Installation & Maintenance Manual

Energy Calculation Software

Model: CCSE01

IMPORTANT:

READ AND UNDERSTAND THIS MANUAL BEFORE USING THIS ENERGY CALCULATION SOFTWARE.
KEEP THIS MANUAL FOR FUTURE REFERENCE.

P5417069

TABLE OF CONTENTS

1. Safety Summary 3
2. Overview 4
3. Preparation 5
4. System Configuration 5
5. Setup 7
   - 5.1 Inserting SD Card 7
   - 5.2 Activating Energy Calculation Software 8
6. Energy Calculation Setting 9
   - 6.1 Software Initial Setting 9
   - 6.2 Setting and Checking Meters 10
   - 6.3 Unit Connection and Registration State 11
   - 6.4 Energy Calculation Setting 12
   - 6.5 Calculation Method Setting 13
   - 6.6 Ratio Method Setting 17
   - 6.7 Unit Data Setting 19
   - 6.8 System Setting 31
   - 6.9 Check Registration and Activating Calculation 32
7. Test Run 33
   - 7.1 Checking Pulse Count on Meter 33
   - 7.2 Creating Study Data by Controlling Unit 34
   - 7.3 Calculation 34
   - 7.4 Checking Accumulated Data 35
   - 7.5 Checking Energy Calculation Result 36
   - 7.6 Checking Usage Ratio Calculation Result 37
   - 7.7 Preparation for Actual Use 38
   - 7.8 Before Handing Over 40
8 Maintenance and Service 41
   - 8.1 Troubleshooting 41
   - 8.2 Calculation Information History 43
   - 8.3 Phenomenon Analysis and Measure 44
   - 8.4 Periodic Check 44
9. Addendum 45

Pass these manuals on to the next operator/maintenance team. Secure for safe keeping somewhere near the machine for easy access. (Installer) → (Wiring electrician) → (Operator) → (Customer)

Please carefully read this manual before installation.

This installation manual applies to CCSE01 only. Also refer to the installation manual for "VRF Central Touchscreen Controller Adapter (CCXLA01)" and "VRF Central Touchscreen Controller Software (CCSE01)" as required.

Preface

This software is intended for managing standard air conditioners combined with a "VRF Central Touchscreen Controller Adapter (CCXLA01)" (referred to as VRF Central Touchscreen Controller in this document).
Install this software in accordance with the following procedures.
Observe all precautions concurrent with the PC operation manual.

- Do not install VRF Central Touchscreen Controller with this software in following places.
  - ○ Places where oil (including machine oil) mists or streams drift.
  - ○ Places where sulfide gas form as hot spring drifts.
  - ○ Places where inflammable gas may generate or flow.
  - ○ Places where high in salt contents surrounding as coast regions.
  - ○ Places where with atmosphere of acidity and alkalinity humid place.
- In case of using a medical equipment generating electro-magnetic waves, place the equipment as the surface that is emitting electro-magnetic waves does not directly face the system.
- To avoid any influence on radiation propagation in the air, install this software at least 3m away from the medical equipment and radios that may generate electro-magnetic waves.

Safety Summary

- Please carefully read this section before installation of the software.
- Contents with "DANGER" shows the certain cases where improper operation WILL result in severe personal injury or even death. For your safety, please follow this instruction.
- After installation is completed, conduct test running to ensure that no faulty condition is detected.
- Please also ensure to backup the data according to this manual upon completing installation.

[Symbols Used in This Manual]

⚠ DANGER : Immediate hazards which WILL result in severe personal injury or death.

⚠ CAUTION : Hazards or unsafe practices which could result in minor personal injury or product or property damage.

NOTE: This sign indicates other alert information than DANGER.

NOTICE: Useful information for operation and/or maintenance.

▬ Installation and Electrical Work ▬

⚠ DANGER

- Contact your distributor or qualified engineer for Installation work. Improper installation can cause electric shock, fire, or unexpected accidents.
- To avoid any electric shock or accident, ask the distributor to have electrical work done by qualified electrician.
- This system is for computer use only. If using with a general audio or music reproducing device, depending on the high level of sound, it may result in device damage or effects on the body.

⚠ CAUTION

- Do NOT expose this system in direct sunlight or keep it in a place where there is a high temperature or humidity.

1. Safety Summary

Important Notice

- This system calculates the value of meters according to the actual usage on each indoor/outdoor/facility 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 well to use this software.
- This system correctly calculate according to ratio only when all of VRF Central Touchscreen Controller, VRF Central Touchscreen Controller Adapter and their peripheral are correctly connected and operating. Electricity may not be correctly calculated upon device failure. Discuss the solution and its measure for inappropriate calculation output (such as establishing specific independent calculation system) with customer beforehand.
- Note that if the pulse is counted via external input, pulse cannot be accumulated during power off and connection checking. This may affect usage calculation and charging ratio. Discuss the solution and its measure for inappropriate calculation output with customer beforehand.
- Go to Energy calculation setting to select [Calc. start] to utilize energy calculation.
  (Do not remove the SD card with software included.)
- This software do the calculation and save the result every day/hour. Calculation and data saving will take place at 0:00-1:30 if everyday calculation was specified.
  Do not remove the SD card with software included while saving calculation result or the result data on the last day will not be saved. Unsaved data will be recalculated and saved on the next day.
  Calculation and data saving will take place at :00 - 30 if everyday calculation was specified.
  Do not remove the SD card with software included while saving calculation result or the result data on the last hour will not be saved. Unsaved data will be recalculated and saved at the following hour.
- Some units may or may not support all ratio methods.
  (Refer to page 13 “6.5 Calculation method setting” for detail.
- Correct calculation result cannot be expected if meter registration, if any, on this software is not correct. Ensure that the meter registration on this software is correct.
- The window image may differ from the actual window figure.
- Terms

  ■ Output type

  This software provides 2 types of output format. See the following table.

Output Type	Description
Electricity Ratio	Output usage data according to the data on meters.
Usaga Ratio	Output usage ratio data without the data on meters.

  ■ GHP: GHP stands for Gas Heat Pump

  ■ EHP: EHP stands for Electric Heat Pump

  ■ Facilities: Indicates units controlled and monitored via external in/output function of VRF Central Touchscreen Controller.

  ■ Meters: Indicates all electricity meters, gas meters, and water meter connected to this system.

2. Overview

This section describes how to setup, set ratio calculation and test run. Follow the steps illustrated below. Ensure that the setup on both VRF Central Touchscreen Controller and VRF Central Touchscreen Controller Adapter are successfully completed. Also ensure that the preparation (see the next page) has been completed.

Procedure	Electricity Ratio (Use pulse accumulator or external input.)	Usage Ratio Calculation (Without Pulse Accumulator or External Input)
5. Setup		
5.1 Inserting SD Card Slot	○	○
5.2 Activating Energy Calculation Software	○	○
↓		
6. Energy Calculation Setting		
6.1 Software Initial Setting	○	○
6.2 Setting and Checking Meters	○	—
6.3 Unit Connection and Registration State	○	○
6.4 Rate Setting	○	—
6.5 Calculation Method Setting	○	—
6.6 Ratio Method Setting	—	○
6.7 Unit Data Setting	○	○
6.8 System Setting	○	○
6.9 Check Registration and Activating Calculation	Δ	—
↓		
7. Test Run		
7.1 Checking Pulse Count on Meter	○	—
7.2 Creating Study Data by Controlling Unit	○	○
7.3 Calculation	○	○
7.4 Checking Accumlated Data	○	○
7.5 Checking Energy Calculation Result	○	—
7.6 Checking Usage Ratio Calculation Result	—	○
7.7 Preparation for Actual Use	○	○

○ : Indicates this item is required. Ensure to register/check this item.
— : Indicates this item is optional. Registration or checking is not required.
Δ : Indicates this item is optional. Set this item as necessary.

3. Preparation

Prepare for the test run by following the steps below. These preparation will facilitate setup procedures. Data for system configuration, calculation method, pulse rate and area/block/group name are required for the preparation. Fill in the result of preparation on page 45 “5. Addendum Data Sheet” for reference during test run.

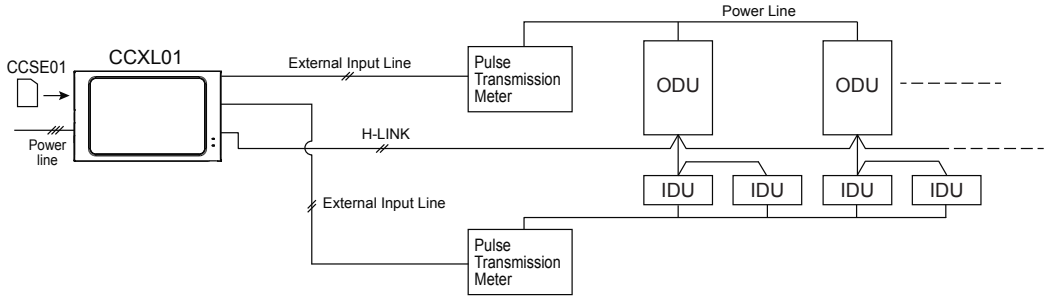
(1) Fill in the meter reading data and retio method/usage ratio method on page 45 “Data Sheed (1/5)”. (Write/type calculation method for usage ratio)

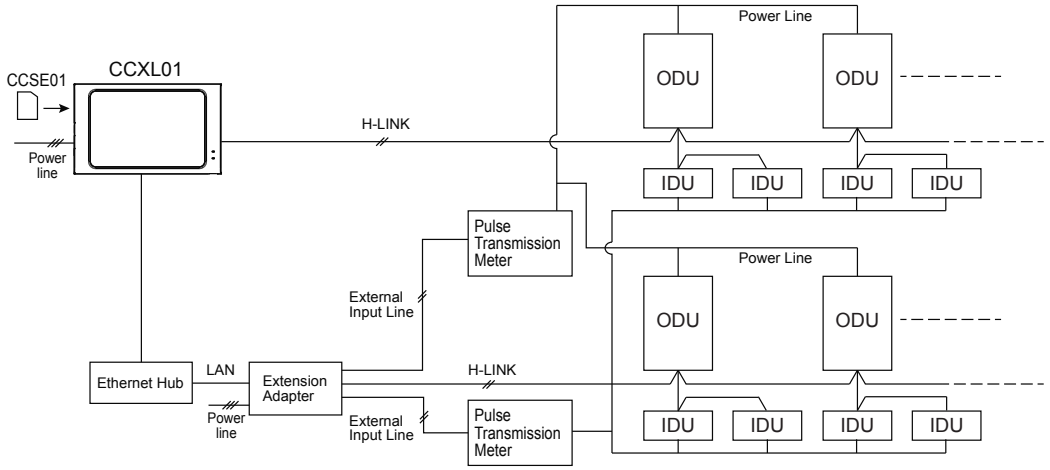
(2) Fill in the unit data setting values on page 46-48 “Data Sheet (2/5-4/5)”. Regarding setting items and how to check, refer to page 19 “6.7 Unit Data Setting”.

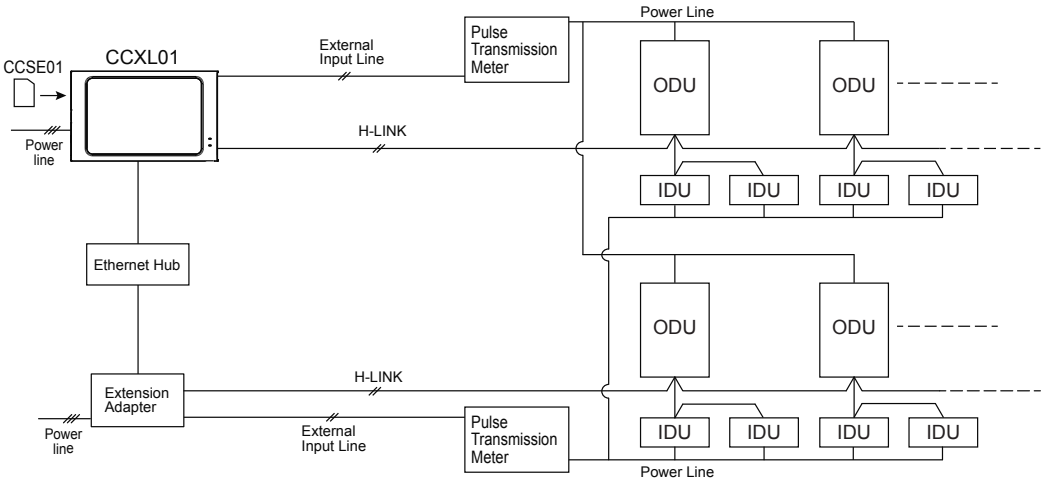
(3) Fill in the pulse rate on page 49 “Data Sheet (5/5)”. (Not required for usage ratio calculation)

4. System Configuration

Sample system configuration is as follows. This installation and maintenance manual is exclusively for CCSE01. Also refer to installation and maintenance manual for other air conditioners and devices connecting to the system.







NOTICE:

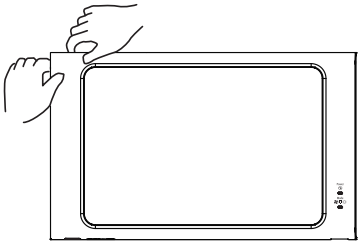
1. This software is intended for use with VRF Central Touchscreen Controller (CCXL01) only.
2. Up to 15 Extension Adapters (CCXLA01) can be connected to a system.
3. Ethernet® is a registered trademark of Fuji Xerox Co., Ltd.
4. This software always expect power meter connected to indoor units. Successful 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.

5. Setup

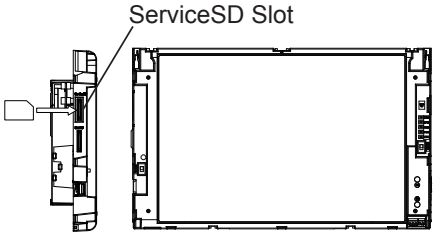
5.1 Inserting SD Card

Insert the SD card with software included to VRF Central Touchscreen Controller to activate Energy calculation function. Follow instructions to insert SD card to the slot.

(1) Remove the top cover of VRF Central Touchscreen Controller.



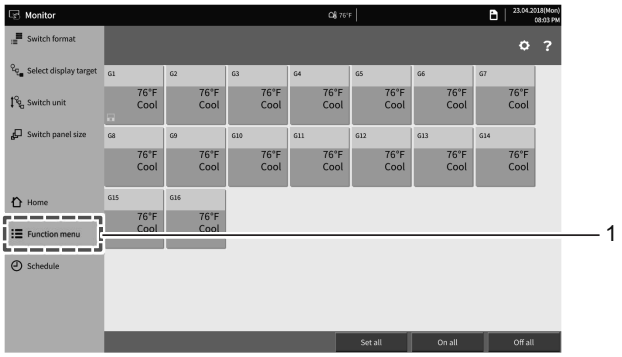
(2) Insert the SD card enbedded with this software to ServiceSD slot.



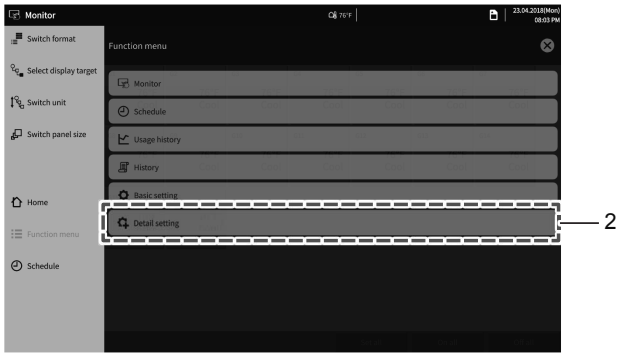
NOTICE:

- Do NOT insert the SD card with software included other than the designated SD card slot. Once inserted, do not remove this SD card while VRF Central Touchscreen controller is operating.

5.2 Activating Energy Calculation Software

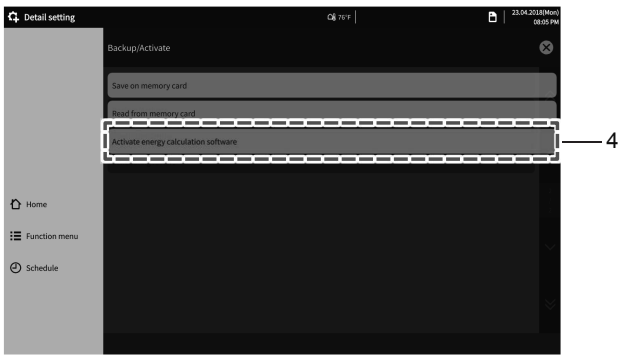


1. Tap **Function Menu**.
   Function Menu window is shown.



2. Tap **Detail setting**.
   Password input window is shown if the password is activated.
   The default password for detail setting window is “2468”.
   After entering password, detail setting window is shown.

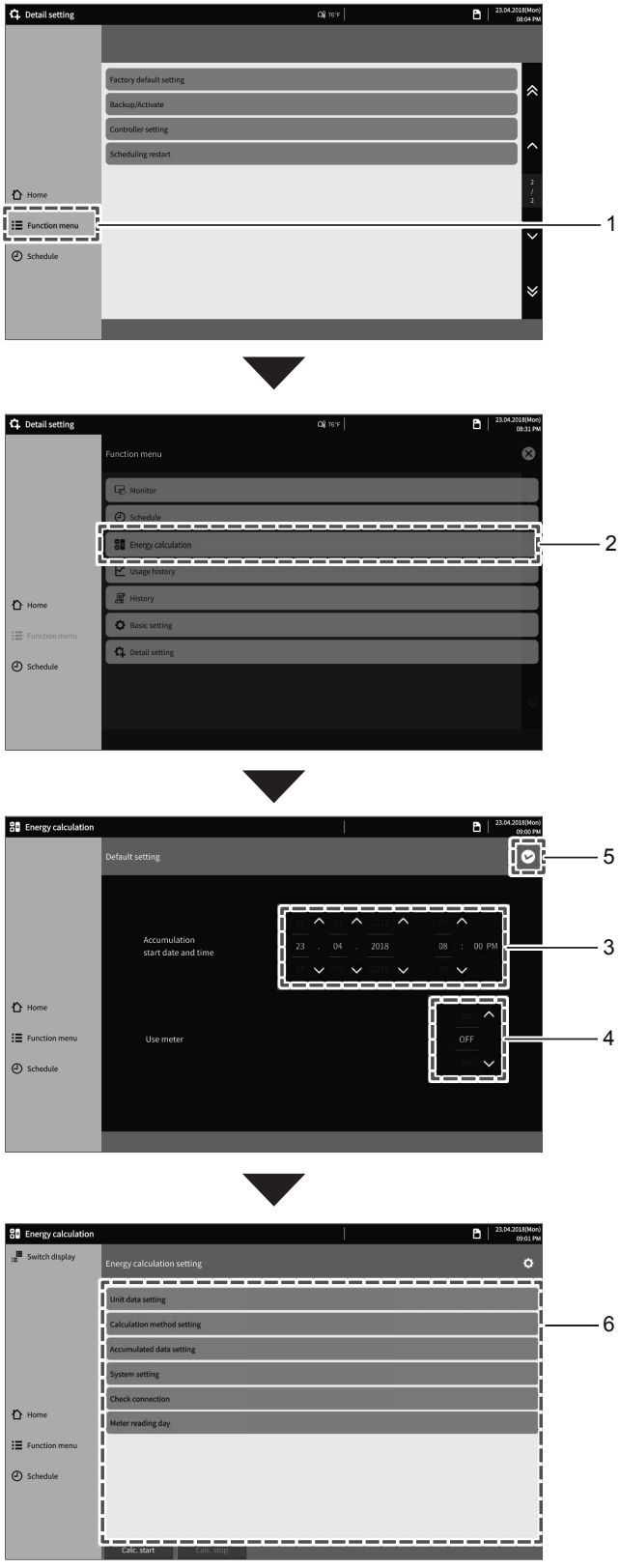
3. Scroll the page down and tap **Backup/Activate**.
   Backup/Activate window is shown.



4. Tap **Activate energy calculation software**. Energy calculation software then is ready to use.

6. Energy Calculation Setting

6.1 Software Initial Setting



1. Tap **Function Menu**.
   Function Menu window is shown.

2. Tap **Energy calculation**. Initial setting for energy calculation window is shown.
   This section is protected with a password by default.
   The default password is “2468”.

3. Tap ∧ or ∨ to set starting date and time for calculation.

4. Tap ∧ or ∨ and select **ON** to use meters for energy calculation (electricity ratio).
   If meters are not in use (usage ratio), select **OFF**.

5. Tap ✓ to confirm setting and to show Energy calculation setting window.

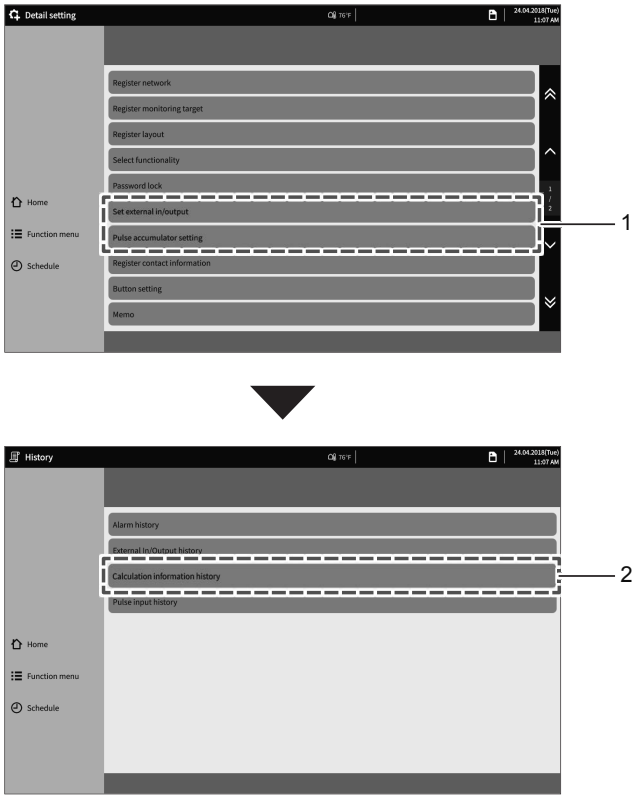
6. Displayed items may differ depending on whether or not meters are in use. Tap desired item to show detail window.

NOTICE:

● To modify accumulation start date, refer to page 38 “7.7 Preparation for actual use”.

6.2 Setting and Checking Meters

Set meters on external input.
To use electricity ratio, 3rd-party meters (electricity meter, gas meter or water meter) need to be connected for calculating electricity, gas or water amount based on values on the meters.

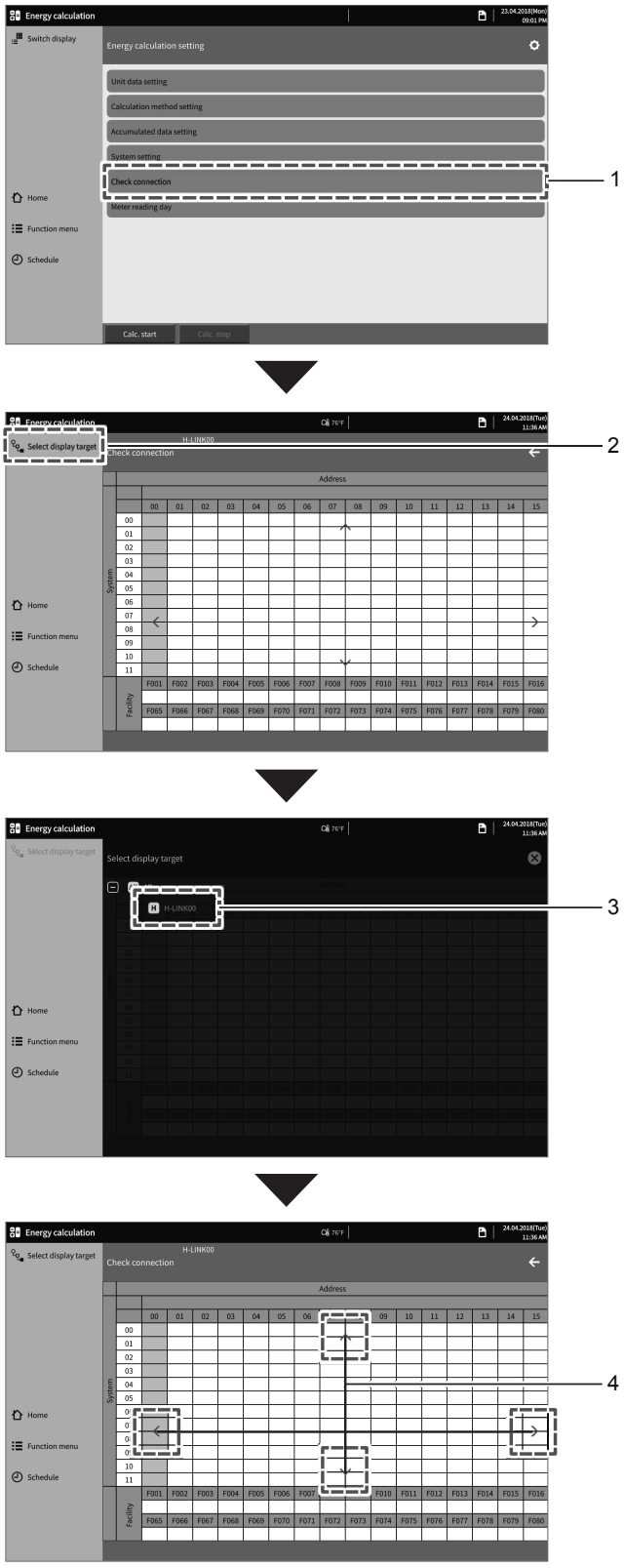


1. Tap **Detail setting** - **External in/ output setting** to set meters. Refer to installation manual and operation manual for detail.
   - To set meters on external input, only standard set point “si001~004” are available.
   - Do not use “Pulse accumulator setting”.

2. Tap **History** - **Pulse input history** to check the pulse is correctly counted. Refer to operation manual for detail of checking procedure.

6.3 Unit Connection and Registration State

Check unit connection and registration state. Cells for each unit are shown in blue (meaning it is set as calculation target).



1. Tap **Check connection**.
   Connection status window is shown.

2. Tap **Select display target**.
   Select Display Target is shown.

3. Tap name of the desired VRF Central Touchscreen Controller/Extension adapter.
   Connection status for the selected target is shown.

4. Touch window and button to scroll (both horizontally and vertically) the table appears. Tap the button to check unit connection and registration state. The meaning of back ground color for each sell is as follows:
   ■ Light blue: This unit is set as calculation target
   ■ Yellow: This unit is not set as calculation target

- The value in the cell indicates Group No. The white blank indicates the unit does not exist.

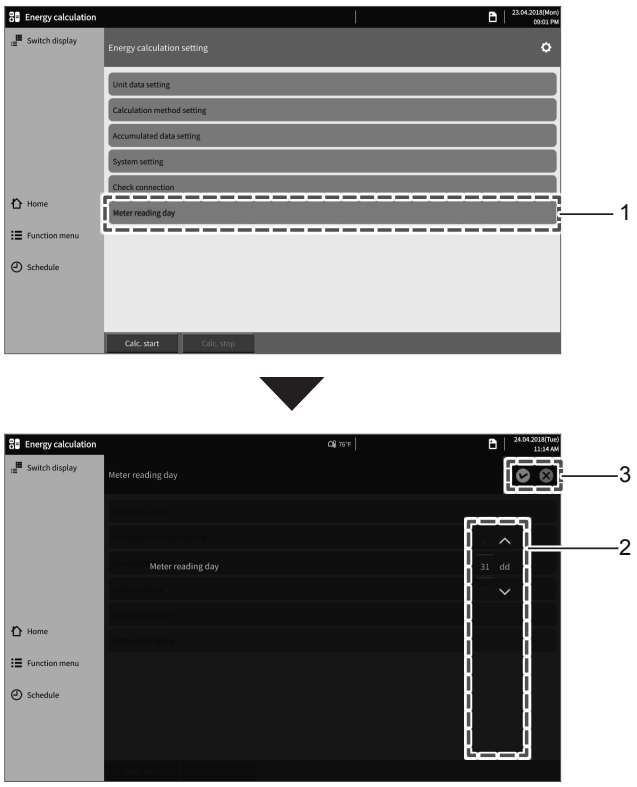
NOTICE:

- The system may not correctly operate when the Group No is not shown. Ensure that the all units are registered in Group/Block/Area.

6.4 Energy Calculation Setting

Set unit price for electricity to show total price. Registration items for rating setting are as follows:
Meter reading day: This is used as a standard date for showing power consumption data.

(1) Meter reading day



1. Tap **Meter reading day**.
   The window for meter reading day setting is shown.

2. Tap ∧ or ∨ to change setting.

   ■ Meter reading day: Set closing date from the range of 1 - 31.

3. Tap ✓ to confirm setting and to return to Energy calculation setting window.
   Tap ✗ to discard the change and to return to Energy calculation setting window.

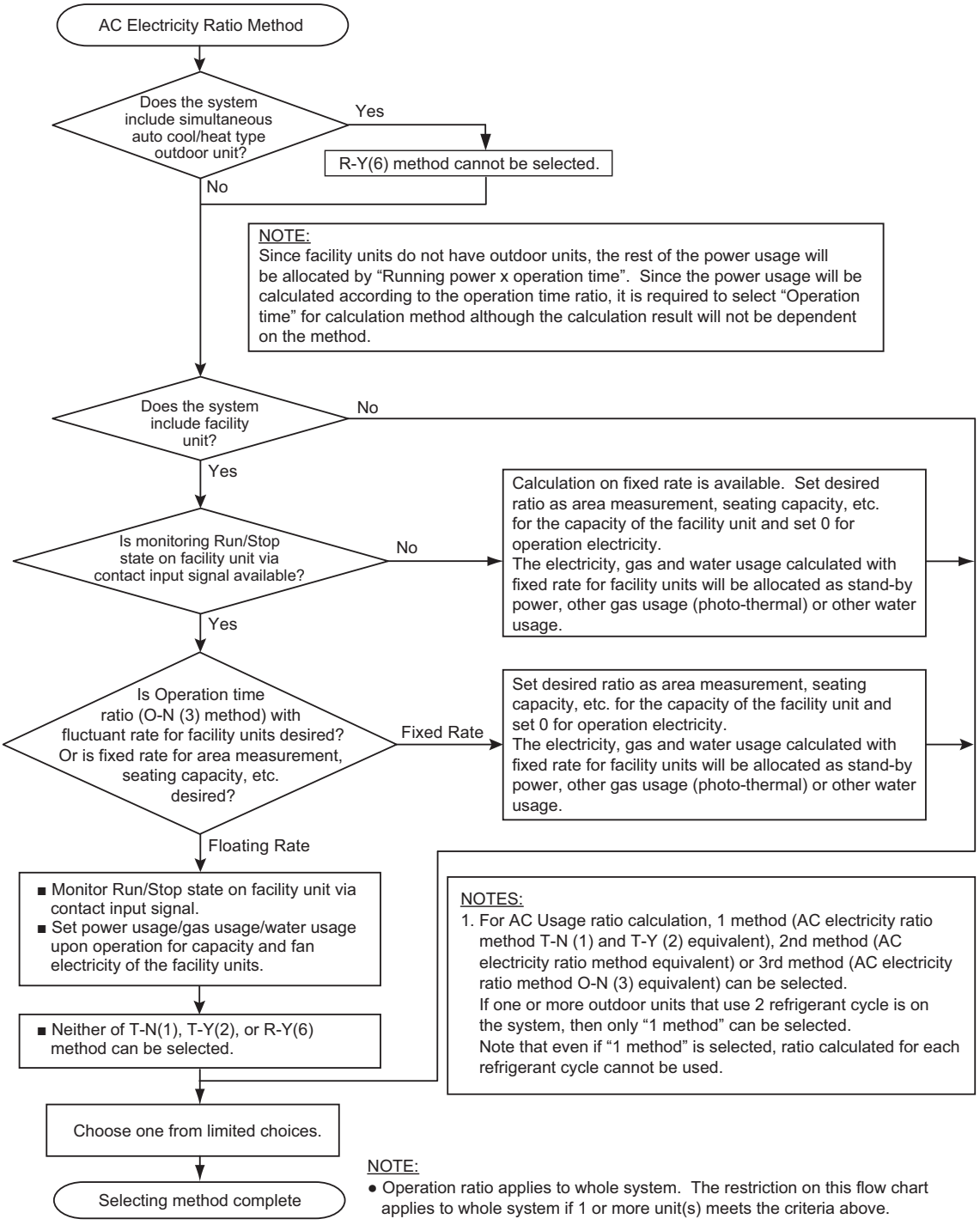
NOTICE:

- Metering closes at 11:59 PM on the meter closing day.
- The date is calibrated to the last day of the month if 29 ~ 31 is specified but the date does not exist in the month.
- Set 31 for closing date if metering is desired to be closed on the last day of each month.

6.5 Calculation Method Setting

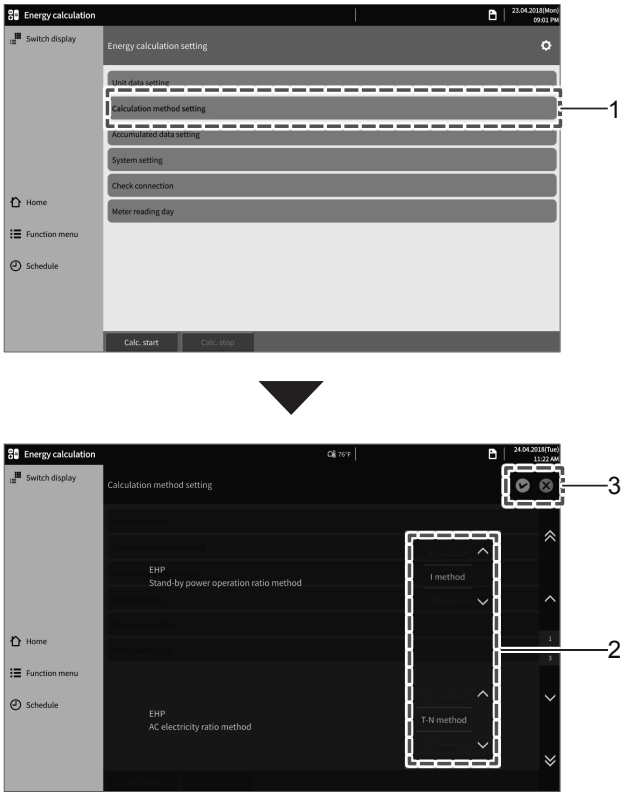
Select calculation method for electricity ratio.

Flow Chart for Selecting Calculation Method



NOTE:

- Operation ratio applies to whole system. The restriction on this flow chart applies to whole system if 1 or more unit(s) meets the criteria above.



1. Tap **Calculation method setting**. Calculation method setting window is shown.

2. Tap ∧ or ∨ to change setting. Regarding the setting item for each method, refer to the following.
3. Tap ✔ to confirm setting and to return to energy calculation setting window. Tap ✕ to discard the change and to return to energy calculation setting window.

Characteristic of calculation method [Electricity (Gas) ratio calculation].

(1) Stand-by power operation ratio method select how the stand-by power; the electricity consumed by air conditioners just being turned ON, regardless of its operating state, is calculated for each air conditioner. The electricity calculated with fixed rate for facility units are treated as stand-by power.

I method Calculate the stand-by power using ratio for indoor unit capacity.

Characteristics

■ The actual Stand-by electricity is calculated for each indoor unit.

■ Indoor units in vacant room (or that did not operate) is charged for stand-by power.

II method Includes stand-by power in power usage and then calculate with AC electricity ratio method/ AC gas amount ratio method.

Characteristics

■ Indoor units in vacant room (or that did not operate) is not charged. Note that if none of the air conditioners operated, the indoor unit (that did not operate) is charged according to the capacity.

■ Also note that if only one unit operates while all the other did not, all the stand-by power is charged to the one air conditioner that had operated.

III method Stand-by power is calculated separately.

Characteristics

■ Power consumption is not calculated for each unit. Discussion on how to allocate the charged amount before hand is necessary.

(2) AC electricity ratio method Specify how the power consumption on outdoor units are allocated to indoor units.

■ This value and power consumption on indoor units consists total power usage.

T-N (1) Method

Thermo-on time (indoor unit) x Capacity (indoor unit). (This value depends solely on thermo-on time and capacity on indoor unit. The refrigerant cycle is completely disregarded.)

Characteristics

■ The rate is similar on indoor units that have close values for thermo-ON time and capacity because the amount is calculated regardless of the refrigerant cycle that the unit belongs.

■ The actual electricity usage may differ from calculated amount because the amount is calculated regardless of the refrigerant cycle that the unit belongs.

T-Y (2) Method

Thermo-on time (indoor unit) x Capacity (indoor unit) x Operation ratio calculation result for the refrigerant cycle

Characteristics

■ The actual electricity usage may differ from calculated amount because the amount is calculated regardless of the refrigerant cycle that the unit belongs.

■ The rate on the units with same capacity and thermo-ON time may differ depending on which refrigerant cycle (outdoor unit) that the unit is connected to.

O-N (3) Method

Thermo-on time (indoor unit) x Operation time (indoor unit). (This result is solely calculated with IDU thermo-on time x IDU operation time and is not the result of each refrigerant cycle/outdoor unit.).

Characteristics

■ Usage is allocated according to operation time for users to easily understand.

■ In this method, all the setting temperature is disregarded. Indoor units with the same capacity may have close values regardless of setting temperature for energy saving purpose.

R-Y (6) Method

Refrigerant flow amount (indoor unit) x Operation ratio calculation result for the refrigerant cycle

Characteristics

■ Since the rate is calculated according to the refrigerant cycle and refrigerant flow, the rate is close to the actual usage.

■ The rate may not be clear for the users (refrigerant cycle and refrigerant flow do not appear obvious).

● Setting Sample

Each Ratio method has characteristics. See the following table to set calculation method.

Criteria	Ratio Method			
	T-N(1)	T-Y(2)	O-N(3)	R-Y(6)
No vacant rooms. Or all indoor units operate equally.	△	○	△	○
One or more vacant room(s). Or some units frequently operate.	○	△	○	△
Power consumption is desired to be allocated by the operation.	×	×	○	×
Power consumption is desired to be allocated by thermo-ON.	○	○	×	×
Power consumption is desired to be allocated by actual.	△	△	×	○

○: Recommended △ : Reasonable ×: Not Recommended

NOTICE:

- The table above is an example. It is not mandatory to follow the table.
- Select most favorable method for the user.

(3) Heat storage electricity ope. ratio method Specify how the power consumption on outdoor units and heat storage units are allocated.

■ Total amount is calculated according to this method.
■ This method cannot be selected if no heat storage units are connected.
■ For heat storage electricity ope. ratio method, A method is fixed.

A method

Electricity consumed for heat storage during night time is allocated for units that used stored heat for operation.

Characteristics

■ The rate for refrigerant cycle with heat storage units connected is reduced.
■ The rate for refrigerant cycle without heat storage units connected is not reduced.

(4) AC gas amount ratio method Specify how the gas usage and power consumption for outdoor fan are allocated to indoor units.

■ This method cannot be selected if no GHP units are connected.

T-N (1) Method

Thermo-on time (indoor unit) x Capacity (indoor unit).
(This value depends solely on thermo-on time and capacity on indoor unit. The refrigerant cycle is completely disregarded.)

Characteristics

■ The rate is similar on indoor units that have close values for thermo-ON time and capacity because the amount is calculated regardless of the refrigerant cycle that the unit belongs.
■ The actual gas usage (outdoor fan electricity) may differ from calculated amount because the amount is calculated regardless of the refrigerant cycle that the unit belongs.

O-N (3) Method

Operation time (indoor unit) x Capacity (indoor unit).
(This value depends solely on thermo-on time and capacity on indoor unit. The refrigerant cycle is completely disregarded.)

Characteristics

■ Usage is allocated according to operation time for users to easily understand.
■ The gas usage (outdoor fan electricity) is similar on indoor units that have close values for operation time and capacity because the amount is calculated regardless of the refrigerant cycle that the unit belongs.
■ In this method, all the setting temperature is disregarded. Indoor units with the same capacity may have close values regardless of setting temperature for energy saving purpose.

● Setting sample Each Ratio method has characteristics.
See the following table to set calculation method.

Criteria	Ratio Method	
	T-N(1)	O-N(3)
No vacant rooms. Or all indoor units operate equally.	△	△
One or more vacant room(s). Or some units frequently operate.	○	○
Power consumption is desired to be allocated by the operation.	×	○
Power consumption is desired to be allocated by thermo-ON.	○	×
Power consumption is desired to be allocated by actual.	△	×

○: Recommended △: Reasonable ×: Not Recommended

NOTICE:

● The table above is an example. It is not mandatory to follow the table.
● Select most favorable method for the user.

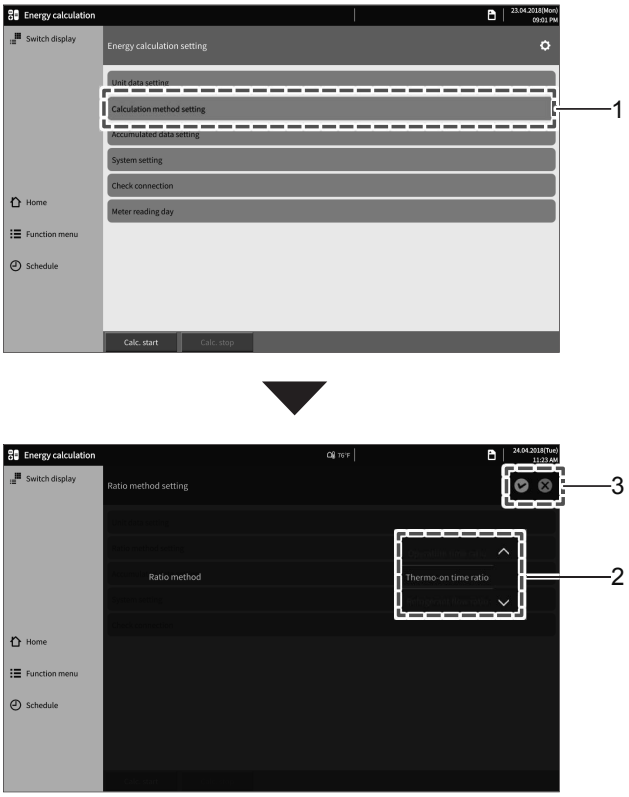
(5) Power/Gas/water operation ratio method Select one ratio method for facility units. O-N (3) Method fixed.

O-N (3) Method Electricity is calculated by the ratio of operation time x capacity.
Electricity is calculated by the ratio of capacity if operation time could not be acquired.

NOTICE:

- Upon changing ratio method, the change takes effect from the next calculation period.
- Select one from T-N(1), T-Y(2), or O-N (3) Method for electricity ratio if Cool/Heat type outdoor unit is connected to the system.
- In calculation data table and CSV file, only the values shown in ( ) :parenthesis in installation manual are shown.
  (E.g. T-Y(2) method : only “2” is shown as operation method in calculation data table and CSV file.

6.6 Ratio Method Setting



1. Tap **Calculation method setting**. Ratio method setting window is shown.
2. Tap ∧ and ∨ to change setting. Regarding the setting item for each calculation method, refer to the following:
3. Tap ✓ to confirm setting and to return to energy calculation setting window. Tap ✗ to discard the change and to return to energy calculation setting window.

Characteristic of ratio method **Usage ratio calculation**

(1) Usage ratio calculation method Specify how the ratio on indoor unit operation is calculated.

Thermo-on time ratio (1) method

The ratio is calculated by thermo-on time and capacity of indoor unit.

Characteristics

■ The ratio is calculated by thermo-on time x capacity.

Refrigerant flow ratio (2) method

The ratio is calculated by accumulated operation electricity or accumulated outdoor load on outdoor unit and accumulated refrigerant flow on indoor unit.

Characteristics

■ The ratio is calculated by accumulated valve expansion or outdoor load x expansion valve coefficiency.

Operation time ratio (3) method

The ratio is calculated by operation time and capacity of indoor unit.

Characteristics

■ The ratio is calculated by operation time x capacity.

NOTE:

- Output result includes both ratio calculated by air conditioner operation of indoor units in the refrigerant cycle and ratio calculated by air conditioner operation of all indoor units.
  Use method appropriate for user/customer.

- Setting sample Each Ratio method has characteristics.
  See the following table to set calculation method.

Criteria	Usage Ratio Calculation		
	1 Method	2 Method	3 Method
To calculate by thermo-ON time	○	×	×
To calculate by actual operation capacity	△	○	×
To calculate by actual operation time	×	×	○

○: Recommended △ : Reasonable ×: Not Recommended

NOTICE:

- The table above is an example. It is not mandatory to follow the table.
- Select most appropriate method for the user.

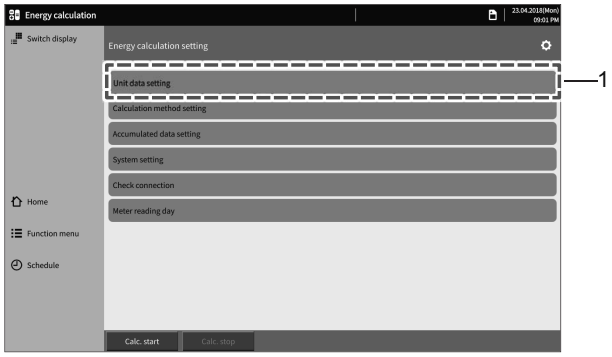
NOTICE:

- Upon changing ratio method, the change takes effect from the next calculation period.
- For the following unit, the ratio is always 0% when thermo-on time ratio (1 method) or refrigerant flow ratio (2 method) was selected.
  - Facility Unit

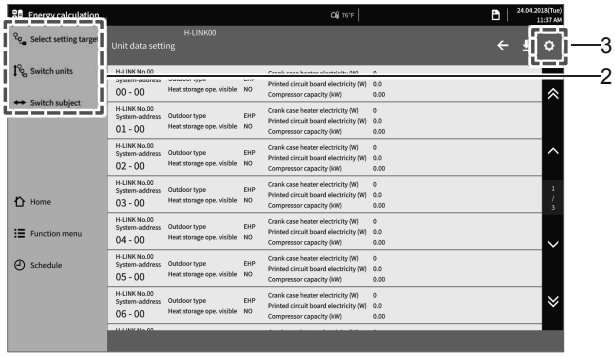
6.7 Unit Data Setting

In Unit data setting, set necessary values for ratio calculation.

(1) Checking unit data



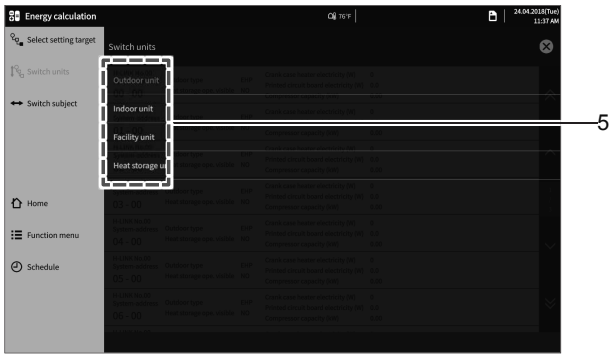
1. Tap **Unit data setting**. Unit data setting window is shown.



2. Tap item to switch display.
   - Tap **Select setting target** and step 4 is shown.
   - Tap **Switch units** and step 5 is shown.
   - Tap **Switch subject** and step 6 is shown.

3. Tap ⚙ to switch single selection mode and multiple selection mode.

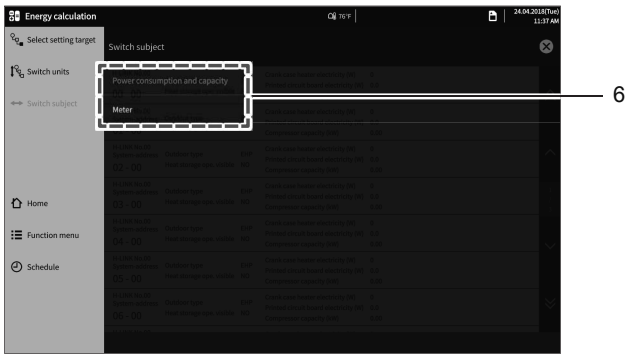
4. Tap the name of H-LINK that the unit is registered in.
   The Unit data setting window for specified VRF Central Touchscreen Controller or extension adapter is shown.



5. Tap unit to set.
   Tap unit and Unit data setting window for the specified unit is shown.

Continue to next page.

Continue from previous page.



6. Tap item to switch **Power consumption and capacity** and **Meter** display.

To register H-LINK adapter/RAC adapter, refer to each manual/service guide.
Setting items for unit data are as follow:

Outdoor Unit	Electricity ratio	Usage ratio calculation
Outdoor Type	○	○
Power Meter No.(H-LINK No., Station Address, Input No. or H-LINK No. External input number)	○	–
Gas Meter No. (H-LINK No., Station Address, Input No. or H-LINK No. External Input No.)	–	–
Crankcase Heater Electricity	○	–
Printed Circuit Board Electricity	○	–
Compressor Capacity	○	–
Compressor Heater Electricity	–	–
Drain Heater Electricity	–	–
Engine Block Heater Electricity	–	–
Heat Storage ope. Visible	○	–

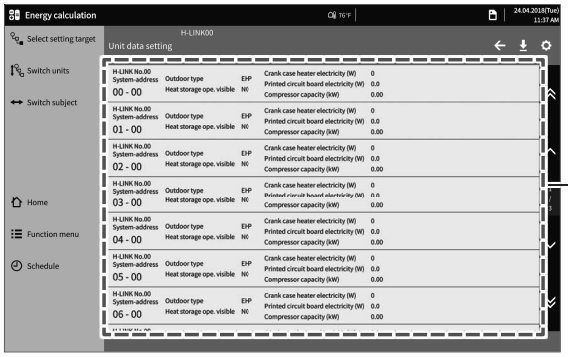
Indoor Unit	Electricity ratio	Usage ratio calculation
Calculation Target	○	○
Power Meter No.(H-LINK No., Station Address, Input No. or H-LINK No. External input number)	○	–
Ventilator Electricity	○	–
Printed Circuit Board Electricity	○	–
Heater Electricity	○	–
Expansion Valve Coefficient	○	○
Capacity	○	○
Total Heat Exchanger	○	○

Heat Storage Unit	Electricity ratio	Usage ratio calculation
Power Meter No.(H-LINK No., Station Address, Input No. or H-LINK No. External input number)	○	–
Printed Circuit Board Electricity	○	–
Expansion Valve Coefficient	○	–

Facility Unit	Electricity ratio	Usage ratio calculation
Calculation Target	○	○
Power Meter No.(H-LINK No., Station Address, Input No. or H-LINK No. External input number)	○	–
Running Power	○	–
Stand-by Electricity	○	–
Capacity	○	–

○ : Indicates this item is required. Ensure to register/check this item.
– : Indicates this item is optional. Registration or checking is not required.

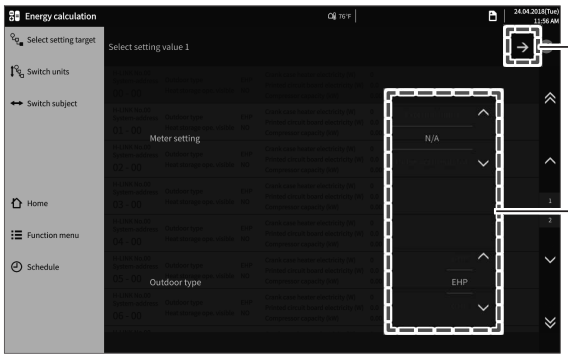
(2) Setting Unit Data



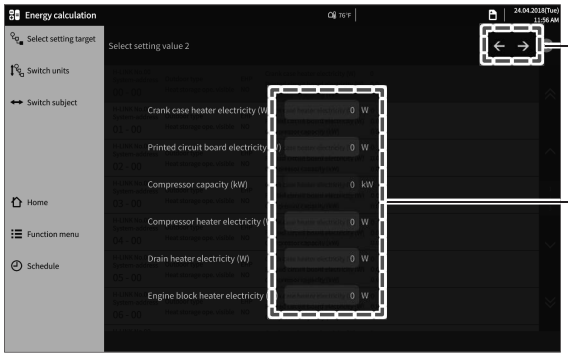
Refer to step 5 of “Checking Unit Data” (page 19) to select unit to set.

1. Tap the list for unit to set.
   Edit menu is shown.

2. Tap **Select setting value**.
   Select setting value window is shown.
   - Tap **Copy** to copy the information for the selected unit.
   - Tap **Paste** to paste the copied unit information.



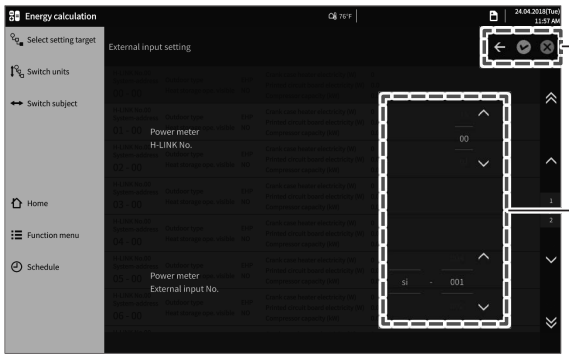
3. Tap ∧ or ∨ for each item to change setting.
   Regarding the detail of setting item, refer to the following page.
4. Tap → to proceed.



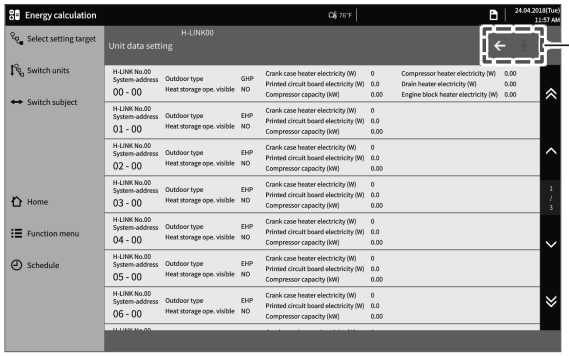
5. Tap input field for each item to enter value.
6. Tap → to proceed. Tap ← to return to the previous page.

Continue to next page.

Continue from previous page.



7. Tap ∧ or ∨ to change setting for power meter and gas meter (GHP).
8. Tap ✓ to confirm setting and return to Basic setting window.
   Tap ✗ to confirm setting and return to Unit data setting window.
   Tap ← to return to the previous page.



9. Upon completing the setting, tap ↓ to register the contents.

- Make sure to tap this icon when the contents have been changed. Otherwise the change made is not registered.
  Tap ← to return to energy calculation setting window.

Setting Items

Items	Choices	Outdoor Unit	Indoor Unit	Facility Unit	Heat Storage Unit	Electricity Ratio	Usage Ratio
						EHP	EHP
Meter Setting	Pulse Accumulator/ External Input/ No Used	(3)-(a)	(4)-(a)	(5)-(a)	(6)-(a)	○	-
Outdoor Type	GHP/EHP	(3)-(b)	-	-	-	○	○
Heat Storage Ope.	YES/NO	(3)-(c)	-	-	-	○	-
Calculation Target	N/A	-	(4)-(b)	(5)-(b)	-	○	○
Total Heat Exchanger	N/A	-	(4)-(c)	-	-	○	○

Items	Outdoor Unit	Indoor Unit	Facility Unit	Heat Storage Unit	Electricity Ratio	Usage Ratio
					EHP	EHP
Crankcase Heater Electricity	(3)-(d)	–	–		○	–
Printed Circuit Electricity	(3)-(e)	(4)-(d)	–	(6)-(b)	○	–
Compressor Capacity	(3)-(f)	–	–	–	○	–
Compressor Heater Electricity	(3)-(g)	–	–	–	–	–
Drain Heater Electricity	(3)-(h)	–	–	–	–	–
Engine Block Heater Electricity	(3)-(i)	–	–	–	–	–
Ventilator Electricity	–	(4)-(e)	–	–	○	–
Heater Electricity	–	(4)-(f)	–	–	○	–
Capacity	–	(4)-(g)	(5)-(c)	–	○	○
Expansion Valve Coefficient	–	(4)-(h)	–	(6)-(c)	○	Required for Indoor Unit
Running Power	–	–	(5)-(d)	–	○	–
Stand-by Electricity	–	–	(5)-(e)	–	○	–

Items		Outdoor Unit	Indoor Unit	Facility Unit	Heat Storage Unit	Electricity Ratio	Usage Ratio
						EHP	EHP
Power Meter External Input	H-LNK No. External Input No.	(3)-(j)	(4)-(i)	(5)-(f)	(6)-(d)	○	–

(3) Outdoor Unit Setting

(a) Meter Setting

● Required setting is as described in the following table.

Output Type	Electricity Ratio	Usage Ratio Calculation
Unit Type	EHP	EHP
Necessity	Required	Required
	Not Required	Not Required

■ Select “External Input” if electricity meter is connected.

(b) Outdoor Setting

● Required setting is as described in the following table.

Output Type	Electricity Ratio	Usage Ratio Calculation
Unit Type	EHP	EHP
Necessity	Required	Required
	Not Required	Not Required

■ Detected outdoor type is shown.

■ Ensure that the detected types match the actual outdoor unit type.

(c) Heat Storage Operation

● Required setting is as described in the following table.

Output Type	Electricity Ratio	Usage Ratio Calculation
Unit Type	EHP	EHP
Necessity	Required	Required
	Not Required	Not Required

■ Select **NO** if heat storage unit is not connected.

■ Select **YES** for the unit that heat storage operation is visible, and select **NO** for the others. Contact your distributor for the detail of heat storage operation.

(d) Crankcase Heater Electricity

● Required setting is as described in the following table.

Output Type	Electricity Ratio	Usage Ratio Calculation
Unit Type	EHP	EHP
Necessity	Required	Required
	Not Required	Not Required

■ This setting is not required if II method (stand-by power is included in electricity usage) is selected.

■ Set the total crank case heater electricity amount of units connected to the 0th unit if multiple units are connected to the same refrigerant cycle.

■ Refer to Engineering manual for Heat Pump and Heat Recovery outdoor units [(H,Y)VAHP(R)83(4)2S] to set the output value for crank case heater.

■ The value needs to be unsigned integer in the range of 1 - 9999. If the value on the engineering manual has 1 or more decimal places, round the number off to the integer.

(e) Printed Circuit Board Electricity

● Required setting is as described in the following table.

Output Type	Electricity Ratio	Usage Ratio Calculation
Unit Type	EHP	EHP
Necessity	(Required)	Required
	Not Required	(Not Required)

■ This setting is not required if II method (stand-by power is included in electricity usage) is selected.

■ Set the total printed circuit board electricity amount of connected units if multiple units are connected to the same refrigerant cycle.

■ Refer to the following table to find the value.

・Printed Circuit Board Electricity (Outdoor Unit)

Type	Printed circuit board power consumption (W) Frequency (50Hz)	Printed circuit board power consumption (W) Frequency (60Hz)
Side Flow	9.0	9.0
Top Flow	3.3	3.3

(f) Compressor Capacity

● Setting for these items are not required.

(g) Compressor Heater Electricity

● Setting for these items are not required.

(h) Drain Heater Electricity

● Setting for these items are not required.

(i) Engine Block Heater Electricity

● Setting for these items are not required.

(j) Power Meter No.

● Required setting is as described in the following table.

Output Type	Electricity Ratio	Usage Ratio Calculation
Unit Type	EHP	EHP
Necessity	(Required)	Required
	Not Required	(Not Required)

■ Correct calculation result cannot be expected if power meter registration, if any, on this software is not correct. Ensure that the power meter registration on this software is correct.

■ Set H-LINK No (0-15) of the adapter that is connected to external input *1 to H-LINK No field.

■ Set external input number (si-001 ~ 004) for external input *1

*1: The external input device that is counting pulse of the power meter for the indoor unit.

(k) Gas Meter No. (GHP)

● Setting for these items are not required.

(4) Indoor Unit Setting

(a) Meter Setting

● Required setting is as described in the following table.

Output Type	Electricity Ratio	Usage Ratio Calculation
Necessity	Required	Required
	Not Required	Not Required

■ Select “External Input” if electricity meter is connected.

(b) Calculation Target

● Required setting is as described in the following table.

Output Type	Electricity Ratio	Usage Ratio Calculation
Necessity	Required	Required
	Not Required	Not Required

Electricity ratio

■ Select **Target** if electricity shall be allocated on this indoor unit.

■ Select **Not applicable** if electricity shall NOT be allocated on this indoor unit.

■ Select **Not applicable** if electricity shall NOT be allocated on this indoor unit.

■ Other setting for this indoor unit is not required if **Not applicable** is set.

Usage ratio calculation

■ Select **Target** if usage ratio on this indoor unit shall be calculated.

■ Select **Not applicable** if usage ratio on this indoor unit shall NOT be calculated.

■ Other setting for this indoor unit is not required if **Not applicable** is set.

(c) Total Heat Exchanger

● Required setting is as described in the following table.

Output Type	Electricity Ratio	Usage Ratio Calculation
Necessity	Required	Required
	Not Required	Not Required

■ Select [NO].

(d) Printed Circuit Board Electricity

● Required setting is as described in the following table.

Output Type	Electricity Ratio	Usage Ratio Calculation
Necessity	Required	Required
	Not Required	Not Required

■ This setting is not required if II method (stand-by power is included in electricity usage) is selected.

■ Refer to the following table to find the value.

・Printed Circuit Board Power Consumption (Indoor Unit)

Type	Printed circuit board power consumption (W) Frequency (50Hz)	Printed circuit board power consumption (W) Frequency (60Hz)
4-way cassette, On wall type (capacity 50 or larger)	4.7	4.7
Other	10.0	9.8

・Printed Circuit Board Power Consumption (CH Unit)

Type	Printed circuit board power consumption (W) Frequency (50Hz)	Printed circuit board power consumption (W) Frequency (60Hz)
CH unit	3.6	3.2
CH unit for top flow	2.5	2.5

■ If CH unit is in use, add printed circuit board power consumption on CH unit and on indoor unit that uses CH unit. If 2 or more indoor unit uses 1 CH unit, divide printed circuit board power consumption by indoor unit numbers and then add the number to printed circuit board power consumption on each indoor unit.

Example 1: One 4-way cassette type indoor unit and one CH unit (50 Hz)
4.7 + 3.6 = 8.3 (Printed circuit board electricity on one indoor unit)

Example 2: Two 4-way cassette type indoor unit and one CH unit (50 Hz)
4.7 + (3.6 ÷ 2) = 6.5 (Printed circuit board electricity on one indoor unit)

(e) Fan Electricity

● Required setting is as described in the following table.

Output Type	Electricity Ratio	Usage Ratio Calculation
Necessity	Required	Required
	Not Required	Not Required

■ Refer to Engineering manual for Heat Pump and Heat Recovery outdoor units [(H,Y)VAHP(R)83(4)2S] to set the output value for Fan Motor Output (Pole) motor".

■ This value need to be in the range from 0.001 to 9.999, in three decimal places If the value on the engineering manual has 4 or more decimal places, round the number off to 3 decimal places.

(f) Heater Electricity

● Required setting is as described in the following table.

Output Type	Electricity Ratio	Usage Ratio Calculation
Necessity	(Required)	Required
	Not Required	(Not Required)

■ Set 0 for heater less.

■ Refer to the values prescribed by local manufacturer of auxiliary heater.

■ This value need to be in the range from 0.1 to 99.9, in one decimal places. If the value on the engineering manual has 2 or more decimal places, round the number off to 1 decimal places.

(g) Capacity

● Required setting is as described in the following table.

Output Type	Electricity Ratio	Usage Ratio Calculation
Necessity	(Required)	(Required)
	Not Required	Not Required

■ Check if the value matches capacity of the unit.

■ Correct the capacity if the value is incorrect.

■ Set the correct capacity when blank is shown.

■ Set the correct capacity if the value contains " / " or "-".

NOTE:

● Unit corresponding set capacitance values are shown here.

Capacity (kBtu/h)	Value to set in Capacity
006	22
008	28
012	40
015	56
018	71
024	90
030	112
036	140
048	160

(h) Expansion Valve Coefficient

● Required setting is as described in the following table.

Output Type	Electricity Ratio	Usage Ratio Calculation
Necessity	Required	Required
	Not Required	Not Required

■ Data will be according to the table below.

Capacity (kBtu/h)	Expansion valve coefficient
0	0
001 to 015	1
018 to 030	2.12
036 or more	2.52

NOTICE:

● Use capacity of the connected unit to set expansion valve setting.
Ensure that the value on (g) is correct if detected capacity (on (g)) is to be used.

(i) Power Meter No.

● Required setting is as described in the following table.

Output Type	Electricity Ratio	Usage Ratio Calculation
Necessity	Required	Required
	Not Required	Not Required

■ Correct calculation result cannot be expected if power meter registration, if any, on this software is not correct. Ensure that the power meter registration on this software is correct.

■ Set H-LINK No (0-15) of the adapter that is connected to external input *3 to H-LINK No field.

■ Set external input number (si-001 ~ 004) for external input *3.

*3: The external input device that is counting pulse of the power meter for the outdoor unit.

(5) Facility Unit Setting

(a) Meter Setting

● Required setting is as described in the following table.

Output Type	Electricity Ratio	Usage Ratio Calculation
Necessity	Required	Required
	Not Required	Not Required

■ Select “External Input” if meter is connected.

(b) Calculation Target

● Required setting is as described in the following table.

Output Type	Electricity Ratio	Usage Ratio Calculation
Necessity	Required	Required
	Not Required	Not Required

Electricity Ratio

■ Select **Target** if electricity shall be allocated on this facility unit.

■ Select **Not applicable** if electricity shall NOT be allocated on this facility unit.

■ Select **Not applicable** if electricity shall NOT be allocated on this facility unit.

■ Other setting for this facility unit is not required if **Not applicable** is set.

Usage Ratio Calculation

■ Select **Target** if usage ratio on this facility unit shall be calculated.

■ Select **Not applicable** if usage ratio on this facility unit shall NOT be calculated.

■ Other setting for this facility unit is not required if **Not applicable** is set.

(c) Capacity

● Required setting is as described in the following table.

Output Type	Electricity Ratio	Usage Ratio Calculation
Necessity	Required	Required
	Not Required	Not Required

■ Set power usage/gas usage/water usage upon operation for fluctuate rate.
Set desired rate (for area measurement, seating capacity, etc.) for fixed rate.

(d) Running Power

● Required setting is as described in the following table.

Output Type	Electricity Ratio	Usage Ratio Calculation
Necessity	Required	Required
	Not Required	Not Required

■ Set power usage/gas usage/water usage upon operation for fluctuate rate. Set 0 for fixed rate.

■ This value need to be in the range from 0.001 to 9.999, in three decimal places.

(e) Stand-by Power

● Required setting is as described in the following table.

Output Type	Electricity Ratio	Usage Ratio Calculation
Necessity	Required	Required
	Not Required	Not Required

■ Set stand-by power if electricity meter is connected to the facility unit.
Set 0 if gas meter/water mater is connected to the unit.

(f) Power meter No./Gas meter No. (Photo thermal)/Water meter No.

● Required setting is as described in the following table.

Output Type	Electricity Ratio	Usage Ratio Calculation
Necessity	Required	Required
	Not Required	Not Required

■ Correct calculation result cannot be expected if meter registration, if any, on this software is not correct. Ensure that the meter registration on this software is correct.

■ Set H-LINK No (0-15) of the adapter that is connected to external input *4 to H-LINK No field.

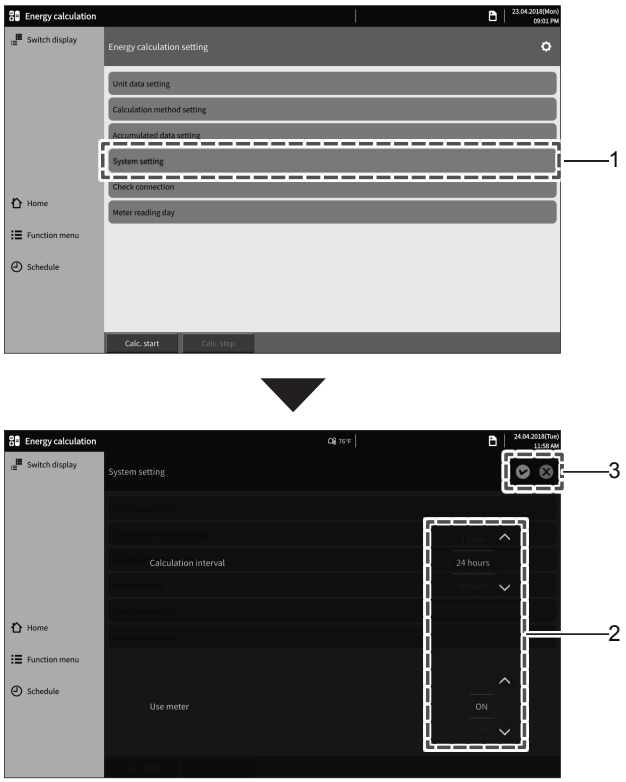
■ Set external input number (si-001 ~ 004) for external input *4

*4: The external input device that is counting pulse of the power/gas/water meter for the facility unit.

(6) Heat Storage Unit Setting

(a) Setting for these items are not required.

6.8 System Setting



1. Tap **System setting**. System setting window is shown.

2. Tap ∧ or ∨ to change setting.
   - Calculation interval: Select from “24 hour" / “1 hours” / “Manual”.
   - Use meter: Select from “ON” or “OFF”.

3. Tap ✓ to confirm setting and to return to energy calculation setting window. Tap ✕ to discard the change and to return to energy calculation setting window.

(1) Calculation interval Select calculation interval for this system.

- **1 hour**: Calculation is conducted every hour
- **24 hour**: Calculation is conducted every day after midnight.
- **Manual**: Calculation is not automatically conducted.
  Go to **Energy calculation setting** - **New data acquisition** to manually start the calculation.

(2) Use meter

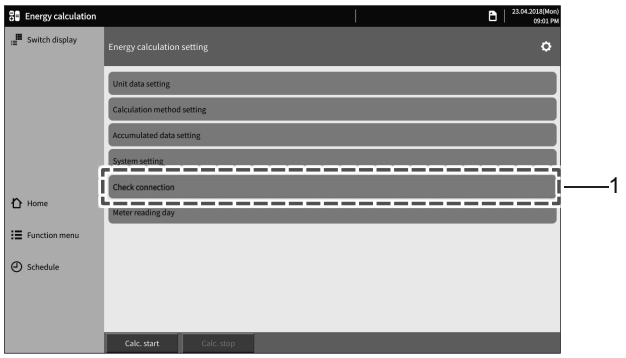
Select either to use meters on this system or not. Refer to page 9 “6.1 Software initial setting” to change setting as necessary.

- **ON**: Calculation is conducted according to the actual usage amount.
- **OFF**: Calculation is conducted according to the predetermined fixed rate.

NOTICE:

- For ratio calculation, operation ratio calculation is conducted every 1 hour / everyday to output each result file.

6.9 Check Registration and Activating Calculation



1. Tap **Check connection** to check units status and connection.
   Refer to page 11 “Unit Connection and Registration State”.
2. Tap **calc.start** to start data acquisition and ratio calculation.

Changes made is activated upon following points.

Unit data setting	On next calculation
Accumulated data setting	Immediately after setting
Ratio (calculation) method setting	On next calculation
System setting	Immediately after setting
Pulse rate setting on external input setting	On next calculation

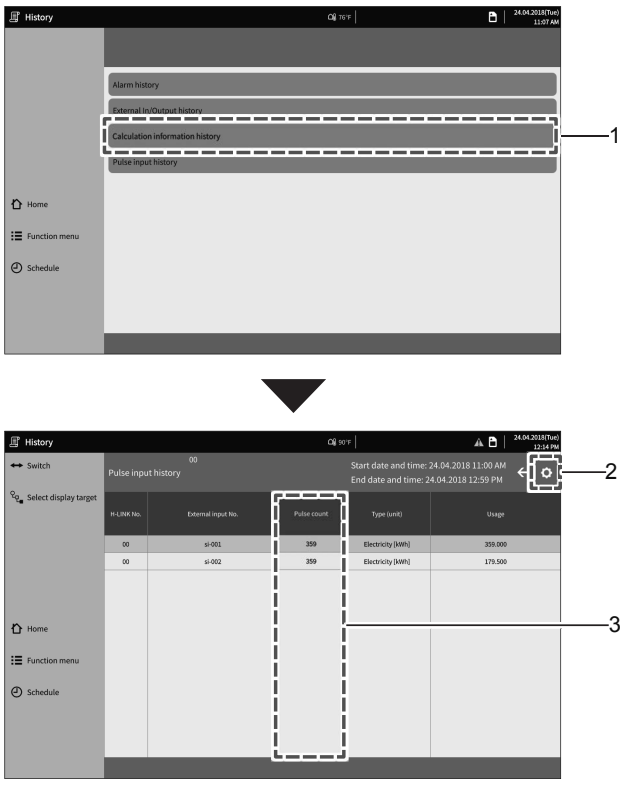
7. Test Run

7.1 Checking Pulse Count on Meter

To use electricity ratio, more than 1 pulse count is necessary to calculate electricity/gas/water usage on each unit. This is not shown if input pulse is less than 1 pulse.

- Required setting is as described in the following table.

Output Type	Electricity Ratio	Usage Ratio Calculation
Necessity	Required	Required
	Option	Option
	Not Required	Not Required



1. Tap **History** - **Pulse input history** to check the pulse is correctly counted. Refer to operation manual for detail of checking procedure.
2. Tap ⚙ and set metering period for **Period setting** and then tap **Update**.
3. Check that 1 or more pulse is counted.

NOTICE:

- If software setup completed within 1 hour from turning on the power for extension adapter ~ adapter setup (up to this page), pulse count may not have been enough counted.
  Check 1 hour or longer later.
- Meter(s) may not be correctly connected if pulse count is not shown.
  Check the wiring and connections for meters.
- If wiring and connections for meters are correct but pulse count is still not shown, then electricity usage may not be enough for the specified pulse rate.
  Run all unit on Cool/heat mode to use electricity enough to make pulse count and then check again.

7.2 Creating Study Data by Controlling Unit

Upon test run for energy calculation, operation data for longer than 1 hour is required. Also each unit needs to have respective running time for clear energy calculation result. To create data with each unit having individual running time, follow the steps below.

- Control (operate) air conditioner unit from monitor window of VRF Central Touchscreen Controller.

(1) Run all unit at “Cool 66°F” or “Heat 86°F” to make all units thermo-on.

NOTE:

Start accumulation of running time / thermo-on time / refrigerate flow by this step.

(2) Wait until clock hits XX:00 (o’clock).

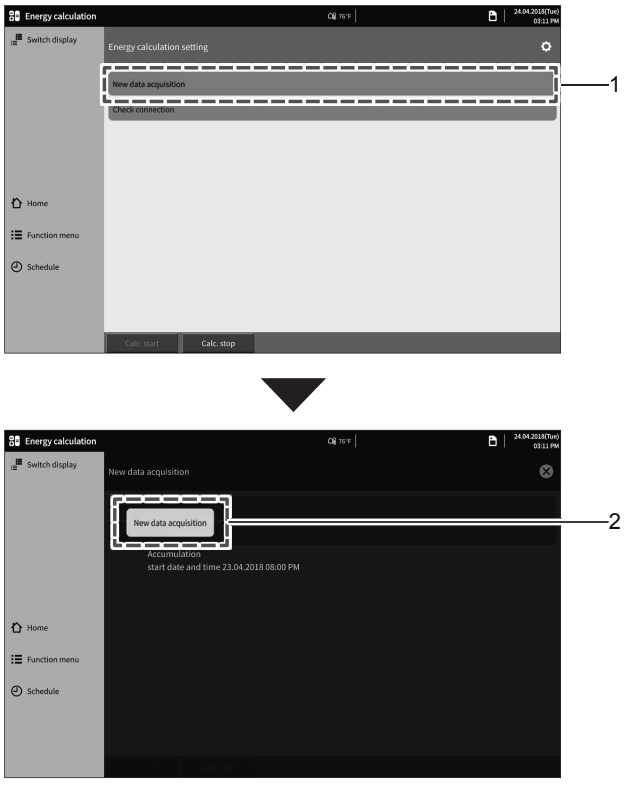
(3) After clock hit XX:00 (o’clock), start “stopping” each unit with 1 minute interval in the ascending order from one with smallest refrigerant cycle and address number.

NOTE:

Stopping units one by one, accumulation data for 1 minute to 60 minutes after the starting of the test is generated.

7.3 Calculation

Note that the operation data from the start of test run to current time is used for the calculation although this software conducts the calculation at the midnight in the general operation.

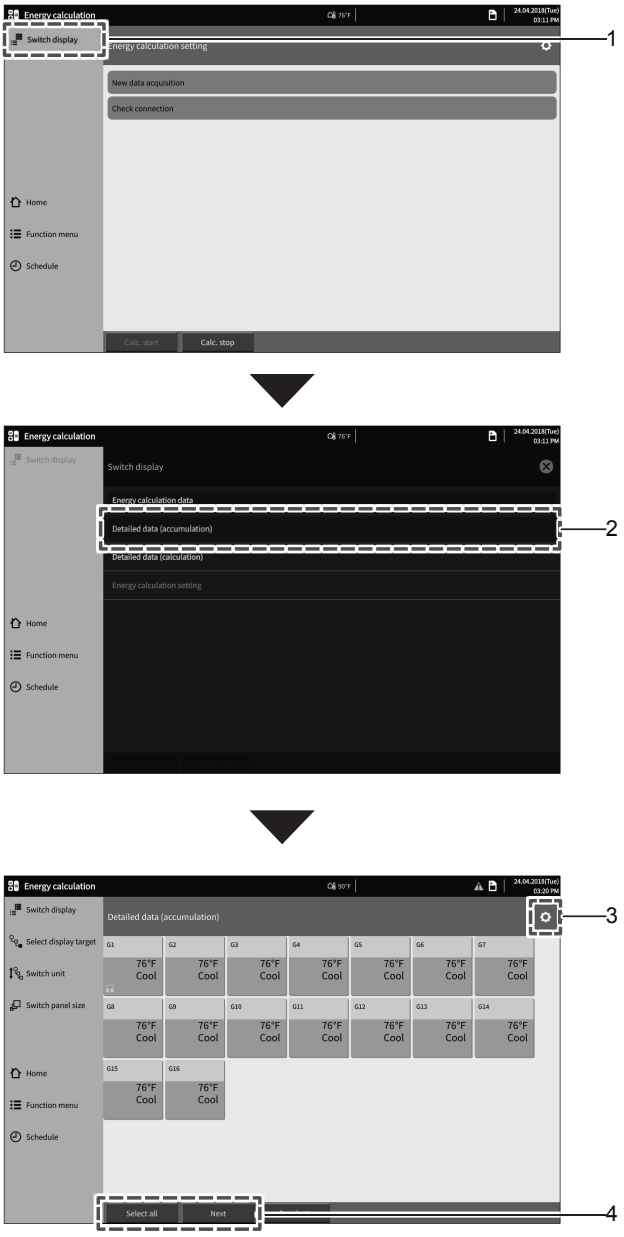


1. Tap **New data acquisition**. New data acquisition window is shown.

2. Tap **New data acquisition** to start calculation. While calculating, confirmation pop up is shown.
   - The calculation may take hours to complete depending on H-LINK connected and/or aggregating period.

7.4 Checking Accumulated Data

Check the running states and energy calculation result.



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

2. Tap **Detailed data (accumulation)**.
   Detailed data (accumulation) window is shown.

Make following configuration on detailed data (accumulation) window and ensure the contents are correct.

- Select display target: All
- Switch unit: Unit

3. Tap ⚙ and **Multiple selection mode**.
4. **Select all** to select all units and tap **Multiple selection mode**. Set time from the time when the operation was started according to step 3 of “7.2 Creating Study Data by Controlling Unit” (page 34) to the current time. Refer to operation manual for Energy Calculation Software to study calculation data.

Checking (Example)

- Check that the operation time increases as the refrigerant cycle and address number.
- If the capacity is the same, also check that the thermo on time and refrigerant flow increase likewise.
- Check that outdoor and indoor electricity usage is NOT 0 (kWh).

NOTICE:

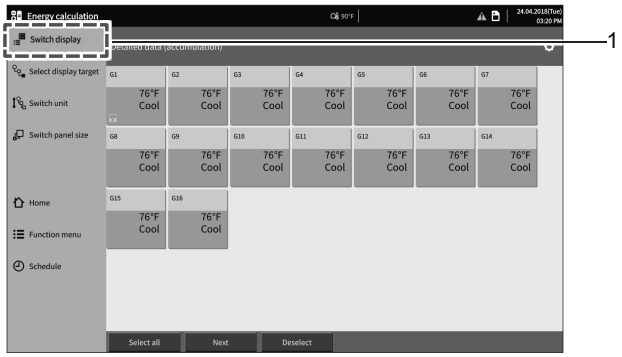
- The calculation may take hours to complete depending on H-LINK connected and/or aggregating period.
- Correct calculation result cannot be expected if meter registration, if any, on this software is not correct. Ensure that the meter registration on this software is correct.

7.5 Checking Energy Calculation Result

Check the running states and energy calculation result.

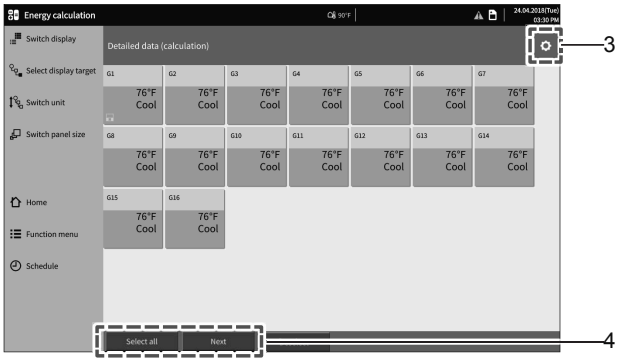
- Required items is as described in the following table.

Output Type	Electricity Ratio	Usage Ratio Calculation
Necessity	Required	Required
	Option	Option
	Not Required	Not Required



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

2. Tap **Detailed data (calculation)**. Detailed data (calculation) window is shown.



Make following configuration on detailed data (accumulation) window and ensure the contents are correct.

- Select display target: All
- Switch unit: Unit

3. Tap ⚙ and **Multiple selection mode**.
4. **Select all** to select all units and tap **Multiple selection mode**. Set time from the time when the operation was started according to step 3 of “7.2 Creating Study Data by Controlling Unit” (page 34) to the current time. Refer to operation manual for Energy Calculation Software to study calculation data.

Checking (Example)

■ Check if the energy has been divided according to the specified calculation criteria.

NOTICE:

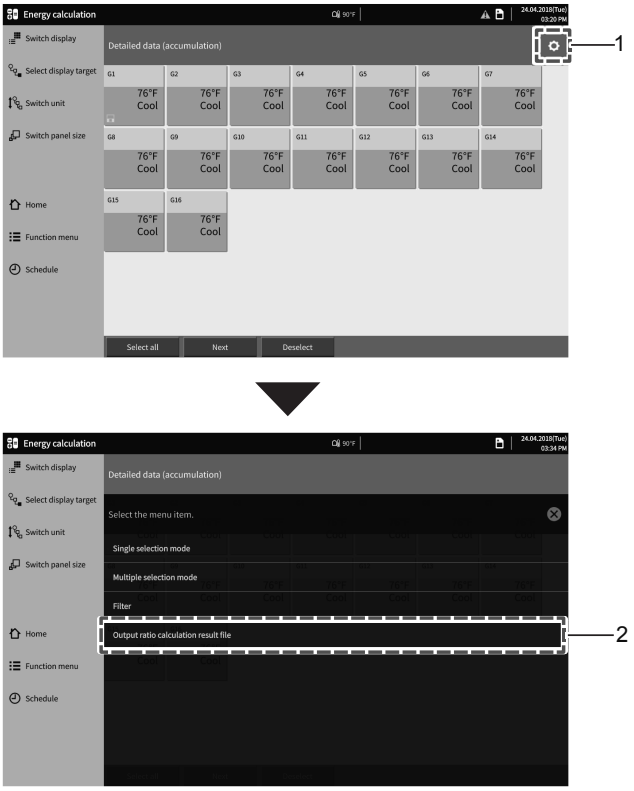
- Correct calculation result cannot be expected if meter registration, if any, on this software is not correct. Ensure that the meter registration on this software is correct.

7.6 Checking Usage Ratio Calculation Result

Output the operation ratio calculation result to USB flash memory or SD card to check the values.

- Required items is as described in the following table.

Output Type	Electricity Ratio	Usage Ratio Calculation
Necessity	Required	Required
	Option	Option
	Not Required	Not Required



1. Tap ⚙.
   Setting menu is shown.

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

- Refer to the CSV file in “/CS-EX/operating_ratio_results/yyyymm” folder in SD card to check the calculation result.

Checking (Example)

■ Compare the file with the result for operation time, thermo ON time and/or refrigerant flow confirmed on page 34 “8.4 Checking Accumulated Data”.

NOTICE:

- Regarding the detail of CSV file, refer to operation manual for Energy Calculation Software “Usage ratio calculation 1 Referencing usage ratio calculation”.

7.7 Preparation for Actual Use

Upon completion of data backup, delete the test run data to prepare for actual use.

(1) Configuration Data Backup

(a) Insert USB flash memory or memory card to VRF Central Touchscreen Controller (memory card/ UserSD slot).

(b) Refer to operation manual for Energy Calculation Software “Maintenance and service 1. Configuration data backup”

(c) After the data has been saved, remove the USB flash memory or memory card from VRF Central Touchscreen Controller (memory card/ UserSD slot).

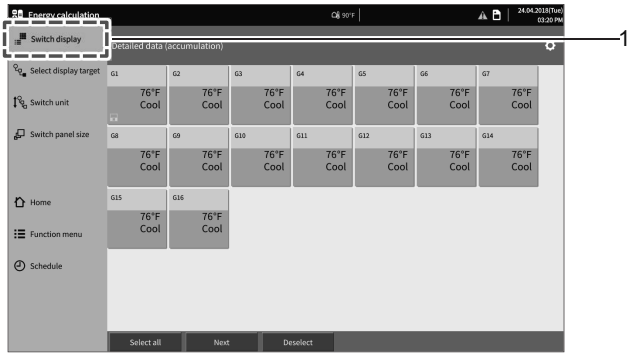
(2) Operation Ratio Data Backup

(a) Remove the top cover of VRF Central Touchscreen Controller to remove SD card from ServiceSD slot.

(b) Insert the SD card for this software to copy “CS-EX” folder in the SD card to any file on PC.

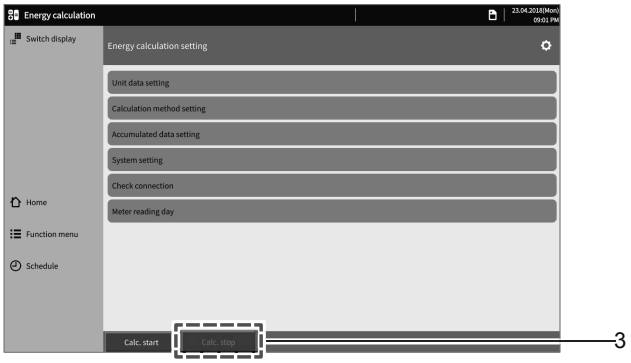
(c) After copying the data, remove the SD card from the PC and insert it again to ServiceSD slot on VRF Central Touchscreen Controller.

(3) Changing Start Date and Time



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

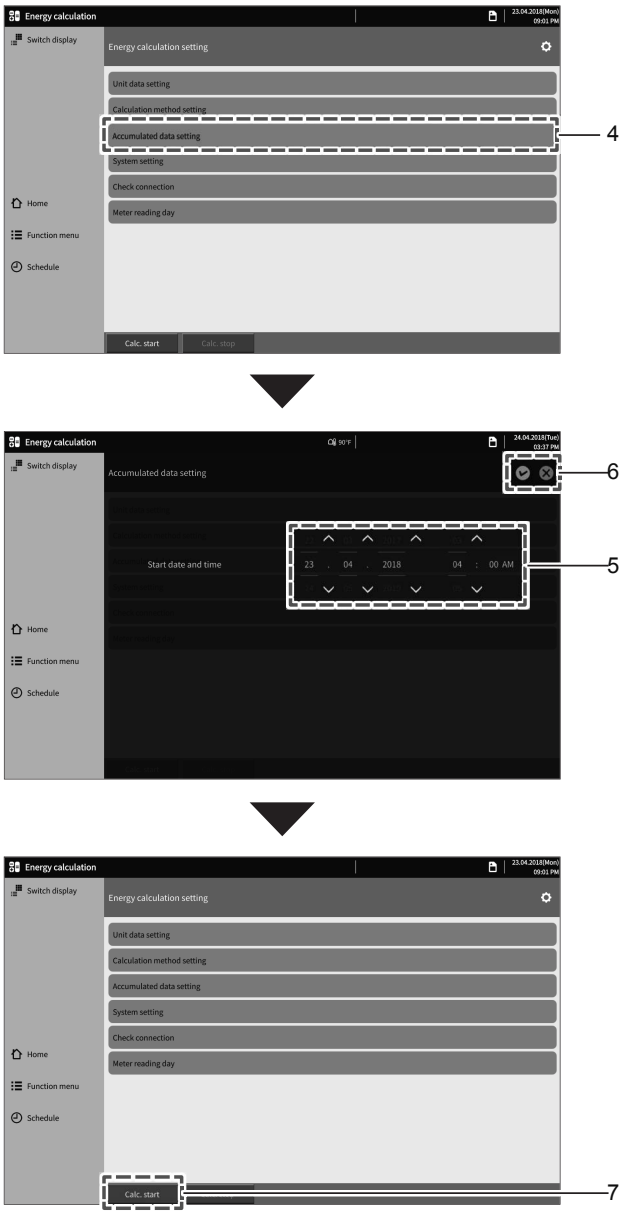
2. Tap **Energy calculation setting**.
   Energy calculation setting window is shown.



3. Tap **Calc. stop**.

Continue to next page.

Continue from previous page.



4. Tap **Accumulated data setting**. Accumulated data setting window is shown.

5. Tap ∧ or ∨ to set aggregation start date and time as the actual operation start date and time.
6. Tap ✓ to confirm setting and to return to energy calculation setting window. Tap ✗ to discard the change and to return to energy calculation setting window.

7. Tap **Calc. start**.

This is the end of set up procedure. Refer to operation manual for detail of general operation.

7.8 Before Handing Over

Check the following items before handing over to the user/customer.

(1) Refer to test run procedure in the installation and operation manual to ensure that each unit can be individually controlled/monitored.

(2) VRF Central Touchscreen Controller is assumed to be in operation at all time. Explain to customer that usage and other history data and energy calculation data cannot be recorded while VRF Central Touchscreen Controller is being halted or in stop state (scheduled periodic restart is not included in this case).

(3) Complete control and monitor may not be assumed upon device failure. Discuss the solution and its measure with customer beforehand.

(4) Refer to Step 1 and 2 of “7.7 Preparation for Actual Use” (page 38) to periodically backup data in PC or other memory/media.

(5) Before handing this system over, explain how to operate/maintain this system well to the customer.

(6) This system calculates the value of meters according to the actual usage on each unit.

(7) Complete calculation may not be assumed upon device failure. Discuss the solution and its measure for inappropriate calculation output (such as establishing specific independent calculation system) with customer beforehand.

8. Maintenance and Service

8.1 Troubleshooting

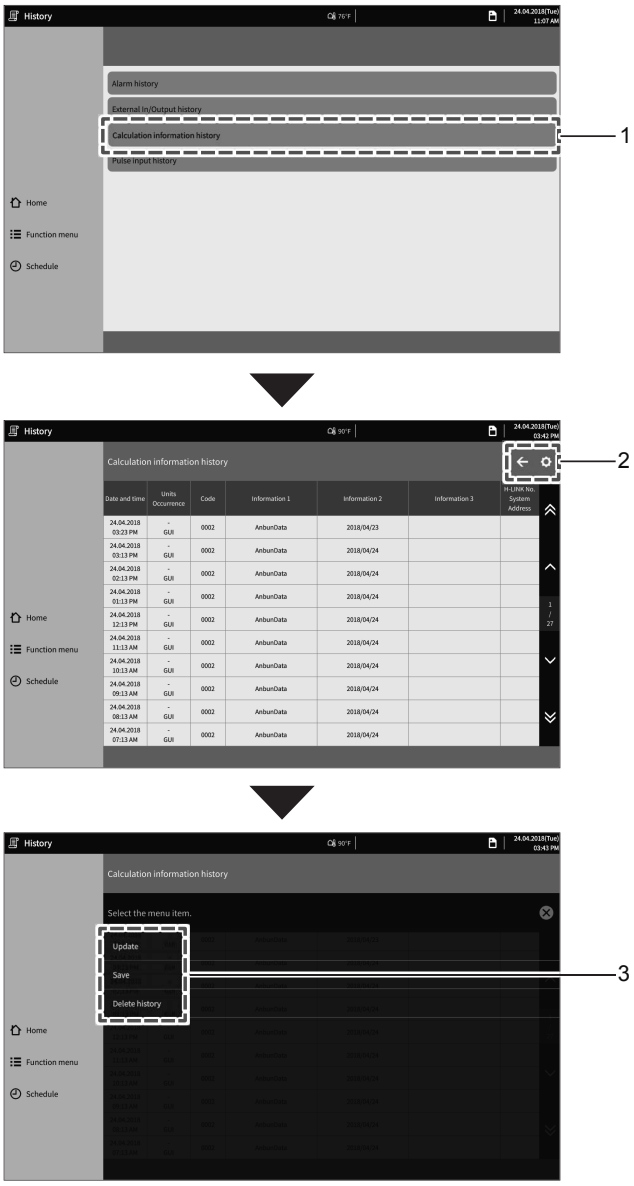
The following table identifies possible troubleshooting solutions for abnormal conditions.

Item	Phenomenon	Check	Action
1	**Energy calculation** 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 “1. Setup” to activate the calculation.
2	Electricity ratio data/ Detailed data window do not appear.	Are meters in use (for electricity ratio calculation)?	Usage ratio calculation has been incorrectly set. Go to **Energy calculation setting** - **System setting** to set **Use meter** as **ON**.
		Is usage ratio calculation (without meters) intended?	This is not a failure. The following functions is available only if meters are in use. ■ Power consumption window ■ Ratio display on data output window
3	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.
		Are power on all Extension adapter, VRF Central Touchscreen Controller and relaying hub turned ON and all wirings are correct?	Check the LAN wiring between VRF Central Touchscreen Controller and Extension adapter and turn on the power for relay hub.
		Have VRF Central Touchscreen Controller or Extension adapter been out of power, for 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 output.
		Is all configuration completed?	Refer to this manual “6. Energy calculation setting”.
		Is Pulse rate set?	Go to **Detail setting** - **External in/output setting** to set pulse rate setting.
4	Meter output value and value on energy calculation window are inconsistent.	Are all meters connected appropriately?	Check the wiring for meters.
		Is calculation activated?	Go to **Energy calculation setting** - **Active**/ **Inactive** to set **Active**.
5	Usage amount is not accumulated. (Pulse count is 0.)	Is all Meter No. set correctly?	Go to **Energy calculation setting** - **Unit data setting** 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 **Energy calculation setting** - **Active**/ **Inactive** to set **Active**.

Item	Phenomenon	Check	Action
6	Power consumption/ Stand-by power consumption shows 0 kW.	Is Accumulation start date and time set on the future date?	Go to **Energy calculation setting** - **Accumulated data setting** to check Accumulation start date and time.
		Does Calculation information history window show calculation information record?	Refer to the next page “8.2 Calculation Information History”.
		Is the unit calculation target?	Go to **Energy calculation setting** - **Unit data setting** to check setting for calculation target.
		Is unit data correctly registered?	Go to **Energy calculation setting** - **Unit data setting** to check all required items are registered.
		Is calculation activated?	Go to **Energy calculation setting** - **Active**/**Inactive** to set **Active**.
7	Only Stand-by electricity shows 0 kW.	Is Stand-by power operation ratio method set as II method or III method?	Go to **Energy calculation setting** - **Calculation method setting** to check registered contents. If Stand-by power consumption ratio method is set as II method or III method, stand-by power shall be always 0kW.

8.2 Calculation Information History

Calculation information history shows information generated upon calculation.



1. Tap **History** - **Calculation information history**. Calculation information history window is shown.

Information that is currently active is shown.

2. Tap ⚙ to show setting menu window. Tap ← to return to history window.

3. Tap **Update** to acquire the latest calculation information. Tap **Save** to save calculation information history data. Tap **Delete history** to delete the calculation information history data.
   - Regarding the contents of each information code, tap **Save** to generate CSV and refer to the file.

8.3 Phenomenon Analysis and Measure

According to the table below to find the cause and to take action.

Item	Phenomenon	Cause	Assumued Cause	Action
1	Certain unit(s) have all/most of electricity usage allocated.	Like in moderate seasons in which few air conditioners operate, all/most of the power usage is allocated to units that operated if stand-by power is included in the calculation.	Crank case heater electricity and printed circuit board electricity on outdoor units is consumed as stand-by power even if air conditioner did not operate. E.g.) If only one unit operated in the system where 16 outdoor units with crank case heater electricity 0.2kW and printed circuit board electricity 0.039kW each are connected, then amount of (0.2+0.039) x 16 units x 24 hours x 30 days is allocated to the unit operated.	Set Stand-by power operation ratio method as to calculate by the ratio of indoor unit capacity. Stand-by power is consistently allocated. Note that the power usage is allocated to units that did not operate.
2	Electricity usage is not always allocated to units.	When stand-by power is included in the calculation and if NOT all air conditioner units operated in the given hour, the power usage for the specified hour is allocated to “all” units according to the capacity of the indoor unit.	Crank case heater electricity and printed circuit board electricity on outdoor units is consumed as stand-by power even if air conditioner did not operate. E.g.) In the system where 16 outdoor units with crank case heater electricity 0.2kW and printed circuit board electricity 0.039kW each are connected, amount of (0.2+0.039) x 16 units x 1 hour is allocated.	Set Stand-by power operation ratio method as to calculate by the ratio of indoor unit capacity. Stand-by power is consistently allocated. Then the power usage is allocated to each unit on hourly basis.

8.4 Periodic Check

To maintain safety and health of the system including VRF Central Touchscreen Controller with this software, perform the following periodic check.

(1) Environment

- Ensure that the VRF Central Touchscreen Controller with this software is NOT extremely hot.
- Ensure that the ambient temperature of VRF Central Touchscreen Controller is NOT extremely high.
- Ensure that the VRF Central Touchscreen Controller is free from dust/swarf/wire waste.

(2) Display

- Ensure that VRF Central Touchscreen Controller is showing correct result/data.

(3) Installation and connection

- Ensure that the wiring and connection with other devices are appropriate.

9. Addendum

Data Sheet (1/5)

Meter Reading/Calculation Method Setting/Ratio Method Setting (1)

Fill in the data and tick on this sheet.

Electrictity / Gas / Water		Check
Meter Reading Day	Day	

Ratio Method		Check
Stand-by power operation ratio method	Method	
AC electricity ratio method	Method	
Heat storage electricity ope. ratio method	Method	
AC gas amount ratio method	Method	

Ratio Method		Check
Usage ratio calculation method	Method	

Data Sheet (2/5)
Unit Data Setting: Outdoor Unit Data

Fill in the data and tick on this sheet. Copy this sheet as necessary.

		Check																			
H-LINK No.																					
System																					
Address																					
Outdoor Type																					
Power Meter No.	H-LINK No.																				
	Station Address																				
	External Input Number																				
Crank Case Heater Electricity (W)																					
Printed Circuit Board Electricity (W)																					
Compressor Capacity (kW)																					
Heat Storage Ope. Visible																					

Data Sheet (3/5)
Unit Data Setting: Indoor Unit Data

Fill in the data and tick on this sheet. Copy this sheet as necessary.

		Check																			
H-LINK No.																					
System																					
Address																					
Calculation Target																					
Power Meter No.	H-LINK No.																				
	External Input Number																				
Ventilator Electricity (W)																					
Printed Circuit Board Electricity (W)																					
Heater Electricity (kW)																					
Expansion Valve Coefficient																					
Capacity																					
Total Heat Exchanger																					

Data Sheet (4/5)
Unit Data Setting: Facility Unit Data

Fill in the data and tick on this sheet. Copy this sheet as necessary.

		Check																			
H-LINK No.																					
Facility Unit No.																					
Calculation Target																					
Power Meter No. / Gas Meter No. (Photo Thermal)/ Water Meter No.	H-LINK No.																				
	External Input Number																				
Running Power (kW)																					
Stand-by Power (W)																					
Capacity																					

Data Sheet (5/5)
Pulse Rate Setting

Copy this sheet as necessary.

H-LINK No.	External Input	Electricity / Gas(GHP) / Gas (Photo Thermal) / Water	Pulse Rate	Check
	1			
	2			
	3			
	4			
	1			
	2			
	3			
	4			
	1			
	2			
	3			
	4			
	1			
	2			
	3			
	4			
	1			
	2			
	3			
	4			
	1			
	2			
	3			
	4			
	1			
	2			
	3			
	4			

LIT-12013194 P5417069
Date Issued: Feb. 2019