

Air Conditioning Control System

Centralized Controller

AE-200A/AE-50A/EW-50A

AE-200E/AE-50E/EW-50E

Instruction Book

–BACnet[®] Apportioned Electricity Billing Function Trial Run–

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Before using the controller,
please read this Instruction
Book carefully to ensure proper
operation.
Retain this manual for future
reference.
BACnet[®] is a registered
trademark of ASHRAE (American
Society of Heating, Refrigerating
and Air-Conditioning Engineers,
INC.).

Safety precautions

- ▶ Observe these precautions carefully to ensure safety.
- ▶ After reading this manual, pass the manual on to the end user to retain for future reference.
- ▶ The user should keep this manual for future reference and refer to it as necessary. This manual should be made available to those who repair or relocate the units. Make sure that the manual is passed on to any future air conditioning system user.

 WARNING	: indicates a hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION	: indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
CAUTION	: addresses practices not related to personal injury, such as product and/or property damage.

General precautions

WARNING

Do not install the controller in areas where large amounts of oil, steam, organic solvents, or corrosive gases (such as ammonia, sulfuric compounds, or acids), or areas where acidic/alkaline solutions or special chemical sprays are used frequently. These substances may significantly reduce the performance and corrode the internal parts, resulting in electric shock, malfunction, smoke, or fire.

To reduce the risk of short circuits, current leakage, electric shock, malfunction, smoke, or fire, do not wash the controller with water or any other liquid.

To reduce the risk of electric shock, malfunction, smoke, or fire, do not touch the electrical parts, USB memory, or touch panel with wet fingers.

To reduce the risk of injury or electric shock, before spraying a chemical around the controller, stop the operation and cover the controller.

To reduce the risk of injury, keep children away while installing, inspecting, or repairing the controller.

If you notice any abnormality (e.g., burning smell), stop the operation, turn off the controller, and consult your dealer. Continuing the operation may result in electric shock, malfunction, or fire.

Properly install all required covers to keep moisture and dust out of the controller. Dust accumulation and the presence of water may result in electric shock, smoke, or fire.

CAUTION

To reduce the risk of fire or explosion, do not place flammable materials or use flammable sprays around the controller.

To reduce the risk of electric shock or malfunction, do not touch the touch panel, switches, or buttons with a sharp object.

To avoid injury from broken glass, do not apply excessive force to the glass parts.

To reduce the risk of injury, electric shock, or malfunction, avoid contact with the sharp edges of certain parts.

Consult your dealer for the proper disposal of the controller. Improper disposal will pose a risk of environmental pollution.

Precautions for relocating or repairing the unit

WARNING

The controller must be repaired or moved only by qualified personnel. Do not disassemble or modify the controller. Improper installation or repair may result in injury, electric shock, or fire.

Additional precautions

CAUTION

To avoid discoloration, do not use benzene, thinner, or chemical rag to clean the controller. When the controller is heavily soiled, wipe the controller with a well-wrung cloth that has been soaked in water with mild detergent, and then wipe off with a dry cloth.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

Terms used in this manual

- "Centralized Controller AE-200A/AE-200E" is referred to as "AE-200".
- "Centralized Controller AE-50A/AE-50E" is referred to as "AE-50".
- "Centralized Controller EW-50A/EW-50E" is referred to as "EW-50".

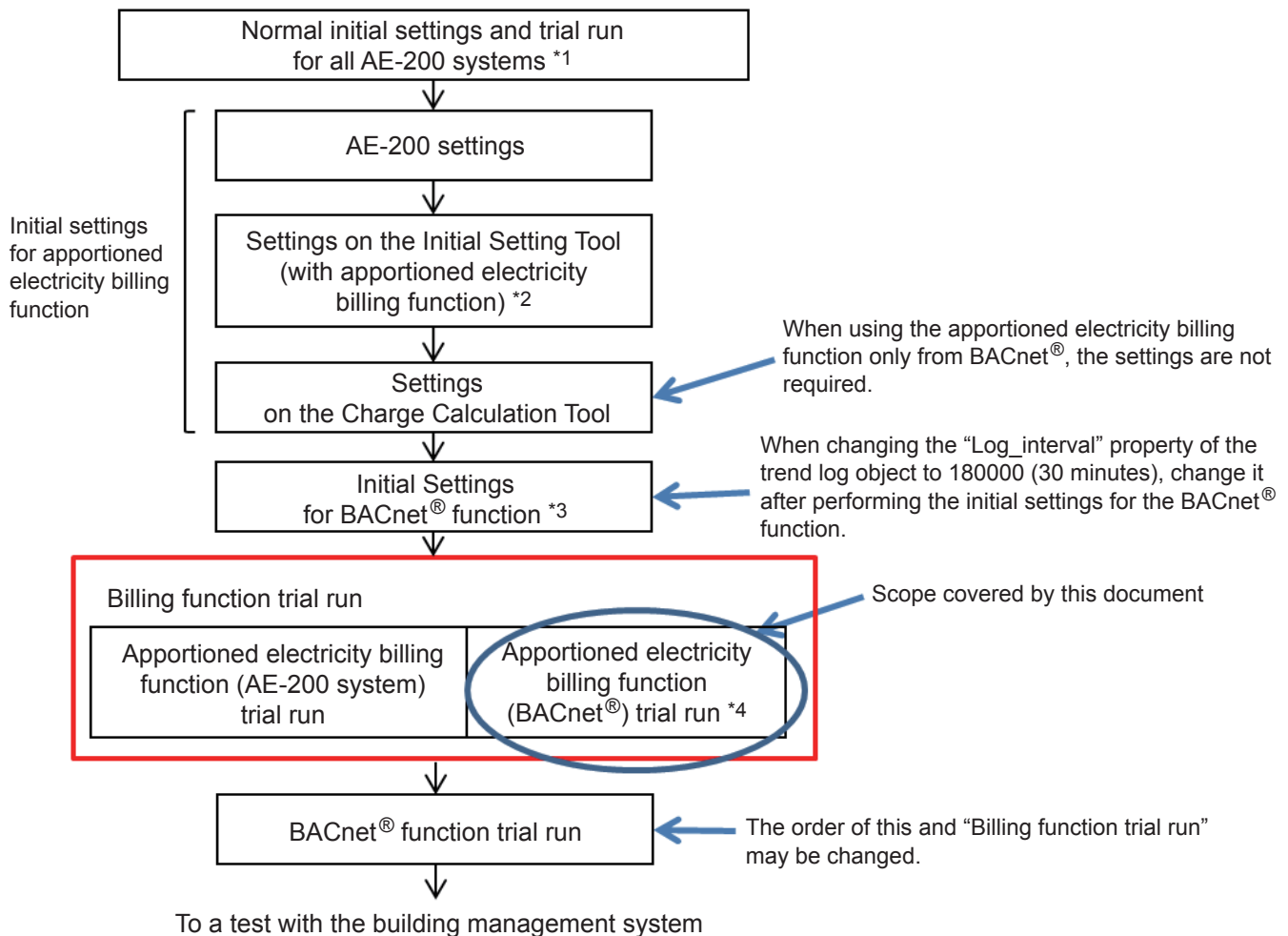
1. Introduction

To use the billing information objects (accumulator objects and trend log objects (excluding Trend Log Room Temp)) for the BACnet® function in the apportioned electricity billing function of the AE-200/AE-50/EW-50, follow the procedure in this document, **in addition to the procedure described** in “7. Billing function trial run” in the AE-200/AE-50/EW-50 Instruction Book –Apportioned Electricity Billing Function–.

To perform a trial run, you need to obtain this document and the AE-200/AE-50/EW-50 Instruction Book –Apportioned Electricity Billing Function–.

To use the billing information objects for the BACnet® function, you need to register the “Charge” license with the AE-200/AE-50/EW-50. For the license registration procedure, refer to the AE-200/AE-50/EW-50 Instruction Book –Initial Settings–.

Entire flow diagram of initial settings and trial run for the AE-200/AE-50/EW-50 (when using the apportioned electricity billing function and BACnet® function)



- *1 Before performing a trial run for the apportioned electricity billing function (BACnet®), perform a trial run for the air conditioning system and check that the group settings/interlocked unit settings are correct (the correspondence of the actual air conditioning units/interlocked units with the group numbers is correct) from the AE-200/AE-50's LCD or from the Integrated Centralized Control Web.
- *2 When using the billing information objects for the BACnet® function, **set a single group in a single block when setting the energy management block**. If there are OA processing units registered as interlocked LOSSNAY, register a single OA processing unit in a single block. (because this operation is required in 4-3-3 “Checking the match with the CSV data (apportioned results) of the AE-200”.
- *3 Enable accumulator objects and trend log objects.
- *4 Perform a continuous operation for each indoor unit for at least 2 hours before performing the check after 00:00 on the day of the 1st check (after air conditioning unit continuous operation).

2. Parts to be used

Prepare the following when performing a trial run.

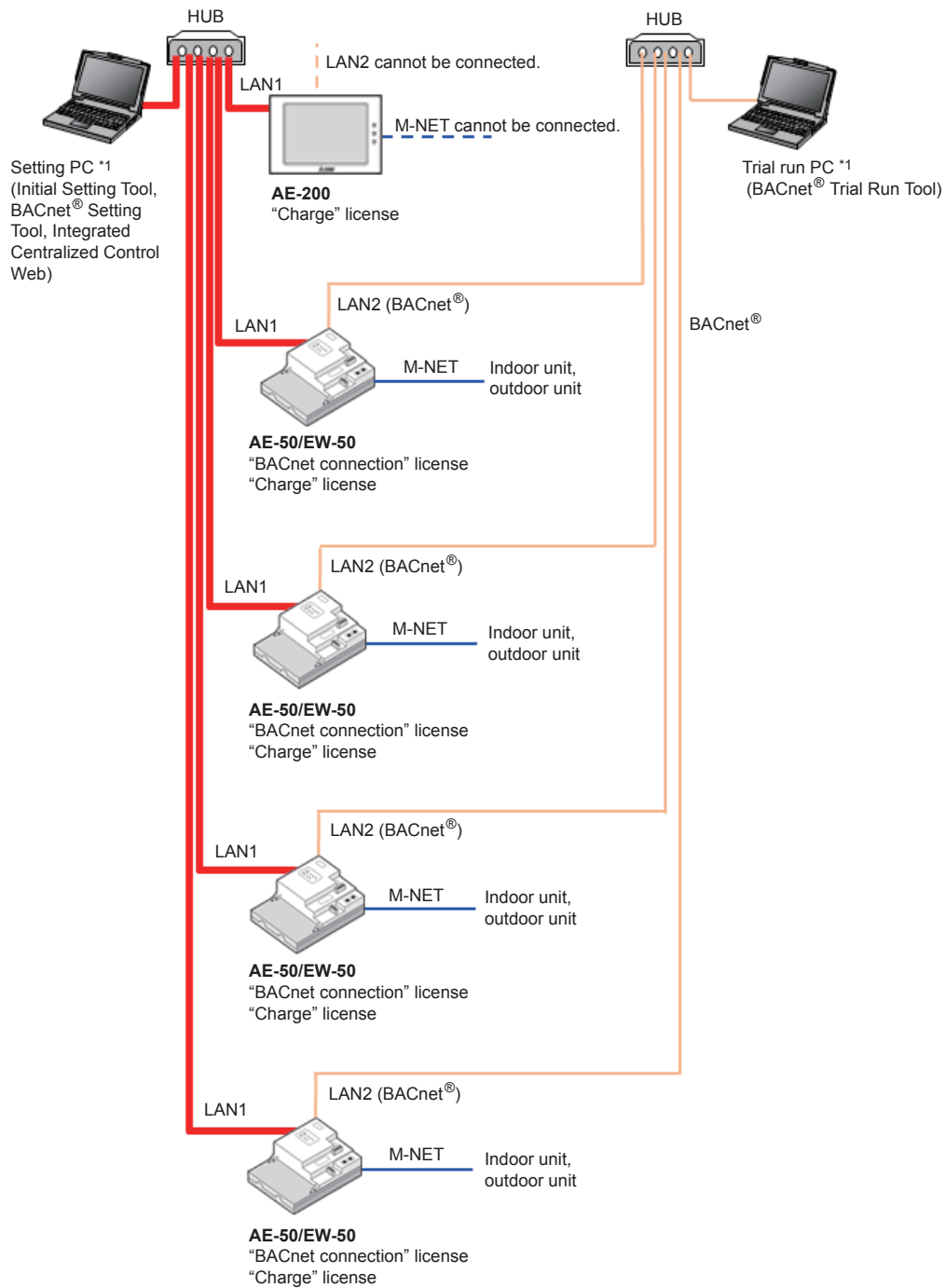
	Item	Qty	Remarks
Material	Diagram of air conditioning control system for building	1	Group configuration, IP address etc.
	Apportioned electricity billing function setting information and metering device connection information	1	
	AE-200/AE-50/EW-50 Instruction Book –Apportioned Electricity Billing Function–	1	*1
	AE-200/AE-50/EW-50 Instruction Book –BACnet® function–	1	*1
	AE-200/AE-50/EW-50 Instruction Book –BACnet® Apportioned Electricity Billing Function Trial Run–	1	This document
	AE-200/AE-50/EW-50 Instruction Book –BACnet® Trial Run Tool–	1	*1
	Instruction books for each air conditioning unit, controller, and metering device	1	
Equipment, device	PC *2	1–2 *3	Used for running Microsoft Excel, Initial Setting Tool, BACnet® Trial Run Tool, and Integrated Centralized Control Web
	Microsoft Excel	1	Microsoft Excel 2007 or later
	BACnet® Trial Run Tool	1	*1
	Initial Setting Tool (with apportioned electricity billing function)	1	*1
	USB memory device	1	Used for retrieving CSV data (apportioned results). For manufacturers and models of USB memory devices for which operation has been verified, refer to the AE-200/AE-50/EW-50 Instruction Book –Initial Settings–.
	Switching HUB	1–2 *3	Used for connecting a PC.
	LAN cable (Category 5 or above straight cable)	2–4 *3	Used for connecting a PC.
	L-shaped driver (hexagonal wrench)	1	Included with AE-200, used for removing or attaching the AE-200 cover.
	General tool such as a driver	-	

*1 Contact your dealer to obtain this.

*2 For the necessary specifications and other information, refer to the AE-200/AE-50/EW-50 Instruction Book –Apportioned Electricity Billing Function–, AE-200/AE-50/EW-50 Instruction Book –Initial Settings–, and AE-200/AE-50/EW-50 Instruction Book –BACnet® Trial Run Tool–.

*3 You just need the minimum number only for a trial run, but the maximum number is more efficient for a combination of the settings and trial run.

Connection diagram for a trial run



*1 If a trial run is performed with a single PC, connect it as a trial run PC. Furthermore, if the settings need to be checked or changed, it can also be used as a setting PC by changing the network connection settings and switching the LAN connection.

3. Apportioned electricity billing function in the BACnet® function

The apportioned results calculated by the apportioned electricity billing function of the AE-200/AE-50/EW-50 are retrieved from the building management system via BACnet® by using the billing information objects of the BACnet® function.

3-1. Change timing of the apportioned electricity billing function objects in the BACnet® function

The billing information objects of the BACnet® function change according to the following specifications and timing.

- The apportioned result (cumulative value) is calculated every 30 minutes from the electric energy consumption for the period between XX:00 and XX:30 minutes or between XX:30 and XX:00 minutes every hour and the cumulative value is stored. (The apportioned result (cumulative value) is a value for internal calculation and cannot be referred to from the outside.)
- The electric energy value stored in the accumulator object is updated at XX:15 and XX:45 minutes every hour.
- The update of the electric energy value stored in the accumulator object is performed by adding the difference between the last two apportioned results (cumulative values) to the value in the "Present_Value" property.
(For the "PI controller Electric Energy 1–4" or "Pulse Input Electric Energy 1–4" objects, the update is performed by adding the difference between the last two measurement results to the value in the "Present_Value" property.)
- The trend log object is updated at each interval set in the "Log_interval" property from the reference point (1970/1/1 00:00).

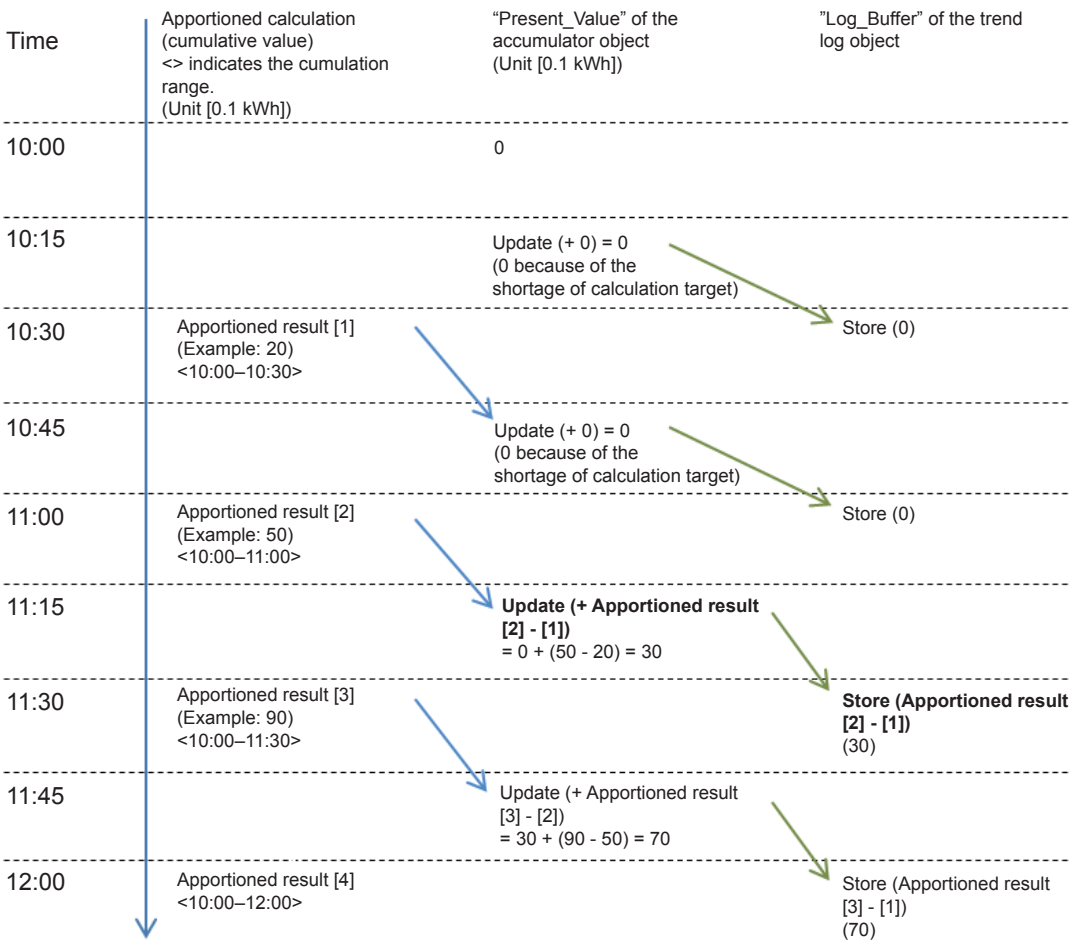
In the test run procedure explained in this manual, the "Log_interval" property needs to be set to 180000 (1800 seconds = 30 minutes).

(For the procedure for setting the "Log_interval" property of the trend log object, refer to the AE-200/AE-50/EW-50 Instruction Book –BACnet® Trial Run Tool–. Furthermore, the "Log_interval" property needs to be specified in 1/100 seconds. The initial value of the "Log_interval" property is 8640000 (24 hours) in versions earlier than AE-200/AE-50/EW-50 Version 7.45, and 180000 (30 minutes) in AE-200/AE-50/EW-50 Version 7.45 and later.)

When comparing the display value of the metering device or the [Monitor/Operation] - [Measurement] display of the AE-200 with the billing information object in the BACnet® function, or when checking the billing information object after changing the settings, make sure to consider the time lag in order not to refer to the data before the change.

The following shows an operation example of the apportioned electricity billing function of the AE-200 (when it is started at 10:00).
 The example assumes that there are no apportioned results in the past (at the default settings) and that 180000 (1800 seconds = 30 minutes) is set in the “Log_interval” property.
 The time when the apportioned result is stored for the first time is indicated by bold characters.

Accumulator and trend log object update timing



4. Apportioned electricity billing function trial run procedure in the BACnet® function

4-1. Entire trial run flow

Perform a trial run according to the following procedure.

Check timing	Step	Procedure explained in the AE-200/AE-50/EW-50 Instruction Book –Apportioned Electricity Billing Function–	Procedure explained in this manual
Before billing function trial run	1	7-1. “Flow of the billing function trial run”	←
	2		4-2-1 “BACnet® metered value correction”
	3	7-2. “Checking the billing function settings (check before billing function trial run)”	←
	4	7-2-1. “Billing-related item sheet”	←
	5	7-2-2. “Unit-related item sheet”	←
	6	7-2-3. “Entering the electric energy”	←
	7		4-2-2 “Billing-related item sheet (BACnet®)”
	8		4-2-3 “Unit-related item sheet (BACnet®)”
1st run check (after air conditioning unit continuous operation for more than 2 hours)		Run each indoor unit continuously for at least 2 hours as explained in the AE-200/AE-50/EW-50 Instruction Book –Apportioned Electricity Billing Function–	
		At 00:00 or later on the day of the 1st run check (after air conditioning unit continuous operation), run each indoor unit continuously for at least 2 hours.	
	9	7-3. “Billing function trial run checks”	←
	10	7-3-1. “1st run check (after air conditioning unit continuous operation)” [1] “Billing-related item sheet”	←
	11		4-3-1 “Billing-related item sheet (BACnet®)”
	12	7-3-1. “1st run check (after air conditioning unit continuous operation)” [2] “Unit-related item sheet”	←
	13		4-3-2 “Unit-related item sheet (BACnet®)”
	14		4-3-3 “Checking the match with the CSV data (apportioned results) of the AE-200”
2nd run check (at least 10 days after the 1st billing function trial run)	15	7-3-2. “2nd run check (at least 10 days after 1st billing function trial run)”	←
	16		4-4 “BACnet® (2nd run check (at least 10 days after the 1st billing function trial run))”
3rd run check (at least 1 month after the 2nd billing function trial run)	17	7-3-3. “3rd run check (at least 1 month after the 2nd billing function trial run)”	←
	18		4-5 “BACnet® (3rd run check (at least 1 month after the 2nd billing function trial run))”
	19	7-4. “Final checks”	←
	20	7-4-1. “Final checks for the operation settings”	←
	21	7-4-2. “Final report”	←

4-2. BACnet® (checking before a billing trial run)

Before performing the procedure in this section, make sure to perform the procedure described in “7-1. Flow of the billing function trial run” in the AE-200/AE-50/EW-50 Instruction Book –Apportioned Electricity Billing Function–.

4-2-1. BACnet® metered value correction

Check that the metering device values used for the apportioned electricity billing function and the “Present_Value” property values of the BACnet® objects “PI controller Electric Energy 1–4” (AC_41mm40–43: mm = PI controller address (01–50)) or “Pulse Input Electric Energy 1–4” (AC_410040–43) match. If they do not match, change the “Present_Value” property values.

However, as described in 3-1 “Change timing of the apportioned electricity billing function objects in the BACnet® function”, there is a time lag until the “Present_Value” property values are reflected so they do not match the metering device display values at the same time (which does not matter for the apportion calculation).

Furthermore, the apportion calculation results are not influenced by changes in the “Present_Value” property values of “PI controller Electric Energy 1–4” (AC_41mm40–43) or “Pulse Input Electric Energy 1–4” (AC_410040–43).

Procedures

1. After starting the AE-200, record the display value of the metering device at the time when the internal clock of the AE-200 shows the XX:00 or XX:30 minutes of every hour.
2. Use BACnet® Trial Run Tool and enter the electric energy value in a unit of 0.1 [kWh] (for example, 1234 for 123.4 kWh) recorded at the time when 20 to 45 minutes have passed since step 1 (for example, between 10:20 and 10:45 if the value was recorded at 10:00, or between 10:50 and 11:15 if the value was recorded at 10:30) in the “Value_Set” property for the object corresponding to the metering device.
(If you failed to enter the value during the entry period, perform the procedure again from step 1.)
3. Immediately read the “Present_Value” property value of the same object and make sure that the entered value is reflected.

The following shows the objects corresponding to the metering device.

Connect metering device to		Object name	Object ID
PI controller	Ch.1	PI controller Electric Energy 1	AC_41mm40
	Ch.2	PI controller Electric Energy 2	AC_41mm41
	Ch.3	PI controller Electric Energy 3	AC_41mm42
	Ch.4	PI controller Electric Energy 4	AC_41mm43
AE-50/EW-50 Pulse Input	Ch.1	Pulse Input Electric Energy 1	AC_410040
	Ch.2	Pulse Input Electric Energy 2	AC_410041
	Ch.3	Pulse Input Electric Energy 3	AC_410042
	Ch.4	Pulse Input Electric Energy 4	AC_410043

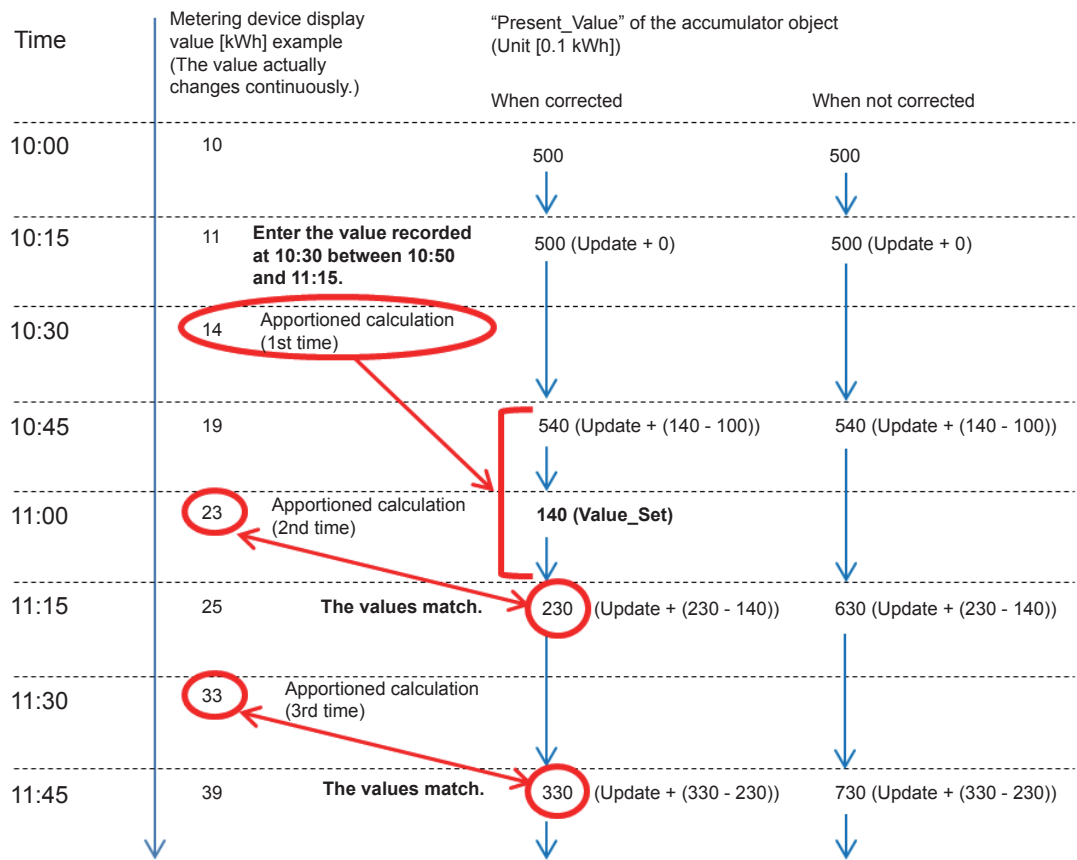
* mm: PI controller address (01–50)

Note

For how to operate BACnet® Trial Run Tool, refer to the AE-200/AE-50/EW-50 Instruction Book –BACnet® Trial Run Tool–.

The following shows an example of correcting the metered value in BACnet® (when it is started at 10:00). The example supposes that there is an apportioned result in the past (500 [0.1 kWh]).

BACnet® metered value correction example



Billing-related item sheet (entire view)

Billing-related item sheet (enlarged view)

[1] Entering the metering device electric energy value

- ① Enter the checked date and time. (XX:00 or XX:30 minutes)
- ② Enter the meter display value of the metering device.

Enter the metering device electric energy value in the AE-200 BACnet® function in the billing-related item sheet after 20 to 40 minutes have passed since [1] (for example, between 10:20 and 10:40 if the metering device value was read at 10:00, or between 10:50 and 11:10 if the value was read at 10:30).

- #### Note

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[3] Checking the generation of trend log object

Check that the BACnet® trend log object has been generated. If the trend log object is disabled from the BACnet® Setting Tool, refer to the AE-200/AE-50/EW-50 Instruction Book –BACnet® Setting Tool– and enable the trend log object.

- ⑤ Use BACnet® Trial Run Tool and check that the “Trend Log PI controller Electric Energy 1–4” (LOG_41mm84–LOG_41mm87: mm = PI controller address (01–50)) or “Trend Log Pulse Input Electric Energy 1–4” (LOG_410084–LOG_410087) objects exist, and if they exist, insert a check mark.

Note

If it takes time to perform the operation in [3] “Checking the generation of trend log object”, first perform the operation in [1] “BACnet® function: Entering the apportioned electric energy value” in 4-2-3 “Unit-related item sheet (BACnet®)”.

For details on the procedures for operating BACnet® Trial Run Tool and checking the trend log object, refer to the AE-200/AE-50/EW-50 Instruction Book –BACnet® Trial Run Tool–.

4-2-3. Unit-related item sheet (BACnet[®])

Unit-related item sheet (entire view)

[illegible]

Unit-related item sheet (enlarged view)

[illegible]

[1] BACnet[®] function: Entering the apportioned electric energy value

Enter the apportioned electric energy values in the AE-200 BACnet® function in the unit-related item sheet at the same timing as that in 4-2-2 [2].

- ① Enter the first checked date and time.
- ② Use BACnet® Trial Run Tool and read the “Present_Value” property values of the “Group Apportioned Electric Energy” (AC_01xx39: xx = Group number (01–50)) or “Interlocked Units Apportioned Electric Energy” (AC_61aa39: aa = Interlocked unit address (01–50)) objects and enter the electric energy values before the trial run.
“Present_Value” property value × 0.1 = Electric energy [kWh]

Note

For how to operate BACnet® Trial Run Tool, refer to the AE-200/AE-50/EW-50 Instruction Book –BACnet® Trial Run Tool–.

Enter the electric energy value for the representative single air conditioning unit if the group consists of multiple units. Enter “-” for the air conditioning units other than the representative unit.

[2] Checking the generation of trend log object

Check that the BACnet® trend log object has been generated. If the trend log object is disabled, refer to the AE-200/AE-50/EW-50 Instruction Book –BACnet® Setting Tool– and enable the trend log object.

- ③ Use BACnet® Trial Run Tool and check whether the “Trend Log Group Apportioned Electric Energy” (LOG_01xx83) or “Trend Log Interlocked Units Apportioned Electric Energy” (LOG_61aa83: aa = Interlocked unit address (01–50)) objects exist, and when they exist, insert a check mark.

4-3. BACnet® (1st run check (after air conditioning unit continuous operation))

4-3-1. Billing-related item sheet (BACnet®)

Billing-related item sheet (entire view)

[illegible]

Billing-related item sheet (enlarged view)

Centralized controller settings information	Current reading of the metering device											PI controller Electric Energy / Pulse Input Electric Energy (BACnet)			Trend Log Object (BACnet)		
	Before trial run (2015/4/2 10:00)	After trial run (2015/4/3 9:00)	Meter difference value	Monitored value before trial run (2015/4/2 10:22)	Monitored value after trial run (2015/4/3 9:21)	Monitored value difference	Check	Generate	Log_Interval	Log_Buffer							
										Interval	Value						
	Metering device name																
Outdoor Unit	100	130	30	100	130	30	✓	✓	180000	✓	✓						
Indoor unit	120	140	20	120	140	20	✓	✓	180000	✓	✓						
				Total - kWh (BACnet)		50											

[1] Entering the metering device electric energy value (after a trial run)

Read the metering device electric energy value at XX:00 or XX:30 minutes of any hour after at least 2 hours have passed since the start of the billing trial run.

- ① Enter the checked date and time. (XX:00 or XX:30 minutes)
- ② Enter the meter display value of the metering device.

[2] BACnet® function: Entering the metering device electric energy value (after a trial run)

Enter the electric energy value after the trial run in the AE-200 BACnet® function in the billing-related item sheet after 20 to 40 minutes have passed since [1] (for example, between 10:20 and 10:40 if the metering device value was read at 10:00, or between 10:50 and 11:10 if the value was read at 10:30).

- ③ Enter the checked date and time.
- ④ Use BACnet® Trial Run Tool and read the “Present_Value” property values of the “PI controller Electric Energy 1~4” (AC_41mm40~AC_41mm43) or “Pulse Input Electric Energy 1~4” (AC_410040~AC_410043) objects and enter the electric energy values after the trial run.
“Present_Value” property value × 0.1 = Electric energy [kWh]

Note

For how to operate BACnet® Trial Run Tool, refer to the AE-200/AE-50/EW-50 Instruction Book –BACnet® Trial Run Tool–.

[3] Checking the difference value

- ⑤ Calculate the meter difference value from the current values of the metering device before and after the trial run and enter it.
- ⑥ Calculate the monitor difference value from the PI controller electric energy/pulse input electric energy values before and after the trial run and enter it.
Check whether there is a value of "0" among the monitor difference values.
If there is a value of "0", check that the settings are correctly set. If there is a wrong setting, correct it and perform a billing trial run check again.
- ⑦ Make sure that the meter difference value matches the monitor difference value.
Check that the values in ⑤ and ⑥ match, and if there is no problem, insert a check mark in the check box.

Note

The actual meter difference value may not match the actual monitor difference value completely because of a time difference for visually checking the metering device.

Up to the following difference value [kWh] will be produced.

Total rated electric power [kW] of the equipment connected to the given metering device × Time difference [h]

[4] Checking the electric energy total data

- ⑧ Total the electric energy values in ⑥ and enter the total value.

[5] Checking the trend log object

- ⑨ Use BACnet® Trial Run Tool and read the "Log_Buffer" property values of the "Trend Log PI controller Electric Energy 1-4" (LOG_41mm84-LOG_41mm87) or "Trend Log Pulse Input Electric Energy 1-4" (LOG_410084-LOG_410087) objects. Check that the "Present_Value" property values of the "PI controller Electric Energy 1-4" (AC_41mm40-AC_41mm43) or "Pulse Input Electric Energy 1-4" (AC_410040-AC_410043) objects are stored in the "Log_Buffer" property at the interval set in the "Log_Interval" property, and that there is no abnormal data, such as a decrease in the value.

Note

If it takes time to perform the operation in [5] "Checking the trend log object", first perform the operation in [1] "BACnet® function: Entering the apportioned electric energy values (after a trial run)" in 4-3-2 "Unit-related item sheet (BACnet®)". For details on the procedures for operating BACnet® Trial Run Tool and checking the trend log object, refer to the AE-200/AE-50/EW-50 Instruction Book –BACnet® Trial Run Tool–.

[6] Check

Check the content again and if there is no error, insert a check mark in the check box.

Check item	Check
Are the watthour meter readings read by the BACnet® object correctly?	

4-3-2. Unit-related item sheet (BACnet®)

Enter the apportioned electric energy value in the AE-200 BACnet® function in the unit-related item sheet.
(entire view)

Unit-related item sheet (entire view)

Unit-related item sheet (enlarged view)

Group	Group Apportioned Electric Energy / Interlocked Units Apportioned Electric Energy (BACnet)				Trend Log Object (BACnet)				CSV output (BACnet)			
No.	Monitored value before trial run (2015/4/2 10:22)	Monitored value after trial run (2015/4/3 9:21)	Monitored value difference	Check	Generate	Log_interval	Log_Buffer	Apportioned electric energy of the start date (/ /)	Apportioned electric energy of the end date (/ /)	Difference value	Apportioned electric energy	Check
							Interval Value					
1	0.0	1.4	1.4	✓	✓	180000	✓	✓				
2	0.0	2.5	2.5	✓	✓	180000	✓	✓				
3	0.0	3.5	3.5	✓	✓	180000	✓	✓				
4	0.0	4.7	4.7	✓	✓	180000	✓	✓				
5	3.0	10.4	7.4	✓	✓	180000	✓	✓				
6	2.1	2.6	0.5	✓	✓	180000	✓	✓				
Total of apportioned electric energy											20	

[1] BACnet® function: Entering the apportioned electric energy values (after a trial run)

Enter the apportioned electric energy values in the AE-200 BACnet® function in the unit-related item sheet at the same timing as that in 4-3-1 [2].

- ① Enter the checked date and time.
- ② Use BACnet® Trial Run Tool and read the “Present_Value” property values of the “Group Apportioned Electric Energy” (AC_01xx39: xx = Group number (01–50)) or “Interlocked Units Apportioned Electric Energy” (AC_61aa39: aa = Interlocked unit address (01–50)) objects and enter the electric energy values after the trial run.
“Present_Value” property value × 0.1 = Electric energy [kWh]

Note

For how to operate BACnet® Trial Run Tool, refer to the AE-200/AE-50/EW-50 Instruction Book –BACnet® Trial Run Tool–.

Enter the electric energy value for the representative single air conditioning unit if the group consists of multiple units. Enter “-” for the air conditioning units other than the representative unit.

[2] Checking the difference value

- ③ Calculate the monitor difference value from the Group Apportioned Electric Energy/Interlocked Units Apportioned Electric Energy values before and after the trial run and enter it.
Check whether there is a value of “0” among the monitor difference values.
If there is a value of “0,” check that the settings are correctly set. For details, refer to 9-6 (3) “If there is a unit with “0” amount of operating electric energy” and 9-6 (4) “If there is a unit with “0” amount of standby electric energy” in the AE-200/AE-50/EW-50 Instruction Book –Apportioned Electricity Billing Function–. If there is a wrong setting, correct it and perform a billing trial run check again.
Even if there is a unit with “0,” the unit may not run or the electric energy consumption may be small, so check the apportionment parameter if the settings are correct.
- ④ Check that the monitor value is larger than before the trial run. If there is no problem, insert a check mark in the check box.

[3] Checking whether the total electric energy value is correct

- ⑤ Total the monitor difference values of all groups/interlocked units connected to the metering device and enter the total value. Furthermore, check that the total value almost matches the total value calculated in [4] “Checking the electric energy total data” in 4-3-1 “Billing-related item sheet (BACnet®)”.
• The total values may not match completely because the electric energy value is rounded off to one decimal place.

[4] Checking the trend log object

- ⑥ Use BACnet® Trial Run Tool and read the “Log_Buffer” property values of the “Trend Log Group Apportioned Electric Energy” (LOG_01xx83) or “Trend Log Interlocked Units Apportioned Electric Energy” (LOG_61aa83) objects. Check that the “Present_Value” property values of the “Group Apportioned Electric Energy” (AC_01xx39) or “Interlocked Units Apportioned Electric Energy” (AC_61aa39) objects are stored in the “Log_Buffer” property at the interval set in the “Log_Interval” property, and that there is no abnormal data, such as a decrease in the value.

Note

For details on the procedures for operating BACnet® Trial Run Tool and checking the trend log object, refer to the AE-200/AE-50/EW-50 Instruction Book –BACnet® Trial Run Tool–.

4-3-3. Checking the match with the CSV data (apportioned results) of the AE-200

This procedure is performed only for the 1st check (after the air conditioning unit continuous operation).

Unit-related item sheet (entire view)

[1][2] [3][1] [4]

Unit-related item sheet (entire view)									
Unit No.	Unit Name	Unit Type	Unit Category	Unit Sub-category	Unit Model	Unit Manufacturer	Unit Serial No.	Unit Installation Date	Unit Status
1	Unit 1	Unit Type 1	Unit Category 1	Unit Sub-category 1	Unit Model 1	Unit Manufacturer 1	Unit Serial No. 1	Unit Installation Date 1	Unit Status 1
2	Unit 2	Unit Type 2	Unit Category 2	Unit Sub-category 2	Unit Model 2	Unit Manufacturer 2	Unit Serial No. 2	Unit Installation Date 2	Unit Status 2
3	Unit 3	Unit Type 3	Unit Category 3	Unit Sub-category 3	Unit Model 3	Unit Manufacturer 3	Unit Serial No. 3	Unit Installation Date 3	Unit Status 3
4	Unit 4	Unit Type 4	Unit Category 4	Unit Sub-category 4	Unit Model 4	Unit Manufacturer 4	Unit Serial No. 4	Unit Installation Date 4	Unit Status 4
5	Unit 5	Unit Type 5	Unit Category 5	Unit Sub-category 5	Unit Model 5	Unit Manufacturer 5	Unit Serial No. 5	Unit Installation Date 5	Unit Status 5
6	Unit 6	Unit Type 6	Unit Category 6	Unit Sub-category 6	Unit Model 6	Unit Manufacturer 6	Unit Serial No. 6	Unit Installation Date 6	Unit Status 6
7	Unit 7	Unit Type 7	Unit Category 7	Unit Sub-category 7	Unit Model 7	Unit Manufacturer 7	Unit Serial No. 7	Unit Installation Date 7	Unit Status 7
8	Unit 8	Unit Type 8	Unit Category 8	Unit Sub-category 8	Unit Model 8	Unit Manufacturer 8	Unit Serial No. 8	Unit Installation Date 8	Unit Status 8
9	Unit 9	Unit Type 9	Unit Category 9	Unit Sub-category 9	Unit Model 9	Unit Manufacturer 9	Unit Serial No. 9	Unit Installation Date 9	Unit Status 9
10	Unit 10	Unit Type 10	Unit Category 10	Unit Sub-category 10	Unit Model 10	Unit Manufacturer 10	Unit Serial No. 10	Unit Installation Date 10	Unit Status 10

Unit-related item sheet (enlarged view)

Group Apportioned Electric Energy / Interlocked Units Apportioned Electric Energy (BACnet)					Trend Log Object (BACnet)							CSV output (BACnet)	
No.	Monitored value before trial run (2015/4/2 10:22)	Monitored value after trial run (2015/4/3 9:21)	Monitored value difference	Check	Generate	Log Interval	Log Buffer		Apportioned electric energy of the start date (2015/4/3 0:30)	Apportioned electric energy of the end date (2015/4/3 11:00)	Difference value	Apportioned electric energy	Check
							Interval	Value					
1	0.0	1.4	1.4	✓	✓	180000	✓	✓	1.4	3.7	2.3	2.3	✓
2	0.0	2.5	2.5	✓	✓	180000	✓	✓	1.1	4.5	3.4	3.4	✓
3	0.0	3.5	3.5	✓	✓	180000	✓	✓	1.6	5.8	4.2	4.2	✓
4	0.0	4.7	4.7	✓	✓	180000	✓	✓	1.2	6.7	5.5	5.5	✓
5	3.0	10.4	7.4	✓	✓	180000	✓	✓	4.8	13.4	8.6	8.6	✓
6	2.1	2.6	0.5	✓	✓	180000	✓	✓	3.2	4.5	1.3	1.3	✓
Total of apportioned electric energy					20								

CSV data (apportioned results) - Energy management block unit

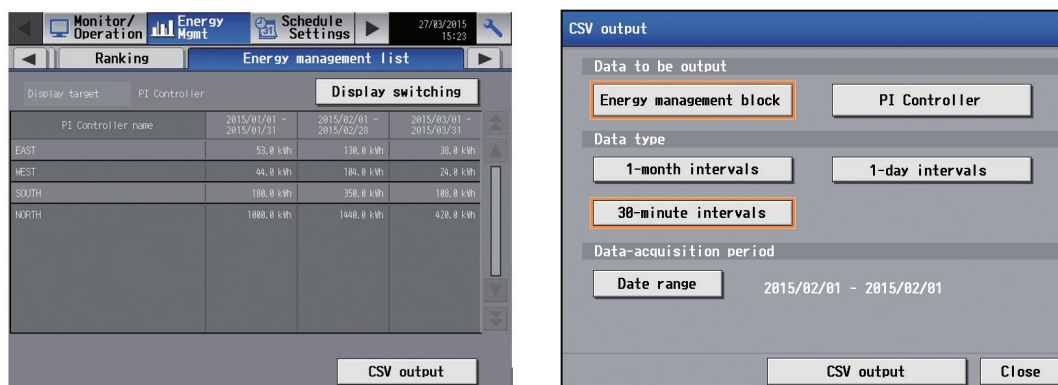
Time period: 2015/04/03 0:30 - 2015/04/03 11:00

Energy management block	Apportioned electric energy	Outdoor units - Apportioned electric energy	(Unit price 1)	Indoor units - Apportioned electric energy	(Unit price 1)
	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]
1	2.3	1.6	1.2	0.7	0.6
2	3.4	2.2	1.9	1.2	0.9

When group 1 is set to energy management block 1 and group 2 is set to energy management block 2

[1] Entering the apportioned electricity energy value from the CSV data at 30-minute intervals in the energy management block of the AE-200

- ① Remove the AE-200 cover, and connect an USB memory device.
- ② Click [Energy Mgmt] - [Energy management list], and select [CSV output].



- ③ In [Date Range], set the period from the following day of the billing run start or 3 days prior to the current date, whichever is later (hereinafter referred to as the “start date”) to the current date (hereinafter referred to as the “end date”) and touch [CSV output] while [Energy management block] and [30-minute intervals] are selected.

Open the output CSV file in Microsoft Excel and enter the “apportioned electricity energy” value in the energy management block unit in the check sheet.

- ④ Enter the date and time in “Time period” in the CSV file in the start date and end date.

[2] Entering the apportioned electric energy values in the BACnet® function

- ⑤ Use BACnet® Trial Run Tool and read the “Log_Buffer” property values of the “Trend Log Group Apportioned Electric Energy” (LOG_01xx83) or “Trend Log Interlocked Units Apportioned Electric Energy” (LOG_61aa83) objects, and enter the apportioned electricity value at the time 30 minutes after the date/time entered in the start date column.

“Log_Buffer” value × 0.1 = Apportioned electric energy [kWh]

- ⑥ Use BACnet® Trial Run Tool and read the “Log_Buffer” property values of the “Trend Log Group Apportioned Electric Energy” (LOG_01xx83) or “Trend Log Interlocked Units Apportioned Electric Energy” (LOG_61aa83) objects, and enter the apportioned electricity value at the time 30 minutes after the date/time entered in the end date column. (If the log at the date/time of the end date is not stored, wait for at least 30 minutes and check again.)

“Log_Buffer” value × 0.1 = Apportioned electric energy [kWh]

[3] Checking the difference value

- ⑦ Calculate the difference value from the apportioned electric energy values of the start date and the end date and enter it.

[4] Checking whether the electric energy value is correct

- ⑧ Check that the difference value of the trend log object matches the apportioned electric energy value of the CSV output. If there is no problem, insert a check mark in the check box.

Note

For how to operate BACnet® Trial Run Tool, refer to the AE-200/AE-50/EW-50 Instruction Book –BACnet® Trial Run Tool–.

Enter the apportioned electric energy value for the representative single air conditioning unit if the group consists of multiple units. Enter “-” for the air conditioning units other than the representative unit.

The total values may not match completely because the electric energy value is rounded off to one decimal place.

If a check needs to be performed on the billing run start date, perform a continuous operation of each indoor unit for at least 2 hours after the apportioned result is stored for the first time after at least 30 minutes have passed since the billing run start, and then perform the procedure in 4-3-3 “Checking the match with the CSV data (apportioned results) of the AE-200” by replacing the data as follows.

- Read the both “start date” and “end date” as the billing run start date in ③ .
- For the electric energy value to be entered in the “Apportioned electric energy” in ③ , referring to the CSV file, total the apportioned electric energy values output at 30-minute intervals in the “Outdoor units - Apportioned electric energy” and “Indoor units - Apportioned electric energy” columns for each energy management block in the range of the “Date” from “XX:00 or XX:30 minutes of any hour after at least 30 minutes have passed since the billing run start (at the time when the apportioned result is stored for the first time)” to “XX:00 or XX:30 minutes of any hour after a continuous operation has been performed for at least 2 hours.”
- The time to be entered in the “start date” in ④ is “XX:00 or XX:30 minutes of any hour after at least 30 minutes have passed since the billing run start (the time when the apportioned result is stored for the first time)”. The time to be entered in the “end date” is “XX:00 or XX:30 minutes of any hour after a continuous operation has been performed for at least 2 hours.”

CSV data (apportioned results) - Unit address unit

Energy management block	Unit address	Date					Outdoor units -	(Unit price 1)			Indoor units -	(Unit price 1)		
							Apportioned electric energy	Electric energy consumption	Standby electric energy		Apportioned electric energy	Electric energy consumption	Standby electric energy	
		[Year]	[Month]	[Day]	[Hour]	[Minute]	[kWh]	[kWh]	[kWh]	Status	[kWh]	[kWh]	[kWh]	Status
1 Energy management block A	1-001	2015	4	2	11	30	0.21	0.2	0.01		0.11	0.1	0.01	
1 Energy management block A	1-001	2015	4	2	12	0	0.31	0.3	0.01		0.21	0.2	0.01	
1 Energy management block A	1-002	2015	4	2	11	30	0.32	0.3	0.02		0.22	0.2	0.02	
1 Energy management block A	1-002	2015	4	2	12	0	0.42	0.4	0.02		0.32	0.3	0.02	

If the energy management block consists of 2 units (1-001 and 1-002) and the “start date” is 2015/4/2 11:30 and the “end date” is 2015/4/2 12:00, total all apportioned electric energy values enclosed in a red circle.

4-4. BACnet[®] (2nd run check (at least 10 days after the 1st billing function trial run))

As with the 1st trial run, perform a check for the period from the first billing trial run until work begins.

For the procedure, refer to 4-3-1 "Billing-related item sheet (BACnet[®])" and 4-3-2 "Unit-related item sheet (BACnet[®])".

4-5. BACnet[®] (3rd run check (at least 1 month after the 2nd billing function trial run))

As with the 1st trial run, perform a check for the period from the second billing trial run until the closing date.

For the procedure, refer to 4-3-1 "Billing-related item sheet (BACnet[®])" and 4-3-2 "Unit-related item sheet (BACnet[®])".

This product is designed and intended for use in the residential,
commercial and light-industrial environment.

The product at hand is based on the following EU regulations:

- Low Voltage Directive 2014/35/EU
- Electromagnetic Compatibility Directive 2014/30/EU
- Restriction of Hazardous Substances 2011/65/EU

Please be sure to put the contact address/telephone number
on this manual before handing it to the customer.

mitsubishi electric corporation

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