

## 5. Usage (Function specifications)

The AE-200/AE-50/EW-50 BACnet<sup>®</sup> function mutually converts communications for air conditioning equipment connected to the AE-200/AE-50/EW-50 and for BACnet<sup>®</sup> communications.

### 5-1. Controller functions and BACnet<sup>®</sup> functions

The table below lists the supported controller functions which can monitor/operate from the web browser or the AE-200/AE-50's LCD and the BACnet<sup>®</sup> functions.

V: Supported  
—: Not supported

Classification	Item	Controller function	BACnet <sup>®</sup> 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 <sup>®</sup> does not support "Downblow 20%" and "Auto" settings.
	Air Direction State	V	V	BACnet <sup>®</sup> 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-200A/AE-50A/EW-50A
	Set Low Limit Setback Temp	V	V	Only AE-200A/AE-50A/EW-50A
	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	
	Prohibition On Off	V	V	
	Prohibition Mode	V	V	
	Prohibition Filter Sign Reset [Prohibition Circulating Water Exchange 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

Classification	Item	Controller function	BACnet® function	Remarks
Alarm monitor	Alarm Signal (Air conditioning unit/PI controller)	√	√	
	Error Code	√	√	Controllers support 4-digit error codes, and BACnet® supports 1- and 4-digit error codes.
	System Alarm Signal	√	√	
	M-NET Communication State	√	√	
	Filter Sign [Circulating Water Exchange Sign]	√	√	
	Filter Sign Reset [Circulating Water Exchange Sign Reset]	√	√	
Control functions	Command Failure	—	√	
	High Limit/Low Limit Alarm	√ *3	√	
	Night Setback control	√	—	
	Schedule control	√	—	
	Interlock control	√	—	
Data management functions	Energy management data/ Trend log	√	√	These are collected individually in the body/BACnet®, so sometimes the values of these do not coincide.
	Group Apportioned Electric Energy	√	√	
	Interlocked Units Apportioned Electric Energy	√	√	
	Group Apportionment Parameter	√	√	BACnet® function has only parameters for outdoor units.
	Interlocked Units Apportionment Parameter	√	√	BACnet® function has only parameters for outdoor units.
	Picontroller Electric Energy (Ch 1–4)	√	√	
	Pulse Input Electric Energy (Metering device 1–4)	√	√	
Other functions	Unit of temperature setting	√	√	This setting on the AE-200/AE-50/EW-50 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 time/ FAN operation time	√	—	
	Time management	√	√	
	BACnet® router	—	√	
	LCD lock	√	—	

\*1 Supports only Thermo-ON time, Thermo-ON/OFF count.

Thermo-ON/OFF count cannot be monitored from the AE-200/AE-50'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).

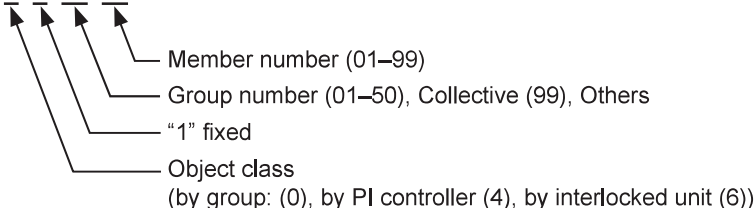
## 5-2. Basic functions

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

### 5-2-1. 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-200/AE-50/EW-50 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				*20
On Off State	BI	01xx02	Stop	Run				*20
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 *16 *18 *22
Operational Mode State	MI	01xx06	01: Cool 02: Heat 03: Fan	04: Auto 05: Dry 06: Setback				*1 *3 *16 *18 *22
Fan Speed Setup	MO	01xx07	01: Low 02: High 03: Mid 2	04: Mid 1 05: Auto				*4 *5 *18
Fan Speed State	MI	01xx08	01: Low 02: High 03: Mid 2	04: Mid 1 05: Auto				*4 *5 *18 *21
Room Temp [Water Temp]	AI	01xx09	°F/°C					*16
Set Temp [Set Water Temp]	AV	01xx10	°F/°C					*16
Filter Sign [Circulating Water Exchange Sign]	BI	01xx11	OFF	ON				
Filter Sign Reset [Circulating Water Exchange Sign Reset]	BV	01xx12	Reset	Void				
Prohibition On Off	BV	01xx13	Permit	Prohibit				*20
Prohibition Mode	BV	01xx14	Permit	Prohibit				*16
Prohibition Filter Sign Reset [Prohibition Circulating Water Exchange Sign Reset]	BV	01xx15	Permit	Prohibit				

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)		
Prohibition Set Temperature	BV	01xx16	Permit	Prohibit				*16	
Prohibition Fan Speed	BV	01xx17	Permit	Prohibit					
M-NET Communication State	BI	01xx20	Normal	Error					
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	*14 *16 *18	
Air Direction State	MI	01xx23	Horizontal	Downblow 60%	Downblow 80%	Downblow 100%	Swing	*8 *14 *16 *18	
Set Temp Cool	AV	01xx24	°F/°C					*16 *18	
Set Temp Heat	AV	01xx25	°F/°C					*16 *18	
Set Temp Auto	AV	01xx26	°F/°C					*16 *18	
Set High Limit Setback Temp	AV	01xx27	°F/°C					*16 *18 *19	
Set Low Limit Setback Temp	AV	01xx28	°F/°C					*16 *18 *19	
Ventilation Mode Setup	MO	01xx35	Heat Recovery	Bypass	Auto			*15 *18	
Ventilation Mode State	MI	01xx36	Heat Recovery	Bypass	Auto			*15 *18 *21	
Air To Water Mode Setup	MO	01xx37	Heating	Heating ECO	Hot Water	Anti-freeze	Cooling	*15 *16 *17	
Air To Water Mode State	MI	01xx38	Heating	Heating ECO	Hot Water	Anti-freeze	Cooling	*15 *16 *17	
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 *13 *15 *16 *17 *18	
Pulse Input Electric Energy 1-4	AC	410040-43	0.1 [kWh]					*2 *12 *13 *15 *16 *17 *18	
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				*15 *18	
Thermo On Off State	BI	01xx47	OFF	ON				*16	
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	
Trend Log Room Temp	LOG	01xx80						*9 *16 *24	

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 Apportioned Electric Energy	LOG	01xx83						*2 *24
Trend Log Interlocked Units Apportioned Electric Energy	LOG	61aa83						*2 *7 *24
Trend Log PIcontroller Electric Energy 1-4	LOG	41mm84-87						*2 *6 *13 *15 *16 *17 *18 *24
Trend Log Pulse Input Electric Energy 1-4	LOG	410084-87						*2 *13 *15 *16 *17 *18 *24
Trend Log Group Apportionment Parameter	LOG	01xx88						*2 *24
Trend Log Interlocked Units Apportionment Parameter	LOG	61aa88						*2 *7 *24

\*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-200/AE-50/EW-50.

\*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-200/AE-50/EW-50 to "ON/OFF (Level signal)". "External Input Setting" can be configured on the Initial Setting Tool, Web Browser for Initial Settings, or AE-200/AE-50's LCD. (Refer to the AE-200/AE-50/EW-50 Instruction Book (Initial Settings) for settings methods.)

\*12 Electric energy for the electricity meter connected to the Pulse Input (PI) of AE-50/EW-50

\*13 Electric energy 1 to 4 correspond to signal lines Ch1 to 4 on the PI controller or metering devices 1 to 4 connected to Pulse Input (PI) of AE-50/EW-50.

- \*14 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

- \*15 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.
- \*16 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.
- \*17 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.
- \*18 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.
- \*19 It can only be used if the system controller is AE-200A/AE-50A/EW-50A and the indoor unit is a Setback mode supported model.
- \*20 Do not use this when "External Input Setting" for AE-200/AE-50/EW-50 is set to "ON/OFF (Level signal)". "External Input Setting" can be configured on the Initial Setting Tool, Web Browser for Initial Settings, or AE-200/AE-50's LCD. (Refer to the AE-200/AE-50/EW-50 Instruction Book (Initial Settings) for settings methods.)
- \*21 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.
- \*22 "Setback" is available only when the "Old model compatibility mode" is set to "OFF" on the Initial Setting Tool, Web Browser for Initial Settings, or AE-200/AE-50's LCD.
- \*23 "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.
- \*24 Use the BACnet® Trial Run Tool to check or set the "Log\_Interval" property. (Refer to the AE-200/AE-50/EW-50 Instruction Book (BACnet® Trial Run Tool) for settings methods.)

Whether or not the object can be supported by the unit type is indicated in the following table.  
 The AE-200/AE-50/EW-50 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	
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	
Set Temp [Set Water Temp]	AV	01xx10	V	—	V	*2
Filter Sign [Circulating Water Exchange Sign]	BI	01xx11	V	V	V	
Filter Sign Reset [Circulating Water Exchange 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 [Prohibition Circulating Water Exchange 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	
	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

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	
Plcontroller Electric Energy 1-4	AC	41mm40-43	—	—	—	
Pulse Input Electric Energy 1-4	AC	410040-43	—	—	—	
Group Apportionment Parameter	AC	01xx44	V	—	V	
Interlocked Units Apportionment Parameter	AC	61aa44	—	—	—	*4
Night Purge State	BI	01xx46	V	V	—	*3
Thermo On Off State	BI	01xx47	V	—	V	
Error Code Detail	AI	01xx49	V	V	V	
External Heat Source State	BI	01xx50	V	—	—	*7
Plcontroller Alarm Signal	BI	41mm03	—	—	—	
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 Plcontroller Electric Energy 1-4	LOG	41mm84-87	—	—	—	
Trend Log Pulse Input Electric Energy 1-4	LOG	410084-87	—	—	—	
Trend Log Group Apportionment Parameter	LOG	01xx88	V	—	V	
Trend Log Interlocked Units Apportionment Parameter	LOG	61aa88	—	—	—	*4

\*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	19-30°C	17-28°C	19-28°C	19-30°C
	Auto (Dual-set-points) mode	19-35°C	4.5-28°C	Cool: 19-35°C Heat: 4.5-28°C	19-35°C

#### Air To Water

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

(Conversion for communication of the air conditioning equipment and BACnet<sup>®</sup> 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-200/AE-50/EW-50 is set to "ON/OFF (Level signal)". "External Input Setting" can be configured on the Initial Setting Tool, Web Browser for Initial Settings, or AE-200/AE-50's LCD. (Refer to the AE-200/AE-50/EW-50 Instruction Book (Initial Settings) 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.