MITSUBISHI ELECTRIC

<ORIGINAL>

UK CA CE

Air Conditioning Control System
Centralized Controller
AE-C400/EW-C50

BM ADAPTER
BACS-AP50

Instruction Book
–BACnet® function–

Contents

Before using the controller, please read this Instruction Book carefully to ensure proper operation.
Retain this manual for future reference.

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-C400” is referred to as “AE-C”.
- “Centralized Controller EW-C50” is referred to as “EW-C”.
- “PI controller (PAC-YG60MCA)” is referred to as “PI controller”.
- “AI controller (PAC-YG63MCA)” is referred to as “AI controller”.
- “OA Processing Unit (LOSSNAY with heater and humidifier)” is referred to as “OA Processing Unit”.
- “e-Series chiller unit (EAHV, EACV)” is referred to as “Chiller unit”.
- “Chiller unit of MEHITS” is referred to as “MEHT-CH&HP unit”.

1. Before use

This manual explains how to use the AE-C/EW-C/BACS-AP50 BACnet function.
For how to install AE-C/EW-C/BACS-AP50 or how to use the functions other than the BACnet function, refer to the AE-C/EW-C/BACS-AP50 Installation Manual and Instruction Book.
For how to use the BACnet Setting Tool, refer to the AE-C/EW-C Instruction Book (BACnet Setting Tool) or BACS-AP50 Instruction Book (Detailed Operation).
When using the apportioned electricity billing function with the BACnet function, refer to the AE-C/EW-C Instruction Book (Apportioned Electricity Billing Function) and the AE-C/EW-C Instruction Book (BACnet Apportioned Electricity Billing Function Trial Run).

For BACS-AP50, please refer to EW-C in this manual.

1-1. Introduction

The AE-C/EW-C BACnet function can be used when connecting AE-C/EW-C to the open network BACnet that is used for the building management system.

1-2. Models of units that can be controlled with BACnet

The table below shows models that can connect to AE-C/EW-C, and models that can be controlled with the BACnet function.

V: Connectable/Controllable
—: Not connectable/Not controllable

Model		Connectable/Not connectable to AE-C/EW-C	Controllable/Not controllable with BACnet
CITY MULTI	S series	V	V
	Y series	V	V
	HP series	V	V
	R2 series	V	V
	WY series	V	V
	WR2 series	V	V
	HVRF series	V	V
Air conditioning unit with outlet air temperature control (E-OA)		V *2	V *2
LOSSNAY		V	V (Only when groups are configured.)
OA Processing Unit		V	V (Only when groups are configured.)
Air To Water Booster unit/Air To Water (PWFY)		V	V
A-control unit (Mr. Slim)		An adapter is required.	V
K-control unit		—	—
Room air conditioner (RAC)		An interface is required.	V
Hot Water Heat Pump unit (CAHV, CRHV, QAHV)		V *3	—
Chiller unit		V	V
MEHT-CH&HP unit		V *1	—
DIDO controller (PAC-YG66DCA)		V *3	—
PI controller (PAC-YG60MCA)		V *3	V *3
AI controller (PAC-YG63MCA)		V *3	—

*1 Only AE-C400E/EW-C50E.
*2 Only AE-C400A/EW-C50A/BACS-AP50.
*3 Except BACS-AP50

1-3. Restrictions and cautions

Restrictions and cautions for AE-C/EW-C BACnet functions are as follows.

(1) Action to take when an error occurs

Immediately carry out repairs to the problem area when an error related to air conditioning units is detected on the building management system.

(2) Functions

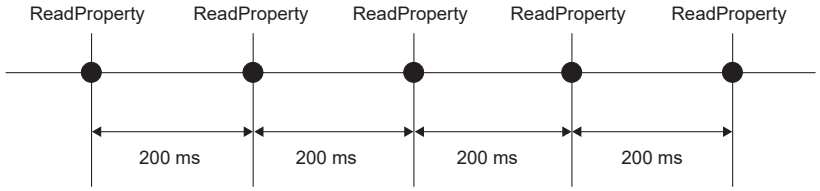
Due to continuing improvement, specifications are subject to change without notice.

(3) Request interval

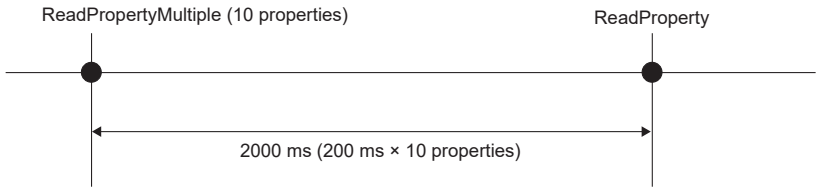
- When sending “ReadProperty” or “WriteProperty” from the building management system to the AE-C/EW-C, set the request interval according to the following requirements.

- **ReadProperty**

① 200 (ms/property) or above

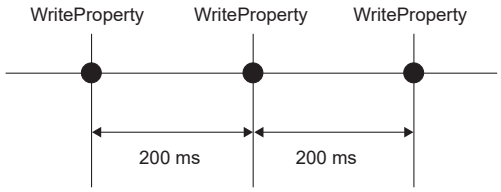


② ReadPropertyMultiple: (200 ms x number of properties) or above
After sending a request for reading 10 properties with ReadPropertyMultiple, leave an interval of at least 2000 ms (= 200 ms x 10 properties) before sending the next request to the AE-C/EW-C.

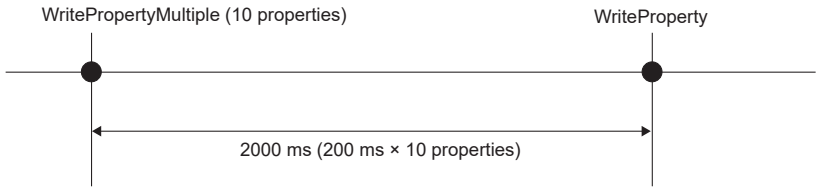


- **WriteProperty**

① 24 times/day or less for each property of an object
When sending a writing request successively, allow an interval of 200 ms between request transmissions.



WritePropertyMultiple: (200 ms x number of properties) or above



- Periodical (or repetitive) transmission of the same value is prohibited.
  Send a writing request only when there is a need to change the operation settings of the air conditioning units.
  Do not send a writing request periodically or repeatedly to keep the operation settings (such as on/off, set temperature, operation mode, and prohibited operations) at a constant value.
  The air conditioning units store the current settings in nonvolatile memory, and the settings are not reset in the event of a power failure. Therefore, there is no need to send a writing request periodically or repeatedly.
  Even when the indoor units are set to automatically recover their operations after a power failure, operating or changing the settings of the air conditioning units frequently may cause them to fail to resume the original operation upon return of power.

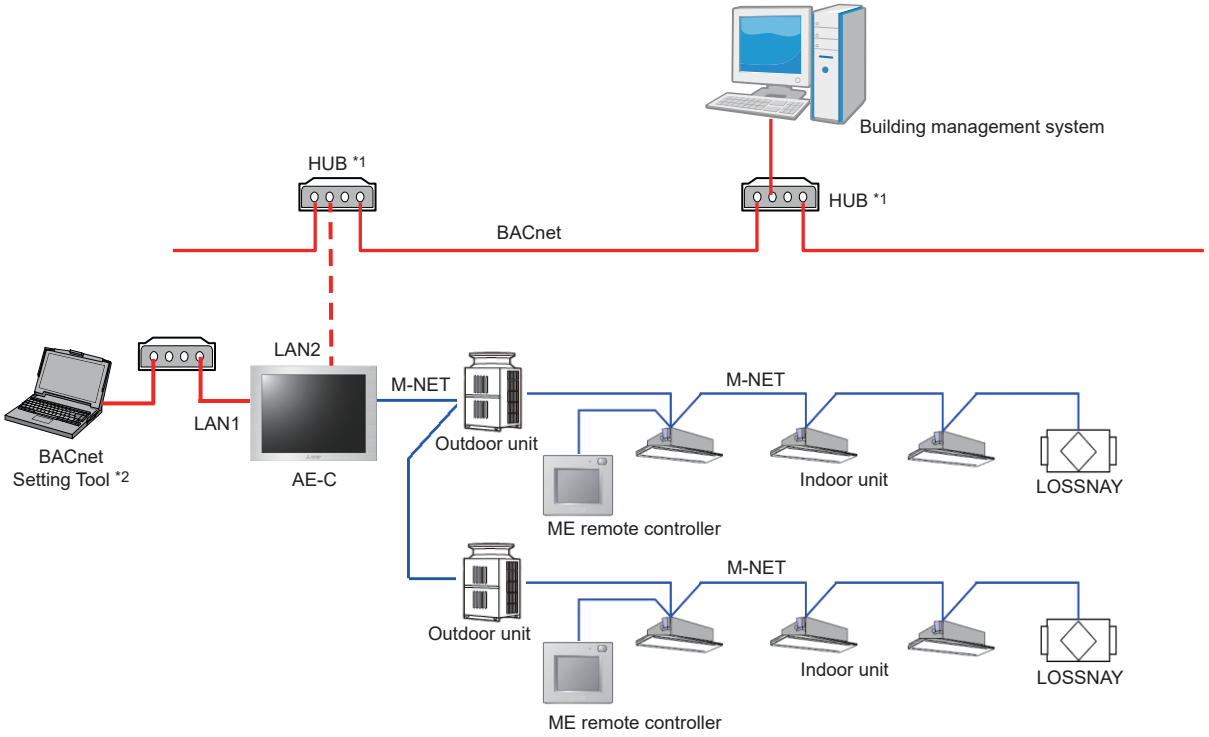
(4) LAN2 port

When the BACnet function is used, the LAN2 port cannot be used for cloud connection. Use a 3G/4G dongle for cloud connection.

* Cloud connection is not available for BACS-AP50.

2. Usage (System configurations)

2-1. System configuration example

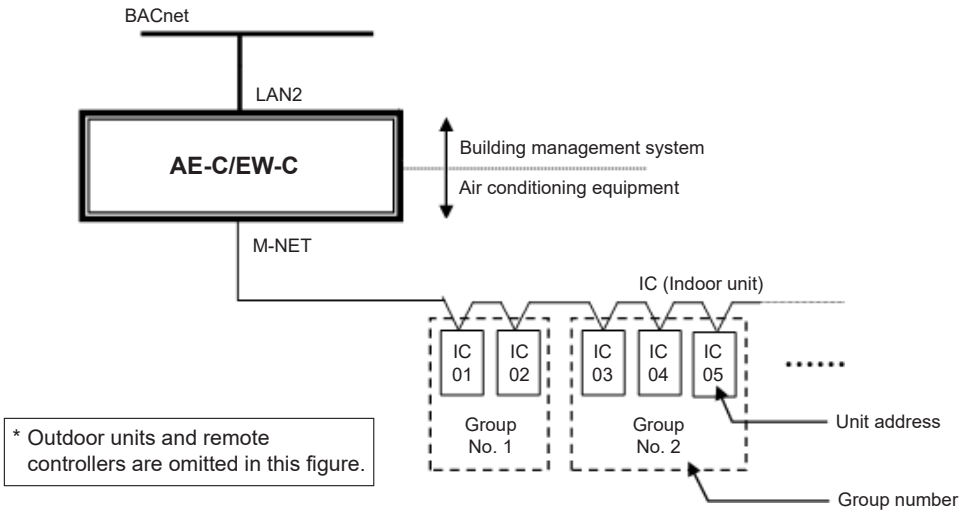


*1 Use a switching HUB for LAN1 and LAN2 (BACnet) connections. Do not connect LAN1 and LAN2 (BACnet) to the same HUB.

*2 A personal computer (hereinafter referred to as "set-up PC") is required to set up the BACnet function of the AE-C/EW-C. After the set-up is completed, disconnect the set-up PC and the LAN cable/HUB for connecting the set-up PC from the AE-C/EW-C. For details, refer to section 6 “Checking installation operations and performing trial run”.

2-2. Group configurations

The basic functions of the BACnet function can be performed for each unit group.
Multiple indoor units (ICs) in a group can collectively be controlled.
The group number is a range of 1 to 50.



2-3. Chiller unit systems and group configuration

The AE-C/EW-C controls chiller systems or individual chiller units using the basic functions of BACnet. When talking about chiller units, a set of water pipes is referred to as a “system,” and the units operated simultaneously are referred to as a “simultaneously operated group.”
One unit consists of two control boards (unit system 1 “CH” and unit system 2 “CL”) that require M-NET address setting. Each simultaneously operated group consists of a maximum of six units.
A maximum of 24 chiller units can be connected to each AE-C or EW-C.
However, when connecting both chiller units and air conditioning units to a single AE-C/EW-C, the total number of chiller units (18 units or fewer) times three and the number of air conditioning units combined must be 50 or fewer.

Chiller-unit-related terms are explained and system configuration examples are shown below.

Name	Description
System	System refers to a set of water pipes. Units are operated in the unit of systems. (Remote controllers are separately connected to each system.)
System representative group	A group of simultaneously operated units including a system representative unit
Simultaneously operated group	A group of units that are operated simultaneously
System representative unit	This unit receives operation commands and performs control of the units in the system. This unit transmits operation commands to the representative unit in the group of simultaneously operated units in the system.
Representative unit in the simultaneously operated group	This unit receives operation commands from the system representative unit in the group of simultaneously operated units. This unit sends the operation commands to the sub unit in the group of simultaneously operated units based on the operation command information from the system representative unit.
Sub unit	This unit operates according to the operation command information from the representative unit in the group of simultaneously operated units.
Unit system 1 and 2	One unit consists of unit system 1 "CH" and unit system 2 "CL."

The group number will be set to a range between 1 and 50. Group numbers of the chiller units and those of other types of units must not overlap.
See “4-2. Basic functions” for the details of basic functions.

3. Usage (Communication specifications)

3-1. BACnet specifications

BACnet communication specifications are based on ANSI/ASHRAE Standard 135-2010.
By selecting the applicable Revision number on the BACnet Setting Tool, the BACnet communication specifications comply with ANSI/ASHRAE Standard 135-2004, 2008, 2010, 2012 and 2016 Revisions (4 to 21).

ANSI/ASHRAE Standard	Revision	Applicable: V Not applicable: –
ANSI/ASHRAE Standard 135-1995	NA	–
	1	–
ANSI/ASHRAE Standard 135-2001	2	–
	3	–
ANSI/ASHRAE Standard 135-2004	4	V *1
	5	V *1
	6	V *1
ANSI/ASHRAE Standard 135-2008	7	V *1
	8	V *1
	9	V *1
	11	V *1
ANSI/ASHRAE Standard 135-2010	12	V *2
	13	V
ANSI/ASHRAE Standard 135-2012	14	V
	15	V
	16	V
	17	V
	18	V
ANSI/ASHRAE Standard 135-2016	19	V
	20	V
	21	V *2
ANSI/ASHRAE Standard 135-2020	22	–

*1 Select the Revision number on the BACnet Setting Tool according to the Revision number of the central monitoring device. When the Revision number of the central monitoring device is 4 to 11, select Revision 12.

*2 The selectable protocol revisions are Rev.12 and Rev.21.

3-2. Communication protocol specifications

(1) Overview of protocol

- Use BACnet/IP based on ANSI/ASHRAE Standard 135-2004, 2008, 2010, 2012 and 2016 on UDP/IP of Ethernet®*.
- LAN2 is used to connect BACnet.

Ether header	IP header	UDP header	BVLL header	NPCI header	APDU

* Ethernet® is a registered trademark of Xerox Corporation in the United States.

(2) Ether header

The physical layer is Ethernet® and the specifications are 100BASE-TX.

(3) IP header

A Class C private address is recommended *1. The sub-net mask is 255. 255. 255. 0.

*1 Recommended values (range): [192.168.2.1] to [192.168.254.254]
[192.168.0.0] and [192.168.255.255] should not be used for a LAN2 IP address.
An IP address set using LAN1 should not be used as a LAN2 IP address.
LAN1 and LAN2 network addresses must not be the same.

(4) UDP header

47808 (0xBAC0) is recommended for the default UDP port for unicast and broadcast.

(5) BVLL header

BVLC type (1 octet): 0x81 fixed (BVLL for BACnet/IP)
BVLC function (1 octet): 0x0A for unicast
0x0B for broadcast
BVLC length (2 octets): Variable (BVLL header (4) + APDU data length)
(The above is a typical example. For details, refer to ANSI/ASHRAE Standard 135-2004, 2008, 2010, 2012 and 2016.)

(6) BACnet NETWORK NPCI header

Version (1 octet): 0x01 fixed
Control (1 octet): 0x04 with response message
0x00 without response message
(The above is a typical example. For details, refer to ANSI/ASHRAE Standard 135-2004, 2008, 2010, 2012 and 2016.)

(7) APDU for BACnet

Data of 1,024 octets and under.
(Refer to ANSI/ASHRAE Standard 135-2010 for details.)

3-3. Objects

Support status for objects and for BACnet functions are listed below.

V: Supported
—: Not supported

Object type *1		Abbreviation	Supported/ Not supported	Object
Access Credential	(32)	—	—	
Access Door	(30)	—	—	
Access Point	(33)	—	—	
Access Rights	(34)	—	—	
Access User	(35)	—	—	
Access Zone	(36)	—	—	
Accumulator *6	(23)	AC	V	Group Apportioned Electric Energy Interlocked Units Apportioned Electric Energy PIcontroller Electric Energy 1–4 Group Apportionment Parameter Interlocked Units Apportionment Parameter
Analog Input	(0)	AI	V	Room Temp [Water Temp] Chiller Representative Inlet Water Temp Chiller Representative Outlet Water Temp Error Code Detail COP
Analog Output	(1)	—	—	
Analog Value	(2)	AV	V	Set Temp [Set Water Temp] Set Temp Cool Set Temp Heat Set Temp Auto Set High Limit Setback Temp Set Low Limit Setback Temp Chiller Set Temp Cool Chiller Set Temp Heat
Alert Enrollment	(52)	—	—	
Audit Log	(61)	—	—	
Audit Reporter	(62)	—	—	
Averaging	(18)	—	—	
Binary Input	(3)	BI	V	On Off State Alarm Signal *2 Filter Sign [Circulating Water Exchange Sign] M-NET Communication State Night Purge State *6 Thermo On Off State System Alarm Signal *2 External Heat Source State PIcontroller Alarm Signal *2 *6 Chiller On Off State Chiller Representative Alarm Signal Chiller Communication State Chiller Unit Alarm Signal
Binary Lighting output	(55)	—	—	
Binary Output	(4)	BO	V	On Off Setup *3 Chiller On Off Setup
Binary Value	(5)	BV	V	Filter Sign Reset [Circulating Water Exchange Sign Reset] Prohibition On Off *3 Prohibition Mode Prohibition Filter Sign Reset [Prohibition Circulating Water Exchange Sign Reset] Prohibition Set Temperature Prohibition Fan Speed System Forced Off (individual)/(collective) *4 Chiller Prohibition On Off Chiller Prohibition Mode Chiller Prohibition Set Temperature

Object type *1		Abbreviation	Supported/ Not supported	Object
BitString Value	(39)	—	—	
Calendar	(6)	—	—	
CharacterString Value	(40)	—	—	
Command	(7)	—	—	
Credential Data Input	(37)	—	—	
Date Pattern Value	(41)	—	—	
Date Value	(42)	—	—	
DateTime Pattern Value	(43)	—	—	
DateTime Value	(44)	—	—	
Device	(8)	DEV	V	Device object of AE-C/EW-C
Elevator Group	(57)	—	—	
Escalator	(58)	—	—	
Event Enrollment	(9)	—	—	
Event Log	(25)	—	—	
File	(10)	—	—	
Global Group	(26)	—	—	
Group	(11)	—	—	
Integer Value	(45)	—	—	
Large Analog Value	(46)	—	—	
Life Safety Point	(21)	—	—	
Lift	(59)	—	—	
Lighting Output	(54)	—	—	
Life Safety Zone	(22)	—	—	
Load Control	(28)	—	—	
Loop	(12)	—	—	
Multi-state Input	(13)	MI	V	Error Code Operational Mode State Fan Speed State Air Direction State Ventilation Mode State Air To Water Mode State Chiller Operational Mode State Chiller Fan Mode State
Multi-state Output	(14)	MO	V	Operational Mode Setup Fan Speed Setup Air Direction Setup Ventilation Mode Setup Air To Water Mode Setup Chiller Operational Mode Setup Chiller Fan Mode Setup
Multi-state Value	(19)	—	—	
Network Port	(56)	NP	V *5	
Network Security	(38)	—	—	
Notification Class	(15)	CLS	V	Notification Class
Nortification Forwarder	(51)	—	—	
OctetString Value	(47)	—	—	
Positive Integer Value	(48)	—	—	
Program	(16)	—	—	
Pulse Converter	(24)	—	—	
Schedule	(17)	—	—	
Structured View	(29)	—	—	
Time Pattern Value	(49)	—	—	

Object type *1		Abbreviation	Supported/ Not supported	Object
Time Value	(50)	—	—	
Timer	(31)	—	—	
Trend Log	(20)	LOG	V	Trend Log Room Temp Trend Log Group Apportioned Electric Energy *6 Trend Log Interlocked Units Apportioned Electric Energy *6 Trend Log PIcontroller Electric Energy 1–4 *6 Trend Log Group Apportionment parameter *6 Trend Log Interlocked Units Apportionment parameter *6
Trend Log Multiple	(27)	—	—	

*1 Values within parentheses are “Object_Type” property values.

*2 Outputs an error code (4-digit) in Description and Message Text of event notification.

*3 Do not use this when “External Input Setting” for AE-C/EW-C is set to “ON/OFF (Level signal)”. “External Input Setting” can be configured on the Initial Setting Tool. (Refer to the AE-C/EW-C Instruction Book (Detailed operations) for settings methods.)

*4 Executes the stop command and remote controller operation prohibition (run/stop) command for air conditioning units.

*5 The Network Port object is generated by the BACnet setting tool when revision 21 is configured.

*6 Not used in BACS-AP50.

3-4. Services

The BACnet service support status is shown below.

V: Supported
—: Not supported
Initiate request: Provides services
Execute request: Receives and uses services

Service		Initiate request	Execute request
1. Alarm and Event Services	(1) Acknowledge Alarm Service	—	—
	(2) ConfirmedAuditNotification Service	—	—
	(3) ConfirmedCOVNotification Service	V	—
	(4) Confirme dCOVNotificationMultiple Service	—	—
	(5) ConfirmedEventNotification Service	V	—
	(6) GetAlarmSummary Service	—	—
	(7) GetEnrollmentSummary service	—	—
	(8) GetEventInformation Service	—	V
	(9) LifeSafetyOperation Service	—	—
	(10) SubscribeCOV Service *1	—	V
	(11) SubscribeCOVProperty Service	—	—
	(12) SubscribeCOVPropertyMultiple Service	—	—
	(13) UnconfirmedCOVNotificationMultiple	—	—
2. File Access Services	(1) AtomicReadFile Service	—	—
	(2) AtomicWriteFile Service	—	—
3. Object Access Services	(1) AddListElement Service	—	V
	(2) AuditLogQuery Service	—	—
	(3) RemoveListElement Service	—	V
	(4) CreateObject Service	—	—
	(5) DeleteObject Service	—	—
	(6) ReadProperty Service	—	V
	(7) ReadPropertyMultiple Service	—	V
	(8) ReadRange Service	—	V
	(9) WriteGroup Service	—	—
	(10) WriteProperty Service	—	V
	(11) WritePropertyMultiple Service	—	V
4. Remote Device Management Services	(1) DeviceCommunicationControl Service	—	—
	(2) ConfirmedPrivateTransfer Service	—	—
	(3) ConfirmedTextMessage Service	—	—
	(4) ReinitializeDevice Service	—	V
5. Virtual Terminal Services	(1) VT-Open Service	—	—
	(2) VT-Close Service	—	—
	(3) VT-Data Service	—	—
6. Unconfirmed Services	(1) I-Am	V	V
	(2) I-Have	V	—
	(3) UnconfirmedAuditNotification Service	—	—
	(4) UnconfirmedCOVNotification Service	V	—
	(5) UnconfirmedEventNotification Service	V	—
	(6) UnconfirmedPrivateTransfer Service	—	—
	(7) UnconfirmedTextMessage Service	—	—
	(8) TimeSynchronization Service	—	V
	(9) UTCTimeSynchronization Service	—	—
	(10) Who-Has	—	V
	(11) Who-Is	V	V

*1 The maximum number of COV notifications which can be registered is 3,150. However, 5 is the maximum number of COV notifications which can be registered in which Lifetime is not = 0.

3-5. Services for each object

The table below lists the supported services for each object.

○ : Supported
△ : Settings can be changed on the BACnet Setting Tool.
INIT: Provides services (Initiate)
EXEC: Receives and executes services (Execute)

Service \ Object		Device	Analog Input	Analog Value	Binary Input	Binary Output	Binary Value	Multi-State Input	Multi-State Output	Notification Class	Accumulator	Trend Log	Network Port
ConfirmedCOVNotification	INIT		△	△	△	△	△	△	△				
	EXEC												
ConfirmedEventNotification	INIT		△		△	△					△		
	EXEC												
GetEventInformation	INIT												
	EXEC	○											
SubscribeCOV	INIT												
	EXEC	○											
AddListElement	INIT												
	EXEC									○			
RemoveListElement	INIT												
	EXEC									○			
ReadProperty	INIT												
	EXEC	○	○	○	○	○	○	○	○	○	○	○	○ *1
ReadPropertyMultiple	INIT												
	EXEC	○	○	○	○	○	○	○	○	○	○	○	○ *1
ReadRange	INIT												
	EXEC	○								○		○	
WriteProperty	INIT												
	EXEC		○	○	○	○	○		○	○	○	○	
WritePropertyMultiple	INIT												
	EXEC		○	○	○	○	○		○	○	○	○	
I-Am	INIT	○											
	EXEC	○											
I-Have	INIT	○											
	EXEC												
UnconfirmedCOVNotification	INIT		△	△	△	△	△	△	△				
	EXEC												
UnconfirmedEventNotification	INIT		△		△	△					△		
	EXEC												
TimeSynchronization	INIT												
	EXEC	△											
Who-Has	INIT												
	EXEC	○											
Who-Is	INIT	○											
	EXEC	○											

*1 Selected Revision 12 returns error response((Error Class=Object Error Code=Unknown). Selected Revision 21 is available.

4. Usage (Function specifications)

The AE-C/EW-C BACnet function mutually converts communications for air conditioning equipment connected to the AE-C/EW-C and for BACnet communications.

4-1. Controller functions and BACnet functions

The table below lists the supported controller functions which can monitor/operate from the web browser or the AE-C's LCD and the BACnet functions.
BACS-AP50 is only available for BACnet function only.

V: Supported
—: Not supported

Classification	Item	Controller function	BACnet function	Remarks
Monitor/ Operation	On Off Setup	V	V	
	On Off State	V	V	
	Operational Mode Setup	V	V	
	Operational Mode State	V	V	
	Fan Speed Setup	V	V	
	Fan Speed State	V	V	
	Air Direction Setup	V	V	BACnet does not support "Downblow 20%" and "Auto" settings.
	Air Direction State	V	V	BACnet does not support "Downblow 20%" and "Auto" settings.
	Room Temp [Water Temp]	V	V	
	Set Temp [Set Water Temp]	V	V	
	Set Temp Cool	V	V	
	Set Temp Heat	V	V	
	Set Temp Auto	V	V	
	Set High Limit Setback Temp	V	V	Only AE-C400A/EW-C50A/ BACS-AP50
	Set Low Limit Setback Temp	V	V	Only AE-C400A/EW-C50A/ BACS-AP50
	Ventilation Mode Setup	V	V	
	Ventilation Mode State	V	V	
	Air To Water Mode Setup	V	V	
	Air To Water Mode State	V	V	
	Night Purge Setup	V	—	
	Night Purge State	V	V	BACS-AP50 does not support.
	Prohibition On Off	V	V	
	Prohibition Mode	V	V	
	Prohibition Filter Sign Reset	V	V	
	Prohibition Set Temperature	V	V	
	Prohibition Timer	V	—	
	Prohibition Air Direction	V	—	
	Prohibition Fan Speed	V	V	
	System Forced Off (individual)	V	V	
	System Forced Off (collective)	V	V	
	Thermo On Off State	V *1	V *2	
	External Heat Source State	—	V	Output status of indoor unit CN24
	COP	V *5	V *5	

Classification	Item	Controller function	BACnet function	Remarks
Alarm monitor	Alarm Signal (Air conditioning unit/PI controller)	V	V	BACS-AP50 does not support PI controller.
	Error Code	V	V	Controllers support 4-digit error codes, and BACnet supports 1- and 4-digit error codes.
	System Alarm Signal	V	V	
	M-NET Communication State	V	V	
	Filter Sign	V	V	
	Filter Sign Reset	V	V	
Control functions	Command Failure	—	V	
	High Limit/Low Limit Alarm	V *3	V	
	Night Setback control	V	—	
	Schedule control	V	—	
	Interlock control	V	—	
Data management functions	Energy management data/ Trend log	V	V	These are collected individually in the body/BACnet, so sometimes the values of these do not coincide. BACS-AP50 does not support.
	Group Apportioned Electric Energy	V	V	BACS-AP50 does not support.
	Interlocked Units Apportioned Electric Energy	V	V	BACS-AP50 does not support.
	Group Apportionment Parameter	V	V	BACnet function has only parameters for outdoor units. BACS-AP50 does not support.
	Interlocked Units Apportionment Parameter	V	V	BACnet function has only parameters for outdoor units. BACS-AP50 does not support.
	PIcontroller Electric Energy (Ch 1–4)	V	V	BACS-AP50 does not support.
Other functions	Unit of temperature setting	V	V	This setting on the AE-C/EW-C and the one on the BACnet are different. On the BACnet, only the unit of temperature that is used for BACnet communication can be set.
	Cumulative operation	V	—	
	Time management	V	V	
	BACnet router	—	V	
	LCD lock	V	—	

Classification	Item	Controller function	BACnet function	Remarks
Chiller monitor/ operation	Chiller On Off Setup	V	V	
	Chiller On Off State	V	V	
	Chiller Operational Mode Setup	V	V	
	Chiller Operational Mode State	V	V	
	Chiller Fan Mode Setup	V	V	
	Chiller Fan Mode State	V	V	
	Chiller Outdoor Temp	V	—	
	Chiller Inlet Water Temp	V	—	
	Chiller Outlet Water Temp	V	—	
	Chiller Representative Inlet Water Temp	V	V	
	Chiller Representative Outlet Water Temp	V	V	
	Chiller Set Temp Cool	V	V	
	Chiller Set Temp Heat	V	V	
	Chiller Drive Ratio (By Unit)	— *4	—	
	Chiller Prohibition On Off	V	V	
	Chiller Prohibition Mode	V	V	
	Chiller Prohibition Set Temperature	V	V	
Chiller alarm monitor	Chiller Representative Alarm Signal	— *4	V	
	Chiller Communication State	—	V	
	Chiller Unit Alarm Signal	V	V	

*1 Supports only Thermo-ON time, Thermo-ON/OFF count.
Thermo-ON/OFF count cannot be monitored from the AE-C's LCD or web browser, but can be checked with the CSV output function.

*2 Supports only Thermo-ON/OFF state.

*3 Alarms can occur when the upper and lower limit values are exceeded due to the AI controller (option).

*4 This item cannot be monitored or operated from the AE-C's LCD or the Integrated Centralized Control Web, but can be checked with the CSV output function.

*5 The target outdoor units must be enabled in the outdoor unit measurement settings by the initial setting tool.
Restart AE-C/EW-C when the outdoor units is changed to disable in outdoor unit measurement settings.

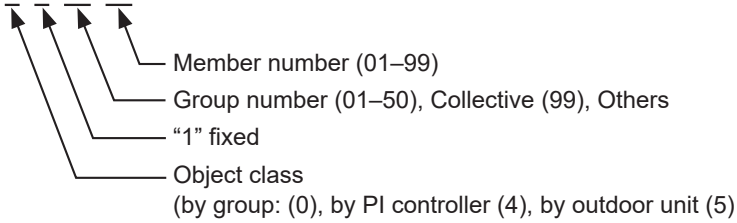
4-2. Basic functions

Sends commands from the building management system to air conditioning equipment. Additionally, sends the air conditioning equipment status to the building management system.

4-2-1. Instance number for basic functions

The instance number is configured of the object type + fixed value “1” + group number + member number.

Instance number (6 digits in decimal notation): 0 1 xx xx



Objects that can be used with the AE-C/EW-C are shown in the table below.

Object	Object type	Instance number	Units					Remarks
			Inactive(0)*23	Active(1)				
			Text-1(1)*23	Text-2(2)	Text-3(3)	Text-4(4)	Text-5(5)	
On Off Setup	BO	01xx01	Stop	Run				*19
On Off State	BI	01xx02	Stop	Run				*19
Alarm Signal	BI	01xx03	Normal	Error				
Error Code	MI	01xx04	01: Normal 02: Other errors 03: Refrigeration system fault 04: Water system error 05: Air system error		06: Electronic system error 07: Sensor fault 08: Communication error 09: System error			
Operational Mode Setup	MO	01xx05	01: Cool 02: Heat 03: Fan		04: Auto 05: Dry 06: Setback			*1 *15 *17 *21
Operational Mode State	MI	01xx06	01: Cool 02: Heat 03: Fan		04: Auto 05: Dry 06: Setback			*1 *3 *15 *17 *21
Fan Speed Setup	MO	01xx07	01: Low 02: High 03: Mid 2		04: Mid 1 05: Auto			*4 *5 *17
Fan Speed State	MI	01xx08	01: Low 02: High 03: Mid 2		04: Mid 1 05 Auto			*4 *5 *17 *20
Room Temp [Water Temp]	AI	01xx09	ºF/ºC					*15 *24
Set Temp [Set Water Temp]	AV	01xx10	ºF/ºC					*15 *24
Filter Sign	BI	01xx11	OFF	ON				
Filter Sign Reset	BV	01xx12	Reset	Void				
Prohibition On Off	BV	01xx13	Permit	Prohibit				*19
Prohibition Mode	BV	01xx14	Permit	Prohibit				*15
Prohibition Filter Sign Reset	BV	01xx15	Permit	Prohibit				
Prohibition Set Temperature	BV	01xx16	Permit	Prohibit				*15
Prohibition Fan Speed	BV	01xx17	Permit	Prohibit				
M-NET Communication State	BI	01xx20	Normal	Error				

Object		Object type	Instance number	Units					Remarks
				Inactive(0)*23	Active(1)				
				Text-1(1)*23	Text-2(2)	Text-3(3)	Text-4(4)	Text-5(5)	
System Forced Off	individual	BV	01xx21	Reset	Execute				*10 *11
	collective		019921						
Air Direction Setup		MO	01xx22	Horizontal	Downblow 60%	Downblow 80%	Downblow 100%	Swing	*13 *15 *17
Air Direction State		MI	01xx23	Horizontal	Downblow 60%	Downblow 80%	Downblow 100%	Swing	*8 *13 *15 *17
Set Temp Cool		AV	01xx24	ºF/ºC					*15 *17
Set Temp Heat		AV	01xx25	ºF/ºC					*15 *17
Set Temp Auto		AV	01xx26	ºF/ºC					*15 *17
Set High Limit Setback Temp		AV	01xx27	ºF/ºC					*15 *17 *18
Set Low Limit Setback Temp		AV	01xx28	ºF/ºC					*15 *17 *18
Ventilation Mode Setup		MO	01xx35	Heat Recovery	Bypass	Auto			*14 *17
Ventilation Mode State		MI	01xx36	Heat Recovery	Bypass	Auto			*14 *17 *20
Air To Water Mode Setup		MO	01xx37	Heating	Heating ECO	Hot Water	Anti-freeze	Cooling	*14 *15 *16
Air To Water Mode State		MI	01xx38	Heating	Heating ECO	Hot Water	Anti-freeze	Cooling	*14 *15 *16
Group Apportioned Electric Energy		AC	01xx39	0.1 [kWh]					*2
Interlocked Units Apportioned Electric Energy		AC	61aa39	0.1 [kWh]					*2 *7
PIcontroller Electric Energy 1–4		AC	41mm40–43	0.1 [kWh]					*2 *6 *12 *14 *15 *16 *17
Group Apportionment Parameter		AC	01xx44	No Units					*2
Interlocked Units Apportionment Parameter		AC	61aa44	No Units					*2 *7
Night Purge State		BI	01xx46	OFF	ON				*14 *17
Thermo On Off State		BI	01xx47	OFF	ON				*15
System Alarm Signal		BI	010048	Normal	Error				
Error Code Detail		AI	01xx49	No Units					
External Heat Source State		BI	01xx50	OFF	ON				
PIcontroller Alarm Signal		BI	41mm03	Normal	Error				*6
COP		AI	51zz01	No Units					
Trend Log Room Temp		LOG	01xx80						*9 *15 *23 *24
Trend Log Group Apportioned Electric Energy		LOG	01xx83						*2 *23
Trend Log Interlocked Units Apportioned Electric Energy		LOG	61aa83						*2 *7 *23
Trend Log PIcontroller Electric Energy 1–4		LOG	41mm84–87						*2 *6 *12 *14 *15 *16 *17 *23

Object	Object type	Instance number	Units					Remarks
			Inactive(0)*23	Active(1)				
			Text-1(1)*23	Text-2(2)	Text-3(3)	Text-4(4)	Text-5(5)	
Trend Log Group Apportionment Parameter	LOG	01xx88						*2 *23
Trend Log Interlocked Units Apportionment Parameter	LOG	61aa88						*2 *7 *23
Chiller On Off Setup	BO	71tt01	OFF	ON				*25
Chiller On Off State	BI	71tt02	OFF	ON				
Chiller Operational Mode Setup	MO	71tt03	Heating	Cooling	Anti-freeze	Heating ECO		*25 *26
Chiller Operational Mode State	MI	71tt04	Heating	Cooling	Anti-freeze	Heating ECO		
Chiller Fan Mode Setup	MO	71tt05	Normal	Snow				*25
Chiller Fan Mode State	MI	71tt06	Normal	Snow				
Chiller Set Temp Cool	AV	71tt07	ºC					*25
Chiller Set Temp Heat	AV	71tt08	ºC					*25
Chiller Representative Inlet Water Temp	AI	71tt09	ºC					
Chiller Representative Outlet Water Temp	AI	71tt10	ºC					
Chiller Representative Alarm Signal	BI	71tt11	Normal	Error				
Chiller Communication State	BI	71tt12	Normal	Error				
Chiller Prohibition On Off	BV	71tt15	Permit	Prohibit				
Chiller Prohibition Mode	BV	71tt16	Permit	Prohibit				
Chiller Prohibition Set Temperature	BV	71tt17	Permit	Prohibit				
Chiller Unit Alarm Signal	BI	91uu11	Normal	Error				

* xx: Group number (01–50)
* mm: PI controller address (01–50)
* aa: Interlocked unit address (01–50)
* tt: Group number of simultaneously operated units including a system representative unit (01–50)
* uu: Unit address (01–50)
* zz: Outdoor unit address minus 50 (01-50)

*1 “Dry” can be used only when the “Use Dry Mode” setting is enabled (checked) on the BACnet Setting Tool. (The default setting is disabled (unchecked).)

*2 “Charge” license is required for AE-C/EW-C.

*3 When the “Operational Mode State” received from the indoor unit is “Auto Cool”, “Cool” can be selected; when it is “Auto Heat”, “Heat” can be selected, or “Auto” can be selected for both.

*4 “Use Fan Speed Mid1/Mid2” setting of the BACnet Setting Tool, and effective fan speeds from indoor unit, LOSSNAY, and OA Processing Unit fan speed switching steps are shown in the table below. (The default setting of “Use Fan Speed Mid1/Mid2” of the BACnet Setting Tool is disabled (unchecked).)
(In the automatic wind velocity compatible model, “Auto” is valid in addition to the fan speed in this table.)

V: Available

Unit type	“Use Fan Speed Mid1/Mid2” setting	Number of available fan speeds	Available fan speed			
			Low	Mid 2	Mid 1	High
Indoor unit	Enabled	2		V		V
		3		V	V	V
		4	V	V	V	V
	Disabled	2–4	V			V
LOSSNAY and OA Processing Unit	Enabled	1				V
		2	V			V
		3	V	V		V
		4	V	V	V	V
	Disabled	1				V
		2–4	V			V

*5 Low < Mid 2 < Mid 1 < High

*6 mm: PI controller address (01–50)

*7 Can be used only for the interlocked units.
aa: Interlocked unit address (01–50)

*8 When the air direction received from the indoor unit is “Downblow 20%” or “Auto”, “Horizontal” will be output to BACnet.

*9 The value of the “Present_Value” in the “Room Temp” (AI_01xx09) object is logged in as the log record.

*10 Batch commands are made for the “System Forced Off” instance number (019921) for all groups.

*11 When the “System Forced Off” (individual/collective) from BACnet communication is used, do not set the “External Input Setting” for AE-C/EW-C to “ON/OFF (Level signal)”. “External Input Setting” can be configured on the Initial Setting Tool. (Refer to the AE-C/EW-C Instruction Book (Detailed operations) for settings methods.)

*12 Electric energy 1 to 4 correspond to signal lines Ch1 to 4 on the PI controller.

*13 It may differ from the actual air direction depending on the type of indoor unit (Ceiling-concealed Ducted, Wall-mounted, Floor-standing). An example of a Floor standing PFFY-P VKM-E is as follows.

	Setting/Status				
Air direction on the BACnet	Horizontal	Downblow 60%	Downblow 80%	Downblow 100%	Swing
Actual air direction	Upblow 100%	Upblow 80%	Upblow 60%	Horizontal	Swing

*14 Cannot be used with an indoor unit model.
Differences in supported/not supported objects depending on whether it is an indoor unit, LOSSNAY or the Air To Water model are indicated on the following page.

*15 Cannot be used with a LOSSNAY which is not interlocked with an indoor unit.
Differences in supported/not supported objects depending on whether it is an indoor unit, LOSSNAY or the Air To Water model are indicated on the following page.

*16 Cannot be used with an OA Processing Unit which is not interlocked with an indoor unit.
Differences in supported/not supported objects depending on whether it is an indoor unit, LOSSNAY or the Air To Water model are indicated on the following page.

*17 Cannot be used with an Air To Water model.
Differences in supported/not supported objects depending on whether it is an indoor unit, LOSSNAY or the Air To Water model are indicated on the following page.

*18 It can only be used if the system controller is AE-C/EW-C and the indoor unit is a Setback mode supported model.

*19 Do not use this when “External Input Setting” for AE-C/EW-C is set to “ON/OFF (Level signal)”. “External Input Setting” can be configured on the Initial Setting Tool. (Refer to the AE-C/EW-C Instruction Book (Detailed operations) for settings methods.)

*20 During Night Purge state, this operates using a specific fan speed and ventilation mode, but these are not reflected in the status display. As a result, the read status from BACnet communications may differ from actual fan speeds and ventilation modes. Additionally, carrying out fan speed and ventilation mode settings during Night Purge state will not change actual operation, and these will only be reflected in the status display.

*21 “Setback” is available only when the “Old model compatibility mode” is set to “OFF” on the Initial Setting Tool.

*22 “Inactive(0),Active(1)” is applied when the object type is BO/BI/BV, and “Text-1(1),Text-2(2),⋯” is applied when the object type is MO/MI.

*23 Use the BACnet Trial Run Tool to check or set the “Log_Interval” property. (Refer to the AE-C/EW-C Instruction Book (BACnet Trial Run Tool) for settings methods.)

*24 When E-OA model unit is connected, outlet air measurement temperature is used for “Room Temp/Trend Log Room Temp,” and outlet air preset temperature is used for “Set Temp.”

*25 This item is available only when the command input source of the chiller unit is set to the system controller. In such a case, the chiller unit cannot be operated from the remote controller.

*26 The Chiller Operational Mode can be changed when the Chiller On Off is set to Off. Before changing the Chiller Operational Mode Setup, set the Chiller On Off Setup to Off. Wait at least for one minute, check that the Chiller Operational Mode State has been changed as intended, and re-start the operation using the Chiller On Off Setup.

Whether or not the object can be supported by the unit type is indicated in the following table.
The AE-C/EW-C only creates objects supported by each group.

V: Supported
—: Not supported

Object		Object type	Instance number	Unit type					Remarks
				Indoor unit and OA Processing Unit that is not interlocked with indoor units	LOSSNAY unit that is not interlocked with indoor units	Air To Water	Chiller unit	Outdoor unit	
On Off Setup		BO	01xx01	V	V	V	—	—	*5
On Off State		BI	01xx02	V	V	V	—	—	
Alarm Signal		BI	01xx03	V	V	V	—	—	
Error Code		MI	01xx04	V	V	V	—	—	
Operational Mode Setup		MO	01xx05	V	—	—	—	—	
Operational Mode State		MI	01xx06	V	—	—	—	—	
Fan Speed Setup		MO	01xx07	V	V	—	—	—	
Fan Speed State		MI	01xx08	V	V	—	—	—	
Room Temp [Water Temp]		AI	01xx09	V	—	V	—	—	*8
Set Temp [Set Water Temp]		AV	01xx10	V	—	V	—	—	*2
Filter Sign		BI	01xx11	V	V	V	—	—	
Filter Sign Reset		BV	01xx12	V	V	V	—	—	
Prohibition On Off		BV	01xx13	V	V	V	—	—	*5
Prohibition Mode		BV	01xx14	V	—	V	—	—	
Prohibition Filter Sign Reset		BV	01xx15	V	V	V	—	—	
Prohibition Set Temperature		BV	01xx16	V	—	V	—	—	
Prohibition Fan Speed		BV	01xx17	V	—	—	—	—	*1 *6
M-NET Communication State		BI	01xx20	V	V	V	—	—	
System Forced Off	individual	BV	01xx21	V	V	V	—	—	
	collective		019921						
Air Direction Setup		MO	01xx22	V	—	—	—	—	*1
Air Direction State		MI	01xx23	V	—	—	—	—	*1
Set Temp Cool		AV	01xx24	V	—	—	—	—	*2
Set Temp Heat		AV	01xx25	V	—	—	—	—	*2
Set Temp Auto		AV	01xx26	V	—	—	—	—	*2
Set High Limit Setback Temp		AV	01xx27	V	—	—	—	—	
Set Low Limit Setback Temp		AV	01xx28	V	—	—	—	—	
Ventilation Mode Setup		MO	01xx35	V	V	—	—	—	*3
Ventilation Mode State		MI	01xx36	V	V	—	—	—	*3
Air To Water Mode Setup		MO	01xx37	—	—	V	—	—	
Air To Water Mode State		MI	01xx38	—	—	V	—	—	
Group Apportioned Electric Energy		AC	01xx39	V	V	V	—	—	
Interlocked Units Apportioned Electric Energy		AC	61aa39	—	—	—	—	—	*4
PIcontroller Electric Energy 1–4		AC	41mm 40–43	—	—	—	—	—	
Group Apportionment Parameter		AC	01xx44	V	—	V	—	—	
Interlocked Units Apportionment Parameter		AC	61aa44	—	—	—	—	—	*4

Object	Object type	Instance number	Unit type					Remarks
			Indoor unit and OA Processing Unit that is not interlocked with indoor units	LOSSNAY unit that is not interlocked with indoor units	Air To Water	Chiller unit	Outdoor unit	
Night Purge State	BI	01xx46	V	V	—	—	—	*3
Thermo On Off State	BI	01xx47	V	—	V	—	—	
System Alarm Signal	BI	010048	—	—	—	—	—	
Error Code Detail	AI	01xx49	V	V	V	—	—	
External Heat Source State	BI	01xx50	V	—	—	—	—	*7
PIcontroller Alarm Signal	BI	41mm03	—	—	—	—	—	
COP	AI	51zz01	—	—	—	—	V	
Trend Log Room Temp	LOG	01xx80	V	—	V	—	—	
Trend Log Group Apportioned Electric Energy	LOG	01xx83	V	V	V	—	—	
Trend Log Interlocked Units Apportioned Electric Energy	LOG	61aa83	—	—	—	—	—	*4
Trend Log PIcontroller Electric Energy 1–4	LOG	41mm 84–87	—	—	—	—	—	
Trend Log Group Apportionment Parameter	LOG	01xx88	V	—	V	—	—	
Trend Log Interlocked Units Apportionment Parameter	LOG	61aa88	—	—	—	—	—	*4
Chiller On Off Setup	BO	71tt01	—	—	—	V	—	
Chiller On Off State	BI	71tt02	—	—	—	V	—	
Chiller Operational Mode Setup	MO	71tt03	—	—	—	V	—	
Chiller Operational Mode State	MI	71tt04	—	—	—	V	—	
Chiller Fan Mode Setup	MO	71tt05	—	—	—	V	—	
Chiller Fan Mode State	MI	71tt06	—	—	—	V	—	
Chiller Set Temp Cool	AV	71tt07	—	—	—	V	—	
Chiller Set Temp Heat	AV	71tt08	—	—	—	V	—	
Chiller Representative Inlet Water Temp	AI	71tt09	—	—	—	V	—	
Chiller Representative Outlet Water Temp	AI	71tt10	—	—	—	V	—	
Chiller Representative Alarm Signal	BI	71tt11	—	—	—	V	—	
Chiller Communication State	BI	71tt12	—	—	—	V	—	
Chiller Prohibition On Off	BV	71tt15	—	—	—	V	—	
Chiller Prohibition Mode	BV	71tt16	—	—	—	V	—	
Chiller Prohibition Set Temperature	BV	71tt17	—	—	—	V	—	
Chiller Unit Alarm Signal	BI	91uu11	—	—	—	V	—	

*1 An OA Processing Unit which is not interlocked with an indoor unit is not supported.

*2 An example of the temperature setting range for the indoor unit/Air To Water is shown in the following table. (Indicates the setting temperature range of a typical model. May differ depending on the model).

Indoor unit

Operational mode		Cool	Heat	Auto	Dry
Standard model	Auto (Single-set-point) mode	19–30ºC	17–28ºC	19–28ºC	19–30ºC
	Auto (Dual-set-points) mode	19–35ºC	4.5–28ºC	Cool: 19–35ºC Heat: 4.5–28ºC	19–35ºC
E-OA model		10–24.5ºC	17–35ºC	17–24.5ºC	10–24.5ºC

Air To Water

Operational mode	Heating	Heating ECO	Hot Water	Anti-freeze	Cooling
Booster unit (BU)	30–50ºC	30–45ºC	30–70ºC	10–45ºC	Invalid
HEX unit (AU)	30–45ºC	30–45ºC	Invalid	10–45ºC	10–30ºC

(Conversion for communication of the air conditioning equipment and BACnet is carried out within a range of 0 to 99°C.)

*3 Supported only by LOSSNAY and OA Processing Unit that are not interlocked with indoor units.

*4 Supported by OA Processing Unit that is interlocked with indoor units.

*5 Do not use this when “External Input Setting” for AE-C/EW-C is set to “ON/OFF (Level signal)”. “External Input Setting” can be configured on the Initial Setting Tool. (Refer to the AE-C/EW-C Instruction Book (Detailed operations) for settings methods.)

*6 Can be used when the indoor unit supports “Prohibition Fan Speed”.

*7 Can be used on the unit models produced in April 2012 or later.

*8 When E-OA model unit is connected, outlet air measurement temperature is used.

4-3. Set temperature objects

Select the set temperature objects below according to the indoor unit group configuration in a given air conditioning system.

V: Selectable
—: Not selectable

Object	Object type	Instance number	Models that support the Auto (Dual-set-points) mode *3			Models that do not support the Auto (Dual-set-points) mode *3
			Auto (Single-set-point) mode *1	Auto (Dual-set-points) mode *1	Old model compatibility mode *2	
Set Temp	AV	01xx10	—	—	V	V
Set Temp Cool	AV	01xx24	V	V	—	—
Set Temp Heat	AV	01xx25	V	V	—	—
Set Temp Auto	AV	01xx26	V	—	—	—
Set High Limit Setback Temp	AV	01xx27	V*4	V*4	—	—
Set Low Limit Setback Temp	AV	01xx28	V*4	V*4	—	—

*1 Auto (Single-set-point) mode or Auto (Dual-set-points) mode can be set on the local remote controller for each indoor unit. Refer to the indoor unit Instruction Book for details about these modes.

*2 Old model compatibility mode can be collectively set for the M-NET system on the Initial Setting Tool. (Refer to the AE-C/EW-C Instruction Book (Detailed operations) for settings methods.)

*3 Selectable/Not selectable of Auto (Dual-set-points) mode is determined automatically for each group. (Group is treated as Auto (Dual-set-points) mode selectable only if all indoor units, all remote controllers, and all system controllers are Auto (Dual-set-points) mode selectable.)

*4 It can only be used if the system controller is AE-C/EW-C and the indoor unit is a Setback mode supported model.

*5 When E-OA model unit is connected, outlet air preset temperature is used.

(1) When the building management system supports two temperature setting (for cooling and heating individually)

Use temperature setting object for “Set Temp” (AV_01xx10) in a group which includes an Auto (Dual-set-points) mode unsupported model.
When operating an Auto (Single-set-point) mode indoor unit in the operation mode “Auto”, use the temperature setting object for “Set Temp Auto” (AV_01xx26).
When operating an Auto (Dual-set-points) mode indoor unit in the operation mode “Auto”, use the temperature setting object for “Set Temp Cool” (AV_01xx24) and “Set Temp Heat” (AV_01xx25).

(2) When the building management system supports only one temperature setting (common for cooling and heating)

Set the “Old model compatibility mode” setting to “ON” on the Initial Setting Tool. Use the temperature setting object for “Set Temp” (AV_01xx10).

4-4. “System Forced Off” forced-reset function

“System Forced Off (individual/collective)” can be forcibly reset from the BACnet Setting Tool when it cannot be reset from the building management system due to a problem such as a communication error.

4-4-1. “System Forced Off” forced-reset function specifications

When forced-reset of “System Forced Off” is performed, the unit status will be as follows.

Unit	Status
AE-C/EW-C	“System Forced Off (individual/collective)” will all be set to “Reset (Inactive)”.
Air conditioning unit	Return the prohibition of remote controller operation (ON/OFF) to the state before “System Forced Off” occurs.

4-5. Apportioned electricity billing function

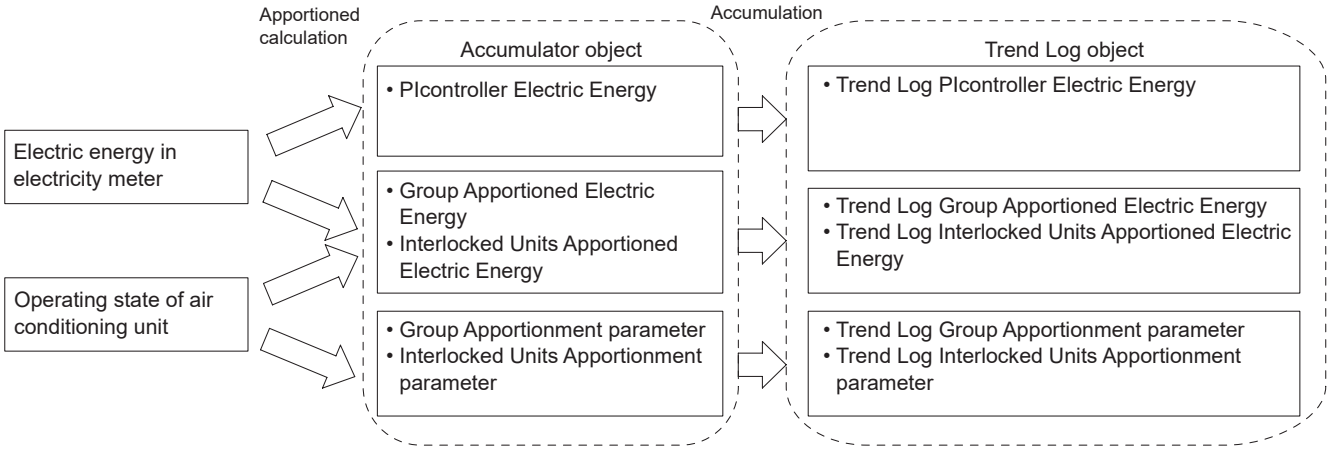
The AE-C/EW-C apportioned electricity billing function calculates the “electric energy for the electricity meter” and the “apportioned electric energy for the electricity meter per group/interlocked unit” or the “apportionment parameters for apportioning the electric energy per group/interlocked unit,” and stores this in the accumulator. Additionally, the accumulator is stored in “Log_Buffer” of the trend log.
The cumulative value and trend log data can be read by BACnet communication.
BACnet communications cannot read billing information.
When using the apportioned electricity billing function, a “Charge” license is required for each AE-C/EW-C.
Refer to the AE-C/EW-C Instruction Book (Apportioned Electricity Billing Function) for details on the apportioned electricity billing function.

4-5-1. Apportioned electricity billing function specifications

The apportioned electricity billing function in the BACnet function is configured of an accumulator object which stores the electric energy and other cumulative value/apportioned results cumulative value and the trend log object which reads the accumulator for each fixed time and accumulates the value. When using the apportioned electricity billing function, a “Charge” license is required.

Note

An interlocked unit is an OA Processing Unit (FU attribute) linked to an indoor unit, and covers those affiliated OA Processing Units that can be registered in the energy management block settings of the Initial Setting Tool.
This does not refer to an OA Processing Unit (IC attribute) that is not linked to an indoor unit that can have group settings performed through the centralized controller.
Chiller unit does not support the apportioned electricity billing function.



Accumulator specifications

Data type	Apportioning type	Contents *3
Electric energy *1 *4	Apportionment source	Cumulative electric energy from electricity meter read from PI controller
	Apportioned results	Electric energy for each group (indoor unit + outdoor unit) *5
		Electric energy for each interlocked unit (indoor unit + outdoor unit) *5
Apportionment parameter *2 *4 *6	Apportionment parameter	Apportionment parameters for each group (for outdoor units) *5
		Apportionment parameters for each interlocked unit (for outdoor units) *5

*1 Electricity meter must be connected to obtain the electric energy. Also, apportionment calculation is carried out using AE-C for dedicated electricity apportionment.
*2 The electricity meter need not be connected to obtain the apportionment parameters. Select when carrying out apportionment calculations in a building management system.
*3 Cumulative data for 30 minute cycles. (Data for until XX:00 and XX:30 minutes is updated at XX:15 and XX:45 respectively)
*4 The value can be compensated by writing the value in the “Value_Set” of the accumulator object.
*5 Stores apportionment results by the apportionment method set in the billing function settings for the apportioned electricity billing function.
*6 The apportionment parameter is a value that is proportionate to the electric energy consumption calculated based on the operation status and operation time of each air conditioning unit, and will be the reference value for separately-calculating the electric energy (or electricity charge) using the ratio of this value and the total value of apportionment parameters for all units.

Trend log specifications (only for portions related to the apportioned electricity billing function)

Item	Setting contents	Setting method
Collection cycle	30 minutes to 1440 minutes (1 day) Can be set in 30-minute increments. (“Log_Interval” property) Initial value: 30 minutes	Settings on the building management system
Collection period	4 days*1 to 192 days*2 (retain the value for the most recent 192 items)	
Collection timing	Carry out collection for each collection cycle using 1970/1/1 00:00:00 as a starting point.	
Collection starts	After participation sequence completed (Status = Operational)	
Log deleted	When “0” is written to the “Record_Count” property	

*1 When the collection cycle is 30 minutes

*2 When the collection cycle is 1 day

4-5-2. Accumulator object

The instance number of the accumulator object which stores the cumulative value is as follows.

Object	Object type	Instance number	Apportioning type	Metering device	Contents
Group Apportioned Electric Energy	AC	01xx39	Apportioned results	Required	Stores the cumulative value of the electric energy (indoor unit + outdoor unit) for each group.
Interlocked Units Apportioned Electric Energy	AC	61aa39			Stores the cumulative value of the electric energy (indoor unit + outdoor unit) for each interlocked unit (OA Processing Unit).
PIcontroller Electric Energy 1–4	AC	41mm40–43	Apportionment source data		Cumulative value (for 4 channels) of electric energy accumulated in PI controller
Group Apportionment Parameter	AC	01xx44	Apportionment parameter	Not required	Stores electric energy apportionment parameters (for outdoor units) for each group.
Interlocked Units Apportionment Parameter	AC	61aa44			Stores electric energy apportionment parameters (for outdoor units) for each interlocked unit (OA Processing Unit).

* xx: Group number (01–50)

* mm: PI controller address (01–50)

* aa: Interlocked unit address (01–50)

4-5-3. Trend log object

Instance number of the trend log object (only the portion related to the apportioned electricity billing function) which stores the accumulator log is as follows.

Object	Object type	Instance number	Apportioning type	Metering device	Contents
Trend Log Group Apportioned Electric Energy	LOG	01xx83	Apportioned results	Required	Accumulates “Present_Value” of accumulator (Group Apportioned Electric Energy) for each collection cycle.
Trend Log Interlocked Units Apportioned Electric Energy	LOG	61aa83			Accumulates “Present_Value” of accumulator (Interlocked Units Apportioned Electric Energy) for each collection cycle.
Trend Log PIcontroller Electric Energy 1–4	LOG	41mm84–87	Apportionment source data		Accumulates “Present_Value” of accumulator (PIcontroller Electric Energy 1–4) for each collection cycle.
Trend Log Group Apportionment parameter	LOG	01xx88	Apportionment parameter	Not required	Accumulates “Present_Value” of accumulator (Group Apportionment parameter) for each collection cycle.
Trend Log Interlocked Units Apportionment Parameter	LOG	61aa88			Accumulates “Present_Value” of accumulator (Interlocked Units Apportionment Parameter) for each collection cycle.

* xx: Group number (01–50)
* mm: PI controller address (01–50)
* aa: Interlocked unit address (01–50)

Note

If the apportioned electricity billing function is enabled and the power to the AE-C/EW-C is turned on between 10 and 15, or between 40 and 45 minutes every hour, then when accumulator objects and trend log objects are first collected, the object “Reliability” property may be other than “0” (indicating no reliability).

4-5-4. System restrictions for apportioned electricity billing function

- “Charge” license is required for each AE-C/EW-C.
- Ensure that the same software versions are used on AE-C/EW-C units.

4-6. Alarm Signal

Error status of the AE-C/EW-C and of air conditioning units connected to the AE-C/EW-C can be read from the building management system.

4-6-1. Alarm signal for object

Error causes and corresponding alarm objects are shown below.

V: Supported

Error cause		Supported object					
		Alarm Signal (BI_01xx03)	Error Code (MI_01xx04)	Error Code Detail (AI_01xx49)	M-NET Communication State (BI_01xx20)	System Alarm Signal (BI_010048)	PIcontroller Alarm Signal (BI_41mm03)
Equipment error	AE-C/EW-C error					V	
	Air conditioning unit error	V	V	V			
	PI controller error						
	ME remote controller or system controller error						
M-NET communication error	AE-C/EW-C communication error, M-NET address overlap (Error code: 6600–6603)	V *1	V	V	V	V	V
	Communication error with air conditioning unit (Error code: 6606–6608) *3	V *1	V	V	V		
	Communication error with PI controller (Error code: 6606–6608)						V *2
	Communication error with ME remote controller or system controller (Error code: 6606–6608)						
LAN communication error	LAN1 communication error of AE-C/EW-C (Communication error between multiple AE-C/EW-Cs)					V	
	LAN2 (BACnet) communication error of AE-C/EW-C						

* xx: Group number (01–50)

* mm: PI controller address (01–50)

*1 Only when “Not reflect communication error to alarm signal” setting on the BACnet Setting Tool is unchecked

*2 The PI controller is not subject to group settings, therefore this is not included in the Alarm Signal (BI_01xx03).

*3 If the communication error is still displayed on the remote controller after the communication error is corrected and the supported objects resume normal operation, stop the operation of the air conditioning unit to clear the error display.

4-6-2. Alarm signal for chiller object

The table below lists the error causes and the supported alarm objects for the chiller unit.

V: Supported

Error cause		Supported object		
		Chiller Representative Alarm Signal (BI_71tt11)	Chiller Communication State (BI_71tt12)	Chiller Unit Alarm Signal (BI_91uu11)
Equipment error	Chiller unit error (by system)	V		
	Chiller unit error (by unit)			V
M-NET communication error	Communication error with chiller unit (Error code: 6606–6608)	V *1 *2	V *2	V *1

* tt: Group number of simultaneously operated units including a system representative unit (01–50)

* uu: Unit address (01–50)

*1 Only when “Not reflect communication error to alarm signal” setting on the BACnet Setting Tool is unchecked

*2 A communication error is issued when even one of the chiller units in the system has a communication error.

4-7. Event service specifications

The table below shows the supported notifications for each object.
Notification settings can be made on the BACnet Setting Tool.

4-7-1. Event service of objects

The availability of the notification setting in BACnet Setting Tool for each object is shown in the following table.

V: Notification can be set on the BACnet Setting Tool.
—: Notification cannot be set.

Object		Object ID	Event Notification	COV Notification	Remarks
On Off Setup		BO_01xx01	V	V	*4
On Off State		BI_01xx02	V	V	
Alarm Signal		BI_01xx03	V *1	V	
Error Code		MI_01xx04	—	V	
Operational Mode Setup		MO_01xx05	—	V	
Operational Mode State		MI_01xx06	—	V	
Fan Speed Setup		MO_01xx07	—	V	
Fan Speed State		MI_01xx08	—	V	
Room Temp [Water Temp]		AI_01xx09	V	V	
Set Temp [Set Water Temp]		AV_01xx10	—	V	
Filter Sign		BI_01xx11	V	V	
Filter Sign Reset		BV_01xx12	—	V	
Prohibition On Off		BV_01xx13	—	V	*4
Prohibition Mode		BV_01xx14	—	V	
Prohibition Filter Sign Reset		BV_01xx15	—	V	
Prohibition Set Temperature		BV_01xx16	—	V	
Prohibition Fan Speed		BV_01xx17	—	V	
M-NET Communication State		BI_01xx20	V	V	
System Forced Off	individual	BV_01xx21	—	V	
	collective	BV_019921			
Air Direction Setup		MO_01xx22	—	V	
Air Direction State		MI_01xx23	—	V	
Set Temp Cool		AV_01xx24	—	V	
Set Temp Heat		AV_01xx25	—	V	
Set Temp Auto		AV_01xx26	—	V	
Set High Limit Setback Temp		AV_01xx27	—	V	
Set Low Limit Setback Temp		AV_01xx28	—	V	
Ventilation Mode Setup		MO_01xx35	—	V	
Ventilation Mode State		MI_01xx36	—	V	
Air To Water Mode Setup		MO_01xx37	—	V	
Air To Water Mode State		MI_01xx38	—	V	
Group Apportioned Electric Energy		AC_01xx39	V	—	
Interlocked Units Apportioned Electric Energy		AC_61aa39	V	—	
PIcontroller Electric Energy 1–4		AC_41mm40–43	V	—	
Group Apportionment Parameter		AC_01xx44	V	—	
Interlocked Units Apportionment Parameter		AC_61aa44	V	—	
Night Purge State		BI_01xx46	V	V	
Thermo On Off State		BI_01xx47	V	V	
System Alarm Signal		BI_010048	V *2	V	
Error Code Detail		AI_01xx49	—	V	

Object	Object ID	Event Notification	COV Notification	Remarks
External Heat Source State	BI_01xx50	V	V	
PIcontroller Alarm Signal	BI_41mm03	V *3	V	
COP	AI_51zz01	V	V	
Trend Log Room Temp	LOG_01xx80	—	—	
Trend Log Group Apportioned Electric Energy	LOG_01xx83	—	—	
Trend Log Interlocked Units Apportioned Electric Energy	LOG_61aa83	—	—	
Trend Log PIcontroller Electric Energy 1–4	LOG_41mm84–87	—	—	
Trend Log Group Apportionment Parameter	LOG_01xx88	—	—	
Trend Log Interlocked Units Apportionment Parameter	LOG_61aa88	—	—	
Notification Class	CLS_xxxxxx	—	—	xxxxxx: Notification class ID
Device	DEV_xxxxxx	—	—	xxxxxx: Device No.
Network Port	NP_xxxxxxx	—	—	xxxxxx: Network port No.
CH_OnOffSetup	BO_71tt01	V	V	
CH_OnOffState	BI_71tt02	V	V	
CH_OperationModeSetup	MO_71tt03	—	V	
CH_OperationModeState	MI_71tt04	V	V	
CH_FanModeSetup	MO_71tt05	—	V	
CH_FanModeState	MI_71tt06	V	V	
CH_SetTempCool	AV_71tt07	—	V	
CH_SetTempHeat	AV_71tt08	—	V	
CH_ReprInletWaterTemp	AI_71tt09	V	V	
CH_ReprOutletWaterTemp	AI_71tt10	V	V	
CH_ReprAlarmSignal	BI_71tt11	V	V	
CH_CommunicationState	BI_71tt12	V	V	
CH_ProhibitionOnOff	BV_71tt15	—	V	
CH_ProhibitionMode	BV_71tt16	—	V	
CH_ProhibitionSetTemp	BV_71tt17	—	V	
CH_UnitAlarmSignal	BI_91uu11	V	V	

* xx: Group number (01–50)
* mm: PI controller address (01–50)
* aa: Interlocked unit address (01–50)
* tt: Group number of simultaneously operated units including a system representative unit (01–50)
* uu: Unit address (01–50)
* zz: Outdoor unit address minus 50 (01-50)

*1 Air conditioning unit error code (4 digits) will be output to “MessageText”.

*2 Error code (4 digits) will be output to “MessageText”.

*3 PI controller error code (4 digits) will be output to “MessageText”.

*4 Do not use this when “External Input Setting” for AE-C/EW-C is set to “ON/OFF (Level signal)”. “External Input Setting” can be configured on the Initial Setting Tool. (Refer to the AE-C/EW-C Instruction Book (Detailed operations) for settings methods.)

4-8. BACnet information and storage timing/cycle in nonvolatile memory within the AE-C/EW-C

The following BACnet information (object property value) is stored in nonvolatile memory inside AE-C/EW-C for each storage timing or cycle in the table below.

After the property value has been updated, if the power source for AE-C/EW-C is cut within the storage cycle and when restart is carried out, it may return to the property value before updating.

Object	Object ID	Property	Storage timing or cycle
On Off State Thermo On Off State Chiller On Off State External Heat Source State	BI_01xx02 BI_01xx47 BI_71tt02 BI_01xx50	Present_Value	60 minutes *1
Room Temp Chiller Representative Inlet Water Temp Chiller Representative Outlet Water Temp COP	AI_01xx09 AI_71tt09 AI_71tt10 AI_51zz01	High_Limit	When updated *3
		Low_Limit	When updated *3
		Deadband	When updated *3
		Limit_Enable	When updated *3
Group Apportioned Electric Energy Interlocked Units Apportioned Electric Energy PIcontroller Electric Energy 1–4 Group Apportionment Parameter Interlocked Units Apportionment Parameter	AC_01xx39 AC_61aa39 AC_41mm40–43 AC_01xx44 AC_61aa44	Present_Value	30 minutes *2
		Value_Change_Time	When updated *3
		Value_Before_Change	When updated *3
		Value_Set	When updated *3
		Pulse_Rate	30 minutes *2
		High_Limit	When updated *3
		Low_Limit	When updated *3
		Limit_Enable	When updated *3
Trend Log Room Temp	LOG_01xx80	Enable	When updated *3
		Start_Time	When updated *3
		Stop_Time	When updated *3
		Log_Interval	When updated *3
Trend Log Group Apportioned Electric Energy Trend Log Interlocked Units Apportioned Electric Energy Trend Log PIcontroller Electric Energy 1–4 Trend Log Group Apportionment Parameter Trend Log Interlocked Units Apportionment Parameter	LOG_01xx83 LOG_61aa83 LOG_41mm84–87 LOG_01xx88 LOG_61aa88	Enable	When updated *3
		Start_Time	When updated *3
		Stop_Time	When updated *3
		Log_Interval	When updated *3
		Record_Count	When updated *3
		Total_Record_Count	When updated *3
		Log_Buffer	When updated *3
Device	DEV_xxxxxx	Object_Name	When updated *3
		Active_COV_Subscriptions	
Notification Class	CLS_xxxxxx	Recipient_List	When updated *3

*1 At XX:05 minutes every hour

*2 At XX:15 minutes and XX:45 minutes every hour

*3 Will be saved within 1 minute after the property value is updated.

4-9. R32 refrigerant leak detection by BACnet

When using the R32 refrigerant leak detection function by BACnet, the following values should be monitored.

Object	Object ID	Property
Alarm signal	BI_01xx03	Description *1
Error Code Detail	AI_01xx49	PresaentValue

*1 Event notification parameter "EventMessageText" can be used for monitoring.

These are four-digit codes that show the details of the current error. If the codes match the codes shown in the table below, consider them as refrigerant leak detected, circuit inspection in progress, or refrigerant leak detection sensor malfunctioning. Since the code shows the error status of the group, if even one unit in the group has an error, the error is handled as a group error.

Error code related to refrigerant leak

Error name	Detection source	Error code	Remarks
Refrigerant leak detection (CFC alarm)	Shut-off valve	1524	
Refrigerant leak detection maintenance error (indoor unit built-in sensor)	Indoor unit	1522	Applicable only for BACS-AP50
Refrigerant leak detection (indoor unit built-in sensor)	Indoor unit	1521	
Circuit inspection in progress (CFC alarm)	Shut-off valve	0912	
Maintenance error during circuit inspection (indoor unit built-in sensor)	Indoor unit	0911	Applicable only for BACS-AP50
Circuit inspection in progress (indoor unit built-in sensor)	Indoor unit	0910	
Notification of leak sensor malfunction	Shut-off valve	5558	
Notification of leak sensor malfunction	Indoor unit	5558	

The BACnet function only indicates the occurrence of refrigerant leak-related errors by the above error codes. For details on how to use AE-C/EW-C's LCD, web screen, and buzzer, refer to the AE-C/EW-C Instruction Book (Detailed operations).

Note that the BACnet function does not have the ability to stop the buzzer. If you do not use the external input contact for buzzer stop or LCD/web screen operation, there is no way to stop the buzzer, so set the following items of the Initial Setting Tool as below to prevent the buzzer from sounding. On the BACS-AP50, the buzzer is disabled and the following settings do not exist.

- Refrigerant leak buzzer settings: Not Available
  and
- External Output (CN6) Setting: Not in use

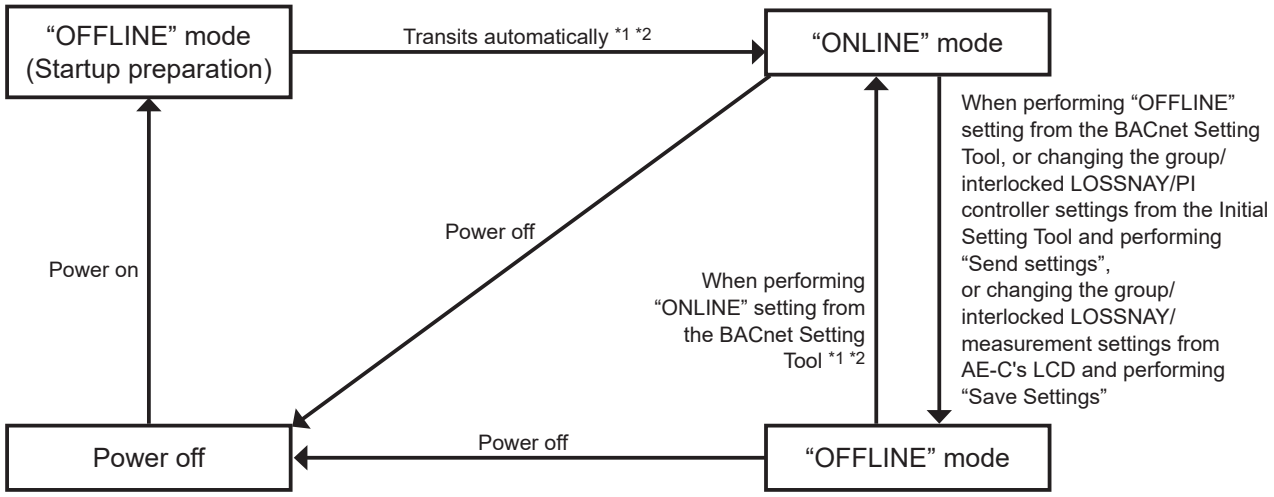
5. Usage (AE-C/EW-C BACnet connection mode)

5-1. AE-C/EW-C BACnet connection mode

The AE-C/EW-C BACnet function operates in the following two connection modes.

Mode name	Details
“ONLINE” mode	This is a mode while operating which carries out BACnet communication.
“OFFLINE” mode	This is a mode while maintenance and settings in which BACnet communication does not occur.

Transition of “ONLINE” and “OFFLINE” mode is as follows.
The current mode can be checked using the BACnet Setting Tool or the BACnet ONLINEOFFLINE Confirmation Tool.



*1 Does not switch to the “ONLINE” mode in the following cases:
- When a valid “BACnet connection” license is not registered
- When inconsistency occurs in BACnet settings information, or before reflecting the first BACnet settings

*2 When there are many setting groups, the time to migration to “ONLINE” mode gets longer. (maximum of approximately 10 minutes)

6. Checking installation operations and performing trial run

For air conditioning system designs before initial settings, consult your dealer.

6-1. Flow of initial settings

In general, the initial settings are largely divided into 4 steps as follows.
By making initial settings along these 4 steps, the cause classification in case of trouble is clarified in each step and the initial settings can be advanced efficiently.

Make the initial settings according to the following procedures.

Step-1 Initial settings for the air conditioning system
Make the system setting of AE-C/EW-C and unit setting of the air conditioning system and chiller unit, and register the required licenses. This is also a step to make initial settings other than for the apportioned electricity billing function and BACnet functions. (Refer to the AE-C/EW-C Instruction Book (Detailed operations) for making the system setting of AE-C/EW-C and the unit setting of the air conditioning system, and registering the licenses.) * For BACS-AP50, skip this step.

Step-2 Trial run of the air conditioning system
Check to see that the air conditioning unit, chiller unit, and controller, etc. have the correct system configuration or to see that the air conditioning unit and chiller unit are operating normally. (Refer to AE-C/EW-C Installation Manual for the method of trial run.) * For BACS-AP50, skip this step.

When not using an apportioned electricity billing function

Step-3 Initial settings for the BACnet related items
Using the BACnet Setting Tool, make settings related to BACnet of AE-C/EW-C. (For BACnet related settings, refer to the AE-C/EW-C Instruction Book (BACnet Setting Tool).)

When not using an apportioned electricity billing function

Step-4 Trial run of BACnet function
Check that the operational status and alarms for air conditioning units and chiller units are being displayed and reported correctly in the BACnet Trial Run Tool; that the air conditioning units are operating in accordance with operation or settings from the BACnet Trial Run Tool.

6-2. Step-1 Initial settings for the air conditioning system

Make initial settings for the AE-C/EW-C using the Initial Setting Tool. Refer to the AE-C/EW-C Instruction Book (Detailed operations) for details.

6-3. Step-2 Trial run of the air conditioning system

Carry out trial run only for the air conditioning system. For details, refer to the Installation Manual of the AE-C/EW-C.

* A trial run of the air conditioning single unit should be completed beforehand and the following should be performed when it is in an operational state.

6-4. Step-3 Initial settings for the BACnet related items

Make the initial settings related to BACnet using the BACnet Setting Tool.

* BACS-AP50 is set up from Step-3.

(1) Data setting

LAN2 (BACnet) settings and BACnet related settings are made using the BACnet Setting Tool which has been installed on the Setting PC. Because the BACnet Setting Tool can only configure single AE-C/EW-C at one time, even when the system is configured with multiple AE-C/EW-C units, it is necessary to configure each AE-C/EW-C unit.

The setting items are as follows. (Refer to the AE-C/EW-C Instruction Book (BACnet Setting Tool) or BACS-AP50 Instruction Book (Detailed Operation) for details for each of the items.)

① LAN2 (BACnet) settings

Settings are made for the IP address, subnet mask, and default gateway of LAN2 (BACnet) of the AE-C/EW-C.

No.	Main tab	Sub tab
1	System Settings	Basic Settings

Important

When the IP address of AE-C/EW-C overlaps the IP address of another unit inside the network, not only can AE-C/EW-C not carry out BACnet communication normally but other devices also cannot carry out BACnet communication normally. Before connecting AE-C/EW-C to BACnet, check the IP address used on AE-C/EW-C and make settings.

② BACnet related settings

Settings are made for the device No. of AE-C/EW-C, the notification destination and whether or not an object is used.

No.	Main tab	Sub tab
1	BACnet Settings	BACnet
2		Network and Device
3		COV Notification
4		Event Notification
5		Object
6		Other

6-5. Step-4 Trial run of BACnet function

Connect the building management system and carry out a trial run.

(1) ONLINE setting

A setting is made to “ONLINE” from the BACnet Setting Tool. AE-C/EW-C restarts automatically. (approximately 10 minutes for maximum time required)
When AE-C/EW-C restarts, a group device with no remote controller may stop.
When a valid “BACnet connection” license is not registered, the setting will not change to “ONLINE”.

(2) Removal of Setting PC

Remove the LAN cable from the Setting PC.

(3) BACnet connection

Connect the LAN2 port of AE-C/EW-C and BACnet using a LAN cable.

(4) Trial run item and trial run method

Refer to the descriptions below for trial run items and trial run methods.
Note that an air conditioning unit and building management system are required for the trial run.

Method of carrying out trial runs for air conditioning control system (AE-C/EW-C) BACnet function

Check the objects used in the system.
Refer to the table in section 4-2-1 “Instance number for basic functions” as to whether or not objects can be supported by different unit types.

Object	Object ID	Status	Checking procedures
On Off Setup *1	BO_01xx01	INACTIVE(0): OFF ACTIVE(1): ON	(1)From the building management system, operate run/stop for a specific group. (2)Using AE-C/EW-C or the remote controller, check to see that the run/stop state of the relevant group is updated to an operating state.
On Off State	BI_01xx02	INACTIVE(0): OFF ACTIVE(1): ON	(1)Using AE-C/EW-C or the remote controller, operate run/stop of a specific group. (2)In the building management system, check to see that the state of run/stop of the relevant group is updated to the operating state.
Alarm Signal	BI_01xx03	INACTIVE(0): Normal ACTIVE(1): Error	(1)Cause air conditioning unit of a specific group to generate an error. (2)In the building management system, check to see that the alarm signal of the relevant group has been updated to “Error” (ACTIVE).*2 (3)Return from an error in an air conditioning unit of a specific group. (4)In the building management system, check to see that the alarm signal of the relevant group has been updated to “Normal” (INACTIVE).

Object	Object ID	Status	Checking procedures
Error Code	MI_01xx04	01: Normal 02: Other errors 03: Refrigeration system fault 04: Water system error 05: Air system error 06: Electronic system error 07: Sensor fault 08: Communication error 09: System error	(1)Remove the M-NET transmission line which is connected to the AE-C/EW-C. *3 (2)In the building management system, check to see that error codes for all groups have been updated to “Communication error” (08). (3)Connect the M-NET transmission line to the AE-C/EW-C. (4)In the building management system, check to see that error codes for all groups have been updated to “Normal” (01). (Perform this when no other errors have occurred. In addition, other errors may occur when there is a communication error, however, in this checking step, attention should be focused on error codes).
Operational Mode Setup	MO_01xx05	01: Cool 02: Heat 03: Fan 04: Auto 05: Dry *4 06: Setback *5	(1)From the building management system, change the operational mode for a specific group. (2)Using AE-C/EW-C or the remote controller, check to see that the operational mode for the relevant group is updated to the operating mode.
Operational Mode State	MI_01xx06	01: Cool 02: Heat 03: Fan 04: Auto 05: Dry *4 06: Setback *5	(1)Using AE-C/EW-C or the remote controller, change the operational mode for a specific group. (2)In the building management system, check to see that the operational mode for the relevant group has been updated to the operating mode.
Fan Speed Setup	MO_01xx07	01: Low 02: High 03: Mid 2 *6 04: Mid 1 *6 05: Auto	(1)From the building management system, change the fan speed for a specific group. (2)Using AE-C/EW-C or the remote controller, check to see that the fan speed for the relevant group is updated to the operating fan speed.
Fan Speed State	MI_01xx08	01: Low 02: High 03: Mid 2 *6 04: Mid 1 *6 05: Auto	(1)Using AE-C/EW-C or the remote controller, change the fan speed for a specific group. (2)In the building management system, check to see that the fan speed for the relevant group is updated to the operating fan speed.
Room Temp [Water Temp]	AI_01xx09	ºF/ºC (32ºF–199ºF/0.0ºC–99.0ºC) *7	(1)Change the intake air temperature for a specific group by cooling or heating. (2)Check to see that the display on the building management system coincides with the display on the AE-C/EW-C or the remote controller. *17
Set Temp [Set Water Temp] *8	AV_01xx10	ºF/ºC (32ºF–199ºF/0.0ºC–99.0ºC) *7	(1)From the building management system, set the set temperature for a specific group. (2)Using AE-C/EW-C or the remote controller, check to see that the set temperature for the relevant group has been updated to an operating value. (3)Using AE-C/EW-C or the remote controller, change the set temperature for a specific group. (4)In the building management system, check to see that the set temperature for the relevant group has been updated to the operating value.

Object	Object ID	Status	Checking procedures
Set Temp Cool *8	AV_01xx24	ºF/ºC (32ºF–199ºF/0.0ºC–99.0ºC) *7	(1)From the building management system, set the cooling set temperature for a specific group. (2)Using AE-C/EW-C or the remote controller, check to see that the cooling set temperature for the relevant group has been updated to an operating value. (3)Using AE-C/EW-C or the remote controller, change the cooling set temperature for a specific group. (4)In the building management system, check to see that the cooling set temperature for the relevant group has been updated to the operating value.
Set Temp Heat *8	AV_01xx25	ºF/ºC (32ºF–199ºF/0.0ºC–99.0ºC) *7	(1)From the building management system, set the heating set temperature for a specific group. (2)Using AE-C/EW-C or the remote controller, check to see that the heating set temperature for the relevant group has been updated to an operating value. (3)Using AE-C/EW-C or the remote controller, change the heating set temperature for a specific group. (4)In the building management system, check to see that the heating set temperature for the relevant group has been updated to the operating value.
Set Temp Auto *8	AV_01xx26	ºF/ºC (32ºF–199ºF/0.0ºC–99.0ºC) *7	(1)From the building management system, set the set temperature (single-set-point in the Auto mode) for a specific group. (2)Using AE-C/EW-C or the remote controller, check to see that the set temperature (single-set-point in the Auto mode) for the relevant group has been updated to an operating value. (3)Using AE-C/EW-C or the remote controller, change the set temperature (single-set-point in the Auto mode) for a specific group. (4)In the building management system, check to see that the set temperature (single-set-point in the Auto mode) for the relevant group has been updated to the operating value.
Set High Limit Setback Temp *5	AV_01xx27	ºF/ºC (32ºF–199ºF/0.0ºC–99.0ºC) *7	(1)From the building management system, set the set temperature (upper limit in the Setback mode) for a specific group. (2)Using AE-C/EW-C or the remote controller, check to see that the set temperature (upper limit in the Setback mode) for the relevant group has been updated to an operating value. (3)Using AE-C/EW-C or the remote controller, change the set temperature (upper limit in the Setback mode) for a specific group. (4)In the building management system, check to see that the set temperature (upper limit in the Setback mode) for the relevant group has been updated to the operating value.

Object	Object ID	Status	Checking procedures
Set Low Limit Setback Temp *5	AV_01xx28	ºF/ºC (32ºF–199ºF/0.0ºC–99.0ºC) *7	(1)From the building management system, set the set temperature (lower limit in the Setback mode) for a specific group. (2)Using AE-C/EW-C or the remote controller, check to see that the set temperature (lower limit in the Setback mode) for the relevant group has been updated to an operating value. (3)Using AE-C/EW-C or the remote controller, change the set temperature (lower limit in the Setback mode) for a specific group. (4)In the building management system, check to see that the set temperature (lower limit in the Setback mode) for the relevant group has been updated to the operating value.
Filter Sign	BI_01xx11	INACTIVE(0): OFF ACTIVE(1): ON	(1)Issue the filter sign for a specific group. (2)In the building management system, check to see that the filter sign for the relevant group has been updated to “ON” (ACTIVE).
Filter Sign Reset	BV_01xx12	INACTIVE(0): Reset ACTIVE(1): Void	(1)From the building management system, carry out operations for filter sign reset for the group which has detected (“ON” (ACTIVE)) filter sign. (2)In the building management system, check to see that filter sign of the relevant group has been updated to “OFF” (INACTIVE).
Prohibition On Off *1	BV_01xx13	INACTIVE(0): Permit ACTIVE(1): Prohibit	(1)From the building management system, carry out prohibition operation for remote controller operation (run/stop) for a specific group. (2)Check to see that run/stop operations have been prohibited by the remote controller in the relevant group. (3)From the building management system, carry out permission operation for remote controller operation (run/stop) for a specific group. (4)Check to see that run/stop operations have been permitted by the remote controller in the relevant group.
Prohibition Mode	BV_01xx14	INACTIVE(0): Permit ACTIVE(1): Prohibit	• Although the operating target is an operational mode, the checking method is the same as “Prohibition On Off” above.
Prohibition Filter Sign Reset	BV_01xx15	INACTIVE(0): Permit ACTIVE(1): Prohibit	• Although the operating target is resetting filter sign, the checking method is the same as “Prohibition On Off” above.
Prohibition Set Temperature	BV_01xx16	INACTIVE(0): Permit ACTIVE(1): Prohibit	• Although the operating target is a set temperature, the checking method is the same as “Prohibition On Off” above.
Prohibition Fan Speed	BV_01xx17	INACTIVE(0): Permit ACTIVE(1): Prohibit	• Although the operating target is a fan speed, the checking method is the same as “Prohibition On Off” above.

Object	Object ID	Status	Checking procedures
M-NET Communication State	BI_01xx20	INACTIVE(0): Normal ACTIVE(1): Error	(1)Remove the M-NET transmission line which is connected to the AE-C/EW-C. *3 (2)In the building management system, check to see that the M-NET communication status of all groups has been updated to “Error” (ACTIVE). (3)Connect the M-NET transmission line to the AE-C/EW-C. (4)In the building management system, check to see that the M-NET communication state for all groups has been updated to “Normal” (INACTIVE). (Other errors occur when there is a communication error, however, in this checking step, attention should be focused on the M-NET communication state).
System Forced Off (individual)	BV_01xx21	INACTIVE(0): Reset ACTIVE(1): Execute	(1)Set “External Input Setting” of the AE-C/EW-C to “Demand (Level signal)/ Not in use” *9 and operate emergency stop for a specific group from the building management system. (2)In the building management system, check to see that the air conditioning units of the relevant group are stopped. Also, check to see that run/stop operations have been prohibited by the remote controller in the relevant group. (3)From the building management system, carry out emergency stop release for a specific group. (4)Check to see that run/stop operations have been permitted by the remote controller in the relevant group.
System Forced Off (collective)	BV_019921	INACTIVE(0): Reset ACTIVE(1): Execute	(1)Set “External Input Setting” of the AE-C/EW-C to “Demand (Level signal)/Not in use” *9 and carry out batch emergency stop from the building management system. (2)In the building management system, check to see that all air conditioning units have been stopped. Also, check to see that run/ stop operations have been prohibited by all remote controllers. (3)From the building management system, carry out batch emergency stop release. (4)Check to see that run/stop operations have been permitted by all remote controllers.
Air Direction Setup	MO_01xx22	01: Horizontal 02: Downblow 60% 03: Downblow 80% 04: Downblow 100% 05: Swing	(1)From the building management system, change the air direction for a specific group. (2)Using AE-C/EW-C or the remote controller, check to see that the air direction for the relevant group is updated to the operating air direction.
Air Direction State	MI_01xx23	01: Horizontal 02: Downblow 60% 03: Downblow 80% 04: Downblow 100% 05: Swing	(1)Using AE-C/EW-C or the remote controller, change the air direction for a specific group. (2)In the building management system, check to see that the air direction for the relevant group is updated to the operating air direction.
Ventilation Mode Setup	MO_01xx35	01: Heat Recovery 02: Bypass 03: Auto	(1)From the building management system, change the ventilation mode for a specific group. (2)Using AE-C/EW-C or the remote controller, check to see that the ventilation mode for the relevant group is updated to the operating mode.

Object	Object ID	Status	Checking procedures
Ventilation Mode State	MI_01xx36	01: Heat Recovery 02: Bypass 03: Auto	(1)Using AE-C/EW-C or the remote controller, change the ventilation mode for a specific group. (2)In the building management system, check to see that the ventilation mode for the relevant group is updated to the operating mode.
Air To Water Mode Setup	MO_01xx37	01: Heating 02: Heating ECO 03: Hot Water 04: Anti-freeze 05: Cooling	(1)From the building management system, change the Air To Water mode for a specific group. (2)Using AE-C/EW-C or the remote controller, check to see that the Air To Water mode for the relevant group is updated to the operating mode.
Air To Water Mode State	MI_01xx38	01: Heating 02: Heating ECO 03: Hot Water 04: Anti-freeze 05: Cooling	(1)Using AE-C/EW-C or the remote controller, change the Air To Water mode for a specific group. (2)In the building management system, check to see that the Air To Water mode for the relevant group is updated to the operating mode.
System Alarm Signal	BI_010048	INACTIVE(0): Normal ACTIVE(1): Error	(1)Shut off the power to the AE-C/EW-C, remove the M-NET power jumper (CN21), and turn the power back on. (2)In the building management system, check to see that system alarm signal has been updated to “Error” (ACTIVE). *10 (3)Shut off the power to the AE-C/EW-C, attach the M-NET power jumper (CN21), and turn the power back on. (4)In the building management system, check to see that the system alarm signal has been updated to “Normal” (INACTIVE). (Other errors occur when there is a communication error, however, in this checking step, attention should be focused on the system alarm signal).
Error Code Detail	AI_01xx49	Normal: 8000 Error: Error code (4 digits)	(1)Remove the M-NET transmission line which is connected to the AE-C/EW-C. *3 (2)In the building management system, check to see that Error Code Detail for all groups have been updated to “M-NET communication error” (660*). (3)Connect the M-NET transmission line to the AE-C/EW-C. (4)In the building management system, check to see that Error Code Detail for all groups have been updated to “Normal” (8000). (Perform this when no other errors have occurred. In addition, other errors may occur when there is a communication error, however, in this checking step, attention should be focused on Error Code Detail).

Object	Object ID	Status	Checking procedures
PIcontroller Alarm Signal	BI_41mm03	INACTIVE(0): Normal ACTIVE(1): Error	(1)Remove the M-NET transmission line which is connected to a specific PI controller. (2)In the building management system, check to see that PI controller alarm signal for the relevant PI controller has been updated to “Error” (ACTIVE). *11 (3)Connect the M-NET transmission line to a specific PI controller. (4)In the building management system, check to see that PI controller alarm signal for the relevant PI controller has been updated to “Normal” (INACTIVE).
Group Apportioned Electric Energy *12 *13 *14	AC_01xx39	0–999,999,999 [0.1 kWh]	(1)From the building management system, set the current values for electric energy (indoor unit + outdoor unit) for each group in a specific group in the “Value_Set” property. Alternatively, in the building management system, record the current values for electric energy (indoor unit + outdoor unit) for each specific group. (2)Operate the air conditioning units in the relevant group continuously for at least two hours. (3)In the building management system, obtain electric energy (indoor unit + outdoor unit) for each group in the relevant group, total the difference with the value set in the “Value_Set” property (or the electric energy recorded in (1)) for each energy management block, and check (using a CSV file) to see that this coincides with the energy management block apportioned electric energy.
Interlocked Units Apportioned Electric Energy *12 *13 *14	AC_61aa39	0–999,999,999 [0.1 kWh]	(1)From the building management system, without registering this in a group, set the current values for electric energy (indoor unit + outdoor unit) for specific OA Processing Unit which has been set as an interlocked unit in the “Value_Set” property. Alternatively, in the building management system, without registering this in a group, record the current values for electric energy (indoor unit + outdoor unit) for specific OA Processing Unit which has been set as an interlocked unit. (2)Operate the relevant interlocked units continuously for at least two hours. (3)In the building management system, obtain electric energy (indoor unit + outdoor unit) for the relevant interlocked unit, total the difference with the value set in the “Value_Set” property (or the electric energy recorded in (1)) for each energy management block, and check (using a CSV file) to see that this coincides with the energy management block apportioned electric energy.

Object	Object ID	Status	Checking procedures
PIcontroller Electric Energy 1–4 *12 *13 *14	AC_41mm40–43	0–999,999,999 [0.1 kWh]	(1)From the building management system, set the current value for electric energy for the electricity meter (1 to 4) connected to the PI controller pulse input in the “Value_ Set” property. Alternatively, in the building management system, record the current value for electric energy for the electricity meter (1 to 4) connected to the PI controller pulse input. (2)Operate devices connected to the electricity meter (1 to 4) connected to pulse input of the PI controller continuously for at least two hours. (3)In the building management system, check (using a CSV file) to see that the electric energy (or difference between the current electric energy and that recorded in (1)) coincides with the reading of the metering device of AE-C/EW-C.
Group Apportionment Parameter *12 *13 *15	AC_01xx44	0–999,999,999 [0.1 (No Units)]	(1)From the building management system, set the current values for apportionment parameter (outdoor unit) for each group in a specific group in the “Value_Set” property. Alternatively, in the building management system, record the current values for apportionment parameter (outdoor unit) for each specific group. (2)Operate the air conditioning units in the relevant group for at least two hours continuously. (3)In the building management system, obtain apportionment parameter (outdoor unit) for each group in the relevant group, total the difference with the value set in the “Value_Set” property (or the electric energy recorded in (1)) for each energy management block, and check (using a CSV file) to see that this coincides with the outdoor unit apportionment parameter of the energy management block.
Interlocked Units Apportionment Parameter *12 *13 *15	AC_61aa44	0–999,999,999 [0.1 (No Units)]	(1)From the building management system, without registering this in a group, set the current values for apportionment parameter (outdoor unit) for specific OA Processing Unit which has been set as an interlocked unit in the “Value_Set” property. Alternatively, in the building management system, without registering this in a group, record the current values for apportionment parameter (outdoor unit) for the specific OA Processing Unit which has been set as an interlocked unit. (2)Operate the relevant interlocked units continuously for at least two hours. (3)In the building management system, obtain apportionment parameter (outdoor unit) for the relevant interlocked unit, total the difference with the value set in the “Value_Set” property (or the apportionment parameter recorded in (1)) for each energy management block, and check (using a CSV file) to see that this coincides with the outdoor unit apportionment parameter of the energy management block.

Object	Object ID	Status	Checking procedures
Night Purge State	BI_01xx46	INACTIVE(0): OFF ACTIVE(1): ON	(1)Using AE-C/EW-C or the remote controller, run Night Purge for LOSSNAY of a specific group. (2)In the building management system, check to see that the status of Night Purge of the relevant group has been updated to “ON”. (3)Using AE-C/EW-C or the remote controller, stop Night Purge for LOSSNAY of a specific group. (4)In the building management system, check to see that the status of Night Purge of the relevant group has been updated to “OFF”.
Thermo On Off State	BI_01xx47	INACTIVE(0): Thermo OFF ACTIVE(1): Thermo ON	(1)Using AE-C/EW-C or the remote controller, have a specific group perform fan operation. (2)In the building management system, check to see that the thermo ON/OFF status of the relevant group has been updated to “Thermo OFF”. (3)Using AE-C/EW-C or the remote controller, cool a specific group using a low temperature setting of at least 2°C lower than the room temperature or heat at a high temperature setting of at least 2°C higher than the room temperature. (4)In the building management system, check to see that the thermo ON/OFF status of the relevant group has been updated to “Thermo ON”.
External Heat Source State	BI_01xx50	INACTIVE(0): OFF ACTIVE(1): ON	(1)Change the ON/OFF conditions of the external heat source that is connected to the indoor unit CN24 of the specific group. (2)In the building management system, check to see that the state of External heat source for the relevant group is updated to the changed value.
COP	AI_51zz01	0-99.99 [1 (No units)]	(1)Change the ON/OFF conditions of specific Outdoor unit. (2)In the building management system, check to see that the "COP" value is updated to the changed value.
Trend Log Room Temp *16	LOG_01xx80		(1)Record the “Room Temp” value and check the log record of the “LogBuffer” property and check that the “Room Temp” data has been logged in after the time longer than collection cycle that is set from the building management system has been elapsed.
Trend Log Group Apportioned Electric Energy *12 *14 *16	LOG_01xx83		(1)Record the “Group Apportioned Electric Energy” value and check the log record of the “LogBuffer” property and check that the “Group Apportioned Electric Energy” data has been logged in after the time longer than collection cycle that is set from the building management system has been elapsed.
Trend Log Interlocked Units Apportioned Electric Energy *12 *14 *16	LOG_61aa83		(1)Record the “Interlocked Units Apportioned Electric Energy” value and check the log record of the “LogBuffer” property and check that the “Interlocked Units Apportioned Electric Energy” data has been logged in after the time longer than collection cycle that is set from the building management system has been elapsed.

Object	Object ID	Status	Checking procedures
Trend Log PIcontroller Electric Energy 1–4 *12 *14 *16	LOG_41mm84~87		(1)Record the “PIcontroller Electric Energy 1–4” value and check the log record of the “LogBuffer” property and check that the “PIcontroller Electric Energy 1–4” data has been logged in after the time longer than collection cycle that is set from the building management system has been elapsed.
Trend Log Group Apportionment Parameter *12 *15 *16	LOG_01xx88		(1)Record the “Group Apportionment parameter” value and check the log record of the “LogBuffer” property and check that the “Group Apportionment parameter” data has been logged in after the time longer than collection cycle that is set from the building management system has been elapsed.
Trend Log Interlocked Units Apportionment Parameter *12 *15 *16	LOG_61aa88		(1)Record the “Interlocked Units Apportionment Parameter” value and check the log record of the “LogBuffer” property and check that the “Interlocked Units Apportionment Parameter” data has been logged in after the time longer than collection cycle that is set from the building management system has been elapsed.

* xx: Group number (01–50)
* mm: PI controller address (01–50)
* aa: Interlocked unit address (01–50)
* zz: Outdoor unit address minus 50 (01-50)

*1 Do not use this when “External Input Setting” for AE-C/EW-C is set to “ON/OFF (Level signal)”. “External Input Setting” can be configured on the Initial Setting Tool. (Refer to the AE-C/EW-C Instruction Book (Detailed operations) for settings methods.)

*2 The air conditioning unit error code (4 digits) is output to the Description and the Message Text of event notification. When an error occurs, check to see that it coincides with the error code (4 digits) detected by AE-C/EW-C or the remote controller.

*3 When the M-NET transmission line has been removed, units in a group with no remote controller stop.

*4 “Dry” can be used only when the “Use Dry Mode” setting is enabled (checked) on the BACnet Setting Tool. (The default setting is disabled (unchecked).)

*5 It can only be used if the system controller is AE-C400A/EW-C50A and the indoor unit is a Setback mode supported model.

*6 “Mid 1” and “Mid 2” can be used only when the “Use Fan Speed Mid1/Mid2” setting is enabled (checked) on the BACnet Setting Tool. (The default setting is disabled (unchecked).)

*7 Accuracy and value ranges in BACnet. Accuracy and value ranges that can be actually set or measured will differ depending on the model of the connected air conditioning units and remote controllers.

*8 The objects that can be used for the temperature setting differ depending on the model and the setting. Refer to section 4-3 “Set temperature objects” for details.

*9 For details of the setting method, refer to the item in “External Input Setting” in the AE-C/EW-C Instruction Book (Detailed operations).

*10 The error code (4 digits) is output to the Description and the Message Text of event notification. When an error occurs, check to see that it coincides with the error code (4 digits) detected by AE-C/EW-C.

*11 Outputs the PI controller error code (4 digits) to the Description and EVENT Notification Message Text. Check that when an error occurs, this matches the error code (4 digits) detected with the AE-C/EW-C.

*12 When “Charge” license is not registered, the correct value is not stored.

*13 Results until XX:00 and XX:30 minutes every hour are reflected at XX:15 and XX:45 respectively.

*14 Can be used only if there is a metering device.

*15 Can be used only when there is no metering device.

*16 The initial value of the log interval of the trend log is 1 minute (Room Temp) or 30 minutes (other than Room Temp). To change the log interval, it is necessary to write (WriteProperty) in the “Log_Interval” property from BACnet Trial Run Tool before trial run.

*17 When the display temperature of the building management system is updated by COV notification, the difference of a maximum of [COV_Increment setting value + 0.1]ºC can be generated between the temperatures displayed on the building management system and on the AE-C/EW-C. If the difference of the display temperature is within this value, assume that there is no difference.

Objects for chillers

Object	Object ID	Status	Checking procedures
Chiller On Off Setup *1	BO_71tt01	INACTIVE(0): OFF ACTIVE(1): ON	(1)Turn on or off a specific system from the building management system. (2)From AE-C/EW-C or the remote controller, check that the ON/OFF state of the system changes accordingly.
Chiller On Off State	BI_71tt02	INACTIVE(0): OFF ACTIVE(1): ON	(1)Turn on or off a specific system from AE-C/EW-C or the remote controller. (2)From the building management system, check that the ON/OFF state of the system changes accordingly.
Chiller Operational Mode Setup *1 *4	MO_71tt03	01: Heating 02: Cooling 03: Anti-freeze 04: Heating ECO	(1)Turn off a specific system from the building management system. (2)Change the operational mode of the system from the building management system. (3)After one or more minutes have elapsed, check that the operational mode has been changed from the building management system, and then operate the system. (4)From AE-C/EW-C or the remote controller, check that the operational mode of the system has been changed to the specified mode.
Chiller Operational Mode State	MI_71tt04	01: Heating 02: Cooling 03: Anti-freeze 04: Heating ECO	(1)Turn off a specific system from AE-C/EW-C or the remote controller. (2)Change the operational mode of the system from AE-C/EW-C or the remote controller. (3)After one or more minutes have elapsed, check that the operational mode has been changed, and then operate the system from AE-C/EW-C or the remote controller. (4)From the building management system, check that the operational mode of the system has been changed to the specified mode.
Chiller Fan Mode Setup *1	MO_71tt05	01: Normal 02: Snow	(1)Turn off a specific system from the building management system. (2)Operate the ventilation mode of the system from the building management system. (3)Operate the system from the building management system. (4)From AE-C/EW-C or the remote controller, check that the ventilation mode of the system has been changed to the specified mode.
Chiller Fan Mode State	MI_71tt06	01: Normal 02: Snow	(1)Turn off a specific system from AE-C/EW-C or the remote controller. (2)Operate the ventilation mode of the specific system from AE-C/EW-C or the remote controller. (3)Operate the specific system from AE-C/EW-C or the remote controller. (4)From the building management system, check that the ventilation mode of the system has been changed to the specified mode.

Object	Object ID	Status	Checking procedures
Chiller Set Temp Cool *1	AV_71tt07	°C (-99.0°C–99.0°C) *2	(1)Set the Set Temp Cool for a specific system from the building management system. (2)From AE-C/EW-C or the remote controller, check that the Set Temp Cool for the system has been changed. (3)Set the Set Temp Cool for the specific system from AE-C/EW-C or the remote controller. (4)From the building management system, check that the Set Temp Cool for the system has been changed.
Chiller Set Temp Heat *1	AV_71tt08	°C (-99.0°C–99.0°C) *2	(1)Set the Set Temp Heat for a specific system from the building management system. (2)From AE-C/EW-C or the remote controller, check that the Set Temp Heat for the system has been changed. (3)Set the Set Temp Heat for the specific system from AE-C/EW-C or the remote controller. (4)From the building management system, check that the Set Temp Heat for the system has been changed.
Chiller Representative Inlet Water Temp	AI_71tt09	°C (-99.0°C–99.0°C) *2	(1)Change the Inlet Water Temp of a specific system. (2)Check that the indication on the building management system matches the indication on AE-C/EW-C or the remote controller.
Chiller Representative Outlet Water Temp	AI_71tt10	°C (-99.0°C–99.0°C) *2	(1)Change the Outlet Water Temp of a specific system. (2)Check that the indication on the building management system matches the indication on AE-C/EW-C or the remote controller.
Chiller Representative Alarm Signal	BI_71tt11	INACTIVE(0): Normal ACTIVE(1): Error	(1)Produce an error in a specific system of chiller unit. (2)From the building management system, check that the alarm signal for the system has been changed to Error (ACTIVE). *3 (3)Reset the error in the system. (4)From the building management system, check that the alarm signal for the system has been changed to Normal (INACTIVE).
Chiller Communication State	BI_71tt12	INACTIVE(0): Normal ACTIVE(1): Error	(1)Remove the M-NET transmission line of the chiller unit from AE-C/EW-C. (2)From the building management system, check that the communication state for the system of the chiller unit has been changed to Error (ACTIVE). (3)Connect the M-NET transmission line of the chiller unit to AE-C/EW-C. (4)From the building management system, check that the communication state for the system of the chiller unit has been changed to Normal (INACTIVE). (Other errors may occur due to a communication error, but focus on the communication status.)

Object	Object ID	Status	Checking procedures
Chiller Prohibition On Off *1	BV_71tt15	INACTIVE(0): Permit ACTIVE(1): Prohibit	(1)From the building management system, prohibit the remote control operation (on/off) of a specific system. (2)Using the specific remote controller, check to see that the on/off operation from the remote controller is prohibited. (3)From the building management system, permit the operation (on/off) of a specific remote controller. (4)Using the specific remote controller, check to see that the on/off operation from the remote controller is permitted.
Chiller Prohibition Mode	BV_71tt16	INACTIVE(0): Permit ACTIVE(1): Prohibit	Although the operating and checking target is the Chiller Prohibition Mode, the operating and checking method is the same as “Chiller Prohibition On Off” above.
Chiller Prohibition Set Temperature	BV_71tt17	INACTIVE(0): Permit ACTIVE(1): Prohibit	Although the operating and checking target is the Chiller Prohibition Set Temperature, the operating and checking method is the same as “Chiller Prohibition On Off” above.
Chiller Unit Alarm Signal	BI_91uu11	INACTIVE(0): Normal ACTIVE(1): Error	(1)Produce an error in a specific chiller unit. (2)From the building management system, check that the alarm signal for the unit has been changed to Error (ACTIVE). *3 (3)Reset the error in the unit. (4)From the building management system, check that the alarm signal for the unit has been changed to Normal (INACTIVE).

* tt: Group number of simultaneously operated units including a system representative unit (01–50)

* xx: Simultaneously operated group number (01–50)

* uu: Unit address (01–50)

*1 Chiller units can be operated from the LCD or the building management system only when the command input source of the chiller unit is set to the system controller. In such a case, the chiller unit cannot be operated from the remote controller.

*2 Indicates the accuracy or the value range in BACnet. The accuracy or the value range that can be actually set or measured varies depending on the model of the chiller unit or the remote controller to be connected.

*3 Alarm signals for chiller objects do not support output of the error code (four digit) for Message Text of Description and EVENT notification.

*4 The Chiller Operational Mode can be changed when the Chiller On Off is set to Off.
Before changing the Chiller Operational Mode Setup, set the Chiller On Off Setup to Off.
Wait at least for one minute, check that the Chiller Operational Mode State has been changed as intended, and re-start the operation using the Chiller On Off Setup.

Air conditioning control system (AE-C/EW-C) BACnet function trial run check list example

Object	Object ID	Results
On Off Setup	BO_01xx01	
On Off State	BI_01xx02	
Alarm Signal (4-digit error code)	BI_01xx03	
Error Code	MI_01xx04	
Operational Mode Setup	MO_01xx05	
Operational Mode State	MI_01xx06	
Fan Speed Setup	MO_01xx07	
Fan Speed State	MI_01xx08	
Room Temp [Water Temp]	AI_01xx09	
Set Temp [Set Water Temp]	AV_01xx10	
Set Temp Cool	AV_01xx24	
Set Temp Heat	AV_01xx25	
Set Temp Auto	AV_01xx26	
Filter Sign	BI_01xx11	
Filter Sign Reset	BV_01xx12	
Prohibition On Off	BV_01xx13	
Prohibition Mode	BV_01xx14	
Prohibition Filter Sign Reset	BV_01xx15	
Prohibition Set Temperature	BV_01xx16	
Prohibition Fan Speed	BV_01xx17	
M-NET Communication State	BI_01xx20	
System Forced Off (individual)	BV_01xx21	
System Forced Off (collective)	BV_019921	
Air Direction Setup	MO_01xx22	
Air Direction State	MI_01xx23	
Set High Limit Setback Temp	AV_01xx27	
Set Low Limit Setback Temp	AV_01xx28	
Ventilation Mode Setup	MO_01xx35	
Ventilation Mode State	MI_01xx36	
Air To Water Mode Setup	MO_01xx37	
Air To Water Mode State	MI_01xx38	
System Alarm Signal (4-digit error code)	BI_010048	
Error Code Detail	AI_01xx49	
PIcontroller Alarm Signal (4-digit error code)	BI_41mm03	
Group Apportioned Electric Energy	AC_01xx39	
Interlocked Units Apportioned Electric Energy	AC_61aa39	
PIcontroller Electric Energy 1–4	AC_41mm40–43	
Group Apportionment Parameter	AC_01xx44	
Interlocked Units Apportionment Parameter	AC_61aa44	
Night Purge State	BI_01xx46	
Thermo On Off State	BI_01xx47	
External Heat Source State	BI_01xx50	
Trend Log Room Temp	LOG_01xx80	
Trend Log Group Apportioned Electric Energy	LOG_01xx83	
Trend Log Interlocked Units Apportioned Electric Energy	LOG_61aa83	
Trend Log PIcontroller Electric Energy 1–4	LOG_41mm84–87	
Trend Log Group Apportionment Parameter	LOG_01xx88	
Trend Log Interlocked Units Apportionment Parameter	LOG_61aa88	
Chiller On Off Setup	BO_71tt01	

Object	Object ID	Results
Chiller On Off State	BI_71tt02	
Chiller Operational Mode Setup	MO_71tt03	
Chiller Operational Mode State	MI_71tt04	
Chiller Fan Mode Setup	MO_71tt05	
Chiller Fan Mode State	MI_71tt06	
Chiller Set Temp Cool	AV_71tt07	
Chiller Set Temp Heat	AV_71tt08	
Chiller Representative Inlet Water Temp	AI_71tt09	
Chiller Representative Outlet Water Temp	AI_71tt10	
Chiller Representative Alarm Signal	BI_71tt11	
Chiller Communication State	BI_71tt12	
Chiller Prohibition On Off	BV_71tt15	
Chiller Prohibition Mode	BV_71tt16	
Chiller Prohibition Set Temperature	BV_71tt17	
Chiller Unit Alarm Signal	BI_91uu11	

* xx: Group number (01–50), mm: PI controller address (01–50), aa: Interlocked unit address (01–50)
* tt: Group number of simultaneously operated units including a system representative unit (01–50)
* uu: Unit address (01–50)

6-6. When changing settings or reconfiguring AE-C/EW-C

The procedures for changing settings or reconfiguring AE-C/EW-C using stored settings data are as follows.

Important

When AE-C/EW-C is reconfigured, communication with the building management system is temporarily cut off and the building management system may detect a communication error. Carry out operations after receiving approval from the building manager beforehand.

(1) Connecting Setting PC

Before the Setting PC is connected to AE-C/EW-C, remove the LAN cable of LAN2 of AE-C/EW-C connected to BACnet.
Connect the LAN 1 of AE-C/EW-C and the Setting PC using a LAN cable via a HUB.

(2) Data setting

Setting changes are made on the Setting PC or the setting data stored is read to reconfigure AE-C/EW-C. Settings are performed for initial settings in the air conditioning system, the apportioned electricity billing function settings (only when used) and the BACnet related settings, in that order.
(For details on setting items and settings in each procedure, refer to section 6-2 “Step-1 Initial settings for the air conditioning system”, AE-C/EW-C Instruction Book (Apportioned Electricity Billing Function), section 6-4 “Step-3 Initial settings for the BACnet related items”, and AE-C/EW-C Instruction Book (BACnet Setting Tool) or BACS-AP50 Instruction Book (Detailed Operation).)
Before configuring the BACnet related items, it is required to set the BACnet connection mode to “OFFLINE” from the BACnet Setting Tool.

(3) Air-conditioning system and apportioned electricity billing function trial run

Carry out a trial run for the air conditioning system and a trial run for the apportioned electricity billing function. Refer to the respective unit Installation Manual for the method of carrying out a trial run of the air conditioning system and the AE-C/EW-C Instruction Book (Apportioned Electricity Billing Function) for the method of carrying out a trial run of the apportioned electricity billing function.

(4) ONLINE setting

A setting is made to “ONLINE” from the BACnet Setting Tool. AE-C/EW-C restarts automatically. (approximately 10 minutes for maximum time required)
When AE-C/EW-C restarts, a group device with no remote controller may stop.

(5) Removing Setting PC

Remove the Setting PC from LAN1 of AE-C/EW-C.

(6) Connecting BACnet

Connect LAN2 of AE-C/EW-C and BACnet.

(7) BACnet trial run

By performing a trial run of the BACnet function, check the operation. Refer to section 6-5 “Step-4 Trial run of BACnet function” for the trial run method.

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- Low Voltage Directive 2014/35/EU
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Please be sure to put the contact address/telephone number on this manual before handing it to the customer.

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