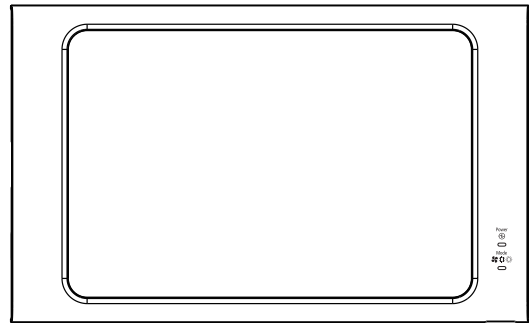


# ***Operation Manual***

*Energy Calculation Software*

*Model: CCSE01*



## **IMPORTANT:**

*READ AND UNDERSTAND  
THIS MANUAL BEFORE USING  
THIS CENTRAL CONTROLLER.  
KEEP THIS MANUAL FOR  
FUTURE REFERENCE.*

**P5417070**



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## 1. Safety Summary



### Important Notice

- Johnson Controls Inc. pursues a policy of continuing improvement in design and performance in its products. As such, Johnson Controls Inc. reserves the right to make changes at any time without prior notice.
- Johnson Controls Inc. cannot anticipate every possible circumstance that might involve a potential hazard.
- This central controller is designed for standard air conditioning applications only. Do not use this unit for anything other than the purposes for which it was intended for.
- The installer and system specialist shall safeguard against leakage in accordance with local pipefitter and electrical codes. The International Organization for Standardization: (ISO 5149) or European Standard (EN 378) may be applicable, if local regulations are not. No part of this manual may be reproduced in any way without the expressed written consent of Johnson Controls Inc. or York.
- If you have questions, please contact your distributor or dealer.
- This manual provides common descriptions, basic and advanced information to maintain and service this central controller which you operate as well for other models.
- This manual should be considered a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.


### Product Inspection upon Arrival

1. Upon receiving this product, inspect it for any damages incurred in transit. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
2. Check the model number, electrical characteristics (power supply, voltage, and frequency rating), and any accessories to determine if they agree with the purchase order.
3. The standard utilization for this unit is explained in these instructions. Do not use of this equipment for purposes other than what it designed for.
4. Please contact your local agent or contractor as any issues involving installation, performance, or maintenance arise. Liability does not cover defects originating from unauthorized modifications performed by a customer without the written consent of Johnson Controls, Inc. Performing any mechanical alterations on this product without the consent of the manufacturer will render your warranty null and void.

## Signal Words

 <b>WARNING</b>	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 <b>CAUTION</b>	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
<b>NOTICE</b>	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

## General Precautions

 <b>WARNING</b>	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
--	--

- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state, and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic "Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake. If the unit is not installed correctly, injuries may occur due to a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a wet cloth and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.
- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
  - May create hazards which could result in death, serious injury or equipment damage;
  - Will void product warranties;
  - May invalidate product regulatory certifications;
  - May violate OSHA standards;

<b>NOTICE</b>	Take the following precautions to reduce the risk of property damage.
---------------	---

- Be careful that moisture, dust, or variant refrigerant compounds not enter the refrigerant cycle during installation work. Foreign matter could damage internal components or cause blockages.
- If air filters are required on this unit, do not operate the unit without the air filter set in place. If the air filter is not installed, dust may accumulate and breakdown may result.
- Do not install this unit in any place where silicon gases can coalesce. If the silicon gas molecules attach themselves to the surface of the heat exchanger, the finned surfaces will repel water. As a result, any amount of drainage moisture condensate can overflow from the drain condensate pan and could settle inside of the electrical box, possibly causing electrical failures.

- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.
- When a wireless controller is used, locate at a distance of at least 3.3 ft. (approximately 1 meter) between the indoor unit and electric lighting. If not, the receiver part of the unit may have difficulty receiving operation commands.
- Do not install the unit in any location where animals and plants can come into direct contact with the outlet air stream. Exposure could adversely affect the animals and plants.
- Do not install the unit with any downward slope to the side of the drain boss. If you do, you may have drain water flowing back which may cause leaks.
- Be sure the drain hose discharges water properly. If connected incorrectly, it may cause leaks.
- Do not install the unit in any place where oil can seep onto the units, such as table or seating areas in restaurants, and so forth. For these locations or social venues, use specialized units with oil-resistant features built into them. In addition, use a specialized ceiling fan designed for restaurant use. These specialized oil-resistant units can be ordered for such applications. However, in places where large quantities of oil can splash onto the unit, such as a factory, even the specialized units cannot be used. These products should not be installed in such locations.

## Installation Precautions



### WARNING

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

- When installing the unit into...
  - A wall: Make sure the wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.
  - A room: Properly insulate any refrigerant tubing run inside a room to prevent "sweating" that can cause dripping and water damage to wall and floors.
  - Damp or uneven areas: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
  - An area with high winds: Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.
  - A snowy area (only for Heat Pump Model): Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.
- Do not install the unit in the following places. Doing so can result in an explosion, fire, damage, corrosion, or product failure.
  - Explosive or flammable atmosphere
  - Where a fire, oil, steam or powder can directly enter the unit, such as nearby or above a kitchen stove.
  - Where oil (including machinery oil) may be present.
  - Where corrosive gases such as chlorine, bromine, or sulfide can accumulate, such as near a hot tub or hot spring.
  - Where dense, salt-laden airflow is heavy, such as in coastal regions.
  - Where the air quality is of high acidity.
  - Where harmful gases can be generated from decomposition.
- Do not position the drain pipe for the indoor unit near any sanitary sewers where corrosive gases may be present. If you do, toxic gases can seep into breathable air spaces and can cause respiratory injuries. If the drainpipe is installed incorrectly, water leakage and damage to the ceiling, floor, furniture, or other possessions may result. If the condensate piping becomes clogged, water may drip from the indoor unit. Do not install the indoor unit where such dripping can cause moisture damage or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
- Before performing any brazing work, be sure that there are no flammable materials or open flames nearby.

- Perform a test run to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.
- Clean up the site when finished, remembering to check that no metal scraps or bits of wiring have been left behind inside the unit being installed.

After installation work for the system has been completed, explain the “Safety Precautions”, the proper use and maintenance of the unit to the customer according to the information in all manuals that came with the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

## Refrigerant Precautions



To reduce the risk of serious injury or death, the following refrigerant precautions must be followed.

- As originally manufactured, this unit contains refrigerant installed by Johnson Controls. Johnson Controls uses only refrigerants that have been approved for use in the unit’s intended home country or market. Johnson Controls distributors similarly are only authorized to provide refrigerants that have been approved for use in the countries or markets they serve. The refrigerant used in this unit is identified on the unit’s faceplate and/or in the associated manuals. Any additions of refrigerant into this unit must comply with the country’s requirements with regard to refrigerant use and should be obtained from Johnson Controls distributors. Use of any non-approved refrigerant substitutes will void the warranty and will increase the potential risk of injury or death.
- If installed in a small room, take measures to prevent the refrigerant from exceeding the maximum allowable concentration in the event that refrigerant gases should escape. Refrigerant gases can cause asphyxiation (0.42 kg/m<sup>3</sup> based on ISO 5149 for R410A). Consult with your distributor for countermeasures (ventilation system and so on). If refrigerant gas has leaked during the installation work, ventilate the room immediately.
- Before installation is complete, make sure that the refrigerant leak test has been performed. If refrigerant gases escape into the air, turn OFF the main switch, extinguish any open flames and contact your service contractor. Refrigerant (Fluorocarbon) for this unit is odorless. If the refrigerant should leak and come into contact with open flames, toxic gas could be generated. Also, because the fluorocarbons are heavier than air, they settle to the floor, which could cause asphyxiation.
- When installing the unit, and connecting refrigerant piping, keep all piping runs as short as possible, and make sure to securely connect the refrigerant piping before the compressor starts operating. If the refrigerant piping is not connected and the compressor activates with the stop valve opened, the refrigerant cycle is subjected to extremely high pressure, which can cause an explosion or fire.
- Tighten the flare nut with a torque wrench in the specified manner. Do not apply excessive force to the flare nut when tightening. If you do, the flare nut can crack and refrigerant leakage may occur.
- A compressor/unit comprises a pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- When maintaining, relocating, and disposing of the unit, dismantle the refrigerant piping after the compressor stops.

## Electrical Precautions



Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death.

- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before servicing, open and tag all disconnect switches. Never assume that electrical power is disconnected. Check with meter and equipment.
- Only use electrical protection equipment and tools suited for this installation.
- Use specified cables between units.

- Communication cabling shall be a minimum of 18-Gauge, two-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- Use a dedicated power supply for the air conditioner at the unit's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker and so on), with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cable clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Turn OFF and disconnect the unit from the power source when handling the service connector. Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply.
- After operation shutdown, be sure to wait at least five minutes before turning OFF the main power switch. Otherwise, water leakage or electrical breakdown may result. Disconnect the power source completely before attempting any maintenance for electrical parts. Check to ensure that no residual voltage is present after disconnecting the power source.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground cable is securely connected. Do not connect ground wiring to gas piping, water piping, lightning conductor, or telephone ground cables.
- If there are frequent occurrences with blown fuses or flipped circuit breakers, shut down the system immediately and contact your service contractor.



## NOTICE

- This system calculates the value of meters according to the actual usage on each unit.
- Insert the SD Card with software included to VRF Central Touchscreen Controller (CCXL01).
- Read installation manual and operation manual for VRF Central Touchscreen Controller throughly use this software.
- This system correctly calculates the ratio only when all VRF Central Touchscreen Controller, VRF Central Touchscreen Controller Adapter and their peripherals are correctly connected and operating. Electricity may not be correctly calculated upon device failure. Discuss the solution with customer beforehand and its measure for inappropriate calculation output (such as establishing specific independent calculation system).
- Note that if the pulse is counted via external input, pulse cannot be accumulated during power off or connection checking. This may effect the usage calculation result. Discuss the solution with customer beforehand and its measure for inappropriate calculation output.
- Go to Energy calculation setting to select [Calc. start] to utilize energy calculation. (Energy amount is not calculated without the inserted SD Card with software included.)
- This software calculates and saves the result every day/hour. Calculation and data saving take place at 0:00-1:30, if everyday calculation was specified.  
Do not remove the SD Card with software included while saving the calculation result or else the result data for the last day will not be saved. Unsaved data will be recalculated and saved on the following day. Data saving occurs in the first thirty minutes of every hour (hh:00 - hh:30) if one hour calculation is specified. Do not remove the SD Card with software included while saving calculation result or the result data for the last hour is not saved. Unsaved data is recalculated and saved during the following hour.
- Some units may or may not support all ratio methods. Refer to Installation and operation manual for Energy Calculation Software “2. Energy Calculation 5. Calculation method setting”.
- Correct calculation results cannot be expected if the meter registration on this software is not correct. Ensure that the meter registration on this software is correct.
- The example image may differ from the actual software image.

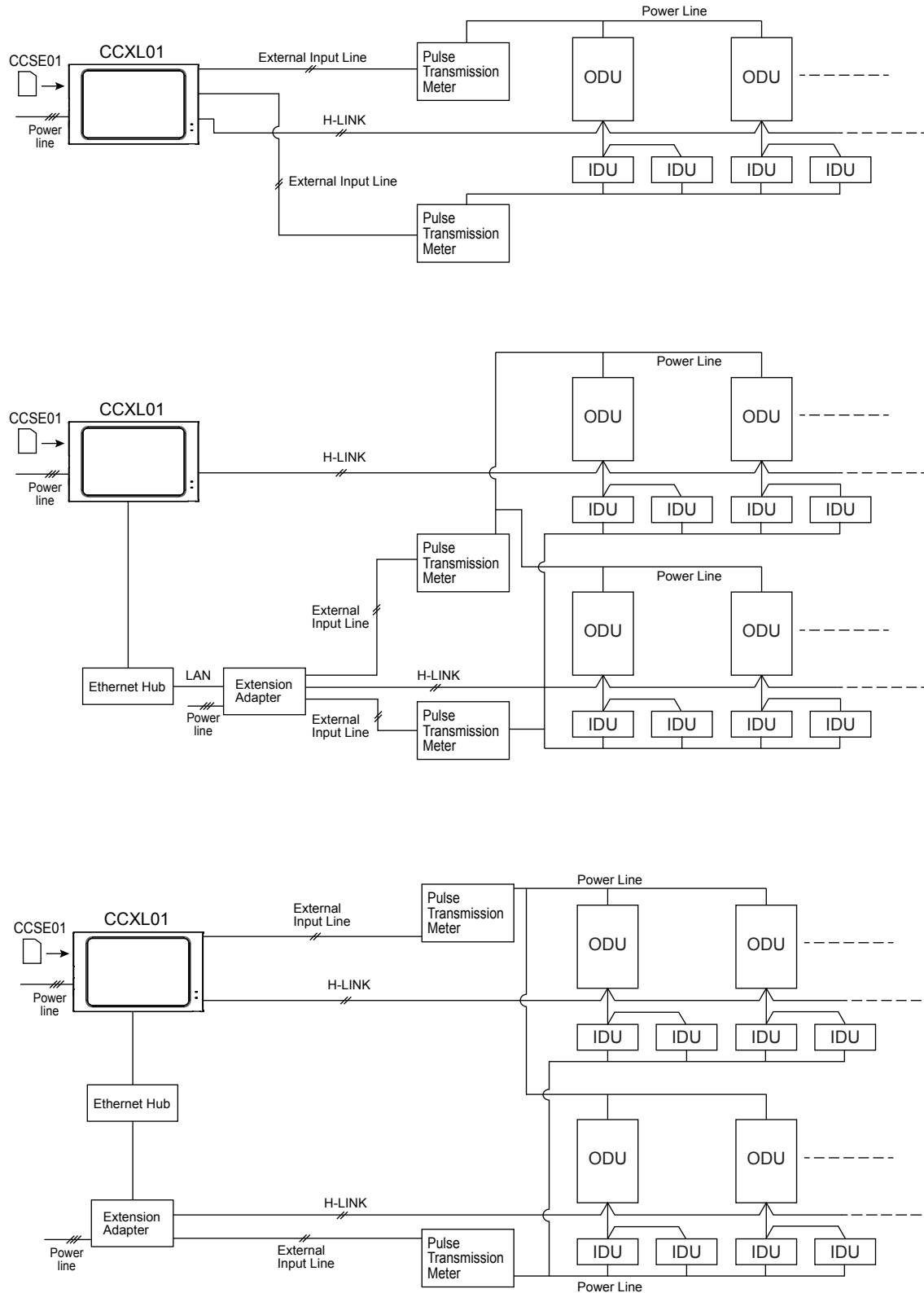
### NOTE:

Meters: Refers to all electrical, gas and water meters connected to this system.

## 2. System Configuration

Connect VRF Central Touchscreen Controller to H-LINK (communication line) to control and monitor air conditioners.

Insert SD Card with software included to activate energy calculation.



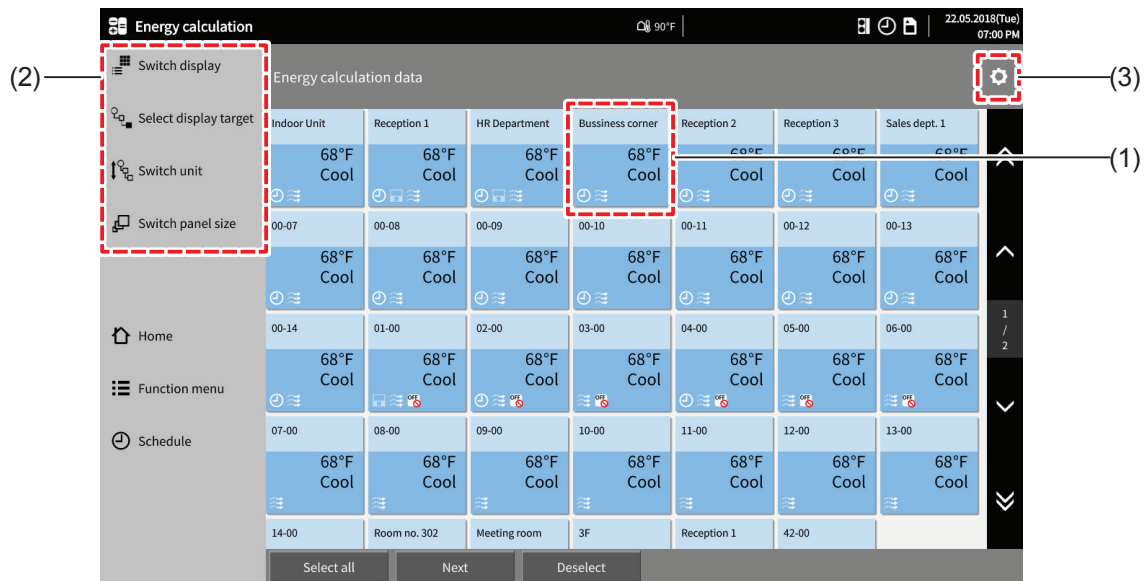
## **NOTICE**

- This system refers to the clock on the VRF Central Touchscreen Controller for controlling and monitoring. Do not perform unnecessary time setting changes or that may affect accurate control and monitoring of the system.
- This software always expect power meter connected to indoor units. Successful monitoring and CSV output can be expected only when power meters are connected to indoor units. If you do not want to connect power meter to indoor units, set pseudo power meter (= physical meter does not have to exist) so that this software can calculate without indoor unit power consumption data.

### 3. Energy Calculation Window

Use this software from Energy calculation data display, detailed data (accumulation) display and/or Detailed data (calculation) display on Energy Calculation function of VRF Central Touchscreen Controller.

#### 3.1 Energy Calculation Display Operation



The same contents are shown as monitor window, but the display format is limited to panel display.

- (1) Tap panel to show window for Aggregated data. Energy Calculation data window provides data display in a table format and CSV file type output into external media. Detailed data window provides only CSV file type output into external media.
- (2) Tap each item to switch the contents.
  - Switch display: Go to Energy calculation window and select one from **Energy calculation data**, **Detailed data (accumulation)** and **Detailed data (calculation)**. Refer to the next page “3.2 Switching display” for details.

The same items are shown as monitor window. Refer to operation manual for VRF Central Touchscreen Controller “Monitor 1 Monitor window operation” for details.
- (3) Tap to filter current items, switch Single selection mode/Multiple selection mode and/or check Rate setting. Regarding filtering and switching to Single/Multiple selection mode, refer to “Monitor 1 Monitor window operation” for details.

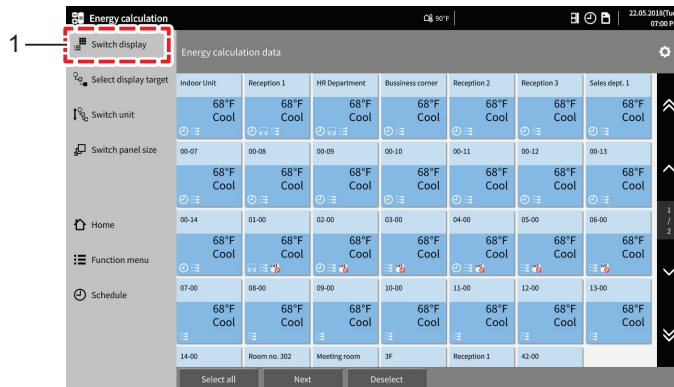
#### 4. Electricity Ratio ... Page 12

- This section describes how to show the energy calculation results and detailed data per month when pulse transmission meters are used in combination.

#### 5. Usage Ratio ... Page 20

- This section describes how to show the energy calculation results and detailed data per month for systems without pulse transmission meters connected.

## 3.2 Switching Display



1. Tap **Switch display**. The window for switching display is shown.

2. Tap the desired content. The display for selected item is shown.

- The current display is shown in orange.
- “Energy Calculation” and “Detailed data (calculation)” will not be shown for systems without pulse transmission meters.

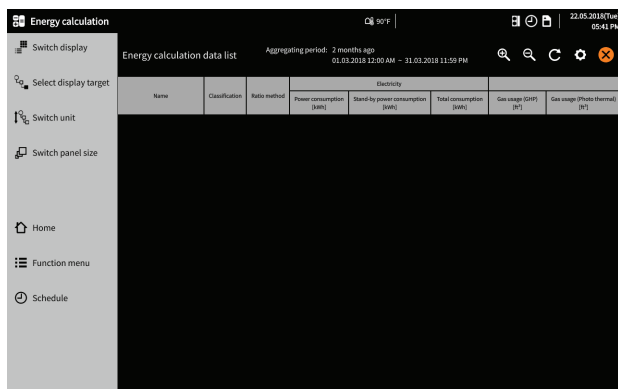
## 4. Electricity Ratio

### 4.1 Energy Calculation Display

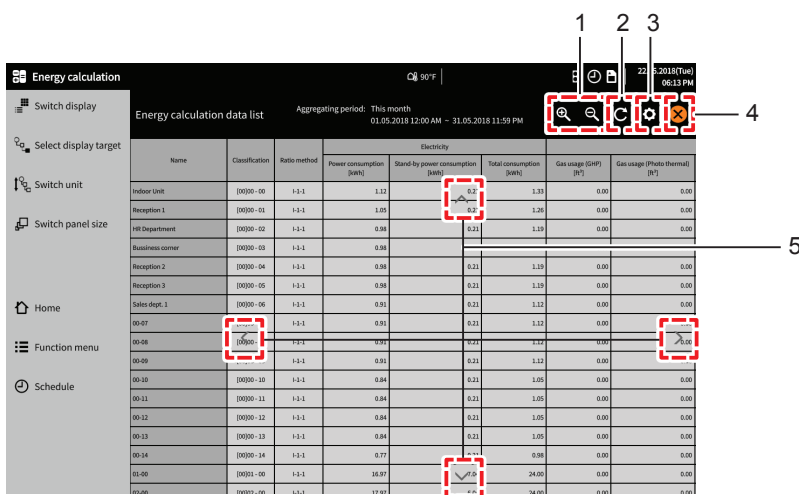
This window provides the energy calculation result per month.



1. Tap **Panel** to show target's energy calculation accumulated data.



The operation of energy calculation display is described below:



1. Tap to zoom in/out data table.
2. Tap to create calculation data table.
3. Tap to set the following items.
  - Switch period: This is used to switch period for calculation data display. Refer to page 14 "4.1.2 Switching period" for detail.
  - Save: This is used to save displayed calculation data on USB flash memory/SD card. Refer to "Saving and Loading Data" in operation manual.
4. Tap to exit energy calculation view and return to Energy Calculation window.
5. Touch window and buttons to scroll (both horizontally and vertically) the table appears. Tap button to check energy calculation data.

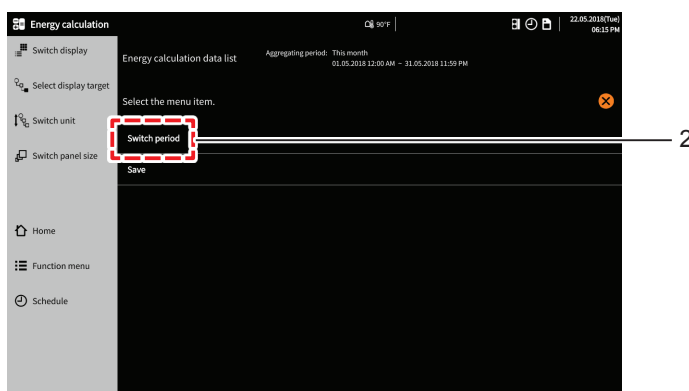
#### 4.1.1 Displayed Items

- (1) Aggregation period: Indicates start/end date and time for the data aggregation.
- (2) Name  
The name of the selected target is shown. Selected items are locked while scrolling the window.
- (3) Criteria  
This criteria is used to classify units number. Criteria indicates the following:  
Area: A### (### indicates the Area number.)  
Block: B### (### indicates the Block number.)  
Group: [\*\*]G### (\*\* indicates the H-LINK number and ### indicates Group number.)  
Unit: [\*\*]##-\$\$ (\*\* indicates the H-LINK number, ## indicates cycle, and \$\$ indicates the IDU address)  
Note: Facility units are indicated with F\*\*\* (\*\* indicates facility unit number.)
- (4) Ratio method  
Operation ratio method that has been used for energy calculation is shown in the order of "Stand-by power operation ratio method - AC electricity ratio method - AC gas amount ratio method". If the ratio method coexists, when the method is changed, for example, then the method is indicated with "--".
  - Stand-by power operation ratio method  
I method: Calculates the stand-by power using ratio for indoor unit capacity.  
II method: Includes stand-by power in power usage and then calculates with AC electricity ratio method/AC gas amount ratio method.  
III method: Stand-by power is calculated separately.
  - AC electricity ratio method  
T-N (1) Method: Thermo-on time (indoor unit) x Capacity (indoor unit).  
(Calculation does NOT take place for each refrigerant cycle (outdoor unit)).  
T-Y (2) Method: Thermo-on time (indoor unit) x Capacity (indoor unit) x Operation ratio calculation result for the refrigerant cycle  
O-N (3) Method: Thermo-on time (indoor unit) x Operation time (indoor unit).  
(Calculation does NOT take place for each refrigerant cycle (outdoor unit)).  
R-Y (6) Method: Refrigerant flow amount (indoor unit) x Operation ratio calculation result for the refrigerant cycle
  - AC gas amount ratio method  
T-N (1) Method: Thermo-on time (indoor unit) x Capacity (indoor unit).  
(Calculation does NOT take place for each refrigerant cycle (outdoor unit)).  
O-N (3) Method: Thermo-on time (indoor unit) x Operation time (indoor unit).  
(Calculation does NOT take place for each refrigerant cycle (outdoor unit)).
- (5) Power consumption  
Calculated, according to ratio, electricity usage.
- (6) Stand-by power  
Calculated, according to ratio, stand-by power consumption.
- (7) Total power usage  
Calculated, according to ratio, electricity usage + stand-by power consumption.
- (8) Gas usage (GHP)  
Calculated, according to ratio, gas usage on GHP.
- (9) Gas usage (Photo thermal)  
Calculated, according to ratio, gas usage on photo thermal.
- (10) Other gas usage (Photo thermal)  
Other gas usage (than calculated)
- (11) Total gas usage (Photo thermal)  
Calculated, according to ratio, gas usage on photo thermal + other gas usage.
- (12) Water consumption  
Calculated, according to ratio, water consumption.
- (13) Other water consumption  
Other water consumption (than calculated)
- (14) Total water consumption  
Calculated, according to ratio, water consumption + other water consumption.

## 4.1.2 Switching Period



1. Tap . Setting menu is shown.



2. Tap **Switch period**. The window for switching period is shown.

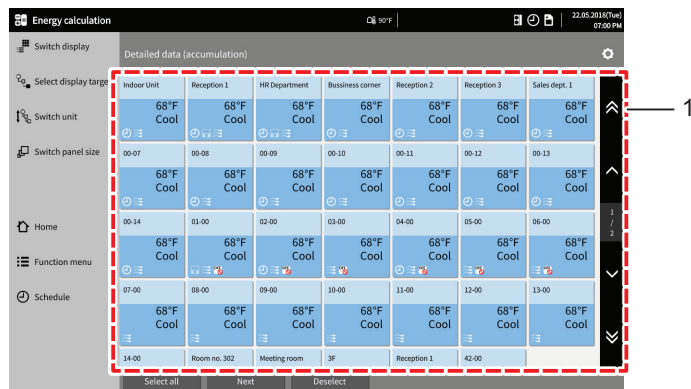


3. Select and tap the period. Period is confirmed and Energy calculation data display is shown.
4. Tap to return to Energy Calculation data display.

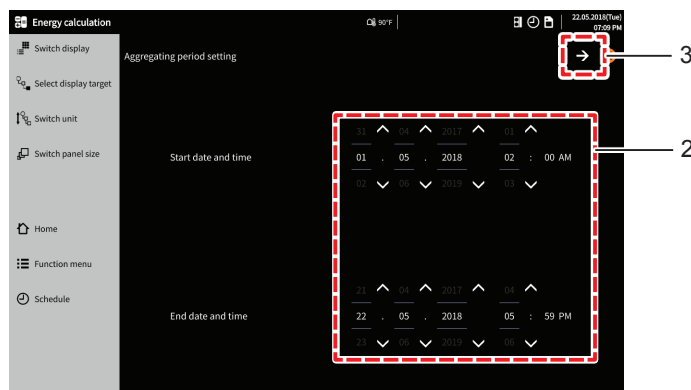


## 4.2 Detailed Data Window

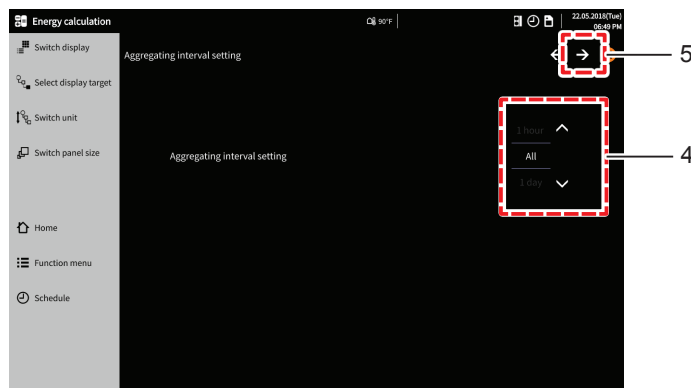
This window is for saving the detailed energy calculation result and accumulated data on USB flash memory/SD card.



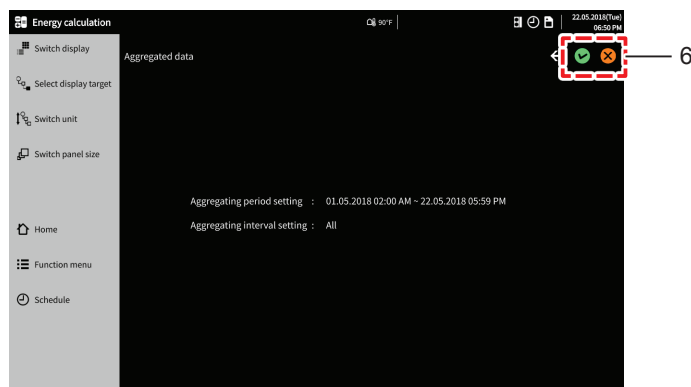
1. Tap **Panel** to select target to aggregate data for Aggregating period setting window is shown.



2. Tap each  $\wedge$  or  $\vee$  to set aggregate start/end date and time.
  - Maximum period is 31 days.
3. Tap  $\rightarrow$  to show aggregate period setting window.



4. Tap  $\wedge$  or  $\vee$  to set aggregate period.
5. Tap  $\rightarrow$  to show data checking window.

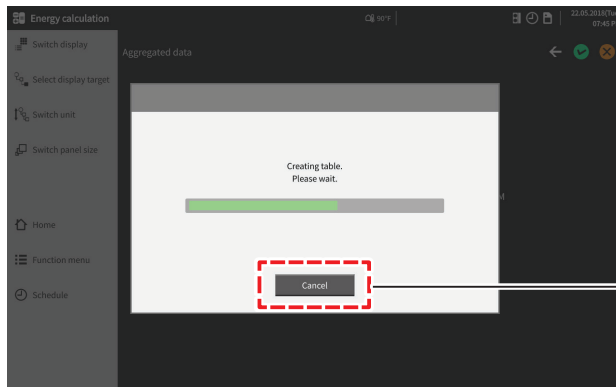


6. Tap to create aggregate data according to the settings.

Tap to discard the change and to return to detailed data window.

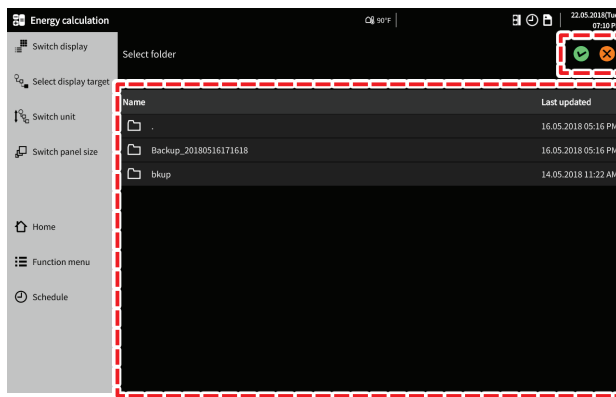
Continue to next page.




Continue from previous page.



Upon completing creation of data table, a window for selecting media is shown.

7. Tap **Cancel** to cancel data table creation.
  - Data up to 30,000 lines can be saved to media.



8. Tap the list of folders to save data. Tap  to move into the specified folder.
9. Tap  to save the data in the specified folder and to close file selection window. Tap  to cancel the operation and to exit from folder selection window.

#### 4.2.1 Displayed Items

##### **Detailed Data (Calculation)**

- (1) Aggregation period (Data collection)  
Indicates start/end date and time for the data aggregation (collected data).
- (2) Date and time  
Specify the date and time
- (3) Name  
The name of the selected target is shown.
- (4) H-LINK No. and system address  
H-LINK No. and system address to identify units shown.  
For facility units, [F] for system and facility unit No. is shown as address.  
“---” is shown if aggregate criteria is not “unit”.
- (5) Power meter No.  
Power meter No. is indicated with H-LINK No - external input number.  
(The items are delimited with “-” (hyphen))
- (6) Gas meter No.(GHP)  
Gas meter No. for GHP is indicated with H-LINK No - external input number.  
(The items are delimited with “-” (hyphen))
- (7) Gas meter No.(Photo thermal)  
Gas meter No. for photo thermal is indicated with H-LINK No - external input number.  
(The items are delimited with “-” (hyphen))
- (8) Water meter No.  
Water meter No. is indicated with H-LINK No - external input number.  
(The items are delimited with “-” (hyphen))
- (9) Ratio method  
Calculation method that has been used for energy calculation is shown in the order of “Stand-by power operation ratio method - AC electricity ratio method - AC gas amount ratio method”.  
Refer to page 13 “4.1.1 Displayed items - (4) Ratio method”.  
If the ratio method coexists in specified period, when method was changed, for example, then the method is indicated with “--”.
- (10) All day  
Data for all day is shown.
- (11) Power consumption  
Calculated, according to ratio, electricity usage.
- (12) Stand-by power  
Calculated, according to ratio, stand-by power consumption.
- (13) Total power usage  
Calculated, according to ratio, electricity usage + stand-by power consumption.
- (14) Gas usage (GHP)  
Calculated, according to ratio, gas usage on GHP.
- (15) Gas usage (Photo thermal)  
Calculated, according to ratio, gas usage on photo thermal.
- (16) Other gas usage (Photo thermal)  
Calculated, according to ratio, gas usage on photo thermal.
- (17) Total gas usage (Photo thermal)  
Calculated, according to ratio, gas usage on photo thermal + other gas usage.
- (18) Water consumption  
Calculated, according to ratio, water consumption.
- (19) Other water consumption  
Other water consumption (than calculated)
- (20) Total water consumption  
Calculated, according to ratio, water consumption + other water consumption.

### Detailed Data (Accumulation)

- (1) Aggregation period  
Indicates start/end date and time for the data collection.
- (2) Date and time  
The date and time is shown.
- (3) Name  
The name of the selected target is shown.
- (4) H-LINK No.  
H-LINK No. that identifies power system, address, power meter No. (for indoor/outdoor unit), that are connected to the unit are shown. For facility units, [F] for system and facility unit No. is shown as address. "---" is shown if aggregating criteria was not "unit".  
For power meter No. (for indoor/outdoor unit), H-LINK No.- external input number are shown.  
(The items are delimited with "-" (hyphen))
- (5) Air conditioner Operation  
Operation state of the unit (accumulated value) is shown.
- (6) Heat storage operation  
State of heat storage operation (accumulated value) is shown.
- (7) Operation time  
Operation time of indoor unit is shown.
- (8) Thermo-on time  
Thermo-on time of indoor unit is shown. This value for facility units is always 0.
- (9) Refrigerant flow (Indoor)  
Accumulated refrigerant flow value for indoor unit is shown. This value for facility units is always 0.
- (10) Heater energizing time  
Heater energizing time for indoor unit is shown.
- (11) Operation electricity accumulated value  
Accumulated operation electricity value for EHP outdoor unit is shown.
- (12) Crank case heater energizing time  
Crank case heater energizing time for EHP outdoor unit is shown.
- (13) Compressor heater elapsed ON time  
Compressor heater elapsed ON time for GHP outdoor unit is shown.
- (14) Drain heater elapsed ON time  
Drain heater elapsed ON time for GHP outdoor unit is shown.
- (15) Engine block heater elapsed ON time  
Engine block heater elapsed ON time for GHP outdoor unit is shown.
- (16) Outdoor load accumulation  
Accumulated number of revolutions of engine for GHP outdoor unit is shown.
- (17) Refrigerant flow (Heat storage)  
Accumulated refrigerant flow value for heat storage unit is shown.
- (18) Total time  
Total time while accumulation was active
- (19) Total power consumption  
The total amount value of all power meters will be shown.  
If aggregating criteria is per unit, refer to (20) and (21).
- (20) Outdoor power consumption  
The total value of power meters that are connected to the outdoor unit. If accumulation criteria is NOT "unit", refer to (19).
- (21) Indoor power consumption  
The total value of power meters that are connected to indoor units. If accumulation criteria is NOT "unit", refer to (19).

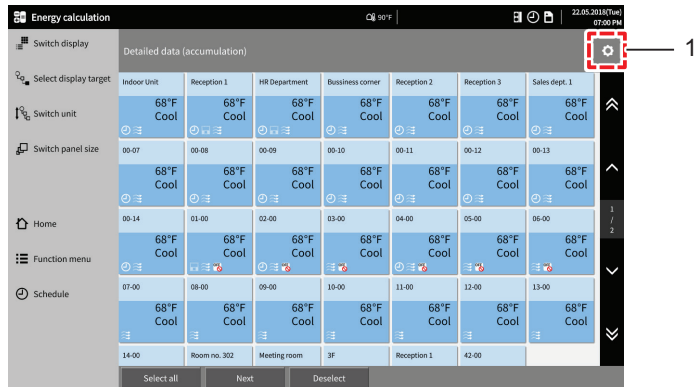
- (22) GHP total gas usage  
The value of all gas meters that are connected to GHP unit is shown.  
If aggregating criteria is unit, refer to (23).
- (23) Outdoor gas usage  
The value of gas meters that are connected to outdoor unit is shown.  
If aggregating criteria is NOT "unit", refer to (22).
- (24) Photo thermal total gas usage  
The value of all gas meters that are connected to facility unit is shown.
- (25) Total water consumption  
The total amount value of all water meter is shown.
- (26) Unallocated power consumption  
If stand-by power consumption ratio method is set as III method, stand-by power for whole system is shown.  
This is not shown if display format is "unit".
- (27) Unallocated gas usage (Photo thermal)  
If stand-by power consumption ratio method is set as III method, other gas usage (Photo thermal) for whole system is shown.  
This is not shown if display format is "unit".
- (28) Unallocated water consumption  
If stand-by power consumption ratio method is set as III method, other water consumption for whole system is shown.  
This is not shown if display format is "unit".


## 5. Usage Ratio

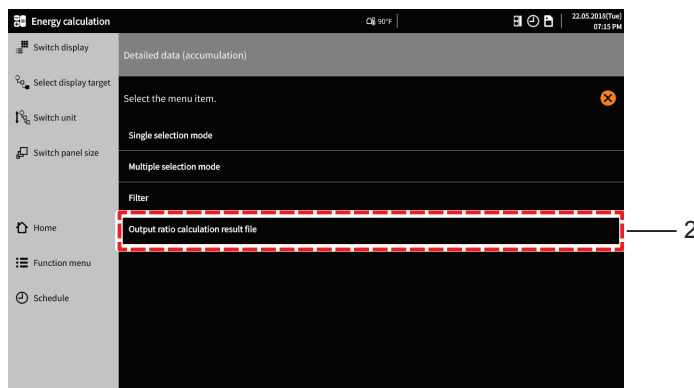
This section describes how to calculate usage ratio.

### 5.1 Referencing Usage Ratio Calculation

Save the operation ratio calculation result to USB drive or SD card, in order to review the results.



1. Tap .  
Setting menu is shown.



2. Tap **Output ratio calculation result file**. The folder selection window will be shown. Refer to “Saving and Loading Data” in operation manual for details.

- The following results are output in “/CS-EX/operating\_ratio\_results/yyyymm”.
  - DAYS\_YYYYMM.csv : Daily operation ratio on EHP
  - UNITS\_YYYYMMDD.csv : Operation ratio on each EHP (1 day)
 NOTE: yyyy stands for year, mm for month, and dd for day.
- The following results are output in “/CS-EX/operating\_ratio\_results/yyyymm/dd”.
  - HOURS\_YYYYMMDD.csv : Hourly operation ratio on EHP
  - UNITS\_YYYYMMDD\_HH.csv : Operation ratio on each EHP (1 hour)
 NOTE: yyyy stands for year, mm for month, dd for day and hh for hour.

#### NOTICE:

- Only method 3 is applicable for facility units. While using methods 1 and 2, usage ratio for all facility units is always 0%.

- Referencing operation ratio of EHP /day (DAYS\_YYYYMM.csv)  
In this file, elapsed days (up to 31 days) in month are assumed as 100% to calculate daily ratio, as shown in the following table.

##### (a) Year/Month/Day

YYYYMMDD 4 digits for year, 2 digits for month and 3 digits for day

##### (b) Accumulated load value on outdoor unit

Selected method 1 = Thermo-on time on all indoor units x capacity 12 digits

Selected method 2 = Accumulated operation electricity value for all outdoor units 12 digits

Selected method 3 = Operation time on all indoor units x capacity 12 digits

##### (c) a day/all days: The current day / total elapsed day 7 digits 100% = 1000000

			Day 1		Day 2		Day 3		Day 4		Day 5		Day 30		Day 31	
(a) Year/ Month/ Day	(b) Converted Load Value for Outdoor Unit	(c) a day/ all days														
20170501	10623902	1000000														
20170502	10623902	487430	11171833	512570												
20170503	10623902	322254	11171833	338875	11171711	338871										
20170504	10623902	240682	11171833	253095	11171711	253092	11173456	253132								
20170505	10623902	192071	11171833	201977	11171711	201975	11173456	202006	11171481	201971						
20170506	10623902	159800	11171833	168042	11171711	168040	11173456	168066	11171481	168037						
20170507	10623902	138466	11171833	145607	11171711	145605	11173456	145628	11171481	145602						
20170508	10623902	122202	11171833	128505	11171711	128503	11173456	128523	11171481	128501						
20170509	10623902	107510	11171833	113055	11171711	113053	11173456	113071	11171481	113051						
20170510	10623902	98156	11171833	103218	11171711	103217	11173456	103233	11171481	103215						
.	.	.	.	.	.	.	.	.	.	.						
.	.	.	.	.	.	.	.	.	.	.						
.	.	.	.	.	.	.	.	.	.	.						
20170530	10623902	32227	11171833	33889	11171711	33888	11173456	33894	11171481	33888	.	.	.	11233611	34076	
20170531	10623902	31165	11171833	32772	11171711	32772	11173456	32777	11171481	32771	.	.	.	11233611	32953	11233611 32953

(2) Referencing operation ratio of EHP /unit (UNITS\_yyyymmdd.csv)

1. CSV file to show ratio on 1 indoor unit calculated by one or all refrigerant cycle(s), as shown in the following table.

(a) Year/Month/Day:	yyyymmdd	4 digits for year, 2 digits for month and 2 digits for day
(b) Address:	H-LINK No/System/Address	Decimal number 2 digits
(c) Area (No.):	Area Name/Area No.	No. is decimal number and has 3 digits
(d) Block (No.):	Block name/Block No.	No. is decimal number and has 3 digits
(e) Group (No.):	Group name/Group No.	No. is decimal number and has 3 digits
(f) Load on indoor unit:	Selected method 1 = Thermo-on time x capacity	8 digits
	Selected method 2 = Expansion valve x aperture Expansion valve coefficient	8 digits
	Selected method 3 = Operation time x capacity	8 digits
(g) Load on Outdoor Unit:	Selected method 1 = Thermo-on time in the system x total capacity in the system	8 digits
	Selected method 2 = Accumulated operation electricity value	8 digits
	Selected method 3 = Operation time in the system x total capacity	8 digits
(h) Indoor Unit/ 1 Outdoor Unit:	1 unit / all indoor units in 1 system (ratio)	7 digits 100% = 1000000
(i) Indoor Unit/ All Outdoor Unit:	1 unit / all indoor units in all systems (ratio)	7 digits 100% = 1000000

(a) Year/ Month/ Day	(b) H-LINK No./ System/Address			(c) Area Name/ Area No.		(d) Block Name/ Block No.		(e) Group Name/ Group No.		(f) Load on Indoor Unit	(g) Load on Outdoor Unit	(h) Indoor/ 1 Outdoor ↓	(i) Indoor/ All Outdoor ↓
2017081315	0	0	0	Ward	1	Ward A 3rd floor	1	Room	1	120	240	500000	93023
2017081315	0	0	1	Ward	1	Ward A 3rd floor	1	Room	1	120	240	500000	93023
2017101315	0	1	0	Ward	1	Ward A 3rd floor	2	Room	1	140	290	482759	108527
2017101315	0	1	1	Ward	1	Ward A 3rd floor	2	Room	2	150	290	517241	116279
2017101315	1	0	0	Ward	1	Ward A 4th floor	3	Room	1	160	430	372093	124031
2017101315	1	0	1	Ward	1	Ward A 4th floor	3	Room	1	140	430	325581	108527
2017101315	1	0	2	Ward	1	Ward A 4th floor	3	Room	1	130	430	303232	100775
2017101315	0	2	0	Ward	2	Ward B 3rd floor	4	Room	3	120	330	363636	93023
2017101315	0	2	1	Ward	2	Ward B 3rd floor	4	Room	4	110	330	333333	85271
2017101315	0	2	2	Ward	2	Ward B 3rd floor	5	Room	5	100	330	303030	77519

**NOTICE:**

- If any facility units exists in the system, refer to data for “(i) indoor / All Outdoor” regarding the ratio.



- (c) 1 hour / elapsed hour: Specified hour / total elapsed hour 7 digits 100% = 1000000

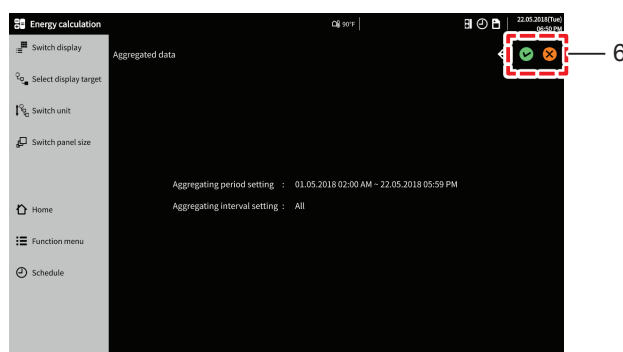
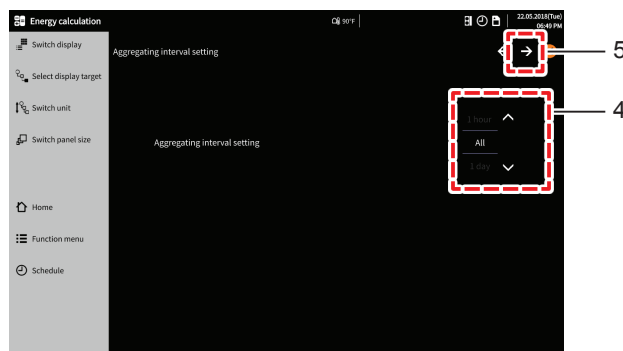
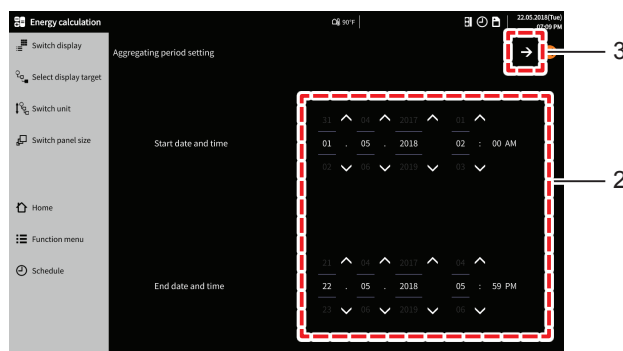
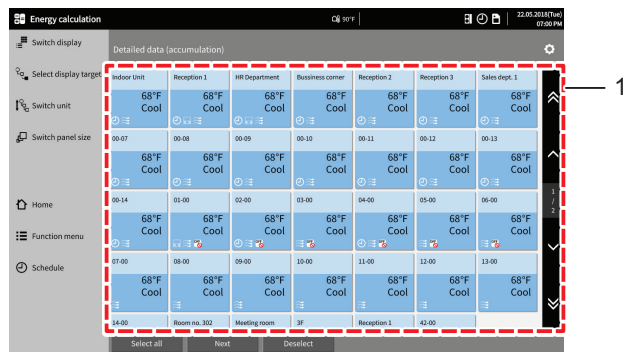
	0:00	1:00	2:00	3:00	4:00					22:00	23:00
(a) Year/ Month/ Day/hr.	(b) Converted Load Value for Outdoor Unit	(c) 1 hour/ elapsed hour									
2017050100	10623902	1000000									
2017050101	10623902	487430	11171833	512570							
2017050102	10623902	322254	11171833	338875	11171711	338871					
2017050103	10623902	240682	11171833	253095	11171711	253092	11173456	253132			
2017050104	10623902	192071	11171833	201977	11171711	201975	11173456	202006	11171481	201971	
2017050105	10623902	159800	11171833	168042	11171711	168040	11173456	168066	11171481	168037	
2017050106	10623902	138466	11171833	145607	11171711	145605	11173456	145628	11171481	145602	
2017050107	10623902	122202	11171833	128505	11171711	128503	11173456	128523	11171481	128501	
2017050108	10623902	107510	11171833	113055	11171711	113053	11173456	113071	11171481	113051	
2017050109	10623902	98156	11171833	103218	11171711	103217	11173456	103233	11171481	103215	
.	.	.	.	.	.	.	.	.	.	.	
.	.	.	.	.	.	.	.	.	.	.	
.	.	.	.	.	.	.	.	.	.	.	
2017050122	10623902	32227	11171833	33889	11171711	33888	11173456	33894	11171481	33888	. . .
2017050123	10623902	31165	11171833	32772	11171711	32772	11173456	32777	11171481	32771	. . .
											11233611 34076
											11233611 32953 11233611 32953

- |                                       |   |  |
|---------------------------------------|---|--|
| (a) Year/Month/Day/hour:              | yyyymmddhh  | 4 digits for year, 2 digits for month,<br>2 digits for day and 2 digits for hour |
| (b) Address:                          | H-LINK No./System/Address   | Decimal number 2 digits  |
| (c) Area (No.):                       | Area Name/Area No.  | No. is decimal number and has 3 digits   |
| (d) Block (No.):                      | Block name/Block No.  | No. is decimal number and has 3 digits   |
| (e) Group (No.):                      | Group name/Group No.  | No. is decimal number and has 3 digits   |
| (f) Load on indoor unit:              | Selected method 1 = Thermo-on time x capacity                                   | 8 digits   |
|                                       | Selected method 2 = Expansion valve x aperture<br>Expansion valve coefficient   | 8 digits   |
|                                       | Selected method 3 = Operation time x capacity                                   | 8 digits   |
| (g) Load on Outdoor Unit:             | Selected method 1 = Thermo-on time in the system x total capacity in the system | 8 digits   |
|                                       | Selected method 2 = Accumulated operation electricity value                     | 8 digits   |
|                                       | Selected method 3 = Operation time in the system x total capacity               | 8 digits   |
| (h) Indoor Unit/<br>1 Outdoor Unit:   | 1 unit / all indoor units in 1 system (ratio)                                   | 7 digits 100% = 1000000  |
| (i) Indoor Unit/<br>All Outdoor Unit: | 1 unit / all indoor units in all systems (ratio)                                | 7 digits 100% = 1000000  |

(a) Year/ Month/ Day/hour ↓	(b) H-LINK No./ System/Address ↓			(c) Area Name/ Area No. ↓	(d) Block Name/ Block No. ↓			(e) Group Name/ Group No. ↓		(f) Load on Indoor Unit ↓	(g) Load on Outdoor Unit ↓	(h) Indoor/ 1 Outdoor ↓	(i) Indoor/ All Outdoor ↓
201710131500	0	0	0	Ward A	1	Ward A 3rd floor	1	Room 301	1	120	240	500000	93023
201710131500	0	0	1	Ward A	1	Ward A 3rd floor	1	Room 301	1	120	240	500000	93023
201710131500	0	1	0	Ward A	1	Ward A 3rd floor	2	Room 302	1	140	290	482759	108527
201710131500	0	1	1	Ward A	1	Ward A 3rd floor	2	Room 302	2	150	290	517241	116279
201710131500	1	0	0	Ward A	1	Ward A 4th floor	3	Room 401	1	160	430	372093	124031
201710131500	1	0	1	Ward A	1	Ward A 4th floor	3	Room 401	1	140	430	325581	108527
201710131500	1	0	2	Ward A	1	Ward A 4th floor	3	Room 401	1	130	430	303232	100775
201710131500	0	2	0	Ward B	2	Ward B 3rd floor	4	Room 311	3	120	330	363636	93023
201710131500	0	2	1	Ward B	2	Ward B 3rd floor	4	Room 311	4	110	330	333333	85271
201710131500	0	2	2	Ward B	2	Ward B 3rd floor	5	Room 312	5	100	330	303030	77519

## 5.2 Detailed Data Window

This window displays accumulated data.

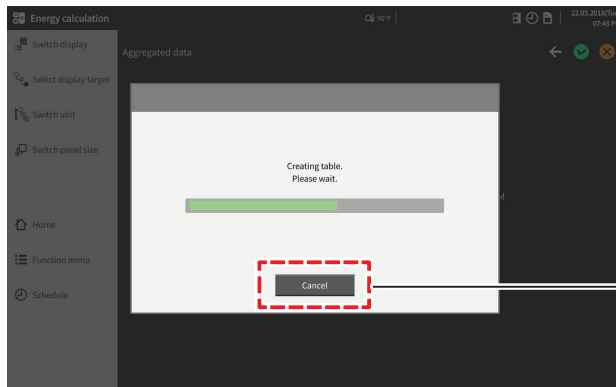


Continue to next page.

1. Tap **Panel** to select target for aggregate data.  
The aggregating period window is shown.
2. Tap each **^** or **v** to set aggregation start/end date and time.
3. Tap **→** to show the aggregating period window.
4. Tap **^** or **v** to set aggregating period.
5. Tap **→** to show data checking window.
6. Tap to create aggregating data according to the settings.




Tap to discard the change and to return to detailed data window.

Continue from previous page.



7. Tap **Cancel** to cancel data table creation.



8. Tap the list of folder to save.  
Tap  to move into the specified folder.
9. Tap  to save the data in the specified folder and to close file selection window.  
Tap  to cancel the operation and to exit from folder selection window.

## 5.2.1 Displayed Items

### Detailed Data (Calculation)

- (1) Aggregation period  
Indicates start/end date and time for the data collection.
- (2) Date and time  
Date and time is shown.
- (3) Name  
The name of the selected target is shown.
- (4) H-LINK No. that identifies power system, address, power meter No. (for indoor/outdoor unit), gas meter No. (GHP/photo thermal), as well as the water meter and power meter No., and gas meter No. and water meter No. that are connected to the unit are shown.  
For facility units, [F] for system and facility unit No. for address are shown as address. "---" is shown if aggregating criteria is not "unit".
- (5) Air Conditioner Operation  
Operation state of the unit (accumulated value) is shown.
- (6) Heat Storage Operation  
State of heat storage operation (accumulated value) is shown.
- (7) Operation Time  
Operation time of indoor unit is shown.
- (8) Thermo-on Time  
Thermo-on time of indoor unit is shown. This value for facility units is always 0.
- (9) Refrigerant Flow (Indoor)  
Accumulated refrigerant flow value for indoor unit is shown. This value for facility units is always 0.
- (10) Heater Energizing Time  
Heater energizing time for indoor unit is shown.
- (11) Operation Electricity Accumulated Value  
Accumulated operation electricity value for EHP outdoor unit is shown.
- (12) Crank case Heater Energizing Time  
Crank case heater energizing time for EHP outdoor unit is shown.
- (13) Compressor Heater Elapsed ON Time  
Compressor heater elapsed ON time for GHP outdoor unit is shown.
- (14) Drain Heater Elapsed ON Time  
Drain heater elapsed ON time for GHP outdoor unit is shown.
- (15) Engine Block Heater Elapsed ON Time  
Engine block heater elapsed ON time for GHP outdoor unit is shown.
- (16) Outdoor Load Accumulation  
Accumulated number of revolutions of engine for GHP outdoor unit is shown.
- (17) Refrigerant Flow (Heat Storage)  
Accumulated refrigerant flow value for heat storage unit is shown.
- (18) Total Time  
Total time while accumulation is active.
- (19) Total Power Consumption  
The total amount value of all power meters is shown. If aggregating criteria is unit, refer to (20) and (21).
- (20) Outdoor Power Consumption  
The value of power meters that are connected to outdoor unit is shown.  
If aggregating criteria is NOT "unit", refer to (19).
- (21) Indoor Power Consumption  
The value of power meters that are connected to indoor unit is shown.  
If aggregating criteria is NOT "unit", refer to (19).
- (22) GHP Total Gas Usage  
The value of all gas meters that are connected to GHP unit is shown.  
If aggregating criteria is unit, refer to (23).

- (23) Outdoor gas usage  
The value of gas meters that are connected to outdoor unit is shown.  
If aggregating criteria is NOT "unit", refer to (22).
- (24) Photo Thermal Total Gas Usage  
The value of all gas meters that are connected to facility unit is shown.
- (25) Total Water Consumption  
The total amount value of all water meter is shown.
- (26) Unallocated power consumption  
If stand-by power consumption ratio method is set as III method, stand-by power for whole system is shown.  
This is not shown if display format is "unit".
- (27) Unallocated gas usage (Photo thermal)  
If stand-by power consumption ratio method is set as III method, other gas usage (Photo thermal) for whole system is shown.  
This is not shown if display format is "unit".
- (28) Unallocated water consumption  
If stand-by power consumption ratio method is set as III method, other water consumption for whole system is shown.  
This is not shown if display format is "unit".

### 5.3 Use Case

(1) The following table shows the CSV file for daily operation ratio calculation file.

DAYS\_201705.csv (Daily operation ratio calculation file - 2017 May)

20170501	*****	1000000															
20170502	*****	*****	*****	*****													
20170503	*****	*****	*****	*****	*****	*****											
20170504	*****	*****	*****	*****	*****	*****	*****	*****									
20170505	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****						
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
20170530	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
20170531	*****	55687	*****	75478	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	54862	*****	24789

Usage ratio on 2017/5/1: 5.5687%

Usage ratio on 2017/5/2: 7.5478%

⋮

Usage ratio on 2017/5/30: 5.4862%

Usage ratio on 2017/5/31: 2.4789%

UNITS\_20170501.csv (Operation ratio calculation for each unit - for 2017 May 1)

20170501	0	0	0	Design dept.	1	AC Design dept.	A01	*****	*****	*****	165484
20170501	0	0	1	Design dept.	1	AC Design dept.	A01	*****	*****	*****	246897
20170501	0	0	2	Design dept.	1	AC Design dept.	A01	*****	*****	*****	301245
20170501	0	1	0	Design dept.	1	Control dept.	A02	*****	*****	*****	116829
20170501	0	1	1	Design dept.	1	Control dept.	A02	*****	*****	*****	169545

Operation ratio on System 0 Address 0 (Indoor/All outdoor): 16.5484%

Operation ratio on System 0 Address 1 (Indoor/All outdoor): 24.6897%

Operation ratio on System 0 Address 2 (Indoor/All outdoor): 30.1245%

Operation ratio on System 1 Address 0 (Indoor/All outdoor): 11.6829%

Operation ratio on System 1 Address 1 (Indoor/All outdoor): 16.9545%

UNITS\_20170502.csv (Operation ratio calculation for each unit - for 2017 May 2)

20170502	0	0	0	Design dept.	1	AC Design dept.	A01	*****	*****	*****	182498
20170502	0	0	1	Design dept.	1	AC Design dept.	A01	*****	*****	*****	224689
20170502	0	0	2	Design dept.	1	AC Design dept.	A01	*****	*****	*****	298531
20170502	0	1	0	Design dept.	1	Control dept.	A02	*****	*****	*****	97856
20170502	0	1	1	Design dept.	1	Control dept.	A02	*****	*****	*****	196426

System 0 Address 0 (Indoor/All outdoor): 18.2498%

System 0 Address 1 (Indoor/All outdoor): 22.4689%

System 0 Address 2 (Indoor/All outdoor): 29.8531%

System 1 Address 0 (Indoor/All outdoor): 9.7856%

System 1 Address 1 (Indoor/All outdoor): 19.6426%

#### <Calculation sample>

(a) The ratio for System 0 Address 0 on 2017/5/1 is:

Daily ratio in DAYS\_201705.csv shows 5.5687% and the ratio for System 0 Address 0 in UNITS\_20170501.csv shows 16.5484%, which makes  $0.055687 \times 0.165484 \times 100 \div 0.9215$  [%]

(b) The ratio for System 0 Address 0 on 2017/5/2 is:

Daily ratio in DAYS\_201705.csv shows 7.5478% and the ratio for System 0 Address 0 in UNITS\_20170502.csv shows 18.2498%, which makes  $0.075478 \times 0.182498 \times 100 \div 1.3775$  [%].

(c) The ratio for System 0 Address 0 from 2017/5/1-2017/5/2 is:

$0.9215$  [%] +  $1.3775$  [%] =  $2.2990$  [%].

Repeatedly calculate for whole month to acquire monthly ratio for System 0 Address 0. Repeatedly calculate for each unit to acquire the monthly ratio for each unit.

E.g. If the monthly ratio for System 0 Address is 30%, then 30% of air conditioning amount in electricity bill is consumed by System 0 Address 0.

#### NOTE:

Amount for air conditioners on electricity bill  $\times 0.3$  = amount on System 0 Address 0.

(2) The following tables show the CSV file for utilizing hourly operation ratio calculation file

DAYS\_201705.csv (Daily operation ratio calculation file - 2017 May)

20170501	*****	1000000															
20170502	*****	*****	*****	*****													
20170503	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
20170504	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
20170505	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
201705030	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
201705031	*****	55687	*****	75478	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	54862	*****	24789

Usage ratio on 2017/5/1: 5.5687%

Usage ratio on 2017/5/2: 7.5478%

⋮

Usage ratio on 2017/5/30: 5.4862%

Usage ratio on 2017/5/31: 2.4789%

HOURS\_20170501.csv (Hourly operation ratio calculation file - for 2017 May 1)

2017050100	*****	1000000															
2017050101	*****	*****	*****	*****													
2017050102	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
2017050103	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
2017050122	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
2017050123	*****	38745	*****	47565	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	26345	*****	28742

Usage ratio on 2017/5/1 at 0:00: 3.8745%

Usage ratio on 2017/5/1 at 1:00: 4.7565%

⋮

Usage ratio on 2017/5/1 at 22:00: 2.6345%

Usage ratio on 2017/5/1 at 23:00: 2.8742%

UNITS\_20170501\_00.csv (Operation ratio calculation for unit file (1 hour) - At 2017 May 1, 00:00)

20170501	0	0	0	Design dept.	1	AC Design dept.	A01	*****	*****	*****	165484
20170501	0	0	1	Design dept.	1	AC Design dept.	A01	*****	*****	*****	246897
20170501	0	0	2	Design dept.	1	AC Design dept.	A01	*****	*****	*****	301245
20170501	0	1	0	Design dept.	1	Control dept.	A02	*****	*****	*****	116829
20170501	0	1	1	Design dept.	1	Control dept.	A02	*****	*****	*****	169545

Operation ratio on System 0 Address 0 (Indoor/All outdoor): 16.5484%

Operation ratio on System 0 Address 1 (Indoor/All outdoor): 24.6897%

Operation ratio on System 0 Address 2 (Indoor/All outdoor): 30.1245%

Operation ratio on System 1 Address 0 (Indoor/All outdoor): 11.6829%

Operation ratio on System 1 Address 1 (Indoor/All outdoor): 16.9545%

UNITS\_20170501\_01.csv (Operation ratio calculation for unit (1 hour) - At 2017 May 1, 00:00)

2017	05	01	01	0	0	0	Design dept.	1	AC Design dept.	A01	*****	*****	*****	182498
2017	05	01	01	0	0	1	Design dept.	1	AC Design dept.	A01	*****	*****	*****	224689
2017	05	01	01	0	0	2	Design dept.	1	AC Design dept.	A01	*****	*****	*****	298531
2017	05	01	01	0	1	0	Design dept.	1	Control dept.	A02	*****	*****	*****	97856
2017	05	01	01	0	1	1	Design dept.	1	Control dept.	A02	*****	*****	*****	196426

Operation ratio on System 0 Address 0 (Indoor/All outdoor): 18.2498%

Operation ratio on System 0 Address 1 (Indoor/All outdoor): 22.4689%

Operation ratio on System 0 Address 2 (Indoor/All outdoor): 29.8531%

Operation ratio on System 1 Address 0 (Indoor/All outdoor): 9.7856%

Operation ratio on System 1 Address 1 (Indoor/All outdoor): 19.6426%

<Calculation sample>

(a) The ratio for System 0 Address 0 at 2017/5/1 00:00 is:

Daily ratio in DAYS\_201705.csv shows 5.5687%, the ratio at 00:00 in HOURS\_20170501 shows 3.8745%, and ratio for System 0 Address 0 in UNITS\_20170501\_00.csv shows 16.5484%, which makes  $0.055687 \times 0.038745 \times 0.165484 \times 100 \div 0.0357[\%]$ .

(b) The ratio for System 0 Address 0 at 2017/5/1 01:00 is:

Daily ratio in DAYS\_201705.csv shows 5.5687%, the ratio at 01:00 in HOURS\_20170501 shows 4.7565%, and ratio for System 0 Address 0 in UNITS\_20170501\_00.csv shows 18.2498%, which makes  $0.055687 \times 0.047565 \times 0.182498 \times 100 \div 0.0483[\%]$

(c) The ratio for System 0 Address 0 from 2017/5/1 00:00-01:00 is:

$0.0357[\%] + 0.0483 [\%] = 0.0840 [\%]$ .

Repeatedly calculate for whole month to acquire monthly ratio for System 0 Address 0.

Repeatedly calculate for each unit to acquire the monthly ratio for each unit.

E.g. If the monthly ratio for System 0 Address is 30%, then 30% of air conditioning amount in electricity bill is consumed by System 0 Address 0.

NOTE:

Amount on electricity bill  $\times 0.3$  = amount on System 0 Address 0.



## 6. Common Function

### 6.1 Energy Calculation Setting

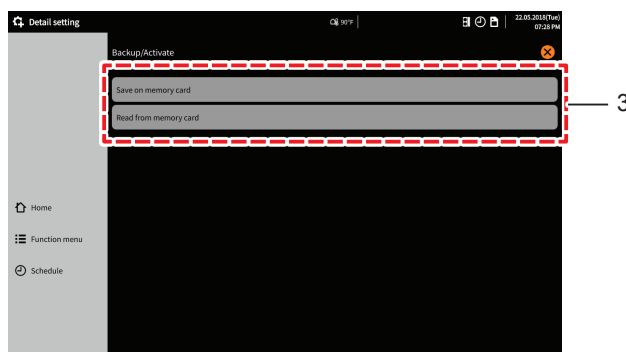
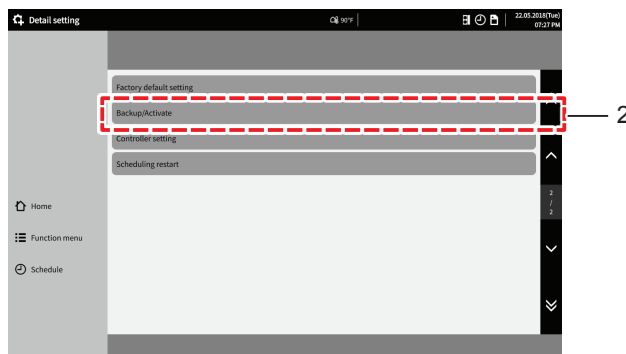
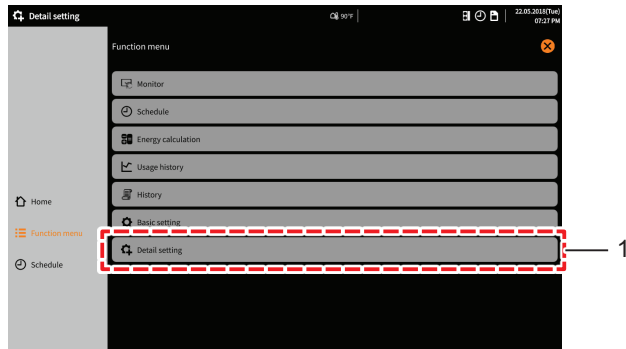
Regarding how to set/check the following contents. Refer to installation manual.

- Unit data setting  
Refer to the item 6.7 Unit Data Setting of **6. Energy Calculation Setting**.
- Calculation method setting  
Refer to the item 6.5 Calculation Method Setting of **6. Energy Calculation Setting**.
- Ratio method setting  
Refer to the item 6.6 Ratio Method Setting of **6. Energy Calculation Setting**.
- Meter reading  
Refer to the item 6.4 Rate Setting of **6. Energy Calculation Setting**.
- New data acquisition  
Refer to the item 7.3 Calculation of **7. Test Run**.
- Accumulated data setting  
Refer to 7.7 Preparation For Actual Use of **7. Test Run**.
- System setting  
Refer to the item 6.8 System Setting of **6. Energy Calculation Setting**.
- Meter setting  
Refer to the item 6.2 Setting and Checking Meters of **6. Energy Calculation Setting**.
- Check connection/Activating calculation  
Refer to the item 6.9 Check Registration and Activating Calculation of **6. Energy Calculation Setting**.

## 7. Maintenance and Service

### 7.1 Configuration Data Backup

Ensure that you sufficiently back up data. Back up data created in this section will facilitate recovery on device replacement and system failure. Create a back up file according to this section upon completion of test run and when system configuration is changed.



1. Tap **Function menu - Detail setting**.  
Detail setting window is shown.

2. Tap **Backup/Activate**.  
Backup/Activate window is shown.  
Alert popup message appears if neither of USB flash memory and/or SD card is inserted. In this case, the page will not change. Ensure that the external media is correctly inserted.

3. Tap **Save on memory card** to save data. Tap **Read from memory card** to load data. The window for selecting folder is shown. Refer to "Saving and Loading Data" in operation manual.

## 7.2 Troubleshooting

The following table identifies possible troubleshooting solutions for abnormal conditions.

Item	Phenomenon	Check	Action
1	<b>Energy calculation</b> does not appear on Function Menu.	Is the SD card with software included correctly inserted to VRF Central Touchscreen Controller and calculation is correctly activated?	Refer to installation manual for Energy Calculation Software "1. Setup".
2	Electricity ratio data/Detailed data window does not appear.	Are meters in use (for electricity ratio calculation)?	Usage ratio calculation is incorrectly set. Go to <b>Energy calculation setting - System setting</b> to set <b>Use meter</b> as <b>ON</b> .
		Is usage calculation (without meters) intended?	This is not a failure. The following function is available only if meters are in use. ■ Electricity display on data output window
	Calculation information history window shows calculation information records.	Are power ON VRF Central Touchscreen Controller and Extension adapter turned ON?	Turn ON the power for VRF Central Touchscreen Controller and Extension adapter.
		Is test run on VRF Central Touchscreen Controller completed?	Refer to Installation and operation manual for VRF Central Touchscreen Controller to check connection and register monitoring target.
		Is power ON for the Extension adapter, VRF Central Touchscreen Controller and relaying hub and is all wiring are correct?	Check the LAN wiring between VRF Central Touchscreen Controller and Extension adapter and turn on the power for relay hub.
		Has the VRF Central Touchscreen Controller or Extension adapter been out of power because of a power failure, for example?	Because accumulated data is not created while the power for VRF Central Touchscreen Controller and/or Extension adapter are OFF, calculation information is indicated.
		Is all configuration completed?	Refer to installation manual for Energy Calculation Software "2. Energy calculation setting".
3	Meter output value and value on energy calculation window are inconsistent.	Is calculation activated?	For pulse accumulator, go to <b>Detail setting - Pulse accumulator setting</b> to set pulse rate setting. For external input, go to <b>Detail setting - External in/output setting</b> to set pulse rate setting.
		Is Pulse rate set?	
4	Usage amount is not accumulated. (Pulse count is 0)	Are all meter numbers set correctly?	Go to <b>Energy calculation setting - Unit data setting</b> to check Meter No.
		Is unit running? (Is usage of electricity, gas and/or water enough to be counted as 1 pulse or more?)	Run all unit at 66°F(19°C) in COOL, and 86°F(30°C) in HEAT and check the pulse 1 hour later.
		Is calculation activated?	Go to <b>Energy calculation setting - Active/Inactive</b> to set <b>Active</b> .

Item	Phenomenon	Check	Action
5	Power consumption/Stand-by power consumption shows zero-kilowatts.	Is Accumulation start date and time set to a future date?	Go to <b>Energy calculation setting - Accumulated data setting</b> to check Accumulation start date and time.
		Does Calculation information history window show calculation information record?	Refer to Installation and Maintenance manual for Energy Calculation Software "4. Maintenance and service".
		Is the unit calculation target?	Go to <b>Energy calculation setting - Unit data setting</b> to check setting for calculation target.
		Is unit data correctly registered?	Go to <b>Energy calculation setting - Unit data setting</b> to check all required items are registered.
		Is calculation activated?	Go to <b>Energy calculation setting - Active/Inactive</b> to set <b>Active</b> .
6	Only Stand-by electricity shows zero-kilowatts.	Is Stand-by power operation ratio method set as II method or III method?	Go to <b>Energy calculation setting - Calculation method setting</b> to check registered contents. If Stand-by power consumption ratio method is set as II method or III method, stand-by power is always zero-kilowatts.