blocks to be generated, are described below.

(1) When there is an R/C group which belongs to a contract, but is not allocated to a block, its power consumption is apportioned to an undefined block.

To prevent generation of an undefined block

- Allocate all R/C groups to blocks.
- When that is not possible, either allocate it to a common block, or power off the indoor unit and perform re-scan so that it is removed from the electricity charge apportionment object.

(2) When the electricity charges of a common block are to be freely distributed to tenant blocks and the total is not 100%, the power consumption under 100% is apportioned to an undefined block.

- To prevent generation of an undefined block, make sure that the total distributed power consumption is 100%. In addition, when the period of the allocated blocks do not match, an undefined block is generated for periods that do not match.

(3) On the day with no block defined, with just common blocks or with blocks but when some units remain unallocated, those energy consumption are apportioned to undefined blocks.

- To prevent generation of an undefined block, disable the electricity charge apportionment function during that period.

8. Electricity charge apportionment error

Errors and their main causes related to electricity charge apportionment detected by the System Controller are described.

(1) Generation conditions

- Generated when a unit that does not send the information necessary for electricity charge apportionment (non-communicating unit) is detected during the period electricity charge apportionment data collection is performed.
  Judgment, performed for the outdoor unit and the indoor unit, is based on whether there is no communication for more than 30 minutes or not.

(2) Processing of errors by the System Controller

- Electricity charge apportionment error with the unit address are displayed for the non-communicating unit.
  The generation time and recovery time are recorded in the error history as with the other errors.
- In the electricity charge apportionment calculation, non-communicating unit is handled as follows:
  · Non-communicating indoor unit: Handled the same as an indoor unit whose operation is stopped by a remote controller
  · Non-communicating outdoor unit: When the non-communicating unit is a master unit, since the minimum data necessary for electricity charge apportionment is not collected, apportionment calculation of the relevant refrigerant system is not performed. (Charge becomes “0”.) When a slave unit is the non-communicating unit, calculation is performed as if the slave unit does not exist.
- Whether or not the outdoor unit standby power is apportioned to non-communicating indoor units can be set from the basic setting screen.

(3) Recovery conditions

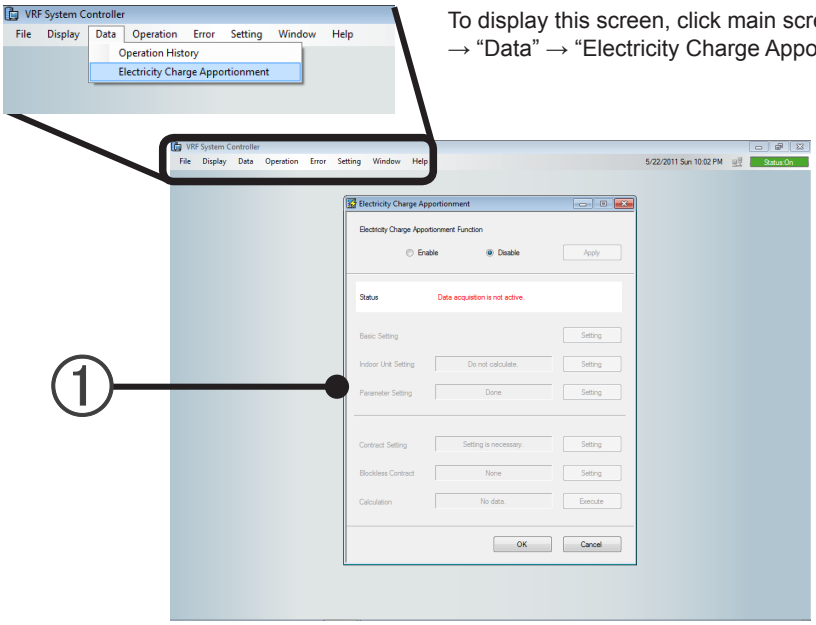
- When the data necessary for electricity charge apportionment can be acquired from the relevant unit, the electricity charge apportionment error is reset.

(4) Main error generation causes

- Electricity charge apportionment errors are mainly generated when the power breaker of a unit is switched off.
  (Because apportionment data is not sent when the power breaker is switched off.)
  When the power breaker of only part of the units in a refrigerant system is switched off, outdoor unit trouble may occur.
  Therefore, if there is a unit whose power breaker is switched off, quickly recover the power by switching on the breaker.

10-2 Electricity charge apportionment main screen

Performs electricity charge apportionment setting.



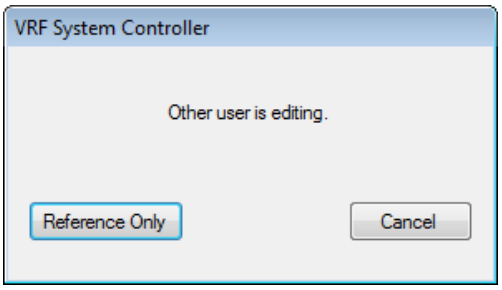
To display this screen, click main screen menu → “Data” → “Electricity Charge Apportionment”.

① Electricity charge apportionment main screen
(The screen is in the unset state. The contents which can be selected vary depending on the setting)

■ Function lock

Only the user that started the electricity charge apportionment main screen for the first time can use the electricity charge apportionment function.

If another user attempts to open the electricity charge apportionment main screen while the electricity charge apportionment function is being used, the message shown below is displayed.



[Reference Only]

Displays the electricity charge apportionment main screen in the locked state. (Only the [OK] button is enabled)

[Cancel]

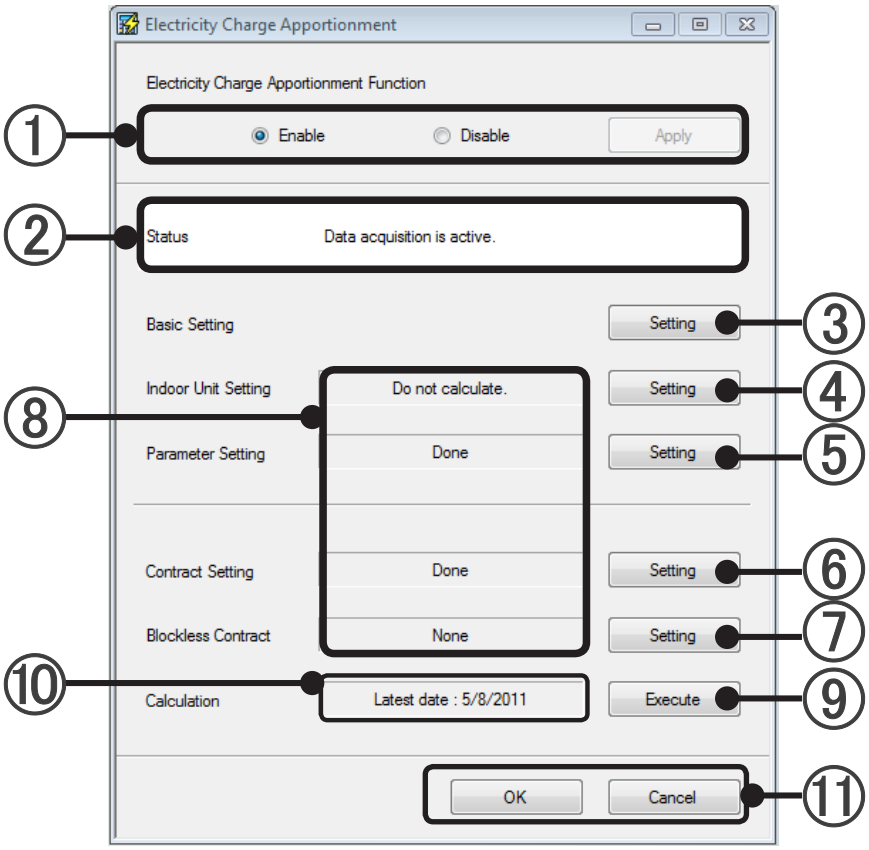
Ends the electricity charge apportionment function without displaying the electricity apportionment main screen.

Note

When performing electricity charge apportionment setting by remote connection, required time varies depending on the network communication speed. To avoid this, perform electricity charge apportionment setting on server PC preferably.

10-2-1 Main screen

The screen is for description purposes.
The contents which can be selected vary depending on the setting.



① Selects whether or not electric charge apportionment is to be performed and is entered by [Apply] button.

② Displays the data acquisition state. If “Data acquisition is active.” is displayed, data acquisition is performed normally.
If ④ to ⑥ are not set correctly, “Data acquisition is not active.” is displayed in red.
In this case, data acquisition are not performed and apportionment calculation cannot be performed.

③ Basic setting
Overall setting is performed at electricity charge apportionment calculation. (For details, see par. 10-3.)

④ Sets whether or not the power consumption of indoor units is included in electricity charge apportionment calculation. (For details, see par. 10-4.)

Display contents of ⑧	“Calculate for all units”:	Includes the power of all indoor units in apportionment calculation.
	“Do not calculate”:	Does not include the power of all indoor units in apportionment calculation.
	“Custom setting”:	Includes the power of some indoor units in apportionment calculation.

⑤ Sets the parameters of each unit. (For details, see par. 10-5.)
Display contents of ⑧ “Done”: Ends parameter setting of all units.
“Setting is necessary”: There is a unit which whose parameters cannot be set.

⑥ Performs contact setting. (For details, see par. 10-6.)
Display contents of ⑧ “Done”: Ends contract setting.
“Setting is necessary”: There are no contract settings or there is a contract without a unit.

⑦ Performs block setting. (For details, see par. 10-7.)
Display contents of ⑧ “Done”: Ends block setting at all contracts.
Display other than this displays the number of contracts without set blocks.

⑧ The current state of settings ④ to ⑦ is displayed.

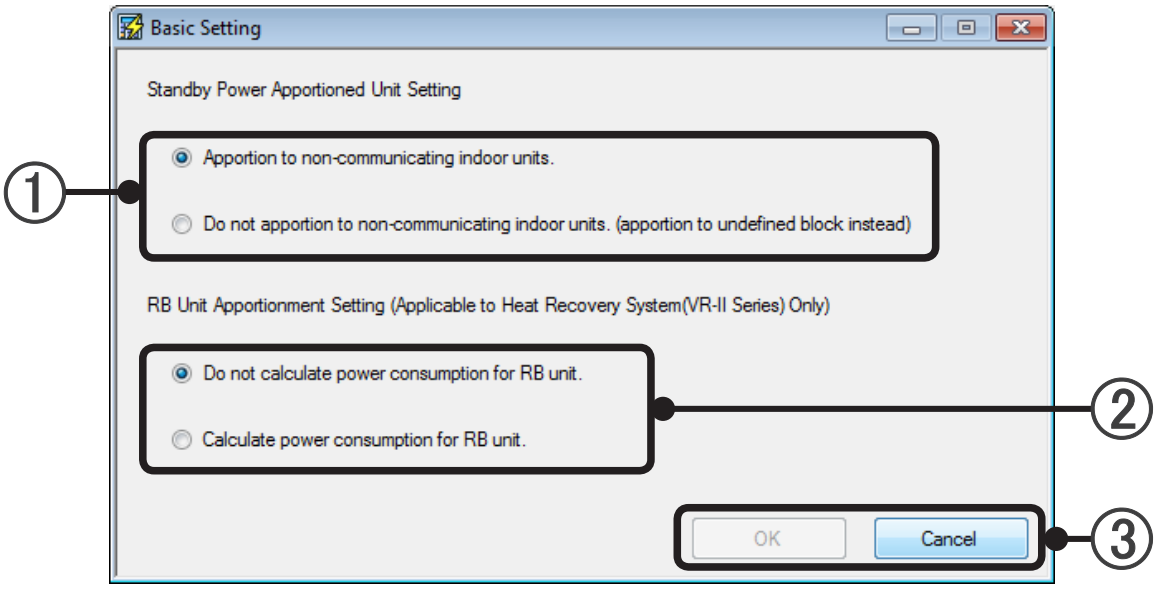
⑨ Performs electricity charge apportionment calculation. Apportionment Calculation screen opens. (For details, see par. 11-2-1.)

⑩ The latest date for which calculation is possible is displayed.

⑪ [OK]: Saves the edited contents and ends setting.
[Cancel]: Ends setting without saving the edited contents.
However, when the [OK] button is clicked in each setting screen at ④ to ⑦ and ⑨, the edited contents cannot be canceled.

10-3 Basic Setting

Sets whether or not outdoor unit standby power is apportioned to non-communicating indoor units.



① Set whether or not the outdoor unit standby power is to be apportioned to non-communicating indoor units.

- Apportion to non-communicating indoor units
  Standby power is apportioned even to non-communicating indoor units
- Do not apportion to non-communicating indoor units.(apportion to undefined block instead)
  Outdoor unit standby power is not apportioned to non-communicating indoor units.
  (Standby power not apportioned to non-communicating indoor units is apportioned to the owner block (Undefined Block).)

② Set the apportioning method of RB unit.

- “Do not calculate RB Unit's power consumption.”
  The calculation of RB unit is not performed.
- “Calculate RB Unit's power consumption.”
  The calculation of RB unit is performed.

③ [OK]: Saves the edited contents and ends setting.
[Cancel]: Ends setting without saving the edited contents.

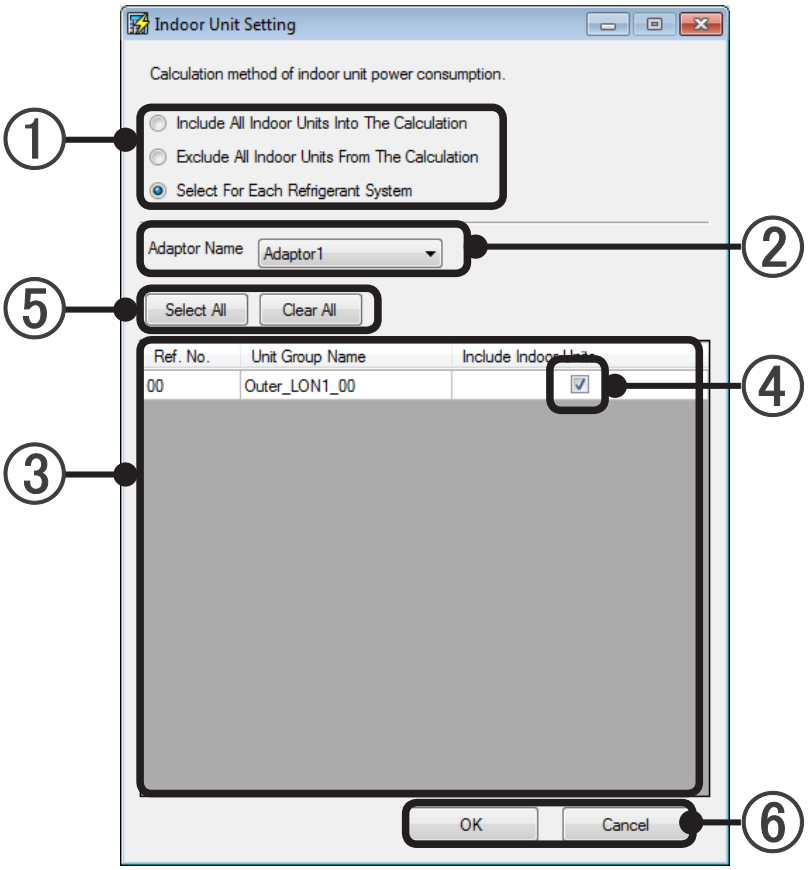
Note

When system controller and outdoor unit cannot communicate due to tripping of a unit power breaker or a network error, since the minimum data needed for apportionment calculation cannot be acquired, electricity charge apportionment calculation is not performed.

10-4 Indoor unit electricity calculation setting

To display this screen, click the [Setting] button of the “Indoor Unit Setting” item on the electricity charge apportionment main screen.
Whether or not the electricity charge of indoor units is included in calculation is decided by this screen.

Description of Indoor Unit Setting



① Selects the indoor unit calculation type.

“Include All Indoor Units Into The Calculation.”	The electricity charge of indoor units is also included in calculation. Select when the power meter is shared by the indoor unit and outdoor unit power source and when the power meter of the same contract destination as an outdoor unit is installed at an indoor unit power source. (Settings ② to ⑤ cannot be performed.)
“Exclude All Indoor Units From The Calculation.”	The indoor unit electricity charge is not included in calculation. Select when a power meter independently contracted with the electric power company by tenants is installed at the indoor unit power source, etc. (Settings ② to ⑤ cannot be performed.)
“Select For Each Refrigerant System”	Select when setting whether or not indoor unit power consumption is included in calculation for each refrigerant system.

Select according to the power meter position and contact with the electric power company.

Note

If a setting is changed during data acquisition, the results of calculation after setting will also change.

When “Select For Each Refrigerant System” is selected at ①, set items ② to ⑤.

② Selects the adaptor (U10 USB Network Interface) which is to perform setting by pull-down menu.

③ Displays a list of the refrigerant systems connected to the adaptor selected at ②.

④ Selects whether or not indoor units are included individually for each refrigerant system by checkbox.

⑤ When clicked, [Select All] or [Clear All] of ④ is checked.
This is convenient when starting from the highest number when selecting the refrigerant systems individually at ④. Reflected by range (adaptor units) displayed at ③.

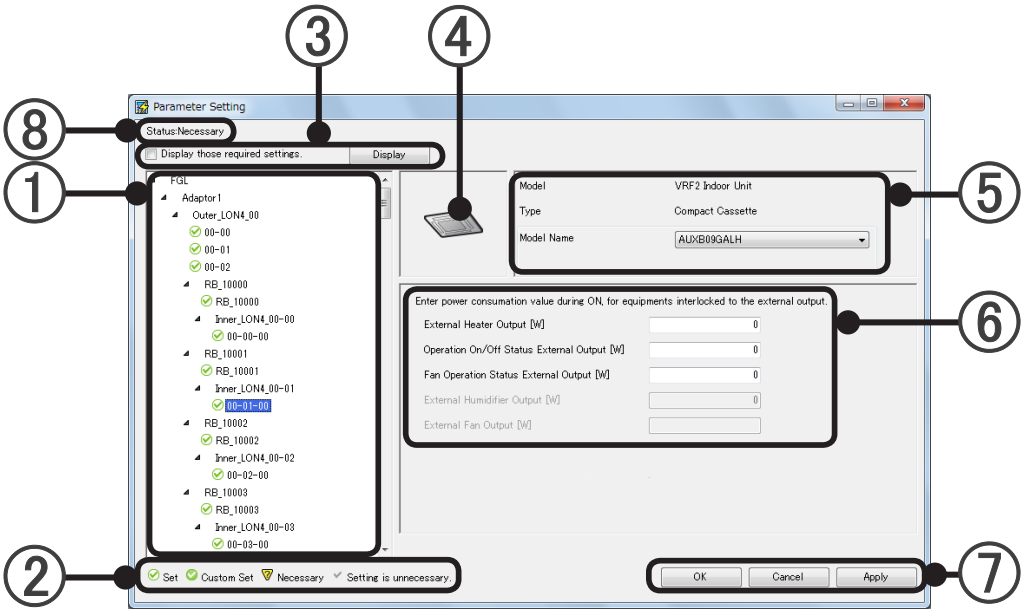
⑥ [OK]: Saves the edited contents and ends setting.
[Cancel]: Ends setting without saving the edited contents.

Note

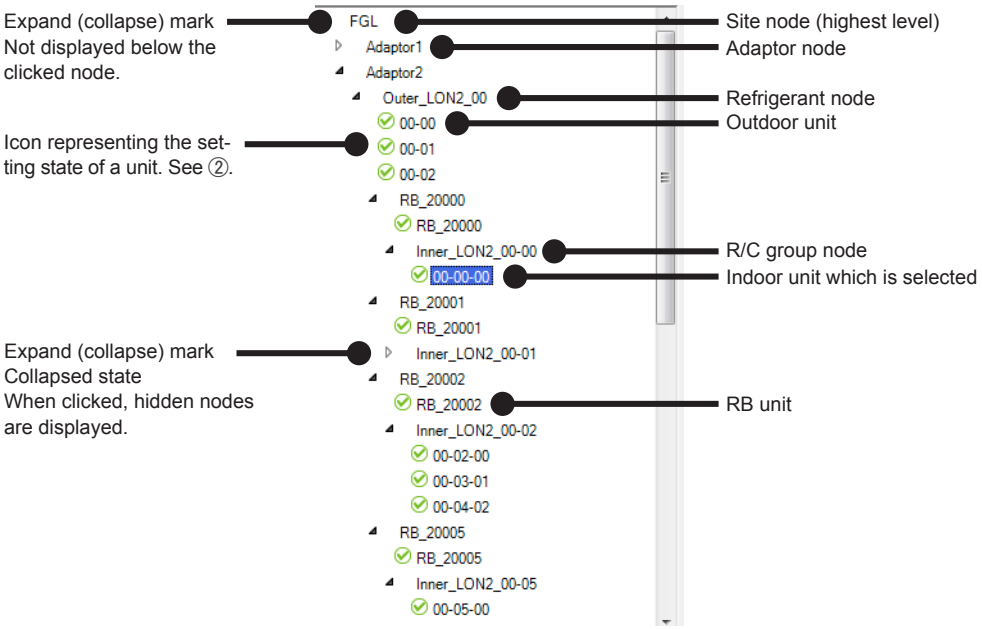
- When setting is finished with [Select All] or [Clear All] checked at ⑤, the setting of ① becomes “Include All Indoor Units From The Calculation.” or “Exclude All Indoor Units From The Calculation.”
- When the power meter or other contract contents were changed by resident or tenant updating, change the setting at the same time.

10-5 Parameter setting

To display this screen, click the [Setting] button of the “Parameter Setting” item on the electricity charge apportionment main screen.
Setting of the model name of the unit which is to perform electricity charge apportionment calculation and the externally linked devices are performed by means of this screen.
Since model name setting is necessary in electricity charge apportionment calculation, perform it certainly. (Normally, if scanning is performed, the model name is set automatically.)



① Selects the unit (outdoor unit, indoor unit, RB unit) which is to be set from the list hierarchically displayed in tree view site, adaptor, refrigerant, and R/C group order.



Note

The “Tree View” may not be displayed on the screen depending on the contents. In this case, display it by scrolling the screen using the scroll bar at the side of the screen.

② Description of icons representing the setting state of the units in the “Tree View”.

Set	V-II/J-II/J-IIS/VR-II Series unit set without externally linked devices
Custom Set	V-II/J-II/J-IIS/VR-II Series unit set with externally linked devices
Necessary	V-II/J-II/J-IIS/VR-II Series Unit whose parameter is unclear. When you install a new unit and replace the board, it may be incompatible with the version of system controller. When this icon is displayed, electricity charge apportionment calculation is performed without ending setting. Please contact your service personnel.
Setting is unnecessary	S Series or V Series unit (Setting is unnecessary)

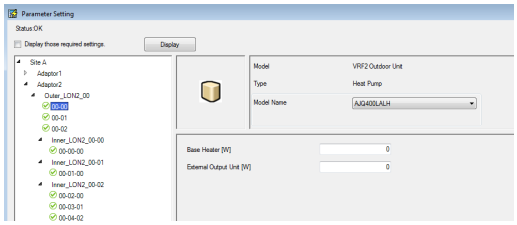
③ Refinement
Display only those units for which parameters have not been set.
Once all unit settings have been configured, the unit name will no longer be displayed.

④ Displays the “unit icon”

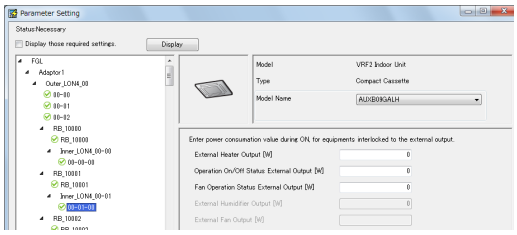
⑤ Displays the Model, type, and model name of the Unit.
When the model name is displayed in red bold characters, it is a model which is not compatible with the system controller. Please contact your service personnel.
In the case of RB unit, type is not displayed.

⑥ Sets the power consumption of auxiliary heater, ventilation fan, or other linked device added to the unit in watt. hr. (within 7 digits, integer number only) Manual setting at all relevant units is necessary. (Except the automatic setting objective at scanning.)

Example of outdoor unit display



Example of indoor unit display

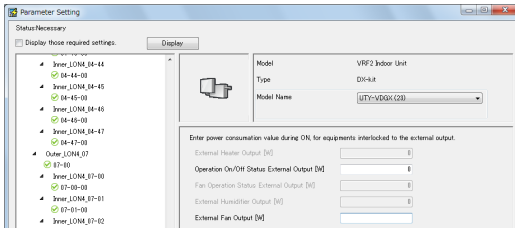


When a unit is ON/OFF linked and controlled by using the external output terminals on its PCB, entering the power at ON here can be taken into account for electricity charge apportionment calculation.
The electricity charge apportionment function performs calculation with power of the value input at the screen as constant while the external output terminal is ON.
When electricity charge apportionment used an electricity meter, the electricity meter must also be connected to the unit to be linked.
Depending on the unit, items without external output function are displayed grey.

- Operation stop state external output [W]
- Fan operation state external output [W]
- External heater output [W]
- External humidifier output [W]
- External fan output [W]

Refer to the “Design & Technical Manual” for a detailed description of each external output operation.

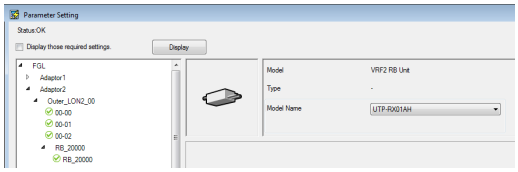
Example of DX-Kit display



Note

* A value may be given in ( ) after “Model Name”.
For detail of the number, refer to the description in the “ReadMeFirst.txt” file within the installation DVD.

Example of RB unit display



⑦ [OK]: Saves the edited contents and ends setting.
[Cancel]: Ends setting without saving the edited contents.
(When [Apply] was performed during work, it cannot be canceled by [Cancel].)
[Apply]: Saves the edited contents without ending setting.

⑧ Displays whether setting are done for all units.
Status: OK - setting are done for all units.
Status: Necessary - Some units still need to be set parameters.

Note

- Except for indoor- and outdoor-units, items cannot be displayed in Tree View.
- If not even one indoor unit or outdoor unit is connected, there may be a display at ① Tree View, but setting is unnecessary.
- When a unit was added or replaced, quickly perform scanning and end unit registration and parameter setting.
- Even if the model name has been set, it will not be reflected in the unit list. Model name setting uses the electricity charge apportionment parameter.

10-6 Contract setting

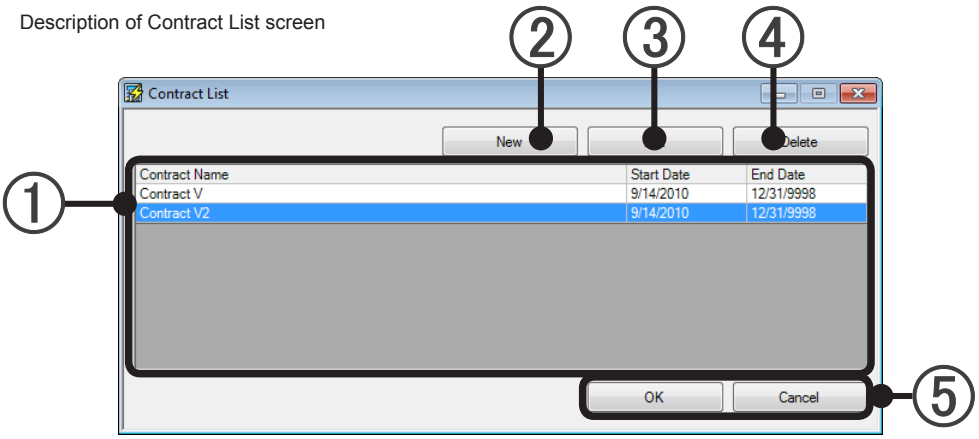
Overview of contract

- Performs data acquisition at which the scan unit becomes the apportionment objective.
- Create a contract either for each invoice from the electricity company (invoice to be apportioned), or in units in which the apportionment calculation is to be carried out.
- Create blocks (become the bill output unit of the apportionment function) in the contract
- One refrigerant system cannot be set to span multiple contracts

10-6-1 Contract list creation

To display this screen, click the [Setting] button of the “Contract Setting” item on the electricity charge apportionment main screen.
On this screen, you can create contracts as many as contracts with electricity companies. The electricity charge apportionment is calculated for each contract which is created here.

Description of Contract List screen



① Lists set contracts and contract periods.

② Creates and adds new contract setting. (See par. 10-6-2.)

③ Changes the contract setting selected at ①. (See par. 10-6-2.)

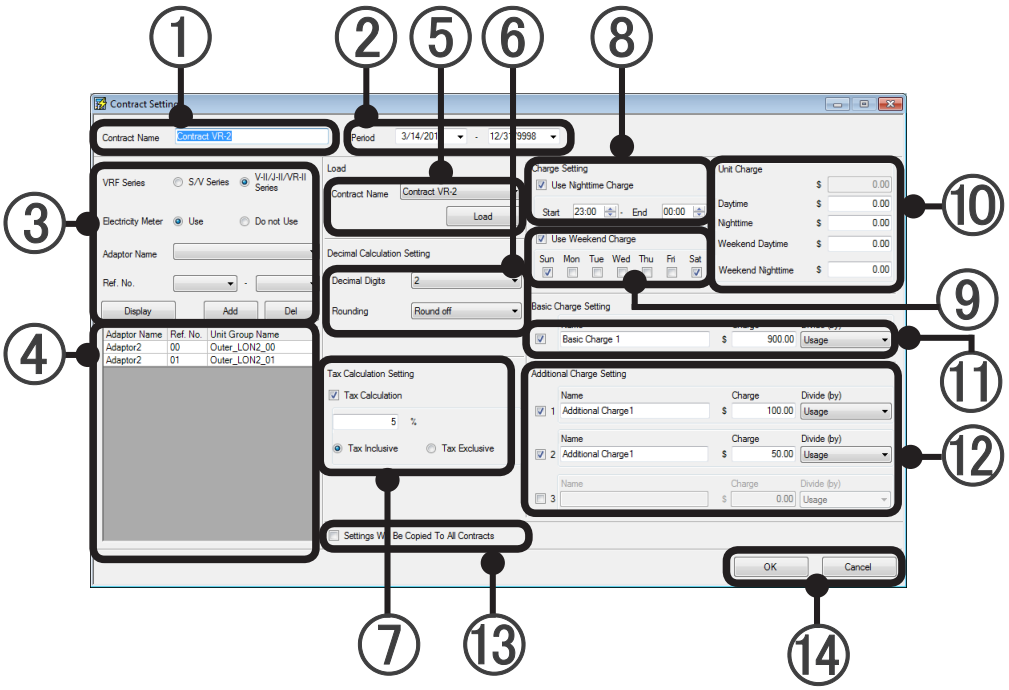
④ Deletes the contract setting selected at ①.
Block settings in this contract are simultaneously deleted.

⑤ [OK]: Saves the edited contents and ends setting.
[Cancel]: Ends setting without saving the edited contents.

10-6-2 New contract creation and editing

Performs setting for each contract created at par. 10-6-1.
To display this screen, click the [New] button or [Edit] button at par. 10-6-1 Contract list creation.

Description of contact setting screen



① Inputs and edits the name of the contract. (Within 20 characters of alphabet, numeric, and symbol)

② Contract start and end dates setting. (Calendar is opened by pull-down menu. Key input is also possible.) After setting, the refrigerant systems which can be selected during this period at ③ are updated by clicking the [Display] button of ③.

③ Refrigerant system setting and change

1. Select the contract system type.
2. Configure whether to use the electricity meter or not for registered contracts.
3. Select the objective adaptor (U10 USB Network Interface).
4. Select the refrigerant system range by pull-down menu. (Cannot be selected when all systems were set.)
5. When the [Add] button is clicked, the refrigerant systems are displayed in the list at ④.

Deleting refrigerant system from setting

1. Select the refrigerant system to be deleted at the list of ④.
2. Click the [Del] button.

Redisplaying the refrigerant systems

1. Since the refrigerant systems which can be selected at ③ are updated when [Display] is clicked when the contract period was changed at ②, reset the refrigerant systems.

④ List of refrigerant systems set at the contract.

⑤ The contents of items ⑥ to ⑫ can be used in contracts which have already been set.
Select the contract name to be referenced by pull-down menu and load it using the [Load] button.

⑥ Sets the number of display digits after the decimal point. (Calculation is performed at this setting.)
- Number of digits after the decimal point which is displayed. Select by pull-down menu. (0 to 5)
- Method of rounding of fractions below the display. Select by pull-down menu. (Round off, count fractions as one, truncate)

⑦ Tax calculation setting. Enabled when checkbox is checked.
Input the tax rate at the text box. (0~99.99)
Selects whether the amount of the calculated result is to be handle “Tax inclusive” or “tax exclusive”.
When the billed amount includes the tax, select “Tax inclusive” and when the tax is separate, select “Tax exclusive”.

⑧ Nighttime charge setting. Set when the electricity charge unit price is different in the daytime and at nighttime.
Enabled when checkbox is checked.
Set the start time and end time of the time frame corresponding to nighttime charge. (Set in 30 minutes units and evening of current day to morning of next day)

⑨ Weekend charge setting. Set when the electricity charge unit price is different on weekdays and weekends.
Enabled when checkbox is checked.
Select the day of week corresponding to weekend charge. (Multiple days can be selected)

⑩ Configure the unit price for each item. This is only enabled in the case that usage of the meter was selected in ③.

⑪ Basic charge setting. Enabled when checkbox is checked.
“Name”: An arbitrary name can be set. (Within 20 characters of alphabet, numeric, and symbol)
“Charge”: Inputs the basic charge. (Numeric only within 11 digits. Can be changed during calculation)
* Input up to the number of digits after the decimal point set at ⑥.
“Divide”: Select the charge distribution method by pull-down menu. (Equal distribution, distribution according to number of units, distribution by amount of electricity used, distribution according to total indoor unit capacity)

⑫ Additional charge setting. Up to 3 additional charges can be set. Enabled when checkbox is checked.
Perform input sequentially, beginning from additional charge 1.
“Name”: An arbitrary name can be set. (Within 20 characters of alphabet, numeric, and symbol)
“Charge”: Inputs the additional charge. (Numeric only within 11 digits. Can be changed during calculation)
* Input up to the number of digits after the decimal point set at ⑥.
“Divide”: Select the additional charge distribution method by pull-down menu. (Equal distribution, distribution according to number of units, distribution by amount of electricity used, distribution according to total indoor unit capacity)

⑬ When checked and [OK] is clicked, items ⑥ to ⑫ are made the same setting for all the contracts.

⑭ [OK]: Saves the edited contents and ends setting.
[Cancel]: Ends setting without saving the edited contents.

Note

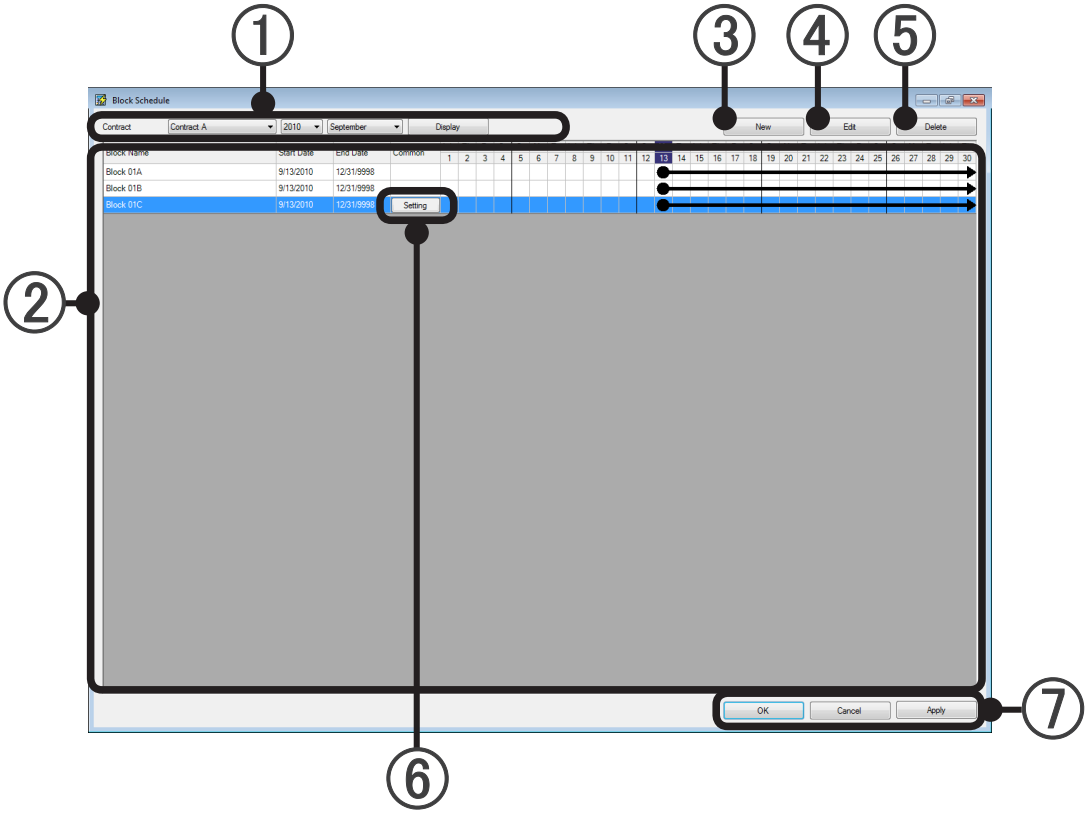
At contract addition, change or end, finish setting up to the relevant date.
If changes are made later, correct calculation will not be performed.
You cannot calculate the start day of data collection.
Do not add/remove outdoor/indoor unit during contract period.
IF you need to do so, end the contract and define a new contract.
Set Basic Charge to the basic amount charged by the electricity company, if there is a basic charge.
If there is no basic charge, you do not need to set this.

10-7 Block setting

10-7-1 Block schedule setting

To display this screen, click the [Setting] button of the “Blockless contract” item on the electric charge apportionment main screen.
Setting of the move-in/move-out schedule of supposed tenant blocks is performed for each contract. Common blocks can also be set.

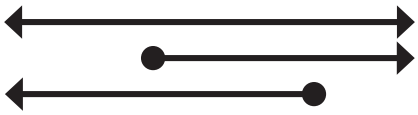
Description of screen



① Selects the contract name, year, and month to be displayed.
When the [Display] button is clicked, the blocks set at ② are displayed.

② The block setting state of the contents selected at ① is displayed. The block setting period is represented on the calendar by a line.

- When the block setting period spans the previous month and the next month or more
- When the block setting period starts from in the displayed month
- When the block setting period ends in the displayed month



(Units of periods not belonging to a block are attributed to an “Undefine” block.)

Note

The calendar display of ② may not appear on the screen depending on the number of set blocks and the PC monitor size.
In this case, display it by scrolling the screen with the scroll bar at the end of the screen.

③ New block creation button. (See par. 10-7-2.)
Creates a new block. When the [New] button is clicked, the “Specify Block” screen opens. The created blocks are displayed at ②.

④ Block edit button. (See par. 10-7-2.)
Edits the setting contents of the block. When the [Edit] button is clicked after a block is selected at ②, the “Specify Block” screen opens.

⑤ Block delete button.
Deletes the block. When the [Delete] button is clicked after a block is selected at ②, that block is deleted.

⑥ Common block [setting] button.
(See par 10-7-2. Displayed when set to common block at the “Specify block” screen.) When clicked, the “Common Specify Block” screen opens. Always set when there is a common block. (If common block setting is not complete, correct calculation cannot be performed.)

* Perform common block setting after creating all the tenant blocks.

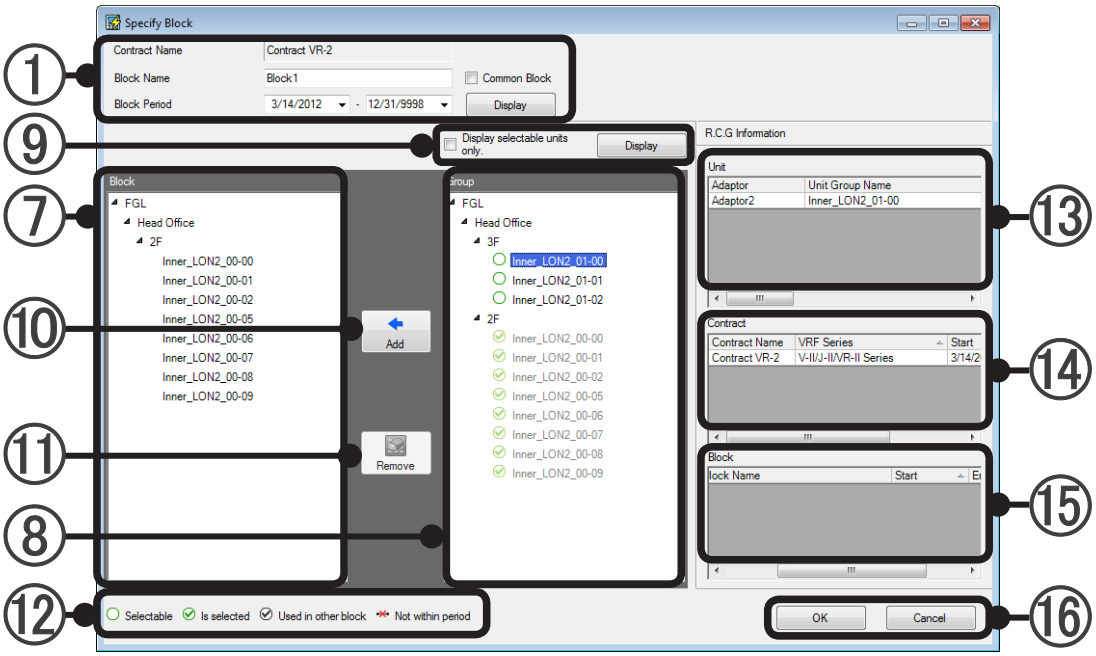
⑦ [OK]: Saves the setting and ends it.
[Cancel]: Ends the setting without saving it.
(When [Apply] was performed during work, it cannot be canceled by [Cancel].)
[Apply]: Saves the block schedule setting without ending it.

Note

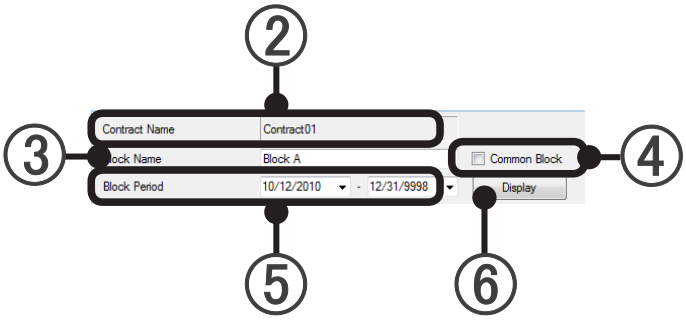
When a new contract was created and when a block (resident or tenant) was updated, end setting before the block period starts.
In addition, when the block period end date was decided, end setting before the end date.

10-7-2 Specify Block screen

To display this screen, click the [New] button or the [Edit] button of the par. 10-7-1 “Block schedule setting” screen.
Creates a new block or edits an existing block. Registers and edits R/C groups belonging to the block.



① Block basic setting



② Contract name: Displays the name of the contract to which the block belongs.

③ Block name setting:
An arbitrary name can be text input. (Within 20 characters of alphabet, numeric, and symbol)

④ Common setting:
Can be set as a common block. Enabled by checking the checkbox. The [Setting] button at the block schedule setting screen is enabled.

⑤ Block period setting:
Sets the start and end dates of the objective period of the block. Can be set by key input or from the calendar displayed by pull-down menu. Setting within the contract period is possible.

⑥ [Display] button: When clicked, the setting state for the period specified at ⑤ is displayed at ⑦ and ⑧.

⑦ Block list:
Tree view of the R/C groups registered at the block being set.

⑧ Group list:
Tree view of the R/C groups by group. R/C groups not set at a group are displayed as “Undefine” Group.
Registered R/C groups are displayed in gray and cannot be set.
* R/C groups without electricity charge apportionment function are not displayed.

⑨ Refinement button
Display only those units for which parameters have not been set.

⑩ [Add] button
Registers the R/C groups and groups selected at ⑧ group list at the block of ⑦.

⑪ [Remove] button
Deletes the R/C group and group set at a block at ⑦.

⑫ Description of icon displayed at ⑧. Represents the state of the unit.

Selectable	R/C group which can be registered
Is selected	R/C group already registered at the block being set
Used in other block	R/C group already registered at another block
Not within period	Unit that does not exist within the period specified by ⑤

⑬ Unit information: Displays the “Adaptor”, “Unit Group Name”, “Address”, “Unit Type”, “Operation Start Date”, “Operation End Date”, “Model Name*”, “System Type (Cooling Only, Heat Pump, etc)”, and “Model” of the R/C group selected at ⑧.
*The letter ":" as the last letter of the Model Name signifies that the Model Name for the corresponding unit was written after shipment. The letter ":" is not part of the Model Name.

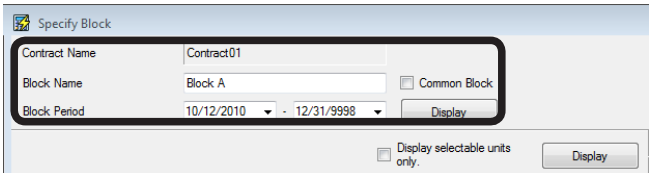
⑭ Contract information: Displays the “contract name”, “contract start date”, and “contract end date” of the R/C group selected at ⑧.

⑮ Block information: Displays the “contract name”, “block name”, “block start date”, and “block end date” of the R/C group selected at ⑧.

⑯ [OK]: Saves the setting and ends it.
[Cancel]: Ends the setting without saving it.

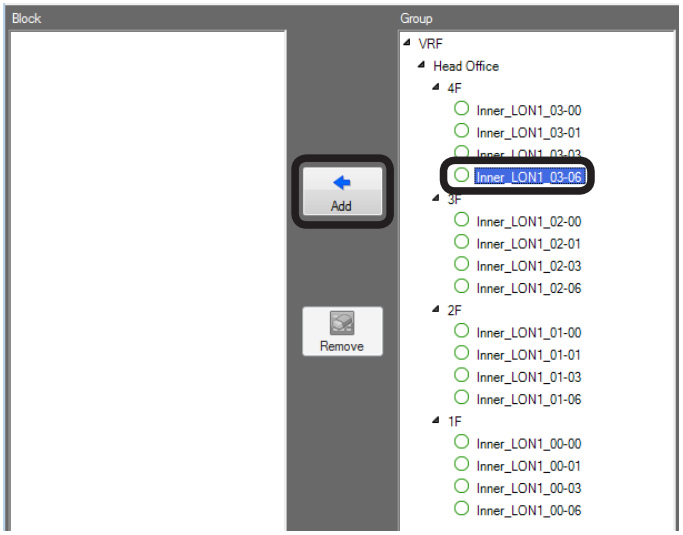
New block setting flow

1. Contract name confirmation. Block name and period setting.

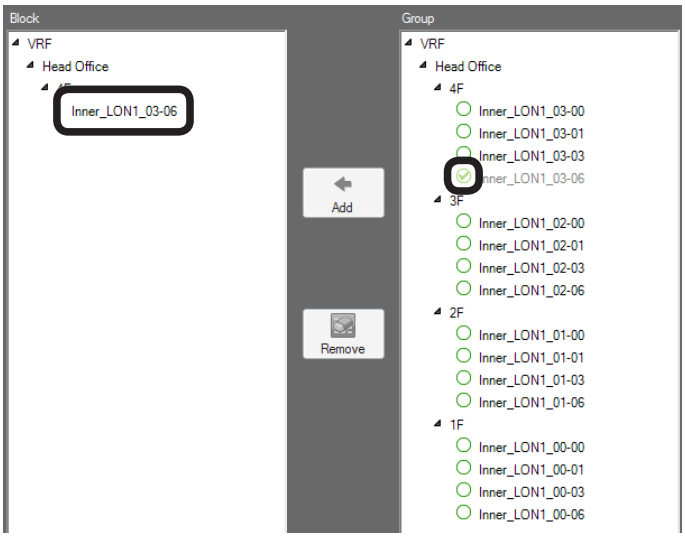


When registering the block as a common block, check “Common Block”.
Reflect the setting on the screen by clicking the [Display] button.

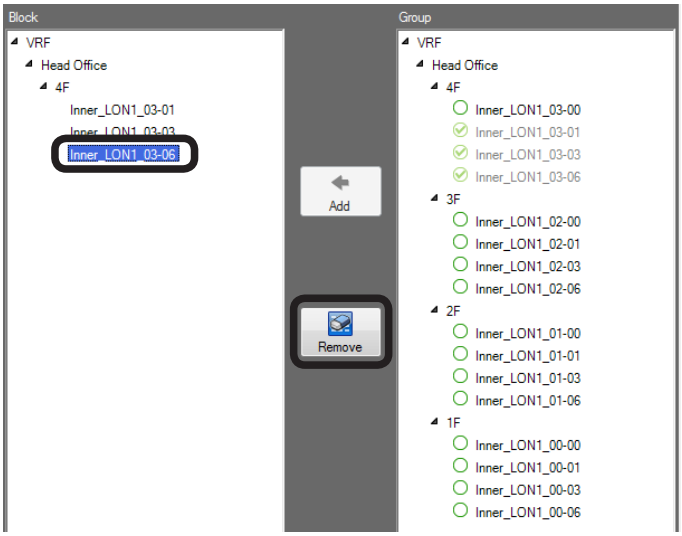
2. Select the R/C group to be registered at the block from the ⑧“Group” list. When the ⑨[Add] button is clicked, the R/C group is registered at the ⑦ “Block” list.



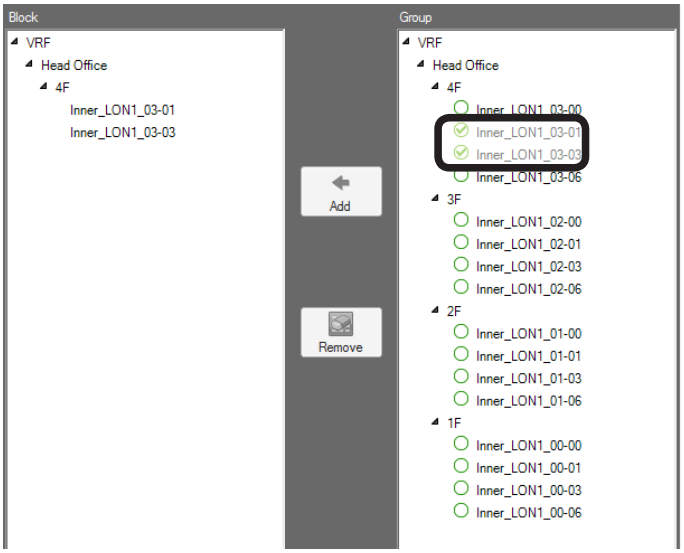
3. The R/C group registered at the block is displayed in the ⑦ “Block” list and becomes the registered display by ⑧“Group” list.



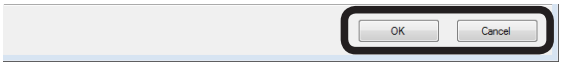
4. To delete an R/C group from a block, select the R/C group to be deleted from the ⑦ “Block” list and click the ⑩ [Remove] button.



5. The selected R/C group is deleted from the block and can be selected at the ⑧“Group” list.



6. After registration is complete, end setting by clicking the [OK] button. To end by canceling the setting, click the [Cancel] button.



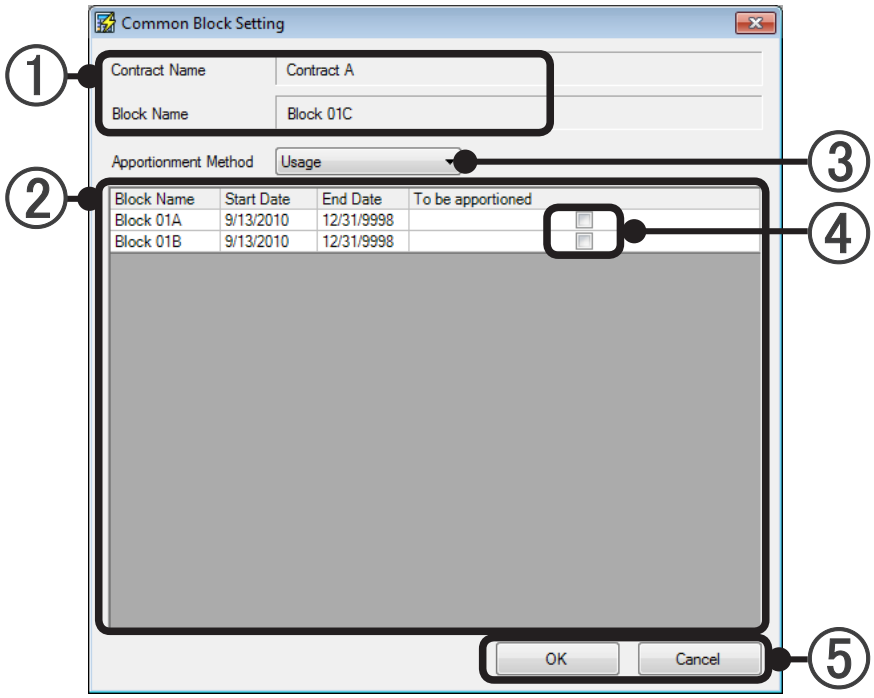
Note

To register each building and floor which already has the units laid out to a block, select the relevant building name or floor name from the ⑧“Group” list and click the ⑨[Add] button.

10-7-3 Common block setting

Sets the block with Common Block ④ checked at par. 10-7-2 Specify Block screen.
To display this screen, click the ⑥ Common block [setting] button of par. 10-7-1 Block schedule setting.
Sets the method the power consumed by common blocks is apportioned to tenant blocks.

Description of screen



① Confirms the contract name and block name.

② Displays the block name and period of tenant blocks in the same contract as a common block in a list.

③ Selects the apportionment method by pull-down menu. See the block apportioned at ④.

"Equally": Apportion equally to the selected blocks

"Unit quantity": Apportion by proportion of number of units

"Usage": Apportion by proportion of amount of power used (metering) (Recommended)

"Capacity": Apportion by allowable capacity of unit

Set by checkbox.

"Manually": Apportion by arbitrary setting.—— Manual setting of apportionment ratio. In the initial state at selection, 100% of the consumed power is apportioned to "Undefine" blocks as imaginary blocks and displayed. Since key input is possible at field (4), adjust so that the total apportionment ratio to the tenant block is 100%. If an apportionment ratio to an "Undefine" block remains, the "Undefine" block will be charged at apportionment calculation.

⑤ [OK]: Saves the setting and ends it.
[Cancel]: Ends the setting without saving it.

Note

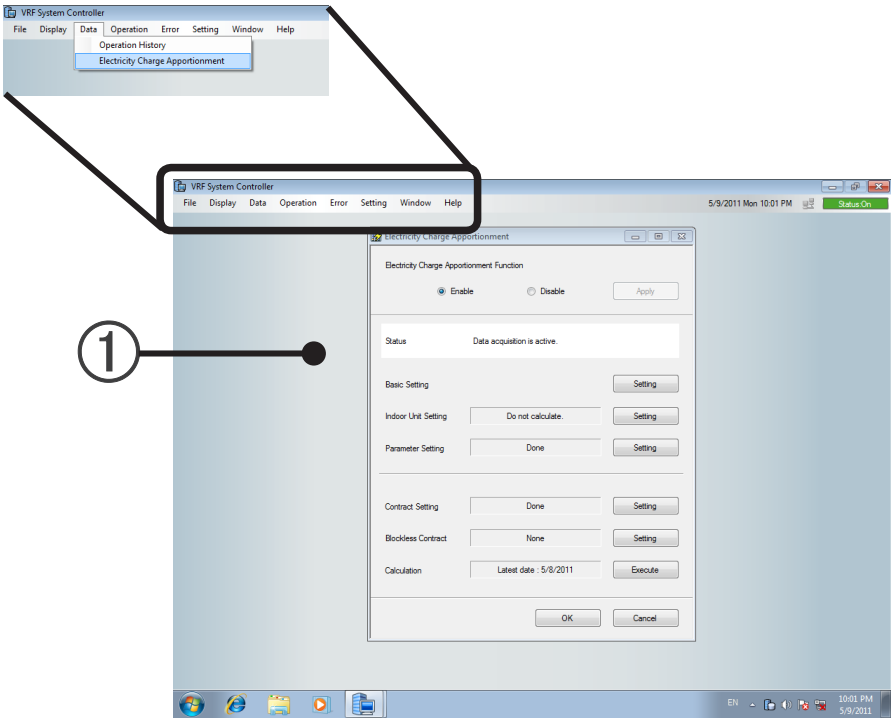
After all settings are finished, electricity charge apportionment data acquisition is started. Close the "Electricity Charge Apportionment" screen (par. 10-2-1). When performing electricity charge apportionment calculation, see par. 6. Electricity charge apportionment.

11. Electricity Charge Apportionment

11-1 Electricity charge apportionment main screen

The electricity apportionment calculation is performed with either the used electricity amount sent from the meter and the unit price, or the invoice amount sent from the electricity company ,as input.
For a description of electric power consumption data acquisition and electricity charge apportionment calculation related settings, see par. 5 Electricity Charge Apportionment Setting.

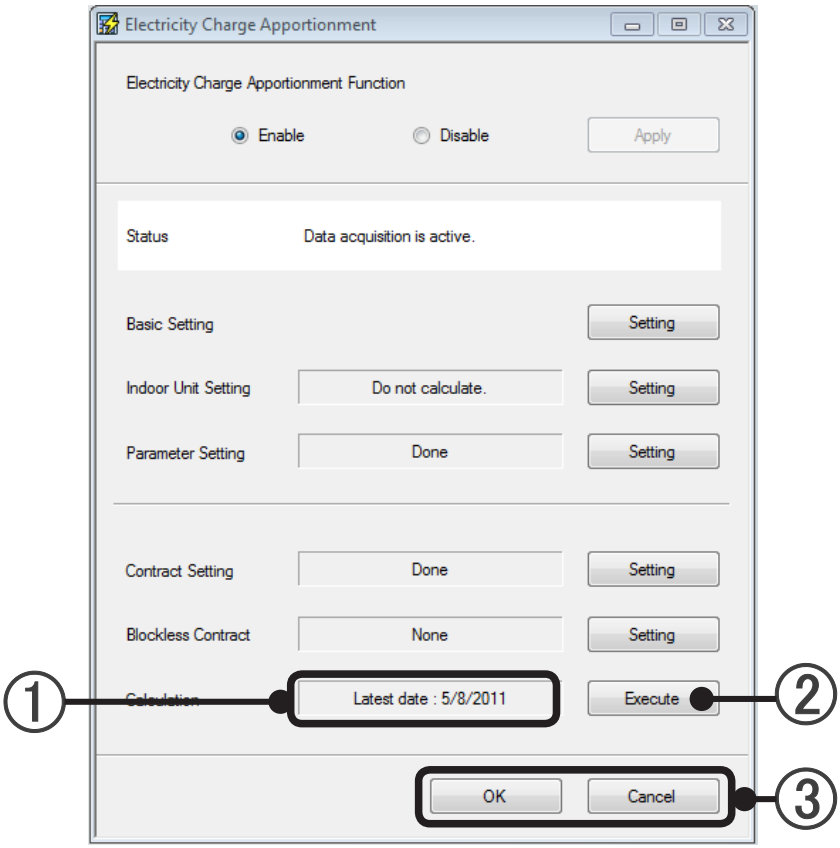
To display this screen,
click main screen menu → “Data” → “Electricity Charge Apportionment”.



① Electricity Charge Apportionment main screen.

11-1-1 Electricity Charge Apportionment main screen

Description of screen



① The latest date which can be calculated is displayed.

② Executes calculation
When clicked, the Apportionment Calculation screen (11-2-1) opens.

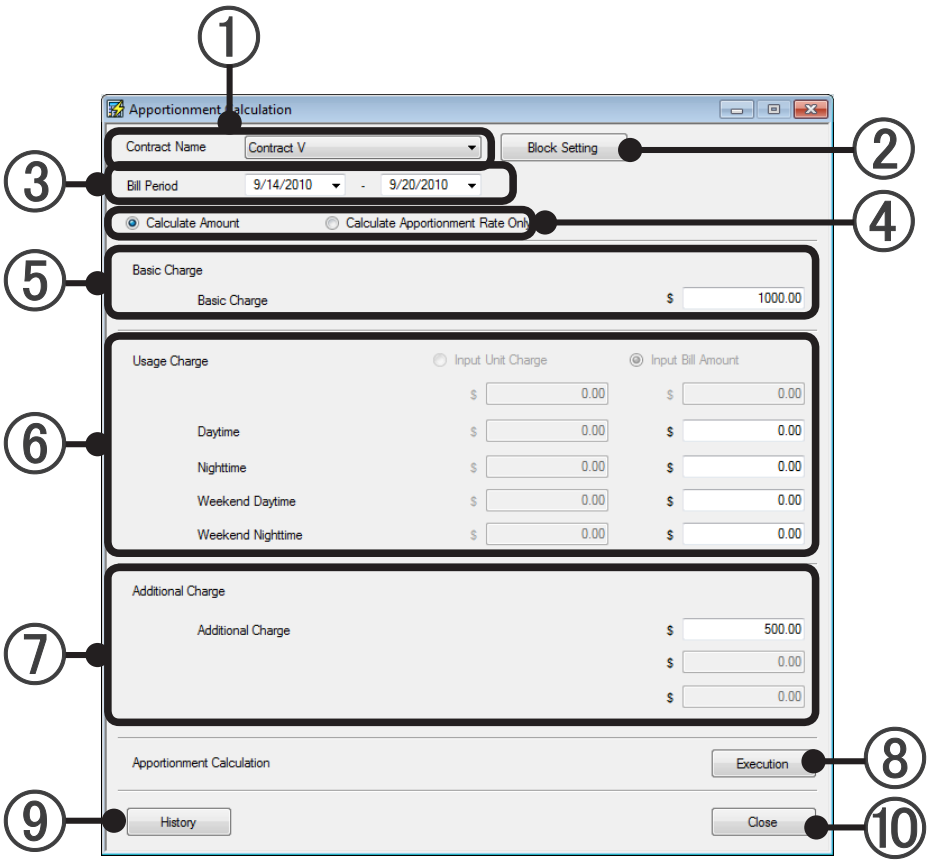
③ Click to end apportionment calculation or to end after printing a bill.
[OK]: Save edited contents and end.
[Cancel]: End without saving edited contents

11-2 Apportionment calculation execution

To display this screen, click the [Execute] button of the Calculation item on the Electricity Charge Apportionment main screen.

11-2-1 Apportionment Calculation screen

Description of screen



① Selects the calculation target contract.

② [Block Setting] button: When you want to check or change the block setting, click this button to open the [Block Schedule Setting] (10-7-1) screen. Close the screen after checking or changing the block setting.

③ Sets the billing target period.
Text can be input.
When the dropdown button at the right-hand side is clicked, a date selection calendar is displayed. Select the day.
The range of the period over which there is electric power apportionment collection data in the contract period can be selected.

④ Select “Calculate Amount” or “Calculate Apportionment Rate Only”.
Calculate Amount: Calculates the apportionment rate and the actual amount billed to each block based on that apportionment rate and the amount.
Calculate Apportionment Rate Only: Calculates the apportionment rate only of each block based on the amount of electricity used.
When “Calculate Apportionment Rate Only” is selected, ⑤, ⑥, and ⑦ cannot be input.

⑤ If there is a basic charge, input the amount.
Input is possible when basic charge setting is performed at 10-6-2 New contract creation and editing.
The name of the basic charge set at the par. 10-6-2 New contract creation and editing is displayed.

⑥ If calculating the invoiced amount, you can choose whether to enter the total invoice fee or the cost per unit of electricity.

- If selecting total invoice fee.

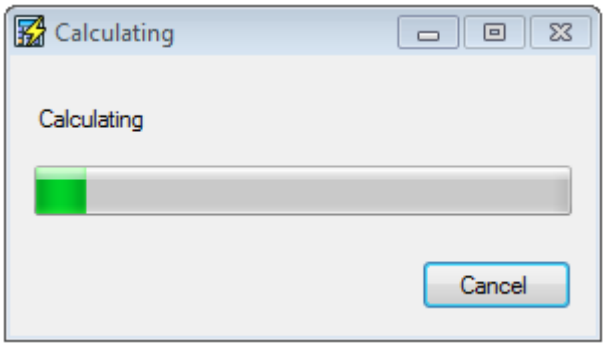
If there is a usage charge, input the amount respectively. (Within 11 digits each)
■ Daytime ■ Nighttime ■ Weekend daytime ■ Weekend nighttime
When nighttime charge setting is performed at the par. 10-6-2 New contract creation and editing, ■ Nighttime input is possible.
When weekend charge setting is performed at the par. 10-6-2 New contract creation and editing, ■ Weekend daytime input is possible.
When nighttime charge setting and weekend charge setting are performed at the par. 10-6-2 New contract creation and editing, ■ Weekend nighttime input is possible.
When nighttime charge setting and weekend charge setting are not performed at the par. 10-6-2 New contract creation and editing, only the topmost item can be input.

- If selecting the cost per unit of electricity.

Enter each of the monetary amounts.
The unit price entered at the time of contract creation will be initially displayed. If changes are made, enter each unit price.
■ Daytime ■ Nighttime ■ Weekend daytime ■ Weekend nighttime

⑦ If there is an additional charge, input the amount. (Within 11 digits each)
■ Add1 ■ Add2 ■ Add3
Input is possible when additional charge setting is performed at the par. 10-6-2 New contract creation and editing.

⑧ Perform apportionment calculation. When the [Execution] button is clicked, Confirmation screen appears. Click the [Yes] button. A calculating progress bar and [Cancel] button are displayed.
When the progress bar reaches 100%, apportionment calculation is complete and the [Calculation result] screen (11-2-2) is opened.
When the [Cancel] button is clicked, apportionment calculation is stopped and the display returns to the Apportionment Calculation screen.



⑨ Displays the History Selection screen. (The calculation items input before the history can be input. See par. 11-2-3 Calculation history.)

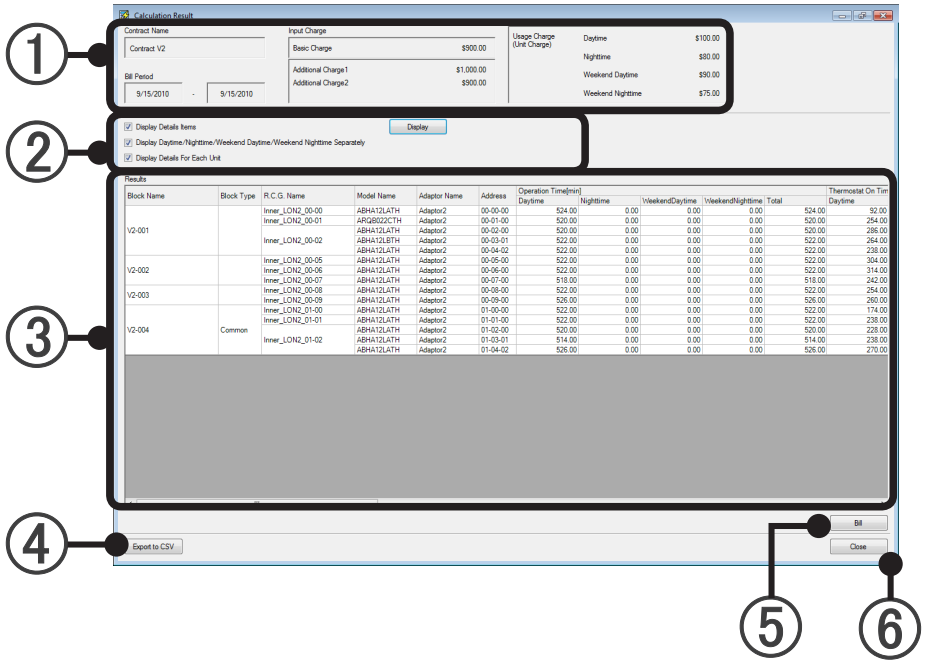
⑩ Click to end and close the screen after apportionment calculation ends or the calculation result is printed.

Note

Apportionment calculation may take several tens of minutes or more depending on the number of units calculation and calculation objective period. Since no operations can be performed during this time, be amply careful when performing apportionment calculation.

11-2-2 Calculation result screen

Calculation Result screen (Amount calculation example)
This screen is displayed after the [Execution] button at the par. 11-2-1. Apportionment Calculation screen is clicked and the calculating progress bar reaches 100%.



① ● If calculating the total invoice amount
Displays the contract name, bill period, and total amount (amount from the electric company) of the basic charge, additional charge, daytime charge, nighttime charge, weekend daytime charge, and weekend nighttime charge.

● If calculating using the unit price
Displays the contract name, applicable invoice period, basic charge, additional charge, and unit prices for daytime charge,nighttime charge, weekend daytime charge and weekend nighttime charge.

② Adds a details display to ③ Calculated charge. (Reflected when the [Display] button is clicked when the check box is ON.)

(a) Displays the detail items. (Operation Time/ Thermostat ON / Total Energy Used)

(b) Displays the daytime charge / nighttime charge / weekend daytime charge / weekend nighttime charge.

* Cannot be checked when both nighttime charge and weekend charge are not set

(c) Displays the details for each unit.

③ Displays the calculation result.

- For “Calculate Amount” and “Calculated Apportionment Rate Only”

<table>
<tr><td colspan="3">Block Name</td><td rowspan="2">Displayed without regard to the checking of (a), (b), and (c).</td></tr>
<tr><td colspan="3">Block Type (Common, Undefine)</td></tr>
<tr><td colspan="3">R.C.G. Name</td><td rowspan="4">Displayed on when (c) is checked.</td></tr>
<tr><td colspan="3">Model Name *
*The letter ":" as the last letter of the Model Name signifies that the Model Name for the corresponding unit was written after shipment. The letter ":" is not part of the Model Name.</td></tr>
<tr><td colspan="3">Adaptor Name</td></tr>
<tr><td colspan="3">Address</td></tr>
<tr><td>Operation Time</td><td rowspan="4">Displayed on when (a) is checked.</td><td rowspan="4">Day, Night, Weekend Day, Weekend Night, Total</td><td rowspan="4">Displayed on when (b) is checked.</td></tr>
<tr><td>Thermostat ON Time</td></tr>
<tr><td>Total Energy Used</td></tr>
<tr><td>Electrical power (KW) *</td></tr>
</table>

* Only when using electricity meter.

- For “Calculate Amount”

<table>
<tr><td>Charge</td><td>Day, Night, Weekend Day, Weekend Night</td><td>Displayed on when (b) is checked.</td><td rowspan="10">Displayed only when “Calculate Amount” is set.
→11-2-1 ④</td></tr>
<tr><td colspan="3">Charged Amount</td></tr>
<tr><td colspan="3">Basic Charge</td></tr>
<tr><td colspan="3">Common Charge</td></tr>
<tr><td colspan="3">Additional Charge 1</td></tr>
<tr><td colspan="3">Additional Charge 2</td></tr>
<tr><td colspan="3">Additional Charge 3</td></tr>
<tr><td colspan="2">Sub Total Charge *</td><td rowspan="2">Displayed only when tax calculation setting effective.
→10-6-2 ⑦</td></tr>
<tr><td colspan="2">Tax</td></tr>
<tr><td colspan="3">Total Charge</td></tr>
</table>

* Amount with Tax subtracted from Total Charge

- For “Calculate Apportionment Rate Only”

Apportionment Rate	Day, Night, Weekend Day, Weekend Night	Displayed only when “Calculate Apportionment Rate Only” is set. →11-2-1 ④

④ Writes the data in CSV format

Write the contents displayed by ③ to a file.

To reflect the details display setting of ②, click the [Export to CSV] button after displaying to ③. A file save dialog box is displayed. Select the folder to be saved and input the filename and save.

⑤ Creates a bill. Advance to “Bill Creation” (11-3).

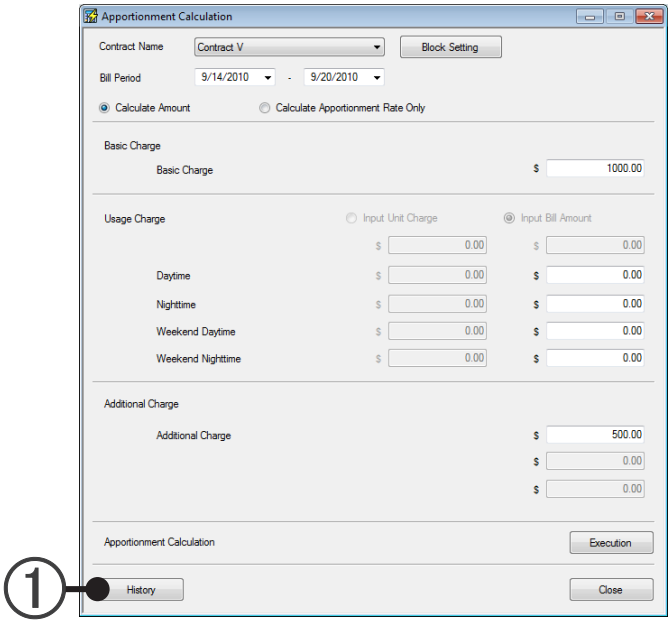
Cannot be pressed when “Calculate Apportionment Rate Only” is selected in 11-2-1 Apportionment Calculation screen.

⑥ Click to end and close the screen after checking the calculation result or printing a bill.

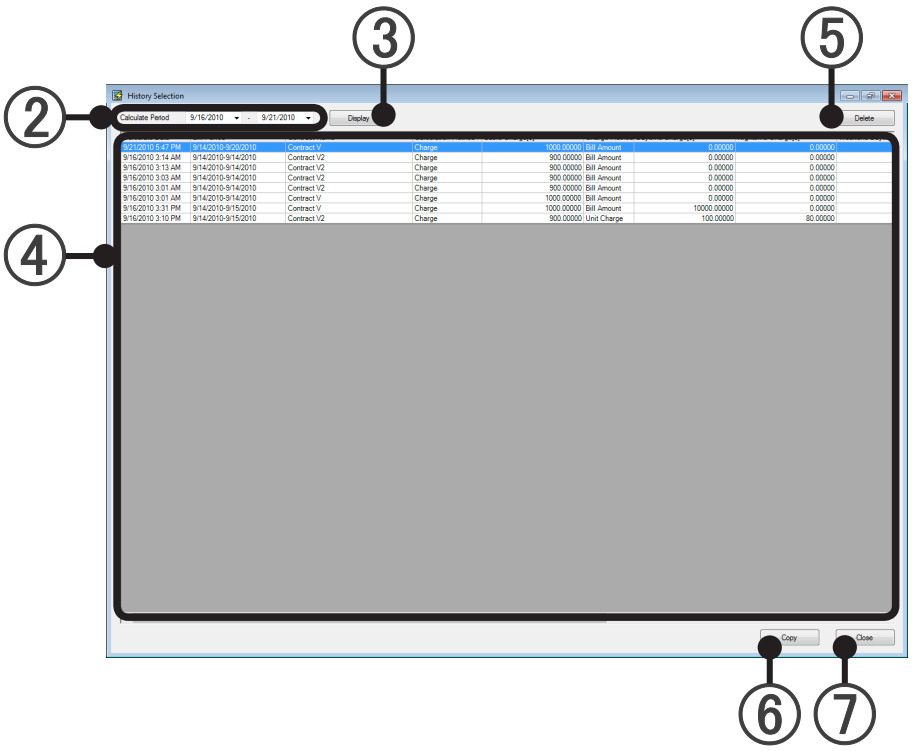
11-2-3 Calculation history

A history of past electricity charge apportionment calculations can be referenced and reflected at the Apportionment Calculation screen.

① Click the [History] button of the Apportionment Calculation screen.



The History Selection screen opens.



② Calculate Period: Set the start and end of the period of time whose calculation history is to be displayed.

③ When the [Display] button is pressed, the calculation history is displayed in the [calculation history list] of ④.

④ Calculation history list:

Displays apportionment calculation input contents for “Calculate Date” within the period specified by ② in a list.

When the [Calculate Date item] is clicked, the apportionment calculations can be sorted in old order or new order.

Calculate Date	Calculation date
Bill Period	Period of time that used the electricity charges to be billed
Contract Name	Calculated contract name
Calculation Method	Charge/Rate
Charge Method	Bill Amount/Unit Charge (Nothing is displayed if the Calculation Method is "Rate")
Basic Charge	Total basic charge
Daytime Charge	Total daytime charge
Nighttime Charge	Total nighttime charge
Weekend Daytime Charge	Total weekend daytime charge
Weekend Nighttime Charge	Total weekend nighttime charge
Additional Charge 1	Total additional charge 1
Additional Charge 2	Total additional charge 2
Additional Charge 3	Total additional charge 3

* When nighttime charge setting and weekend charge setting is not performed, the billing amount of the power used is displayed at “Daytime Charge”.

⑤ [Delete] button:

If there is a calculation history you want to delete from the list of ④, select it and click the [Delete] button.

A confirmation screen is displayed. When [OK] is clicked, the data of the selected calculation history is deleted.

⑥ [Copy] button:

When you want to use input contents from the list of ④, select the calculation history and click the [Copy] button.

A confirmation screen is displayed. Click [OK].

The contents input at the Apportionment Calculation screen are destroyed.

The History Selection screen is closed and the data selected at the list of ④ is reflected at the Apportionment Calculation screen.

⑦ [Close] button:

Interrupts history referencing and closes the History Selection screen and returns to the Apportionment Calculation screen.

Note

The history does not reference past calculation results, but does reference the past data needed in calculation.

The data will be stored for 2 years.

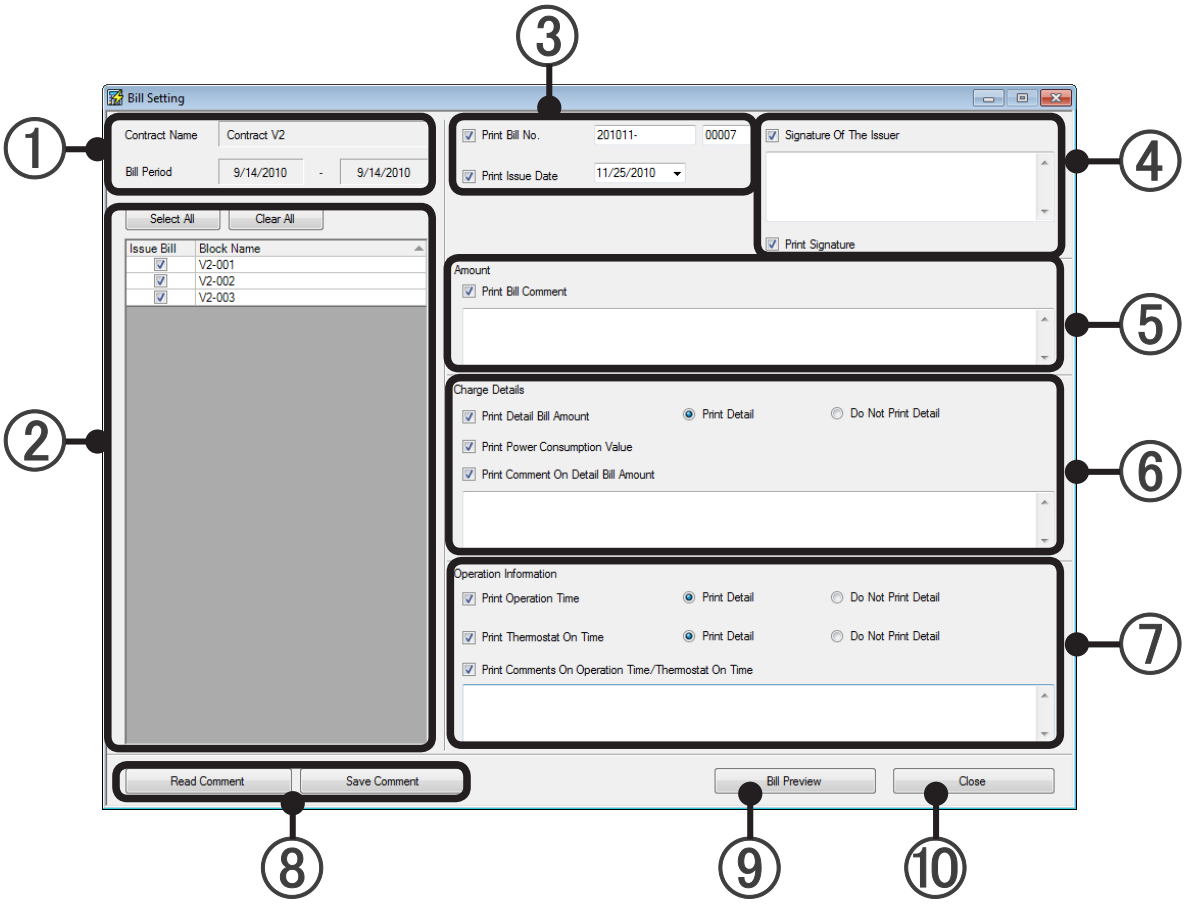
11-3 Bill creation

Creates a bill for each block based on the amount of the apportionment calculation result.

11-3-1 Bill setting

To display this screen, click the [Bill] button on the “Calculation Result” screen.

Description of screen (Different from the initial screen in the state in which all the check boxes are ON)



① Check “Contract Name” and “Bill Period”.

② Select bill destination (Block) which is to output the bill. All select is possible by [Select All] button and all clear is possible by [Clear All] button.

③ Select whether or not the bill No. and bill issue date are to be printed.
(Bill No. is stored for each user in the VRF Controller database.)
When a check is entered, the number allocated by the VRF Controller database is input at “Bill No.” and the date the bill setting screen was opened is input at “Bill issue date”.
To change them, enter them at the “Bill No. (Within 15 characters of alphabet, numeric, symbol + 5 digits of numeric)” and “Bill issue date”.

④ Select whether or not the bill issuer is to be printed and the comment (within 500 characters) is to be input and whether or not the bill destination name field is to be printed.

⑤ Amount

Print Bill Comment check box:

Select whether or not a comment related to the bill is to be output.

To output a comment, enter the comment in the comment field. (Within 500 characters)

⑥ Charge Details

Print Detail Bill Amount check box:

Select whether or not basic charge (when set), usage charge, common charge, and additional charge 1 to 3 (when set) are to be output.

When Print Detail is selected, a summary of the nighttime charges and weekend charges is output.

Turn the Print Amount of Power checkbox to On:

If entering the invoice amount, the amount of power will be displayed.

If entering the unit price, the unit price and the amount of power will be displayed.

Print Comment On Detail Bill Amount check box:

Select whether or not a comment related to the amounts summary is to be output.

To output a comment, enter the comment in the comment field. (Within 500 characters)

⑦ Operation Information

Print Operation Time check box:

Select whether or not Operation Time is to be output.

When Print Detail is selected, a summary of the Night Operation Time and weekend Operation Time is output. (Cannot be selected when both night time charge and weekend charge are not set.)

Print Thermostat On Time check box:

Select whether or not Thermostat On Time is to be output.

When Print Detail is selected, a summary of the Night Thermostat On Time and weekend Thermostat On Time is output. (Cannot be selected when both nighttime charge and weekend charge are not set.)

Print Comment On Operation Time/Thermostat On Time check box:

Select whether or not a comment related to Operation Time/Thermostat On Time is to be output.

To output a comment, enter the comment in the comment field. (Within 500 characters)

⑧ Saves and reads the bill output setting contents.

[Save Comment] button: Saves the setting contents and comments of ③ to ⑦ to a file. (.xml format)

[Read Comment] button: Reads the setting contents and comments of ③ to ⑦ from a file. (.xml format)

* Only the state of the checkbox is saved and read at ③.

⑨ Opens the Bill Preview screen.

(Prints at the preview screen and writes in .rpt format.)

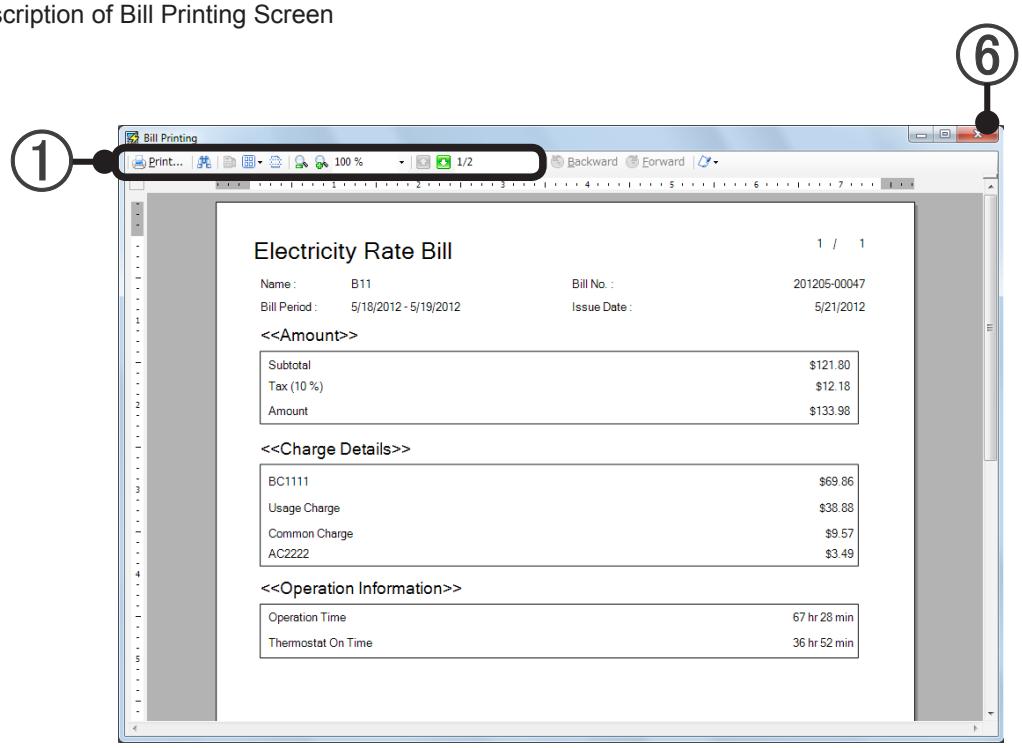
Advance to par. 11-3-2 Bill printing preview.

⑩ Click to end bill creation after bill printing. The Bill Setting screen closes.

11-3-2 Bill printing preview

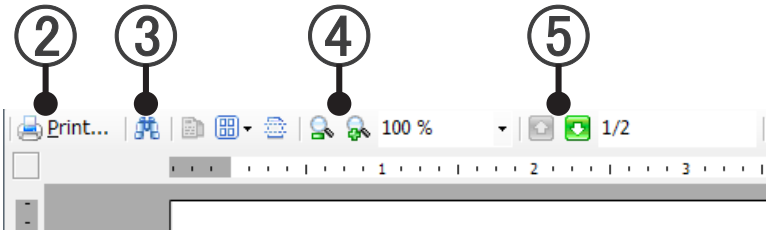
Displays a print preview of the bill.
Check the contents, and if there is no problem, print the bill.

Description of Bill Printing Screen



If “Input Unit Charge” is selected in the apportionment calculation, the unit cost will be displayed.

① Description of tools



② Bill print

③ Text search in document

④ Preview display size specifications. (Zoom)

⑤ Bill page feed

⑥ After bill printing or the end of data write, close the Bill Printing Screen.

Note

- To end bill creation, after closing the Bill Printing Screen, click the [Close] button ⑩ of the “Bill Setting” screen (11-3-1).
- End apportionment calculation in order of “Calculation Result” screen (11-2-2), “Apportionment Calculation” screen (11-2-1), and “Electricity Charge Apportionment” main screen (11-1-1).

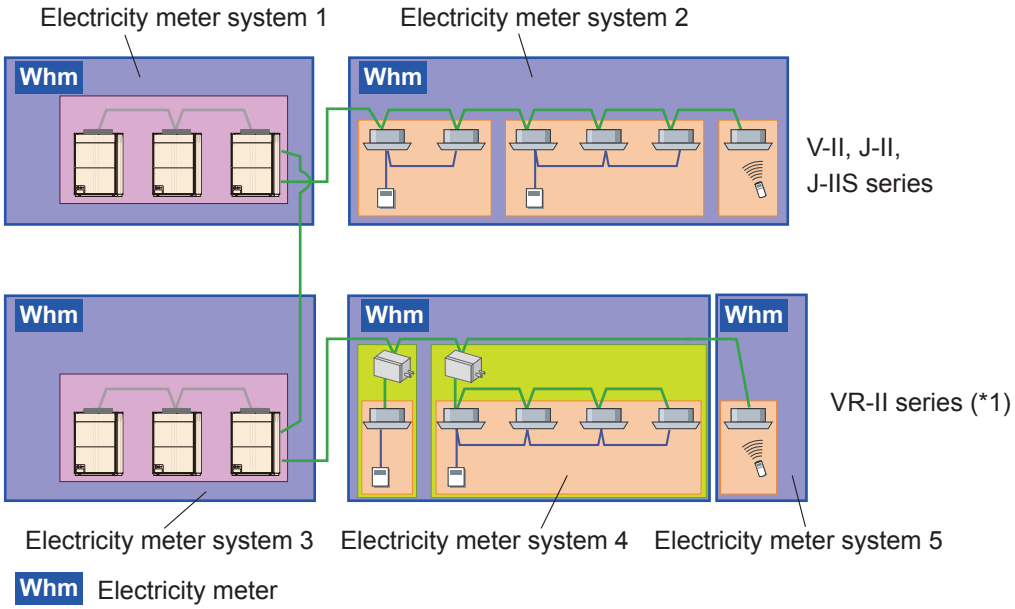
Appendix

12. Electricity Meter System
13. Installation Restriction of Electricity Meter
14. Installation Restriction of Energy Saving Units
15. The Settings of Outdoor Unit and System Controller
16. Electrical Wiring

12. Electricity Meter System

Electricity meter system is the connection configuration of one electricity meter and the air conditioner units which are connected to the power line under it. this is set on the System Controller.
Set to the System Controller match the actual electricity meter installation configuration.
Since the electricity charge apportionment function/energy saving function perform control using the power consumption data from an electricity meter, it is necessary to set an electricity meter system on the System Controller.

When installing electricity meters as shown,5electricity meters systems are set.



(*1) In the VR-II series, Electricity Meter System can contain the RB units.

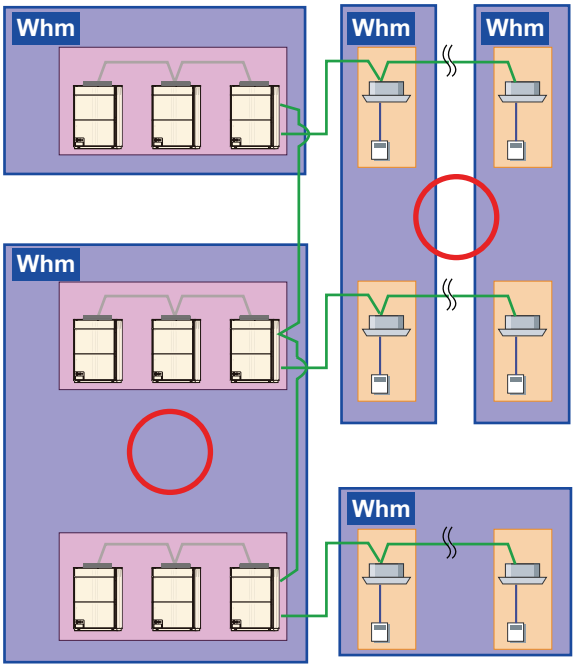
13. Installation Restriction of Electricity Meter

Note

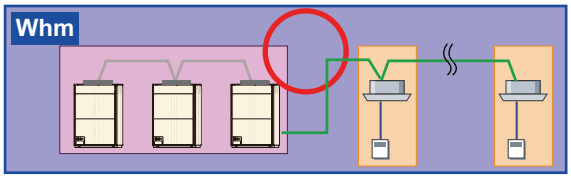
The following items are ways of connecting the electricity meter that are supported by the system controller.
However, it is necessary to observe the following restrictions.

① It is possible to connect multiple VRF-Networks to a single electricity meter. (With network jump)

② Electricity meter may cover more than one refrigerant system.
However, at least one electricity meter is recommended to be installed for each refrigerant system.



③ It is permitted to mix indoor/ outdoor units for a single meter.



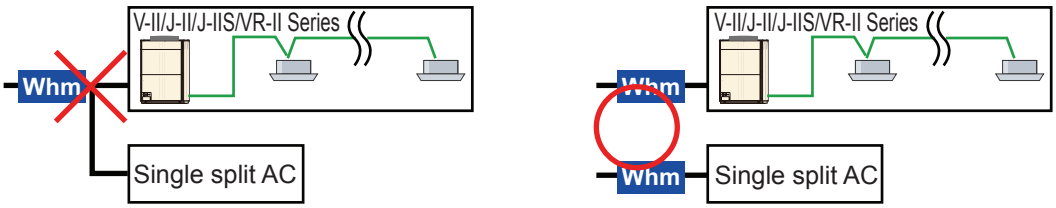
Appendix

- Installation limitations

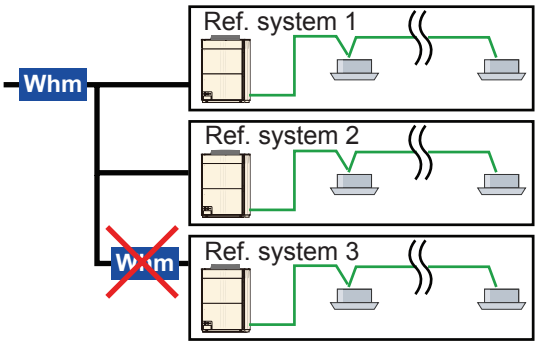
① Only install air-conditioning units which are to be in-scope for the function.
If an electric lamp or other OA equipment is connected to the electricity meter, also take into account the amount of power they use.
Make it so that the electricity meter is only connected to required air-conditioning units.

② Only connect the meter to V-II/J-II/J-IIS/VR-II Series air-conditioners.
Electricity meters can only be installed on V-II/J-II/J-IIS/VR-II Series equipment. Do not connect the electricity meter to S Series or V Series, as these do not support it.

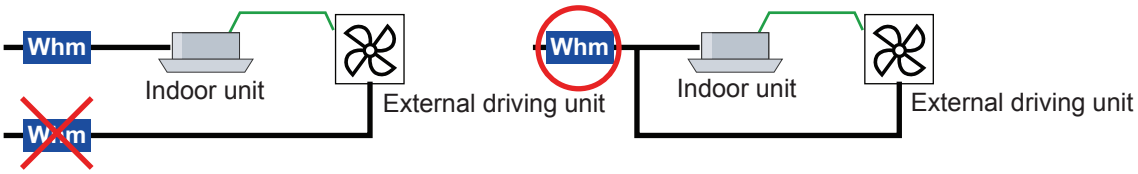
③ You cannot have a mixture of units that support the electricity meter and those that do not support it working under a single electricity meter.
This is because the functions that can be used are different.
If connecting Single split AC using the V-II/J-II/J-IIS/VR-II series' network converter (UTY-VGGX or UTY-VGGXZ1), please separate the connection between the V-II/J-II/J-IIS/VR-II series VRF air conditioner and the electricity meter, as part of the functions*1 are not supported.
However, this does not include UTY-VGGXs that are connected to a Group Remote Controller.
*1: [Electricity Apportionment Function] It is not possible to carry out apportionment processing for indoor units such as Single split AC connected to Network converters.
The electricity cost for equipment connected to the network converter must be calculated in another way.
[Energy Saving Function] The Target Electricity in the Peak Cut function is a target, and there are no restrictions implemented for the Target Electricity.



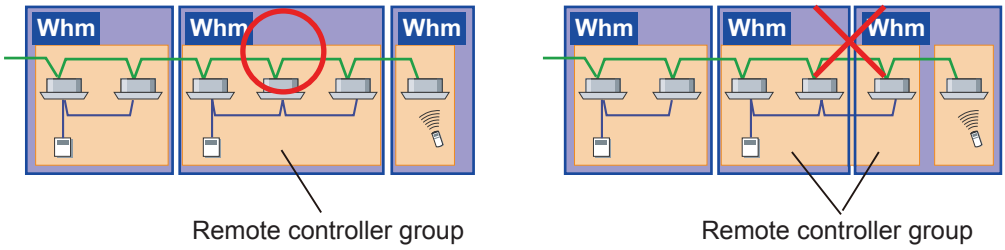
④ Nests for other meters and multiple installations are not permitted.
The meter itself can be installed, but please only use one for the system controller power meter (if you use both, the amount of electricity will be counted twice).



⑤ The externally linked units*shall be connected to the same electricity meter as the air conditioner to which they are connected.
*General-purpose unit which performs calculation as an externally linked unit by electricity charge apportionment function.

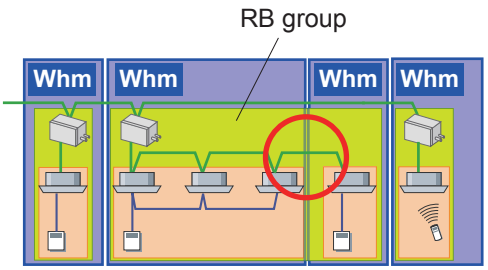


⑥ It is prohibited to install electricity meters that split Remote controller group.

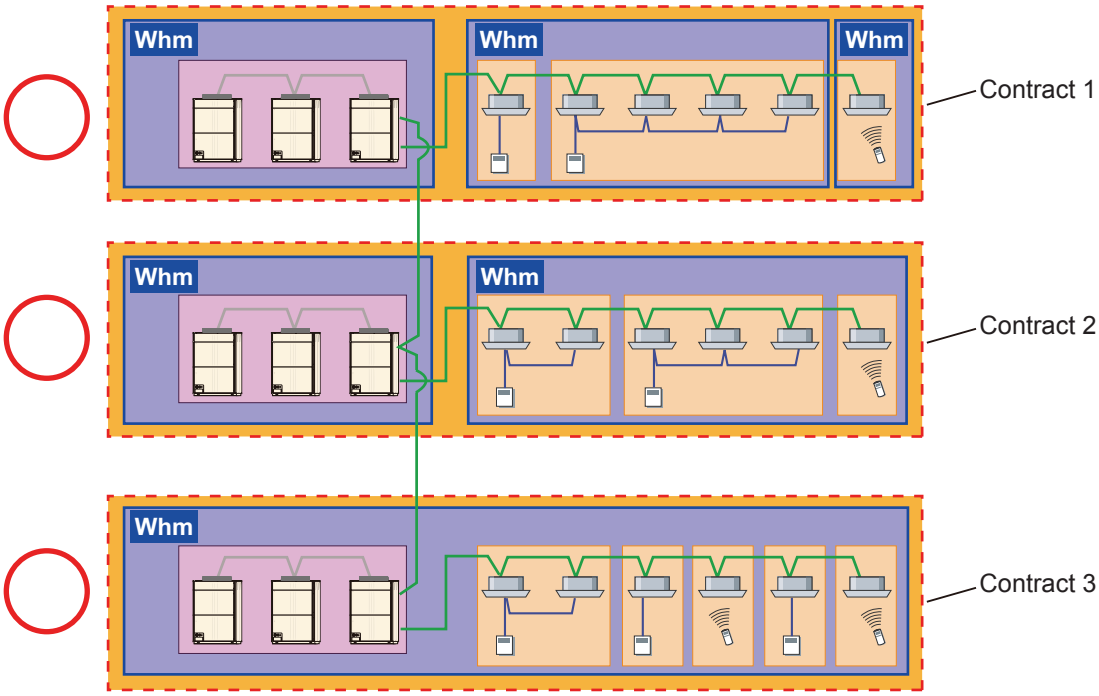


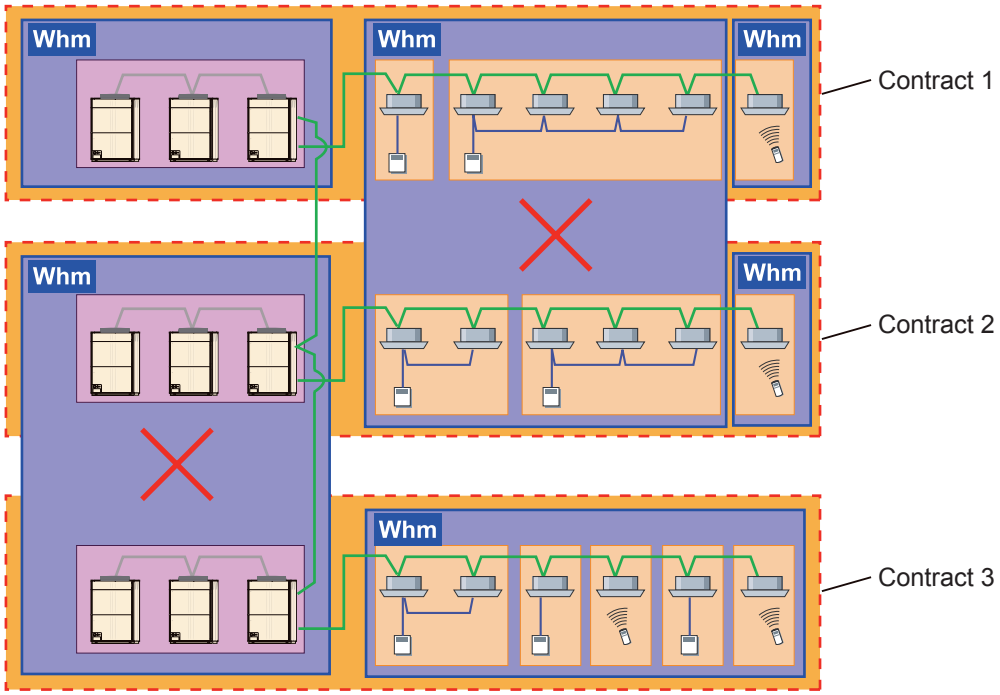
⑦ It is prohibited to install electricity meters that split outdoor unit group.

⑧ Installation of electricity meter which divides RB groups is OK.



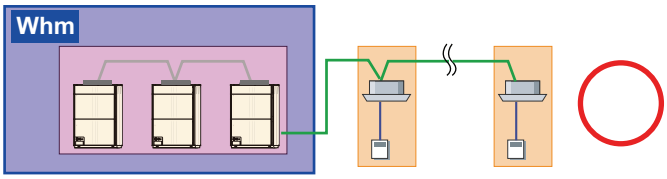
⑨ Installation of cross-contract electricity meters is prohibited.
If an electricity meter is used in the electricity apportionment function, install the electricity meter such that the “contract settings” configured in the electricity apportionment are not skipped.



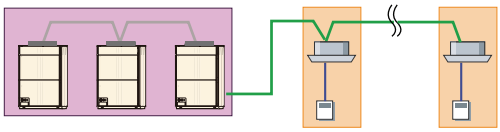


⑩ When an option to use electricity meter for performing an apportionment function is selected, all units which are the subject of calculation must be monitored by electricity meter.
If an electricity meter is not connected, it may not be possible to calculate electricity apportionment using the electricity meter.

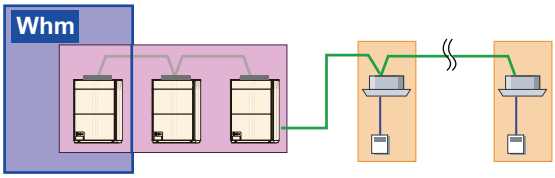
<For only electricity distribution for Outdoor units> → Connect the electricity meter to all Outdoor units.



All outdoor units must be connected to an electricity meter for each refrigerant system.



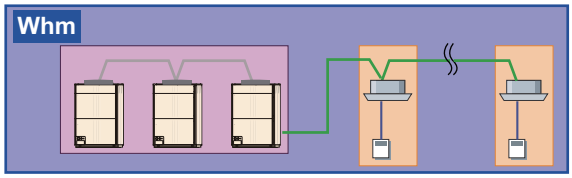
The outdoor unit is not connected to the electricity meter.



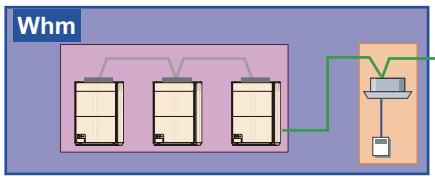
The outdoor unit is only partially connected to the electricity meter.

Appendix

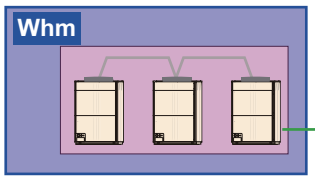
<For an electricity apportionment of outdoor unit + indoor unit> → Necessary to connect the electricity meter to all outdoor units and indoor units.



All outdoor units and indoor units must be connected to an electricity meter for each refrigerant system.

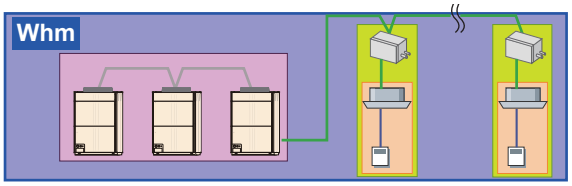


The indoor unit is partially not connected to the electricity meter.

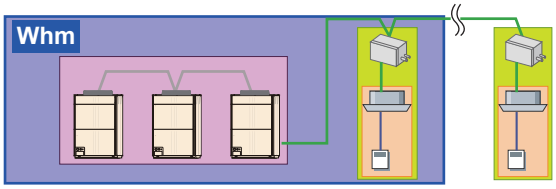


Also, regardless of whether electricity apportionment is carried out for the outdoor unit + indoor unit, the electricity meter is only connected to the outdoor unit.

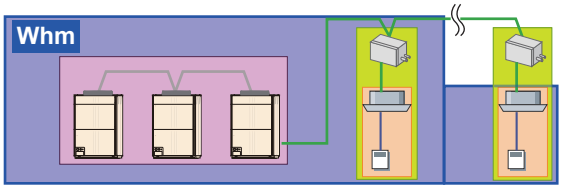
<For an electricity apportionment of outdoor unit + indoor unit + RB unit>→ Necessary to connect the electricity meter to all outdoor units, indoor units and RB units.



All outdoor units, indoor units and RB units must be connected to an electricity meter.



Electricity meter is not connected to some indoor units and RB units



Electricity meter is not connected to some RB units

⑪ Electricity apportionment for DX-Kit

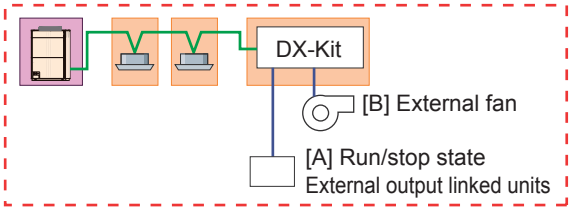
- When electricity meter not connected

The following units can be linked to the DX-Kit, by using external output terminals.

[A]：External fan

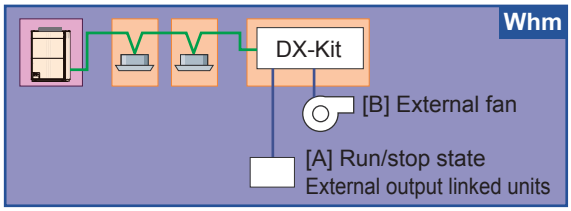
[B]：Units linked to run/stop state external output

At electricity apportionment, the DX-Kit itself and units [A] and [B] mentioned above can be handled.
Set the electricity value at ON beforehand for the units [A] and [B] from the “Parameter Setting” screen.
The input value is included in the calculation as a constant value when the external output terminal is ON.

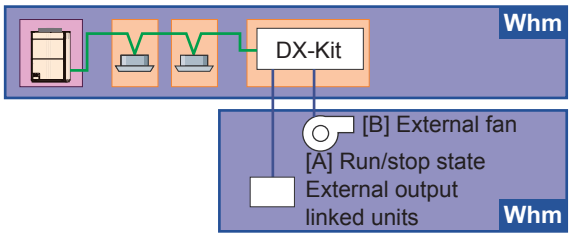


- When an electricity meter is connected

At electricity apportionment, the DX-Kit itself and units [A] and [B] mentioned above can be handled the same as when an electricity meter is not connected.
Set the electricity value at ON beforehand for the units [A] and [B] from the “Parameter Setting” screen and install the electricity meter so that the units [A] and [B] are included.
The input value in the calculation as a constant value when the external output value is ON is included.

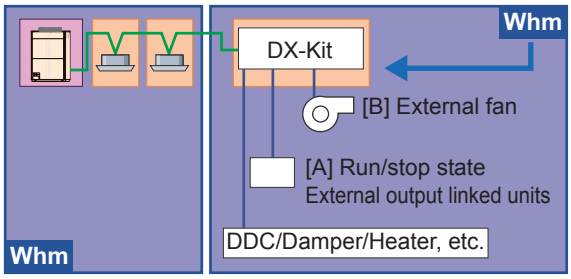


○ The electricity meter is installed so that the units [A] and [B] are included.



× The electricity meter is installed independently from the units [A] and [B].

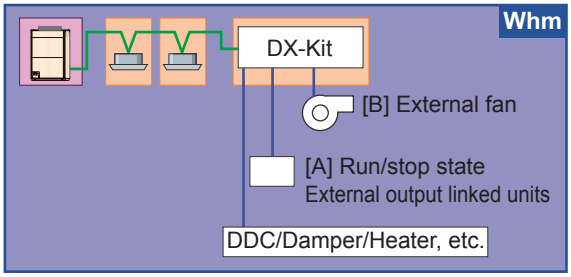
If there is a unit related to the DX-Kit other than [A] and [B], if the DX-Kit is connected as an independent electricity meter system and installed so that other units are included, it may be included in electricity charge apportionment. (All the value of that electricity meter is charged to the DX-Kit.)



○ The electricity meter is installed so that [A], [B], and other units are included.

Appendix

Units other than [A] and [B] must not be connected to an electricity meter together with other indoor units. If connected, the electricity amount of DDC, damper and heater is also charged to the other indoor units.



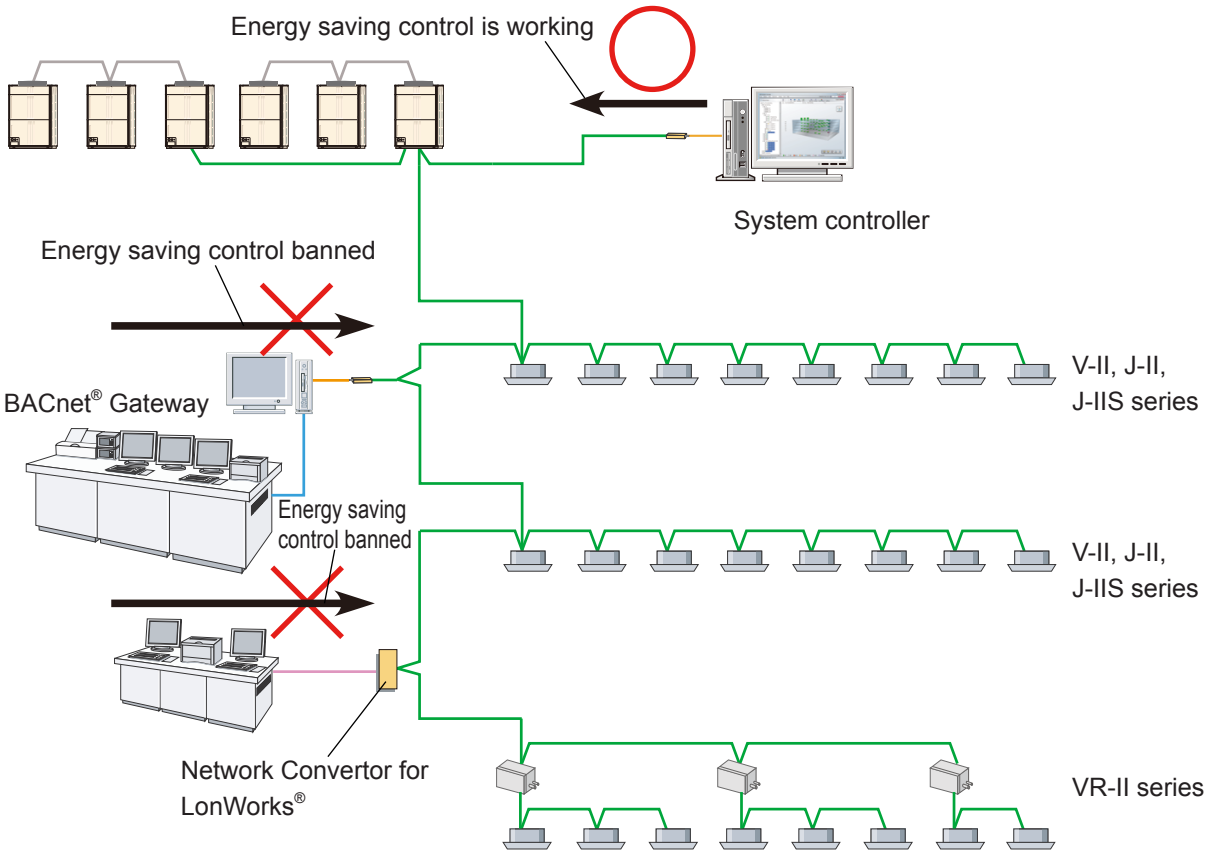
The electricity meter is installed so that the units other than [A], [B] and indoor units are included.

14. Installation Restriction of Energy Saving Units

Only 1 unit may perform energy saving control at a time.
When energy saving control is performed by SYSTEM CONTROLLER (UTY-APGX/PEGX), stop energy saving control *1 from the building management system through the following units.

- BACnet® Gateway (UTY-ABGX)
- Network Convertor for LonWorks® (UTY-VLGX)

When energy saving control is performed from multiple points, trouble may occur.
*1: Forced thermostat OFF, outdoor units stoppage.

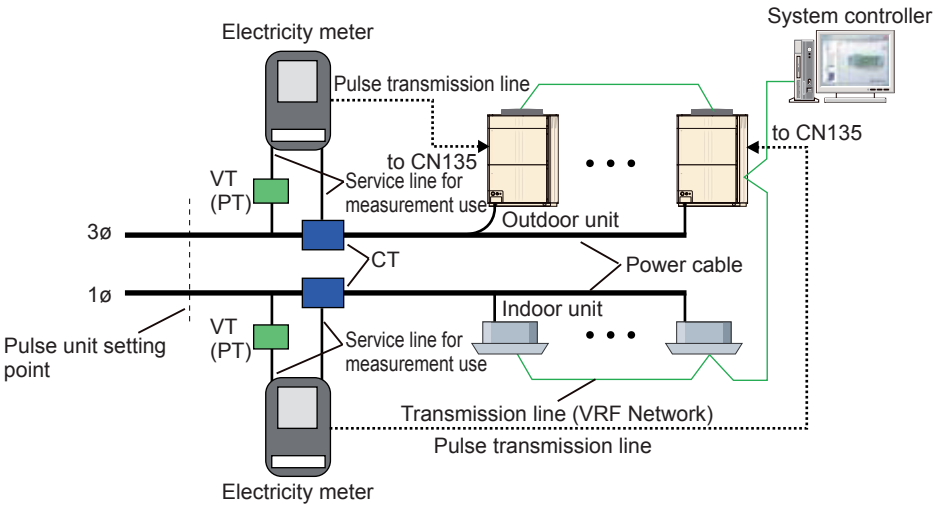


Appendix

15. The Settings of Outdoor Unit and System Controller

In order to understand the appropriate power consumption with the system controller, it is important to correctly transmit the electricity value measured with the power meter.
In order to do this it is necessary to configure appropriate settings on the power meter, outdoor unit, and system controller.
The following describes the method of setting the pulse value on the controller.
Setting example

① If the electricity meter you are using has units of pulses specified.

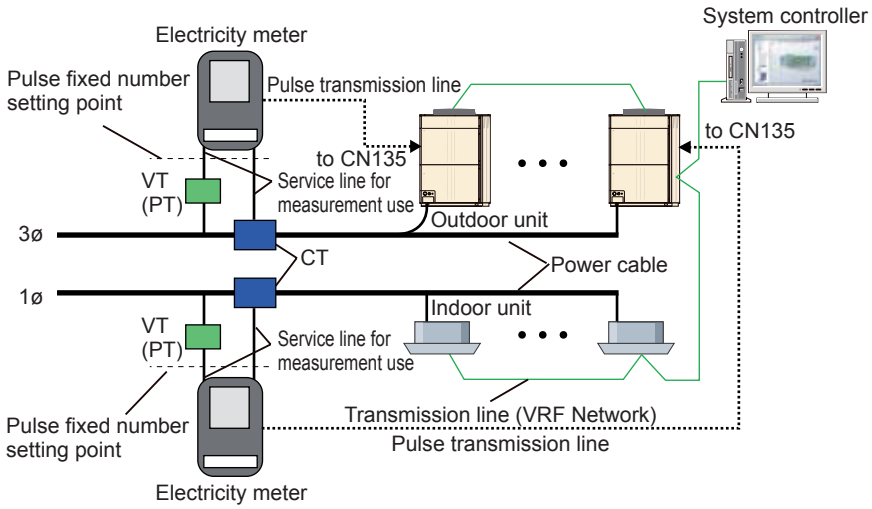


Pulses output with electricity meters specified in units of pulses are normalized (usually 1kWh/pulse) beforehand and then out-put.

Set location	Setting items	Set value	Comment	Remarks
Electricity meter	Configuration following the product manual.	-	If the product has fixed settings, configure by following the product manual (pulse unit value, VT/CT ratio, output factor, etc.).	
Outdoor unit	Meter number setting	Any	In order to distinguish between power meters, configure a fixed power meter number	These information are required for System Controller setting. Please refer to the Installation Manual of the outdoor unit.
	Frequency ratio setting	1	Set it fixed at “1”. When one pulse comes from the electricity meter, the outdoor unit will communicate “1” to the system controller.	
System controller	Electricity meter system settings	Unit that is subject to measurement by the electricity meter	The electricity meter with the meter number set in the outdoor unit configures the measured outdoor and indoor units.	Use values set for each outdoor unit
	Pulse setting	Electricity meter pulse unit value (normally it is either of 1, 10, or 100 [kWh/pulse])	The electricity meter is set to the specified pulse units without them being changed. Set the number of kWh that corresponds to the “1” communicated from the outdoor unit.	Refer to values set for each outdoor unit

[Setting Examples]
Setting conditions: VT ratio = 1 (unused), CT ratio = 50 (250/5A), power meter = 1kWh/ pulse
Set value: Frequency ratio setting = 1 (fixed), pulse setting = 1 (for the electricity meter used)

② If the electricity meter you are using has a fixed number of pulses specified.



Consumed electricity values displayed by output pulses with an electricity meter specified in a fixed number of pulses must be corrected with the VT/CT ratio. In this case configure the following settings.

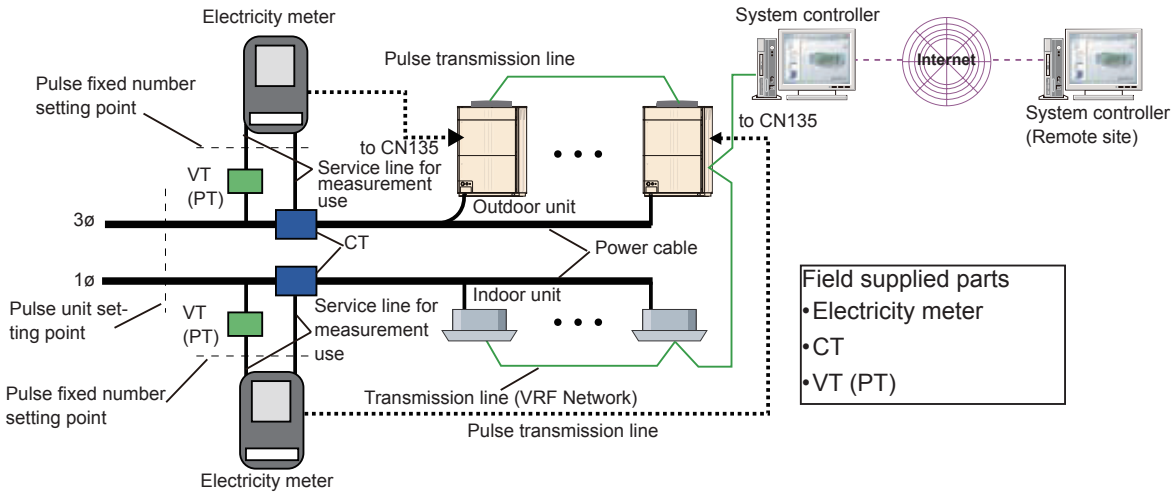
Set location	Setting items	Set value	Comment	Remarks
Electricity meter	Configuration following the product manual.	-	If the product has fixed settings, configure by following the product manual (pulse unit value, output factor, etc.).	
Outdoor unit	Meter number setting	Any	In order to distinguish between power meters, configure a fixed power meter number	These information are required for System Controller setting. Please refer to the Installation Manual of the outdoor unit.
	Frequency ratio setting	The pulse fixed number of settings/ (VT ratio x CT ratio), however, remove the numbers after the decimal point	Set the approximate number of power meter pulses that are equivalent to 1kWh. When several minutes of pulses come from the electricity meter, the outdoor unit will communicate “1” to the system controller.	
System controller	Electricity meter system settings	Unit that is subject to measurement by the electricity meter	The electricity meter with the meter number set in the outdoor unit configures the measured outdoor and indoor units.	Use values set for each outdoor unit
	Pulse setting	(Outdoor unit frequency ratio setting value) x (VT ratio x CT ratio)/ Fixed number of pulses However, the figures after the decimal point are also input.*1	Set whether the communication from the outdoor unit is in kWh. Set the number of kWh that corresponds to the “1” communicated from the outdoor unit.	Refer to values set for each outdoor unit

*1: Input until the 6th place after decimal point
[Setting Examples]
Setting conditions: VT ratio = 1 (unused), CT ratio = 500 (2500/5A), power meter = 3200pulse/kWh
Set value: Frequency ratio setting = 6 (3200/(1x500)),
pulse setting = 0.9375 (6x(1x500)/3200) ... Refer to the calculating formula on above table

Appendix

16. Electrical Wiring

- Electricity meter connection composition
  In order to control the peak cut of energy saving, In principle, It is necessary that a electricity meter with pulse sending function to monitor all electricity consumed by air conditioner. The number of electricity meter should be less than predefined number, but if cover all observed subject, it can be multiple installed. The installation construction of general electricity meter is shown as follows.



Item	Explanation	Remarks
Electricity meter	Service line for measurement use measure the voltage and current of connected power cables to obtain consumed electricity or output a measured value related pulse from pulse transmission line.	
VT(PT)	Voltage Transformer (Power Transformer) Make the voltage of power cables lower to be a voltage that the electricity meter can measured. It will shows with VT(PT) ratio that how the voltage was lowered. Usually, it has no necessary that a voltage level used on outdoor units, indoor units.	
CT	Current Transformer Shunt the current value of power cables to be current that the electricity meter can measured. It will shows with CT(PT) ratio that how the shunt it. It have 2 type of " insert into power cable type" and " through into power cable type".	
Pulse unit	Pulse unit shows the relation of electricity meter's output pulse and measured electricity. The numerical value specified in pulse unit shows the value of kWh that are equivalent to a pulse in consumed electricity of power cables. Unit is [kWh/pulse] The numerical value specified in pulse unit has consider to the used VT or CT ratio, it corresponding to the value of actual consumed electricity.	
Pulse unit setting point	It shows the measurement point of consumed electricity specified in pulse unit.	
A fixed number of pulses	Pulse fixed number shows the relation of measured electricity of electricity meter and output pulse. The numerical value specified in pulse fixed number shows the number of pulses that are equivalent to 1kWh consumed electricity that input electricity meter. Unit is [pulse/kWh] It is need to multiply VT, CT ratio by the value of pulse fixed number respectively when you calculate the actual electricity consumed on power cables, because of the numerical value specified in pulse unit has not taken the used VT or CT ratio into consideration.	
Pulse fixed number setting point	It shows the measurement point of consumed electricity specified in pulse fixed number.	

- Selection of Electricity meter, CT, and VT.

Please take the follow item into consideration to select electricity meter, CT,VT.

① Install the electricity meter with refrigerant system unit as possible.

② Select VT/CT with a low ratio.

③ In the case that a electricity meter specified in pulse unit (kWh/ pulse) is used, a output of kWh/ pulse should be selected usually.

- Outdoor unit connection interface (CN135) to electricity meter

Item		Specifications	Remarks
Interface		Non-powered connection point “a” *3	Connection point “a”: ON upon short circuit*1
Pulse	Specifications	Width: 50ms or greater Interval: 50ms or greater	
	Unit	1 kWh/ pulse (pulse units) is recommended.	
	A fixed number	However, with consideration given to the power meters that can be obtained in some countries, power meters with 3,200 pulse/kWh (fixed number of pulses) and below are also supported.	
Wire length limitations		150m(492ft) or less	Between Electricity meter to Outdoor unit
Wiring specification		Control and instrumentation cable CVV-S (Control-use Vinyl insulated Vinyl sheathed cable - Shielding) *2 2 cores 1.25mm^2(16AWG)	

*1: Pulse signal that is OFF when electricity is flowing (open), and ON at the time of a short circuit (closed).

*2: In the case of the trouble effect caused by induction, please select a CVV cable (CVV-S cable) with shield.

Because the copper shield tape is wrapped on CVV cable make it has a effect to relax induction trouble from near power cable to keep normal transmission.

In additional, in the case of the wiring at outdoor, please select a weather-resistant one.

*3: To connect an electricity meter, an additional service part "External Input Wire"(Parts No.9368777005) is required.

- Restrictions on electricity meter installation

Item	Specifications	Remarks
Number of electricity meters installed	Max.200	For each system controller
	Max.1	Number of units connected to one outdoor unit (Master or Slave)
That which the electricity meter is connected to	Any	There are no restrictions on outdoor units which the electricity meter connects to.You can connect any electricity meter to any outdoor unit.