MITSUBISHI ELECTRIC

CE

Air Conditioning Control System
Centralized Controller
EW-50A/EW-50E

SD SDHC Java POWERED

Installation and Instructions Manual

Contents

Safety notes are marked with ⚠**WARNING** or ⚠**CAUTION**, depending on the severity of possible consequences that may result when the instructions are not followed exactly as stated.
Proper installation is important for your safety and proper functioning of the units. Thoroughly read the following safety precautions prior to installation.

Before installing the controller, please read this Installation Manual carefully to ensure proper operation. Retain this manual for future reference.

1. Safety precautions

►Thoroughly read the following safety precautions prior to installation.

►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.

►All electrical work must be performed by qualified personnel.

⚠ 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.

1-1. 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 injury, electric shock, or fire, do not alter or modify the controller.

To reduce the risk of electric shock, malfunction, smoke, or fire, do not touch the electrical parts or USB memory 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 burns, do not touch the electrical parts with bare hands during and immediately after operation.

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

Test runs, inspection, and service must be performed by qualified personnel in accordance with this manual. Incorrect use may result in injury, electric shock, malfunction, or fire.

If you notice any abnormality, stop the operation and turn off the controller. 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.

To reduce the risk of frostbite, burns, injury, or electric shock, keep the equipment out of the reach of children.

⚠ 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 switches or buttons with a sharp object.

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

To reduce the risk of injury, wear protective gear when working on the controller.

Wear protective gear when working on the controller. High-voltage parts pose a risk of electric shock, and high-temperature parts pose a risk of burns.

1-2. Precautions for unit installation

⚠ WARNING

Do not install the controller where there is a risk of flammable gas leaks. If flammable gas accumulates around the controller, it may ignite and cause a fire or explosion.

Properly dispose of the packing materials. Plastic bags pose a suffocation hazard to children.

Take appropriate safety measures against earthquakes to prevent the controller from causing injury.

To prevent injury, install the controller on a flat surface strong enough to support its weight.

⚠ CAUTION

To reduce the risk of short circuits, current leakage, electric shock, malfunction, smoke, or fire, do not install the controller in a place exposed to water or in a condensing environment.

The controller must be installed by qualified personnel according to the instructions detailed in this manual. Improper installation may result in electric shock or fire.

1-3. Precautions for electrical wiring

⚠ WARNING

To reduce the risk of malfunction, smoke, fire, or damage to the controller, do not connect the power cable to the signal terminal block.

To reduce the risk of malfunction, smoke, fire, or damage to the controller, do not apply a power supply voltage in excess of that specified.

Properly secure the cables in place and provide adequate slack in the cables so as not to stress the terminals. Improperly connected cables may break, overheat, and cause smoke or fire.

To reduce the risk of injury or electric shock, switch off the main power before performing electrical work.

Electrical work must be performed by qualified personnel in accordance with local regulations and the instructions provided in this manual. Only use specified cables and dedicated circuits. Inadequate power source capacity or improper electrical work will result in electric shock, malfunction, or fire.

To reduce the risk of electric shock, install an overcurrent breaker and an earth leakage breaker on the power supply. To reduce the risk of electric shock, smoke, or fire, install an overcurrent breaker for each controller.

Only use properly rated breakers (earth leakage breaker, local switch <switch + fuse that meets local electrical codes>, moulded case circuit breaker, or overcurrent breaker). The use of improperly rated breakers or the substitution of fuses with steel or copper wire may result in electric shock, malfunction, smoke, or fire.

To reduce the risk of current leakage, overheating, smoke, or fire, use properly rated cables with adequate current carrying capacity.

Proper grounding must be provided by qualified personnel. Do not connect the protective ground wire to a gas pipe, water pipe, lightning rod, or telephone wire. Improper grounding may result in electric shock, smoke, fire, or malfunction due to electrical noise interference.

⚠ CAUTION

To reduce the risk of short circuits, electric shock, or malfunction, keep wire pieces and sheath shavings out of the terminal block.

To reduce the risk of short circuits, current leakage, electric shock, or malfunction, keep the cables out of contact with controller edges.

To reduce the risk of electric shock, malfunction, or fire, seal the gap between the cable and the end of the conduit tube with putty.

To reduce the risk of injury, do not touch the burrs of the knockout holes.

1-4. 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.

⚠ CAUTION

To reduce the risk of short circuits, electric shock, malfunction, or fire, do not touch the circuit board with tools or with your hands, and do not allow dust to accumulate on the circuit board.

1-5. Additional precautions

CAUTION

To avoid damage to the controller, use appropriate tools to install, inspect, or repair the controller.

To prevent unauthorized access, always use a security device such as a VPN router when connecting to the Internet.

Take appropriate measures against electrical noise interference when installing the controller in hospitals or radio communication facilities. Inverter, high-frequency medical, or wireless communication equipment as well as power generators may cause the air conditioning system to malfunction. The air conditioning system may also adversely affect the operation of these types of equipment by creating electrical noise.

To avoid malfunction, do not bundle power cables and signal cables together or place them in the same metallic conduit.

To avoid damage to the controller, do not overtighten the screws.

To avoid deformation and malfunction, do not install the controller in direct sunlight or where the ambient temperature may exceed 55°C (131°F) or drop below -10°C (14°F).

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.

2. Introduction

EW-50A/EW-50E is a total management system.

Any connected air conditioning systems can be operated or monitored on the Web browser. EW-50A/EW-50E can also be used as an expansion controller of AE-200A/AE-200E.

By connecting AE-200A/AE-200E, up to 200 indoor units and other equipment can be controlled.

Hereafter, AE-200A and AE-200E, unless otherwise specified, will be called "AE-200."

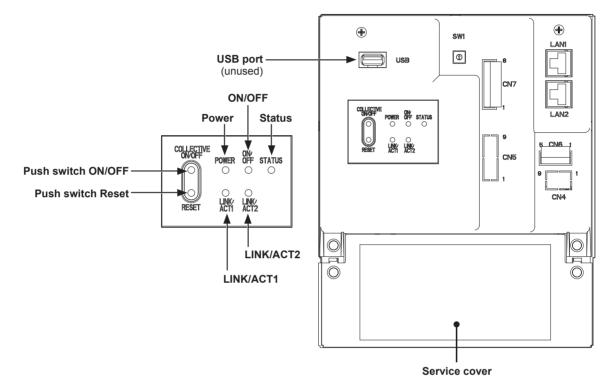Hereafter, AE-50A and AE-50E, unless otherwise specified, will be called "AE-50."

Hereafter, EW-50A and EW-50E, unless otherwise specified, will be called "EW-50."

> Note: A PC is required to monitor and operate the air conditioning units.
> Note: The required licenses vary, depending on the functions to be used. Consult your dealer.
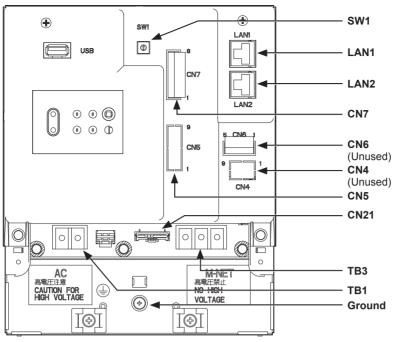> Note: For how to use the Web browser, refer to the Instruction Book (Integrated Centralized Control Web).

2-1. Part names

Item			Description
LED	Power	Lit in green	Power ON
		Unlit	Power OFF
	ON/OFF	Lit in green	One or more air conditioning units are ON. *1
		Blink in green	One or more air conditioning units or other related equipment are in error.
		Unlit	All air conditioning units are OFF. *1
	Status	Blink in orange	Startup error
		Blink in blue	Software update in progress
		Blink in pink	Software update failed
LINK/ACT1		Blink in orange	Data transmission in progress (LAN1)
LINK/ACT2		Blink in orange	BACnet® data transmission in progress (LAN2)
Push switch	ON/OFF		Used to turn the connected air conditioning units and the other related equipment ON and OFF all at once.
	Reset		Used to reboot the EW-50. (This will not affect the operation status of the air conditioning units.)
USB port			Unused

*1 The operation status of the other equipment are excluded.

* Back side with the service cover removed

Item	Description
SW1	IP addresses can be easily set with SW1. Refer to section 7-3 "Quick IP address (LAN1) setting" for details.
LAN1	Connects to other units of equipment over the LAN via a HUB.
LAN2	Connects to the Building Management System over the LAN (BACnet®) via a HUB.
CN7 (Pulse Input) *1	Connects to metering devices using the supplied connector.
CN6	Unused
CN4	Unused
CN5 (External I/O) *1	Connects to an external input/output adapter PAC-YG10HA-E. (When connecting an external input/output adapter PAC-YG10HA-E, cut out the knockout hole.)
CN21 (M-NET power jumper)	Connects to the M-NET power jumper to supply power (default). * If another system controller is connected to the same M-NET system and the power consumption coefficient is 1.5 or above, disconnect the M-NET power jumper to supply power from the separately-sold power supply unit.
TB3 (M-NET A, B, S) (M3.5)	M-NET transmission terminal block Connects to M-NET transmission cables from the outdoor unit. (A, B: Non-polarized, S: Shield)
TB1 (Power source AC L/L1, N/L2) (M3.5)	Connects to the power cable.
Ground (M4)	Connects to the protective ground wire.

*1 Refer to chapter 9 "External input/output" for details.

3. Package contents

The following items are included in the package.

	Package contents		Qty.
(1)	EW-50		1
(2)	Connector (CN6) (Unused)		1
(3)	Connector (CN7) (Used for pulse input)		1
(4)	L-fitting		2
(5)	DIN rail attachment (for attaching DIN rail of 35 mm (1-7/16 in) width)		2
(6)	DIN rail auxiliary bracket		1
(7)	Roundhead screw (M3 × 12) *1 (for fixing DIN rail attachment)		4
(8)	Roundhead screw (M3 × 6) *1 (for fixing DIN rail auxiliary bracket or L-fitting)		4
(9)	Cable tie		4 (Two are spare.)
(10)	Installation and Instructions Manual (this manual) *2		1

(11)	CD-ROM *2
	  ├Installation and Instructions Manual (this manual)
	  └License Classification List
	
	Note
	● The CD-ROM can only be played on a CD-drive or a DVD-drive. Do not attempt to play the CD-ROM on an audio CD player as this may damage your ears and/or speakers.
	● Each document is in PDF format. Viewing documents requires a computer with Adobe® Reader® or Adobe® Acrobat® installed. "Adobe® Reader®" and "Adobe® Acrobat®" are registered trademarks of Adobe Systems Incorporated.
			1

*1 ISO metric screw thread

*2 For details about the apportioned electricity billing function, refer to the Instruction Book that comes with the "Charge" license.

Notes on the SD card installed on the EW-50

● Do not use the SD card installed on the EW-50 for any other equipment.
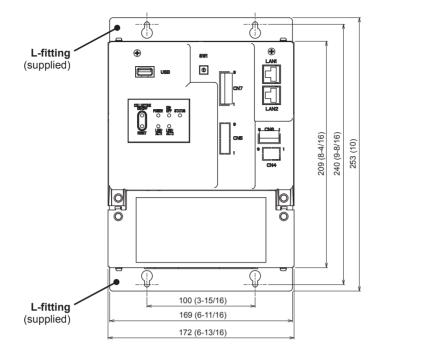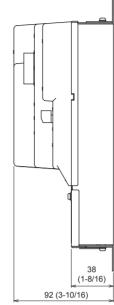
4. Specifications

4-1. Product specifications

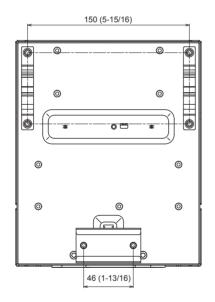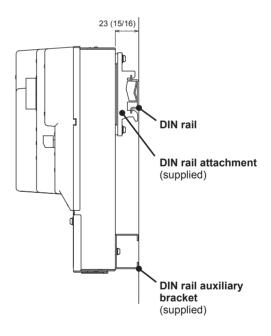| Item			Specifications
Power supply			100–240 VAC ± 10%; 50/60 Hz Single-phase
M-NET power feeding coefficient			1.5
Ambient conditions	Temperature	Operating temperature range	-10°C – +55°C (+14°F – +131°F)
		Storage temperature range	-20°C – +60°C (-4°F – +140°F)
	Humidity		30%–90% RH (Non-condensing)
Dimensions (W × H × D)			172 × 209 × 92 mm (6-13/16 × 8-4/16 × 3-10/16 in) * 172 × 253 × 92 mm (6-13/16 × 10 × 3-10/16 in) when using L-fittings
Weight			1.7 kg (4 lbs)
Installation conditions			Only in a metal control box indoors

4-2. External dimensions

(1) When using L-fittings

Unit: mm (in)

L-fitting
(supplied)

USB

SW1

CN7

LAN1
LAN2

COLLECTIVE
RESET

POWER ON/OFF STATUS

RESET

LAN1 LAN2
ACT1 ACT2

CN5

CN6

CN4

209 (8-4/16)
240 (9-8/16)
253 (10)

L-fitting
(supplied)

100 (3-15/16)
169 (6-11/16)
172 (6-13/16)

38
(1-8/16)

92 (3-10/16)

(2) When using DIN rail

150 (5-15/16)

23 (15/16)

DIN rail

DIN rail attachment
(supplied)

46 (1-13/16)

DIN rail auxiliary bracket
(supplied)

5. Installation

⚠ WARNING

Test runs, inspection, and service must be performed by qualified personnel in accordance with this manual. Incorrect use may result in injury, electric shock, malfunction, or fire.

Do not install the controller where there is a risk of flammable gas leaks. If flammable gas accumulates around the controller, it may ignite and cause a fire or explosion.

Take appropriate safety measures against earthquakes to prevent the controller from causing injury.

To prevent injury, install the controller on a flat surface strong enough to support its weight.

⚠ CAUTION

To reduce the risk of short circuits, current leakage, electric shock, malfunction, smoke, or fire, do not install the controller in a place exposed to water or in a condensing environment.

5-1. Items not included

The following items are required to install the EW-50.

Items not included		Specifications
Locknuts and bushing		Must be suitable for the conduit tube to be used.
Sleeved ring terminal		M3.5 ring terminal (for AC power cables (L/L1, N/L2) and M-NET transmission cables (A, B, S)) M4 ring terminal (for protective ground wire)
AC power cable/Protective ground wire		Type: Sheathed cable (should not be lighter than ordinary sheathed cable IEC 60227.) (designation 60227 IEC 53)[1] Recommended type: VCT, VVF, VVR, or its equivalent Size: 0.75 to 2 mm² (ø1.0 to ø1.6 mm), AWG 18 to 14 Protective ground wire color: green/yellow * Use a wire with an appropriate diameter so that the wire can be fixed with the cable tie below the terminal block. A diameter of 10 mm (25/64 in) is recommended.

Transmission cable		Type: Shielded cable
		● CPEVS ø1.2 to ø1.6 mm
		● CVVS 1.25 to 2 mm²
		  * CPEVS: PE[2] insulated PVC[2] jacketed shielded communication cable
		  * CVVS: PVC[2] insulated PVC[2] jacketed shielded control cable

Relay (for external input)		Contact rating
		  Rated voltage: 12 or 24 VDC
		  Rated current: 0.1 A or above
		  Minimum applied load: DC 1 mA

Relay (for external output)		Operation coil
		  Rated voltage: 12 or 24 VDC
		  Power consumption: Max. 0.9 W

Electrical wire for pulse input		Type: Copper wire that is suitable for the terminal block of the EW-50 Size ● Single wire: ø0.65 to ø1.2 mm, AWG 21 to 16 ● Twisted wire: 0.75 to 1.25 mm², AWG 18 to 16
Watt-hour meter		Must output dry voltage contact pulse for each unit pulse. Output pulse type: Semiconductor relay Pulse width: 100 to 300 ms (Resting interval: Min. 100 ms) Min. 100 ms 100 to 300 ms Output pulse unit: 0.1/1.0/10/100 kWh/pulse * An output pulse unit of 1 kWh/pulse or below is recommended.
LAN cable		Category 5 or above straight cable (Max. 100 m (328 ft))
Switching HUB		A communication speed of 100 Mbps or faster is recommended.
Overcurrent breaker (fuse or circuit breaker)	Fuse	Rated current: 3 A * When using a fuse, use it in combination with a switch (rated current: 3 A).
	Circuit breaker	Type: Bipolar (2P2E) Rated current: 3 A
Earth leakage breaker		Type: Bipolar (2P2E) Rated current: 3 A Rated current sensitivity: 30 mA Operation time: Max. 0.1 sec
PC		Refer to the Instruction Book (Integrated Centralized Control Web) for PC requirements.

[1] For the U.S. and Canada: designation NEC (NEPA70) or CEC

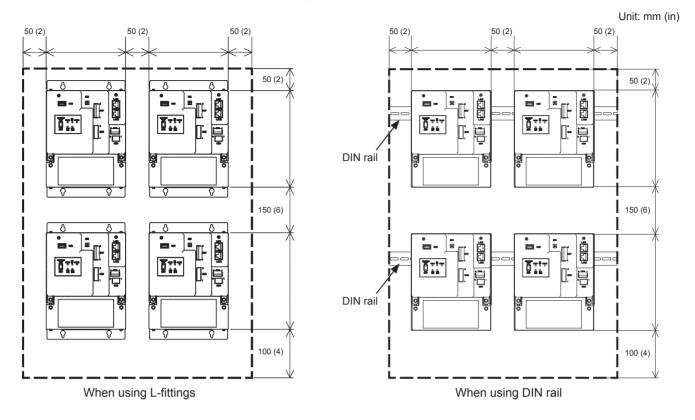[2] PE: Polyethylene, PVC: Polyvinyl chloride

5-2. Items sold separately

Items sold separately	Model name	Remarks
External input/output adapter	PAC-YG10HA-E	Required when using the external input/output function

5-3. Installation space

The EW-50 must be installed inside the metal control box.

Either the supplied L-fittings or DIN rail attachments can be used for the installation.

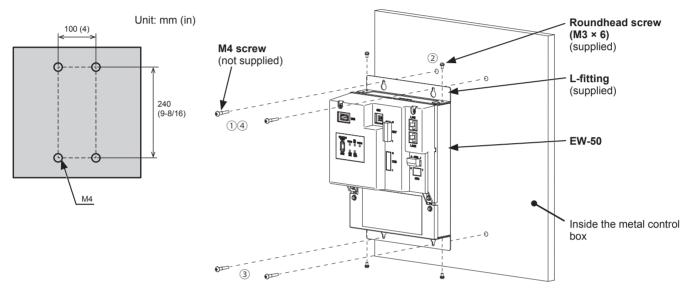Leave a space around the EW-50 as shown in the figure below.

Unit: mm (in)

When using L-fittings

When using DIN rail

5-4. Installation procedures

Note

● Connect the necessary cables and wires before installing EW-50, referring to chapters 6 and 9.
● Do not install the unit where the unit may continuously receive vibration. The continuous vibration may cause the connectors to disconnect.
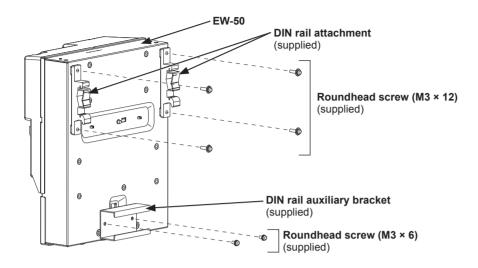
5-4-1. Method 1: Installation using L-fittings

1. Have a metal control box ready.
2. Cut screw holes on the surface on which the EW-50 will be installed as shown in the figure below, taking into consideration the installation space.
3. Attach the supplied two L-fittings to the EW-50 with the supplied roundhead screws (M3 × 6).
4. Properly install the EW-50 with the M4 screws (not supplied) inside the metal control box as shown in the figure below.
   ① Temporarily tighten the top M4 screws.
   ② Temporarily place the M4 screws through the screw holes at the top of the L-fitting.
   ③ Tighten the bottom M4 screws.
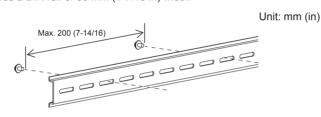   ④ Tighten the top M4 screws.

Note

● The EW-50 to which the L-fittings are attached must be fixed to the metal control box with total of four M4 screws to prevent it from falling.
● The surface on which the EW-50 will be installed needs to be strong enough to support its weight (1.7 kg (4 lbs) each).
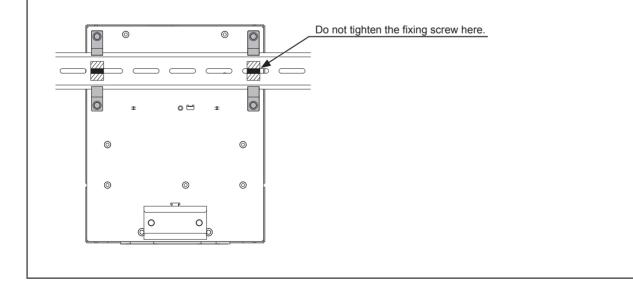
5-4-2. Method 2: Installation using DIN rail

1. Have a metal control box ready.
2. Attach the supplied two DIN rail attachments to the EW-50 with the supplied roundhead screws (M3 × 12).
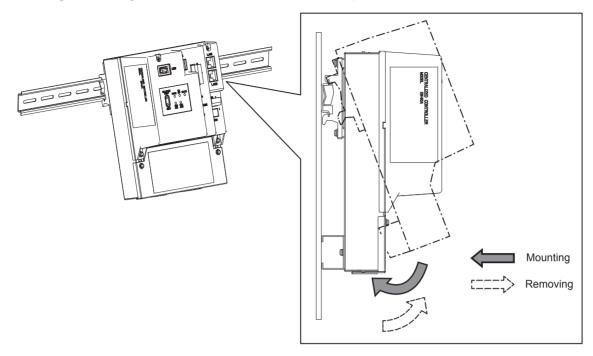3. Attach the supplied DIN rail auxiliary bracket to the EW-50 with the supplied roundhead screws (M3 × 6).

EW-50

DIN rail attachment
(supplied)

Roundhead screw (M3 × 12)
(supplied)

DIN rail auxiliary bracket
(supplied)

Roundhead screw (M3 × 6)
(supplied)

4. Mount the DIN rail (not supplied) to the metal control box.
   * Use a DIN rail of 35 mm (1-7/16 in) width.

Unit: mm (in)

Max. 200 (7-14/16)

Note

● To secure the strength, the screw pitch must be 200 mm (7-7/8 in) or less when DIN rail is mounted to the metal control box.
● The surface on which the EW-50 will be installed needs to be strong enough to support its weight (1.7 kg (4 lbs) each).
● Do not install the EW-50 where it may receive vibration.
● To avoid the contact of the DIN rail fixing screws with the DIN rail attachment, do not tighten the fixing screws at the shaded areas in the figure below.

Do not tighten the fixing screw here.

[Mounting/removing the EW-50 on/from the DIN rail]

Mounting

Removing

(1) Mounting

1. Hook the upper side of the attachments to the DIN rail.
2. Push the lower part of the EW-50 until it snaps into place.

Note
● Ensure that the DIN rail attachments are fixed securely in place to the DIN rail.

(2) Removing

1. Pull the lower part of the EW-50 toward you.
2. Remove the EW-50 from the DIN rail.

6. Wiring connections

⚠ WARNING

To reduce the risk of malfunction, smoke, fire, or damage to the controller, do not connect the power cable to the signal terminal block.

To reduce the risk of injury or electric shock, switch off the main power before performing electrical work.

Electrical work must be performed by qualified personnel in accordance with local regulations and the instructions provided in this manual. Only use specified cables and dedicated circuits. Inadequate power source capacity or improper electrical work will result in electric shock, malfunction, or fire.

To reduce the risk of electric shock, install an overcurrent breaker and an earth leakage breaker on the power supply. To reduce the risk of electric shock, smoke, or fire, install an overcurrent breaker for each controller.

Proper grounding must be provided by qualified personnel. Do not connect the protective ground wire to a gas pipe, water pipe, lightning rod, or telephone wire. Improper grounding may result in electric shock, smoke, fire, or malfunction due to electrical noise interference.
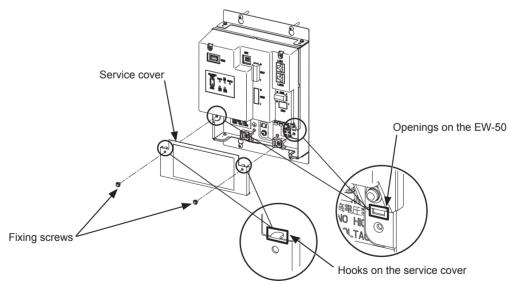
CAUTION

To avoid malfunction, do not bundle power cables and signal cables together or place them in the same metallic conduit.
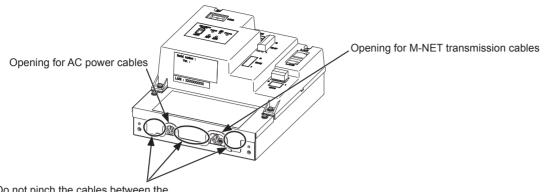
6-1. Removing/reinstalling the service cover

(1) Removing

1. Unscrew the two fixing screws on the service cover.
2. Remove the service cover.

Service cover

Openings on the EW-50

Fixing screws

Hooks on the service cover

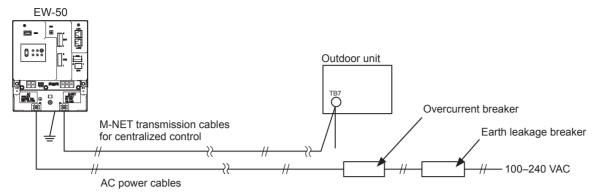## (2) Reinstalling

1. Insert the AC power cables and M-NET transmission cables into the openings, and then insert the hooks to the openings.
    Note: Do not pinch the cables between the EW-50 body and the service cover.
2. Screw down the service panel with the two fixing screws.
3. Check that there are no pinched cables between the EW-50 body and the service cover.

Opening for AC power cables

Opening for M-NET transmission cables

Do not pinch the cables between the
EW-50 body and the service cover.
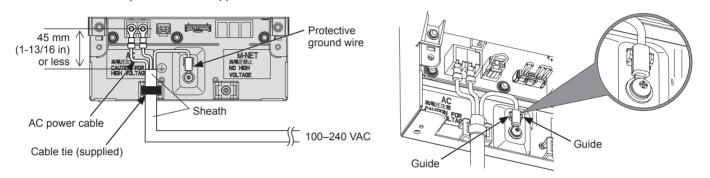
6-2. Connecting AC power cables and M-NET transmission cables

EW-50

Outdoor unit

TB7

Overcurrent breaker

Earth leakage breaker

100–240 VAC

M-NET transmission cables
for centralized control
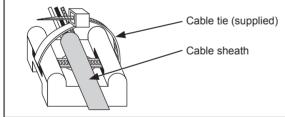
AC power cables

6-2-1. AC power cables and protective ground wire

1. Attach M3.5 sleeved ring terminals to the AC power cables, and attach an M4.0 sleeved ring terminal to the protective ground wire.
2. Connect the AC power cables to the power supply terminal block, and connect the protective ground wire to the ground terminal.
   Note: Thread the protective ground wire through the guides to prevent the wire from moving when it is retightened to the ground terminal.
3. Fix the cables in place with the supplied cable tie.

45 mm (1-13/16 in) or less

Protective ground wire

AC
CAUTION FOR HIGH VOLTAGE

M-NET
NO HIGH VOLTAGE

Sheath

AC power cable

Cable tie (supplied)

100–240 VAC

AC
CAUTION FOR HIGH VOLTAGE
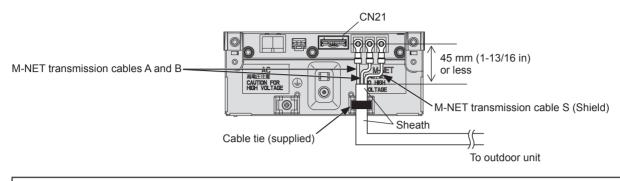
Guide

Guide

Note

- Make the protective ground wire 25 mm (1 in) longer than the AC power cables (L/L1, N/L2).
- Tighten the terminal screws to a torque of 1.0 to 1.3 N•m.
- Properly fix the cable sheaths in place with the supplied cable ties. The distance between the sheath end and the ring terminal must be 45 mm (1-13/16 in) or less.

Cable tie (supplied)

Cable sheath

6-2-2. M-NET transmission cables (Centralized control transmission cables)

1. Attach M3.5 sleeved ring terminals to the M-NET transmission cables (A, B, Shield).
2. Connect the M-NET transmission cables to the M-NET terminal block.
3. Fix the cables in place with the supplied cable tie.
4. When the power is supplied from the unit other than the EW-50, disconnect the M-NET power jumper from CN21. (Refer to section 2-1 "Part names" for the location of CN21.)

CN21

M-NET transmission cables A and B

45 mm (1-13/16 in) or less

M-NET transmission cable S (Shield)

Sheath

Cable tie (supplied)

To outdoor unit

Note

- Provide a single point ground for the shield of the centralized control transmission cable. (Provide the appropriate grounding according to local standards.)
- When leaving the M-NET power jumper connected to CN21 on the AE-200/AE-50/EW-50, the M-NET S (shield) terminal of TB3 is connected to the ground terminal block on the unit, and the ground is supplied via the protective ground wire.
- When disconnecting the M-NET power jumper from CN21 on the AE-200/AE-50/EW-50, provide a ground point at a power supply unit (PAC-SC51KUA).
- Tighten the terminal screws to a torque of 1.0 to 1.3 N•m.
- Properly fix the cable sheaths in place with the supplied cable ties. The distance between the sheath end and the ring terminal must be 45 mm (1-13/16 in) or less.

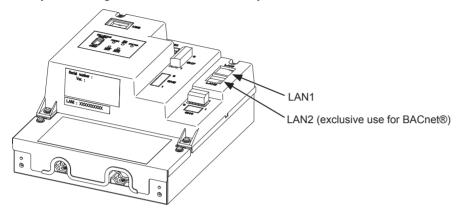
Cable tie (supplied)

Cable sheath

6-3. Connecting the LAN cable

CAUTION

To prevent unauthorized access, always use a security device such as a VPN router when connecting to the Internet.

Connect the LAN cable to the LAN1 port on the EW-50. (The LAN2 port is exclusively used for BACnet® function.)
- The LAN cable is not supplied. Use a category 5 or above straight LAN cable.
- Use a switching HUB compatible with 100 BASE.
- The maximum distance between the switching HUB and AE-200/AE-50/EW-50 is 100 m (328 ft).
- The recommended number of connected devices such as gateway, router, layer 3 switch, or HUB between the AE-200/AE-50/EW-50 is four or less. (Transmission round-trip delay time must not exceed one second. If the transmission delay time is long, a communication error may be detected. Check the transmission delay time, referring to section 6-4.)
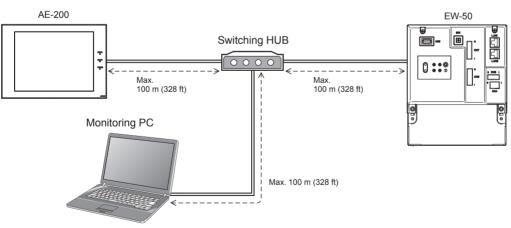

LAN1

LAN2 (exclusive use for BACnet®)

Note

- LAN must be installed before the unit installation. Route the LAN cable to the EW-50 in the same way as the M-NET transmission cables.
- When connecting the EW-50 to an existing LAN, consult the system administrator to decide the IP address.

6-4. Confirming the LAN transmission delay time

Connect a monitoring PC to a device such as HUB that is connected to the AE-200/AE-50/EW-50. Send a command from the PC to the AE-50/EW-50, and receive the response from the AE-50/EW-50. Check the time between sending and receiving on the PC display.
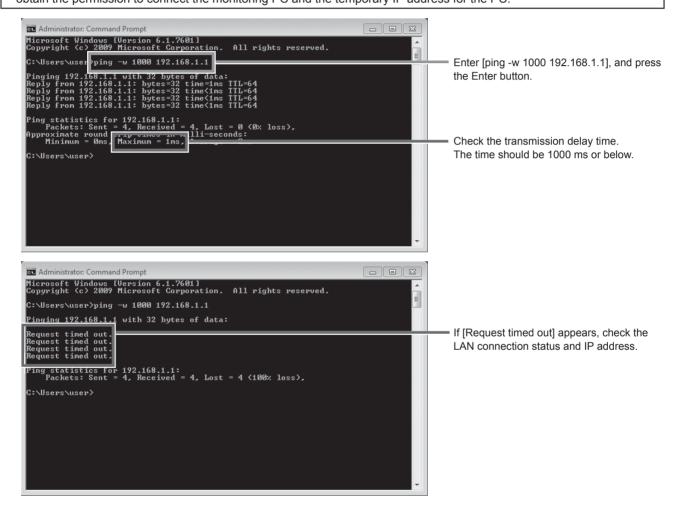
(1) Sample system connection

AE-200

EW-50

Switching HUB

Max. 100 m (328 ft)

Max. 100 m (328 ft)

Monitoring PC

Max. 100 m (328 ft)

(2) Checking the transmission delay time

① Click [Start]>[Program]>[Accessories]>[Command Prompt] on the monitoring PC.

    * The procedure may vary depending on the OS.

② Enter [ping (IP address of AE-200/AE-50/EW-50)], and press the Enter button.
([ping -w 1000 192.168.1.1] is entered on the sample screen below.)

③ Check that the transmission delay time that appears on the screen is 1000 ms or below.
(The transmission delay time is "Maximum = 1 ms" on the sample screen below, which is normal.)
If [Request timed out] appears or the displayed transmission delay time exceeds 1000 ms, consult the network administrator for how to decrease the number of gateway, router, layer 3 switch, or HUB or how to change the network.

Note

● The IP address of the monitoring PC should not overlap any of the addresses that are assigned to the AE-200/AE-50/EW-50. (Refer to the Instruction Book (Initial Settings) for how to set the IP address of the PC.)
● When connecting to an existing LAN system, which does not use a dedicated LAN, consult the network administrator to obtain the permission to connect the monitoring PC and the temporary IP address for the PC.

Enter [ping -w 1000 192.168.1.1], and press the Enter button.

Check the transmission delay time.
The time should be 1000 ms or below.

If [Request timed out] appears, check the LAN connection status and IP address.

7. Initial settings

Initial settings need to be made for each EW-50 on the Web browser.
Details about the initial settings and other settings and operations are covered in the Instruction Book (Initial Settings).

> Note: To monitor and operate the air conditioning units on the web browser (Integrated Centralized Control Web), settings need to be configured on the Initial Setting Tool.

7-1. Logging in to the Web Browser for Initial Settings

(1) Enter the web page address in the address field of the Web browser as follows:
http://[IP address of EW-50]/init/administrator.html
Press the [Enter] key. A login screen will appear.

> Note: If the IP address of the EW-50 is [192.168.1.1], the web page address is [http://192.168.1.1/init/administrator.html].

> Note: The web page will be displayed in the same language as the operating system on the PC.
> The web page can be displayed in other languages by entering the web page address as follows:

Chinese	http://[IP address of EW-50]/init/**zh**/administrator.html
English	http://[IP address of EW-50]/init/**en**/administrator.html
French	http://[IP address of EW-50]/init/**fr**/administrator.html
German	http://[IP address of EW-50]/init/**de**/administrator.html
Italian	http://[IP address of EW-50]/init/**it**/administrator.html
Japanese	http://[IP address of EW-50]/init/**ja**/administrator.html
Portuguese	http://[IP address of EW-50]/init/**pt**/administrator.html
Russian	http://[IP address of EW-50]/init/**ru**/administrator.html
Spanish	http://[IP address of EW-50]/init/**es**/administrator.html

(2) Enter the following default maintenance user name and password in the login screen.

Default user name	Default password
initial	init

7-2. Initial settings on the Web browser

> Note: Initial settings can be configured either using a Web Browser for Initial Settings (Date and time settings, Network settings) via a LAN or using an Initial Setting Tool. Refer to the AE-200/AE-50/EW-50 Instruction Book (Initial Settings) for details.

| Settings*	Details
Date and Time	Current date/time, daylight saving time

Basic System
  [Default network settings]
    IP address: 192.168.1.1
    Subnet mask: 255.255.255.0
    Gateway: 0.0.0.0
	Unit Settings, Network Settings (IP address*, Subnet mask, Gateway), Display format, System Configuration Settings (M-NET Settings, External Input Setting, Time Master/Sub)
	* When connecting the EW-50 to an existing LAN, consult the system administrator to decide the IP address.

Groups	Group name, unit registration
Interlocked LOSSNAY	Interlocked unit registration
Blocks	Block name, group registration
Functions	E-Mail, Measurement, Set Temperature Range Limit, Night Mode Schedule, System-changeover, External Temperature Interlock, Night Setback Control, Energy Management Settings, AHC Port Name Settings
User Settings	Maintenance User, Building Manager
Utility	Back up/import settings data
License registration	License registration for optional functions
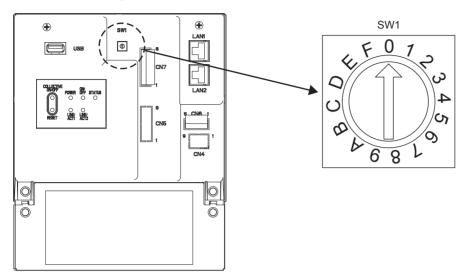
* Setting items vary with the software version of the EW-50.

7-3. Quick IP address (LAN1) setting

When connecting an EW-50 to a dedicated LAN system, IP address (LAN1) of the EW-50 can be easily set to an address between 192.168.1.1 and 192.168.1.15 with rotary switch SW1.

When the IP address cannot be set with rotary switch SW1 (e.g., when connecting an EW-50 to an existing LAN, when the EW-50 is used as an expansion controller of AE-200), set the IP address on the Web browser for Initial Settings.

Set SW1 before turning on the power.

* The arrow on the rotary switch indicates the current setting of the switch. Point the arrow at the desired number.

* To set the address, turn the rotary switch with a precision slotted screwdriver [2.0 mm (2/16 in) (width)] to a torque of less than 19.6 mN•m.

SW1	IP address (LAN1)	Subnet mask	Gateway
0	Default 192.168.1.1	Default 255.255.255.0	Default 0.0.0.0
1	192.168.1.1		
2	192.168.1.2		
3	192.168.1.3		
4	192.168.1.4		
5	192.168.1.5		
6	192.168.1.6		
7	192.168.1.7		
8	192.168.1.8	255.255.255.0	0.0.0.0
9	192.168.1.9		
A	192.168.1.10		
B	192.168.1.11		
C	192.168.1.12		
D	192.168.1.13		
E	192.168.1.14		
F	192.168.1.15		

Note

● If you forget the EW-50 IP address, check the IP address that has been entered on the monitoring PC (Web browser or TG-2000A).

● If you forget the EW-50 IP address, you can start EW-50 by changing the SW1 setting and temporarily using a certain IP address (between 192.168.1.1 and 192.168.1.15). The IP address can be changed to an arbitrary IP address by setting the IP address on the Web Browser for Initial Settings, setting the SW1 back to "0", and rebooting the EW-50. (It is recommended to paste a label with the IP address on the EW-50, so that the IP address is available at all times.)

7-4. Network settings on the Web browser

IP, subnet mask, and gateway addresses can be set on the Web browser. Rotary switch SW1 must be set to "0" (default setting) to make these settings.

When connecting the EW-50 to an existing LAN, consult the system administrator to decide the IP, subnet mask, and gateway addresses.

Refer to the Instruction Book (Initial Settings) for how to make these settings.

8. Test run

8-1. Collective operation ON/OFF

Confirm that the group settings and interlock settings are complete before performing a test run.

It may take approximately five minutes from power on until the local remote controllers become operable.

Refer to the indoor unit Installation Manual for details about a test run.

      Note: Perform a test run in the presence of a customer.

Test run procedure

(1) Turn on the power to the EW-50 and all units.

(2) Make sure that the Power LED on the EW-50 is lit.

(3) Log in to the Integrated Centralized Control Web, and then open the [Monitor/Operation] screen.

(4) On the [Monitor/Operation] screen, click [Select all], click [ON], and then click [OK]. The group of units will start an operation.

(5) On the [Monitor/Operation] screen, check the unit icons to see if the units are in operation.

(6) Check for the proper operation of each unit during the test run (e.g., check to see if cold (or warm) air comes out of the supply air outlet on each indoor unit).

(7) After confirming that all units are operating properly, click [Select all] on the [Monitor/Operation] screen, click [OFF], and then click [OK] to stop the units.

9. External input/output

9-1. External signal input/output function

> ⚠️ **CAUTION**
>
> **To reduce the risk of injury, do not touch the burrs of the knockout holes.**

To use external input/output, a separately-sold external input/output adapter (PAC-YG10HA-E) is required.
When connecting an external input/output adapter (PAC-YG10HA-E), cut out the CN5 knockout hole. (Refer to section 2-1 "Part names" for the location of CN5.)
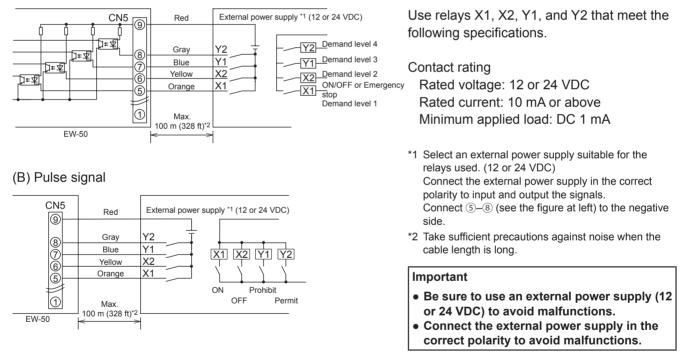
> **Note**
> - Connect the external input/output adapter to each AE-200/AE-50/EW-50. (External input signal to AE-200 cannot perform the collective operations (e.g., emergency stop) for AE-50/EW-50 systems.)
> - Use caution not to damage the circuit board with tools when cutting out the knockout hole.
> - Set the [External Input Setting] setting for each EW-50 on the [Basic System] screen on the Web browser for Initial Settings.

9-1-1. External signal input function

Using external contact signals (12 or 24 VDC), the following collective operations for all connected air conditioning units can be controlled: Demand level, Emergency stop, ON/OFF operation, and Prohibit/Permit local remote controller operation.

(1) Recommended circuit

    (A) Level signal

Use relays X1, X2, Y1, and Y2 that meet the following specifications.

Contact rating
  Rated voltage: 12 or 24 VDC
  Rated current: 10 mA or above
  Minimum applied load: DC 1 mA

*1 Select an external power supply suitable for the relays used. (12 or 24 VDC)
  Connect the external power supply in the correct polarity to input and output the signals.
  Connect ⑤–⑧ (see the figure at left) to the negative side.

    (B) Pulse signal

*2 Take sufficient precautions against noise when the cable length is long.

> **Important**
> - **Be sure to use an external power supply (12 or 24 VDC) to avoid malfunctions.**
> - **Connect the external power supply in the correct polarity to avoid malfunctions.**

> **Note**
> - The relays, DC power supply, and extension cables are not supplied.
> - The total length of the lead wire and extension cable should not exceed 100 m (328 ft). (Use an extension cable of 0.3 mm^2 or thicker.)
> - Cut the excess cable near the connector, and insulate the end of the unused cable with tape.

9-1-2. External signal output function

An ON signal is output when one or more units are in operation, and an Error signal is output when one or more units are in error. (Operation status (On/Error) of the units that are connected to each EW-50 will be output.)

(1) Recommended circuit

Relay-driven circuit

Use relays Z1 and Z2 that meet the following specifications.

Operation coil
    Rated voltage: 12 or 24 VDC
    Power consumption: Max. 0.9 W

*1 Select an external power supply suitable for the relays used. (12 or 24 VDC)
    Connect the external power supply in the correct polarity to input and output the signals.
    Connect ① (shown in the figure at left) to the negative side.
*2 Use a diode at both ends of the relay coils.

Important
● **Be sure to use an external power supply (12 or 24 VDC) to avoid malfunctions.** ● **Connect the external power supply in the correct polarity to avoid malfunctions.** ● **Do not connect the external power supply without relays being connected to the controller (no load).**

Note
● The relays, lamps, DC power supply, diodes, and extension cables are not supplied. ● The total length of the lead wire and extension cable should not exceed 10 m (32 ft). (Use an extension cable of 0.3 mm^2 or thicker.) ● Each element will turn on during operation and when an error occurs.

9-2. Pulse signal input function

Using pulse signals directly input from metering device such as watt-hour meter, billing data and energy management data will be obtained based on the cumulative number of pulse signal input.

> **Note**
> ● To input pulse signals directly from the metering device to the EW-50, use the connector connected to the EW-50. (A precision screwdriver for M1 screws is required.).

Usability of a built-in PI controller for each function

Function	AE-200	AE-50	EW-50
Apportioned electricity billing function (option)	x*1	V*2	V*2
Energy management	V	V	V
Demand function (option)	V	V	V

(V): Usable, (x): Not usable
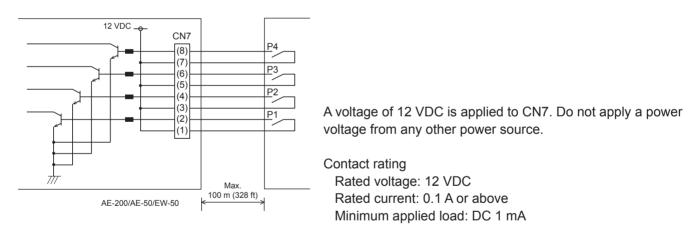
*1 A built-in PI controller on the AE-200 cannot be used for an apportioned electricity billing function. Use a built-in PI controller on the AE-50 or EW-50.

*2 Using a PI controller (PAC-YG60MCA) is recommended instead of a built-in PI controller on the AE-50/EW-50 when using an apportioned electricity billing function. (Discrepancies may occur between the built-in PI controller reading and the actual electric energy because the pulse input cannot be obtained during the AE-50/EW-50 power failure, shutoff process, and software update.)

(1) Pulse signal input specifications

CN7	Signal
No. 7, 8	Metering device 4 (count input)
No. 5, 6	Metering device 3 (count input)
No. 3, 4	Metering device 2 (count input)
No. 1, 2	Metering device 1 (count input)

(2) Recommended circuit

A voltage of 12 VDC is applied to CN7. Do not apply a power voltage from any other power source.

Contact rating
   Rated voltage: 12 VDC
   Rated current: 0.1 A or above
   Minimum applied load: DC 1 mA

> **Note**
> ● The total length of the lead wire and extension cable should not exceed 100 m (328 ft). (Use an extension cable of 0.3 mm^2 or thicker.)
> ● Cut the excess cable near the connector, and insulate the end of the unused cable with tape.
> ● Do not run the signal input cable adjacent to the M-NET transmission and power cables. Do not let the cable form a loop.
> ● Peel off the sheath to 6 ±1 mm (4/16 ±1/16 in) from the end, and securely insert the cable into the terminal.
> ● Leave adequate slack in the cables so that the weight of them will not strain the terminal connectors. Use cable clamps or trunk terminals as necessary.

10. Maintenance

10-1. Inspection and maintenance

Air conditioning units including EW-50 controllers may be damaged after long use, resulting in a performance drop or the units becoming a safety hazard. To use them safely and maximize their lives, it is recommended that a maintenance contract with a dealer or qualified personnel be signed. If the contract is signed, service technicians will periodically inspect the units to identify any damage at an early stage, and take appropriate measures.

<Reference> Maintenance/replacement cycle of components

Component	Maintenance/replacement cycle
Controller (EW-50)	10 years

* "Maintenance/replacement cycle" is not a warranty period.
* "Maintenance/replacement cycle" indicates the estimated cycle period in which each component should be replaced or repaired.
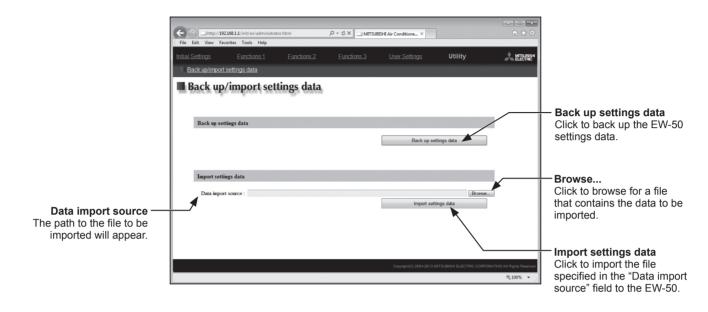
10-2. Back up/import settings data

The settings data that have been made from the Web Browser for Initial Settings can be exported to an HDD as a backup.

The exported data can be imported back to the AE-200/AE-50/EW-50 to restore the previous settings after AE-200/AE-50/EW-50 replacement.

Click [Utility] in the menu bar, and then click [Back up/import settings data] to access the Back up/import settings data screen.
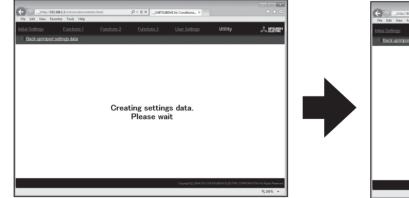
Note: Back up/import settings data function is accessible only if logged in as a maintenance user.

Back up settings data
Click to back up the EW-50 settings data.

Browse...
Click to browse for a file that contains the data to be imported.

Data import source
The path to the file to be imported will appear.

Import settings data
Click to import the file specified in the "Data import source" field to the EW-50.

10-2-1. Backing up settings data

(1) To back up the data, click [Back up settings data]. The settings data will be created and the Window's standard file download dialog will appear.
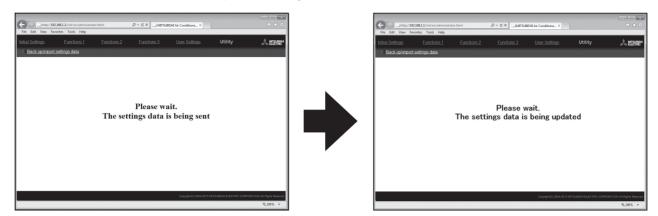
Note: It will take a few minutes to create the settings data.
Note: The name of the settings data will be "SettingData.dat".
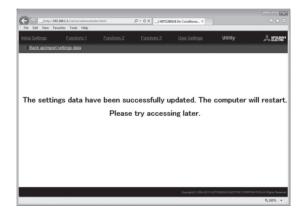
10-2-2. Importing settings data

(1) Click the [Browse...] button to launch the explorer and browse for a file that contains the data to be imported. Select the desired file, and click [Open]. The path to the file to be imported on an HDD will appear in the [Data import source] field.

(2) Click [Import settings data] to import the data from an HDD to the EW-50.
   Note: It will take a few minutes to import the settings data.

(3) When the settings data has been successfully imported, the EW-50 will restart.
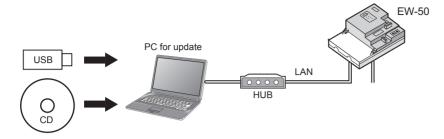
(4) Go back to the login screen and login again.

10-3. Software update

The EW-50 software can be updated by using a Web browser.

10-3-1. Preparation

Follow the instructions below to change the IP address of the PC that is used for software update.

> Note: When the system is connected to the existing LAN, ask the system administrator for permission before changing the IP address settings and updating the software.

(1) Click [Control Panel] in the Start menu, and click [Network and Sharing Center]>[Local Area Setting].
In the [Local Area Connection Status] window, click [Properties].

(2) Click [Internet Protocol Version 4 (TCP/IPv4)] to select it, and click [Properties].

(3) In the [Internet Protocol Version 4 (TCP/IPv4) Properties] window, check the radio button next to [Use the following IP address].
Enter [192.168.1.*] in the [IP address] field. (The number indicated with an asterisk must be different from the IP address of the EW-50 to be updated.)
Leave [255.255.255.0] in the [Subnet mask] field as it is.

Note: If the IP address of the EW-50 is [192.168.1.1], set the same 1st, 2nd, and 3rd numbers and different 4th number, such as [192.168.1.2].
Note: Default IP address of EW-50 is [192.168.1.1].
Note: When performing an update on a PC that is already connected to the existing LAN, [255.255.255.0] may not appear in the [Subnet mask] field. When [255.255.0.0] appears, enter the same 1st and 2nd numbers (192.168) and different 3rd or 4th number of the IP address of the EW-50 in the [IP address] field.

Caution:

Obtain an approval from the client for the following precautions as necessary.

1. The communication between EW-50 and the air conditioning units will stop while the software is being updated. Although the unit in operation may detect a communication error and an error sign may appear on the local remote controllers, the unit will continue its operation and be operable from the local remote controllers.

   * Note that Mr. Slim indoor units or systems with no local remote controllers may detect a communication error and come to an abnormal stop.

2. Record the operation status of the air conditioning units immediately before updating the software. After the software update completes, check the operation status of the units, and manually operate the units as necessary.

3. Some operations and functions, such as scheduled operations, billing function, Peak Cut control, energy management function, will be disabled while the software is being updated. Check the setting details of these functions beforehand, and update the software when it does not affect these functions.

4. If the functions in the table below are used on the TG-2000A, avoid updating the software during the time period indicated in the right column.

TG-2000A function in use	Time period in which the update is prohibited
Electricity charge apportioning function	AM 4:05 – 4:35
Malfunction log backup	AM 0:05 – 0:15
Peak Cut data backup	AM 2:00 – 2:10
Measurement trend data backup	AM 1:05 – 1:15

5. CSV output data (e.g., energy management data) will lose up to 60-minute worth of data.
6. When a built-in PI controller is used, pulse signals cannot be input while the software is being updated.

10-3-2. Update procedures

(1) Make sure that the PC that has been set in section 10-3-1 above and the EW-50 to be updated are connected with a LAN cable.

(2) Turn on the power to the EW-50, and insert a CD or USB memory device in which the update file is stored to the PC.

(3) Enter the web page address in the address field of the Web browser as follows:
https://[IP address of each EW-50]/swupdate/Update.html
Press the [Enter] key.
   Note: If the IP address of the EW-50 is [192.168.1.1], the web page address is [https://192.168.1.1/swupdate/Update.html].

(4) If the security certificate is invalid, a security certificate error page (as shown at right) will appear.
Click [Continue to this website (not recommended)].

(5) Enter the maintenance user name and the password in the login screen, and click [OK]. (Default user name: initial, Default password: init)

(6) A software update screen will appear.

(7) Click the [Browse...] button and select the update file (AExx_ FW####_****.dat) stored in the CD or USB memory device, and click [Start Update].
   Note: The software cannot be downgraded to an earlier version.

(8) A software update process starts.
   Note: It takes about ten minutes to complete the update.
   Note: Do not disconnect the LAN cable or turn off the power to the EW-50 while the software is being updated.

(9) The EW-50 will reboot after the update is complete.
Check that the version that will appear on the screen is the same as the version of the update file. Also check that the version displayed on the Web browser (the Registration of Optional Functions screen, via the Web Browser for Initial Settings) is also the same.

Note: When #### in the update file name (AExx_FW####_****.dat) is 0720 and **** is 0103, "7.20" and "(1.03)" should appear on the screen at right.

> If the software update did not properly complete, update the software again. If the problem persists, the EW-50 may be damaged. Consult your dealer.

10-4. Software information

Detailed information about the open source software of the AE-200/AE-50/EW-50 can be checked by accessing the following address:

https://[IP address of each AE-200, AE-50, or EW-50]/license/

   * Accessible only if logged in as a maintenance user.

SD and SDHC Logos are trademarks of SD-3C, LLC.

Java is a registered trademark of Oracle and/or its affiliates.

BACnet® is a registered trademark of ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers, INC.).

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.
However, there is no guarantee that interference will not occur in a particular installation.
If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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

The product at hand is based on the following EU regulations:
- Low Voltage Directive 2006/95/EC
- Electromagnetic Compatibility Directive 2004/108/EC
- Restriction of Hazardous Substances 2011/65/EU

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

MITSUBISHI ELECTRIC CORPORATION
HEAD OFFICE: TOKYO BLDG., 2-7-3, MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN

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