SANYO

TEST RUN SERVICE MANUAL

ECO i DC Inverter MINI

R410A

MINI ECO-i SYSTEM

OUTDOOR MODEL No.	PRODUCT CODE No.	APPLICABLE INDOOR MODEL No.		V/ø/Hz
SPW-CR365GXH56B	85402843	SPW-ADR, SR, XDR, KR, UR, FR, FMR	74GXH56(A/B)	
SPW-CR485GXH56B	85402844	SPW-ADR, LDR, SR, XDR, KR, UR, FR, FMR	94GXH56(A/B)	
SPW-CR605GXH56B	85402845	SPW-ADR, LDR, SR, XDR, KR, TDR, UR, FR, FMR	124GXH56(A/B)	OUTDOOR
SPW-CR365GX56B	85402846	SPW-LDR, SR, XDR, KR, TDR, UR, FR, FMR	164GXH56(A/B)	220-240/1ø/50/60
SPW-CR485GX56B	85402847	SPW-LDR, SR, XDR, KR, TDR, UR, FR, FMR	184GXH56(A/B)	380-415/3ø/50/60
SPW-CR605GX56B	85402848	SPW-LDR, SR, XDR, KR, TDR, UR, DR, FR, FMR	254GXH56(A/B)	
SPW-CR365GXH8B	85403136	SPW-XDR, TDR, UR, DR	364GXH56(A/B)	INDOOR
SPW-CR485GXH8B	85403137	SPW-XDR, TDR, UR, DR	484GXH56(A/B)	220-240/1ø/50/60
SPW-CR605GXH8B	85403138	SPW-XDR	604GXH56(A/B)	
		SPW-DR	764GXH56(A/B)	
		SPW-DR	964GXH56(A/B)	

85464849254000

REFERENCE NO. SM830154

W

IMPORTANT!
Please Read Before Starting

This air conditioning system meets strict safety and operating standards. As the installer or service person, it is an important part of your job to install or service the system so it operates safely and efficiently.

For safe installation and trouble-free operation, you must:

- Carefully read this instruction booklet before beginning.
- Follow each installation or repair step exactly as shown.
- Observe all local, state, and national electrical codes.
- This product is intended for professional use.
  Permission from the power supplier is required when installing an outdoor unit that is connected to a 16 A distribution network.
- Pay close attention to all warning and caution notices given in this manual.

WARNING This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.

CAUTION This symbol refers to a hazard or unsafe practice which can result in personal injury or product or property damage.

If Necessary, Get Help

These instructions are all you need for most installation sites and maintenance conditions. If you require help for a special problem, contact our sales/service outlet or your certified dealer for additional instructions.

In Case of Improper Installation

The manufacturer shall in no way be responsible for improper installation or maintenance service, including failure to follow the instructions in this document.

SPECIAL PRECAUTIONS

WARNING When Wiring

ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. ONLY A QUALIFIED, EXPERIENCED ELECTRICIAN SHOULD ATTEMPT TO WIRE THIS SYSTEM.

- Do not supply power to the unit until all wiring and tubing are completed or reconnected and checked.
- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause **accidental injury or death.**
- **Ground the unit** following local electrical codes.
- Connect all wiring tightly. Loose wiring may cause overheating at connection points and a possible fire hazard.

When Transporting

Be careful when picking up and moving the indoor and outdoor units. Get a partner to help, and bend your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut your fingers.

When Installing…

…In a Room

Properly insulate any tubing run inside a room to prevent "sweating" that can cause dripping and water damage to walls and floors.

…In Moist or Uneven Locations

Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the outdoor unit. This prevents water damage and abnormal vibration.

…In an Area with High Winds

Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.

…In a Snowy Area (for Heat Pump-type Systems)

Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.

When Connecting Refrigerant Tubing

- Ventilate the room well, in the event that is refrigerant gas leaks during the installation. Be careful not to allow contact of the refrigerant gas with a flame as this will cause the generation of poisonous gas.
- Keep all tubing runs as short as possible.
- Use the flare method for connecting tubing.
- Apply refrigerant lubricant to the matching surfaces of the flare and union tubes before connecting them, then tighten the nut with a torque wrench for a leak-free connection.
- Check carefully for leaks before starting the test run.

When Servicing

- Turn the power OFF at the main power box (mains) before opening the unit to check or repair electrical parts and wiring.
- Keep your fingers and clothing away from any moving parts.
- Clean up the site after you finish, remembering to check that no metal scraps or bits of wiring have been left inside the unit being serviced.

CAUTION

- Ventilate any enclosed areas when installing or testing the refrigeration system. Escaped refrigerant gas, on contact with fire or heat, can produce dangerously toxic gas.
- Confirm after installation that no refrigerant gas is leaking. If the gas comes in contact with a burning stove, gas water heater, electric room heater or other heat source, it can cause the generation of poisonous gas.

Check of Density Limit

The room in which the air conditioner is to be installed requires a design that in the event of refrigerant gas leaking out, its density will not exceed a set limit.

The refrigerant (R410A), which is used in the air conditioner, is safe, without the toxicity or combustibility of ammonia, and is not restricted by laws imposed to protect the ozone layer. However, since it contains more than air, it poses the risk of suffocation if its density should rise excessively. Suffocation from leakage of refrigerant is almost non-existent. With the recent increase in the number of high density buildings, however, the installation of multi air conditioner systems is on the increase because of the need for effective use of floor space, individual control, energy conservation by curtailing heat and carrying power, etc.

Most importantly, the multi air conditioner system is able to replenish a large amount of refrigerant compared to conventional individual air conditioners. If a single unit of the multi air conditioner system is to be installed in a small room, select a suitable model and installation procedure so that if the refrigerant accidentally leaks out, its density does not reach the limit (and in the event of an emergency, measures can be made before injury can occur).

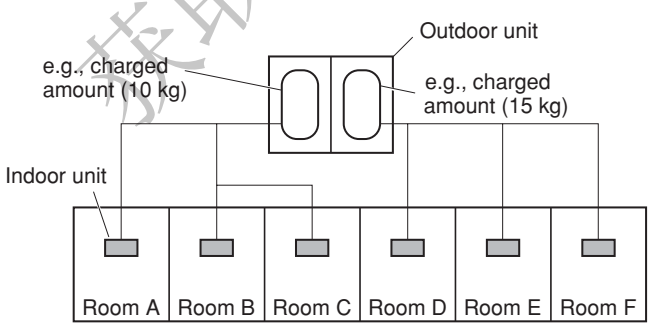
In a room where the density may exceed the limit, create an opening with adjacent rooms, or install mechanical ventilation combined with a gas leak detection device. The density is as given below.

$$\frac{\text{Total amount of refrigerant (kg)}}{\text{Min. volume of the indoor unit installed room (m}^3\text{)}} \leq \text{Density limit (kg/m}^3\text{)}$$

The density limit of refrigerant which is used in multi air conditioners is 0.3 kg/m^3 (ISO 5149).

NOTE

1. If there are 2 or more refrigerating systems in a single refrigerating device, the amount of refrigerant should be as charged in each independent device.



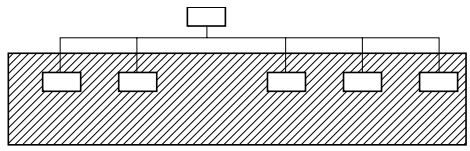
For the amount of charge in this example:

The possible amount of leaked refrigerant gas in rooms A, B and C is 10 kg.

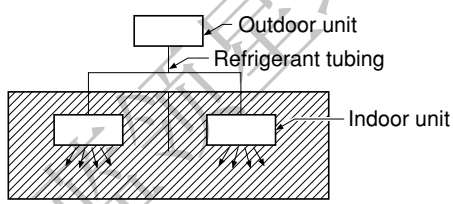
The possible amount of leaked refrigerant gas in rooms D, E and F is 15 kg.

2. The standards for minimum room volume are as follows.

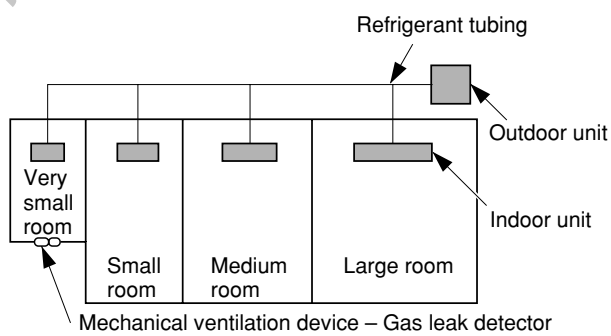
(1) No partition (shaded portion)



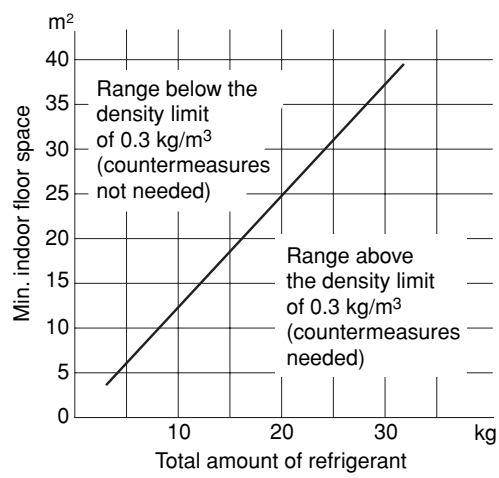
(2) When there is an effective opening with the adjacent room for ventilation of leaking refrigerant gas (opening without a door, or an opening 0.15% or larger than the respective floor spaces at the top or bottom of the door).



(3) If an indoor unit is installed in each partitioned room and the refrigerant tubing is interconnected, the smallest room of course becomes the object. But when mechanical ventilation is installed interlocked with a gas leakage detector in the smallest room where the density limit is exceeded, the volume of the next smallest room becomes the object.



3. The minimum indoor floor space compared with the amount of refrigerant is roughly as follows: (When the ceiling is 2.7 m high)



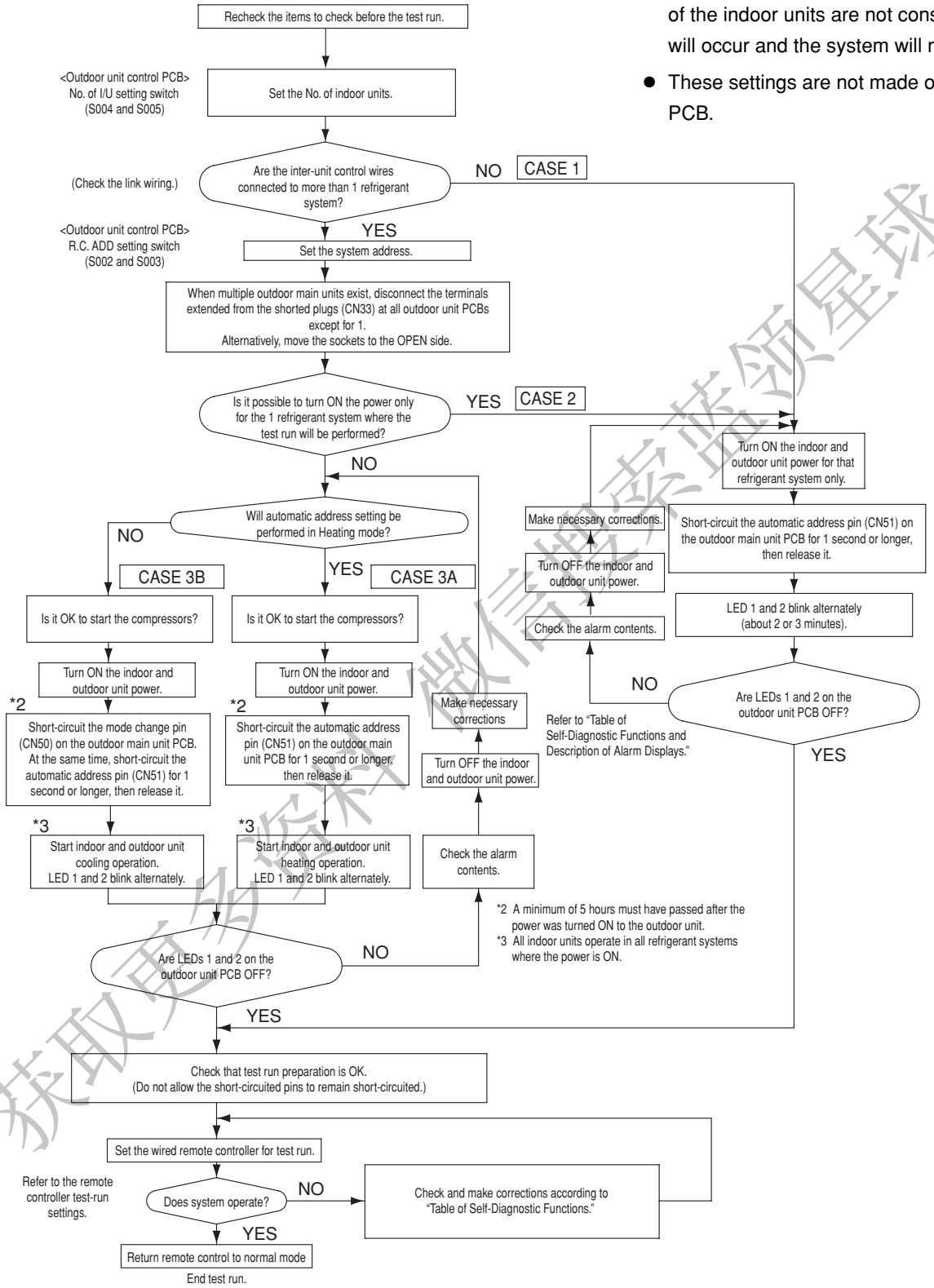
CONTENTS

1. Address Settings (Outdoor Units)

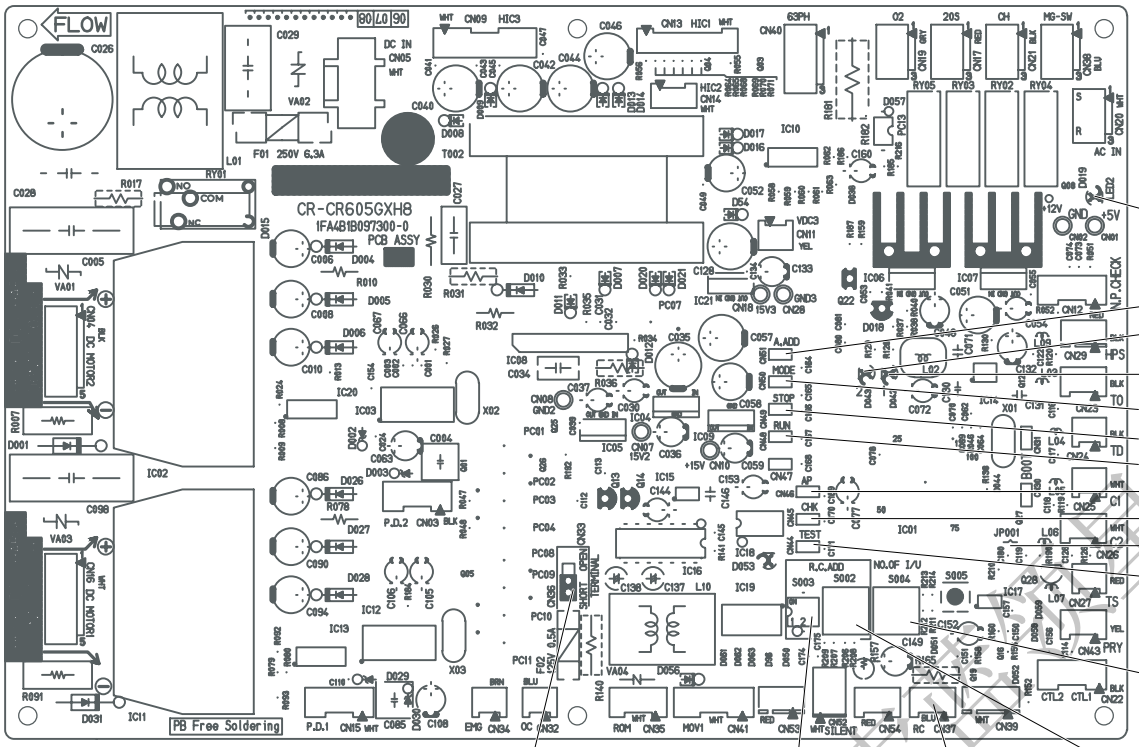
1

Test Run Procedure

- Use caution when making the settings. If there are duplicated system addresses setting at R.C. ADD switch, or if the settings for the Nos. of the indoor units are not consistent, an alarm will occur and the system will not start.
- These settings are not made on the indoor unit PCB.



2. Settings of Indoor Unit Control PCB



● **Examples of the No. of indoor units settings**

No. of indoor units	NO. OF I/U (S004) (Rotary switch, red)
1 unit (factory setting)	Set to 1
2 units	Set to 2
3 units	Set to 3
)	)
9 units	Set to 9

● **Examples of system address settings (required when link wiring is used)**

System address No.	R.C. ADD (S003) (2P DIP switch, blue) 10 20	R.C. ADD (S002) (Rotary switch, black)
System 1 (factory setting)	Both OFF	Set to 1
System 11	1 ON	Set to 1
System 21	2 ON	Set to 1
System 30	1 & 2 ON	Set to 0

<General Explanation of the Switches on the Outdoor Unit Control PCB>

MODE (2P, white) (CN50)
Changes the operating mode (heating/cooling). (Can be used only at the main unit.) During normal operation: Short-circuiting these pins once will change all indoor units in that system to either cooling mode or heating mode. During automatic address setting: When the pins are not connected, the mode is heating mode.

A. ADD (2P, white) (CN51)
Short-circuited for 1 s or longer → Automatic address setting begins when the pins are released. Short-circuiting these pins for 1 s or longer while automatic address setting is in progress interrupts automatic address setting.

CHK (2P, white) (CN45)
When these pins are short-circuited, the mode is test run mode. (Test run mode is automatically canceled after 1 hour.) When the pins are released, test run mode is canceled.

RC (3P, blue) (CN37)
The outdoor unit maintenance remote controller can be connected here to check the alarm details.

RUN (2P, white) (CN48)
Short-circuit these pins and apply a pulse signal to start all indoor units in that system.

STOP (2P, white) (CN49)
Short-circuit these pins and apply a pulse signal to stop all indoor units in that system. (If the pins are left short-circuited, it will not be possible to start operation from the indoor unit remote controllers.)

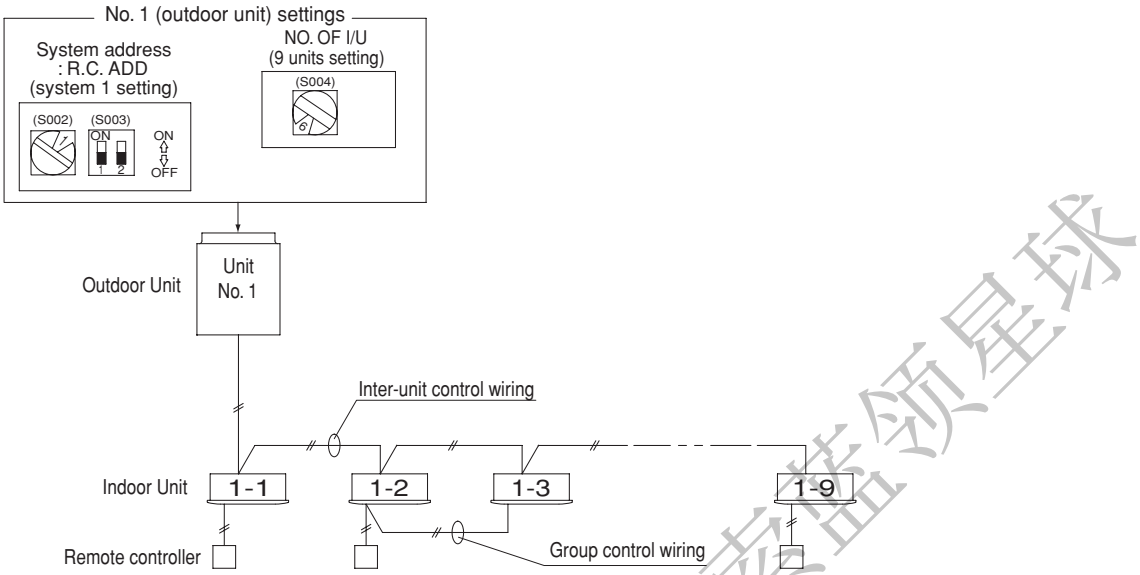
AP (2P, white) (CN46)
These pins are used when applying vacuum to the outdoor unit.

3. Auto Address Setting

Auto Address Setting

Basic wiring diagram: Example (1)

• If link wiring is not used
(The inter-unit control wires are not connected to multiple refrigerant systems.)
Indoor unit addresses can be set without operating the compressors.



Case 1 **Automatic Address Setting from the Outdoor Unit**

1. On the outdoor unit control PCB, check that the system address rotary switch (S002) is set to "1" and that the DIP switch (S003) is set to 

"0." (These are the settings at the time of factory shipment.)

2. To set the number of indoor units that are connected to the outdoor unit to 9, on the outdoor unit control PCB set the No. of indoor units rotary switch (S004) to "9."
3. Turn ON the power to the indoor and outdoor units.
4. On the outdoor main unit control PCB, short-circuit the automatic address pin (CN51) for 1 second or longer, then release it.
   ↓
   (Communication for automatic address setting begins.)
   ↓
   * To cancel, again short-circuit the automatic address pin (CN51) for 1 second or longer, then release it. The LED that indicates automatic address setting is in progress turns OFF and the process is stopped. Be sure to perform automatic address setting again.

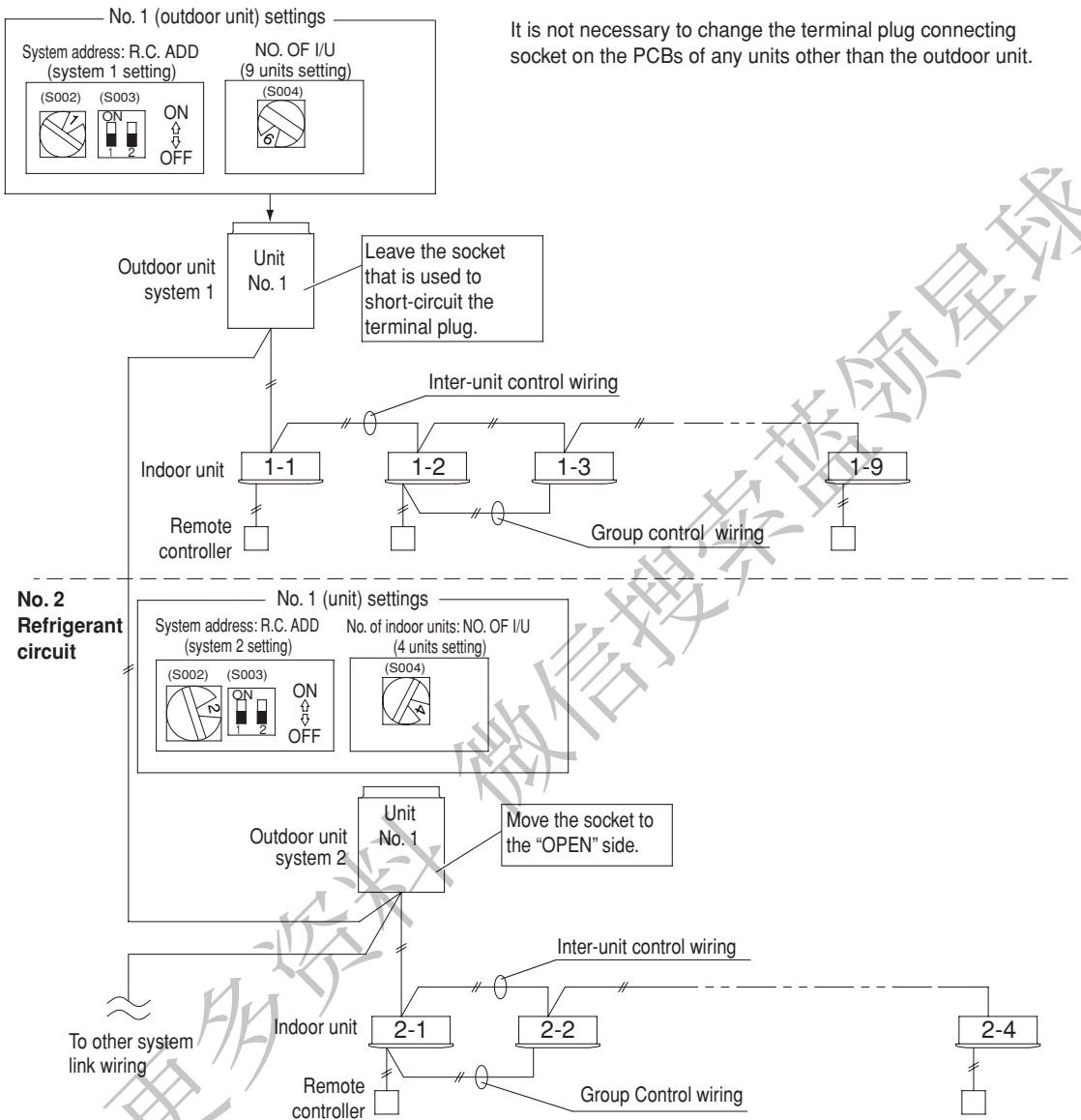
   (Automatic address setting is completed when LEDs 1 and 2 on the outdoor unit control PCB turn OFF.)
   ↓
5. Operation from the remote controllers is now possible.
   * To perform automatic address setting from the remote controller, perform steps 1 to 3, then use the remote controller and complete automatic address setting. For the necessary procedure, refer to "Automatic Address Setting from the Remote Controller."

Basic wiring diagram: Example (2)

• **If link wiring is used**

* When multiple outdoor main units exist, remove the socket that is used to short-circuit the terminal plug (CN33) from all outdoor unit PCBs except for one unit.
Alternatively, move the sockets to the "OPEN" side.

It is not necessary to change the terminal plug connecting socket on the PCBs of any units other than the outdoor unit.



Make settings as appropriate for the cases listed below.
(Refer to the instructions on the following pages.)

• **Indoor and outdoor unit power can be turned ON for each system separately.** → Case 2

• **Indoor and outdoor unit power cannot be turned ON for each system separately.**

Automatic address setting in Heating mode → Case 3A

Automatic address setting in Cooling mode → Case 3B

3. Auto Address Setting

Case 2

● Indoor and outdoor unit power can be turned ON for each system separately.

Indoor unit addresses can be set without operating the compressors.

Automatic Address Setting from Outdoor Unit

1. On the outdoor unit control PCB, check that the system address rotary switch (S002) is set to “1” and that the DIP switch (S003) is set to “0” 

. (These are the settings at the time of factory shipment.)
2. To set the number of indoor units that are connected to the outdoor unit to 9, on the outdoor unit control PCB set the No. of indoor units rotary switch (S004) to “9.”
3. Turn on power to all indoor and outdoor units in the system.
4. Short-circuit the automatic address pin at the outdoor unit (CN51) for 1 second or longer, then release it.

   ↓

   (Communication for automatic address setting begins.)

   ↓

   * To cancel, again short-circuit the automatic address pin (CN51) for 1 second or longer, then release it. The LED that indicates automatic address setting is in progress turns OFF and the process is stopped. Be sure to perform automatic address setting again.

   (Automatic address setting is completed when LEDs 1 and 2 on the outdoor unit control PCB turn OFF.)

   ↓
5. Next turn the power ON only for the indoor and outdoor units of the next (different) system. Repeat steps 1 – 2 in the same way to complete automatic address settings for all systems.

   ↓
6. Operation from the remote controllers is now possible.

   * To perform automatic address setting from the remote controller, perform steps 1 – 2, then use the remote controller and complete automatic address setting. For the necessary procedure, refer to “Automatic Address Setting from Remote Controller.”

Case 3A **Automatic Address Setting in Heating Mode**

- Indoor and outdoor unit power cannot be turned ON for each system separately.
  In the following, automatic setting of indoor unit addresses is not possible if the compressors are not operating.
  Therefore perform this process only after completing all refrigerant tubing work.

Automatic Address Setting from Outdoor Unit

1. Perform steps 1 – 2 in the same way as for Case 2.
3. Turn the indoor and outdoor unit power ON at all systems.

   ↓
4. To perform automatic address setting in Heating mode, on the outdoor unit control PCB in the refrigerant system where you wish to set the addresses, short-circuit the automatic address pin (CN51) for 1 second or longer, then release it.
   (Be sure to perform this process for one system at a time. Automatic address settings cannot be performed for more than one system at the same time.)

   ↓

   (Communication for automatic address setting begins, **the compressors turn ON, and automatic address setting in Heating mode begins.**)
   (All indoor units operate.)

   ↓

   * To cancel, again short-circuit the automatic address pin (CN51) for 1 second or longer, then release it. The LED that indicates automatic address setting is in progress turns OFF and the process is stopped. Be sure to perform automatic address setting again.

   (Automatic address setting is completed when the compressors stop and LEDs 1 and 2 on the unit control PCB turn OFF.)
5. At the outdoor unit in the next (different) system, short-circuit the automatic address pin (CN51) for 1 second or longer, then release it.

   ↓

   (Repeat the same steps to complete automatic address setting for all units.)

   ↓
6. Operation from the remote controllers is now possible.

   * To perform automatic address setting from the remote controller, perform steps 1 – 3, then use the remote controller and complete automatic address setting. For the necessary procedure, refer to “Automatic Address Setting from Remote Controller.”

3. Auto Address Setting

Case 3B Automatic Address Setting in Cooling Mode

- Indoor and outdoor unit power cannot be turned ON for each system separately.
  In the following, automatic setting of indoor unit addresses is not possible if the compressors are not operating.
  Therefore perform this process only after completing all refrigerant tubing work.
  Automatic address setting can be performed during Cooling operation.

Automatic Address Setting from Outdoor Unit

1. Perform steps 1 – 2 in the same way as for Case 2.
3. Turn the indoor and outdoor unit power ON at all systems.

   ↓
4. To perform automatic address setting in Cooling mode, on the outdoor unit control PCB in the refrigerant system where you wish to set the addresses, short-circuit the mode change 2P pin (CN50). At the same time, short-circuit the automatic address pin (CN51) for 1 second or longer, then release it. (Be sure to perform this process for one system at a time. Automatic address settings cannot be performed for more than one system at the same time.)

   ↓

   (Communication for automatic address setting begins, **the compressors turn ON, and automatic address setting in Cooling mode begins.**)
   (All indoor units operate.)

   ↓

   * To cancel, again short-circuit the automatic address pin (CN51) for 1 second or longer, then release it. The LED that indicates automatic address setting is in progress turns OFF and the process is stopped. Be sure to perform automatic address setting again.

   (Automatic address setting is completed when the compressors stop and LEDs 1 and 2 on the outdoor unit control PCB turn OFF.)
5. At the outdoor main unit in the next (different) system, short-circuit the automatic address pin (CN51) for 1 second or longer, then release it.

   ↓

   (Repeat the same steps to complete automatic address setting for all units.)

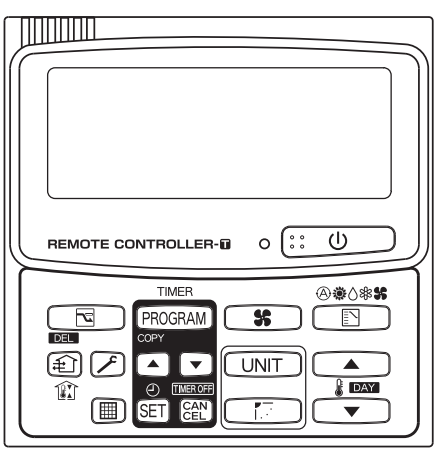
   ↓
6. Operation from the remote controllers is now possible.

* Automatic address setting in Cooling mode cannot be done from the remote controller.

Automatic Address Setting* from the Wired Remote Controller

Selecting each refrigerant system individually for automatic address setting

---Automatic address setting for each system: Item code “A1”



1. Press the remote controller timer time ▲ button and 🔧 button at the same time. (Press and hold for 4 seconds or longer.)
2. Next, press either the temperature setting ▲ or ▼ button.
   (Check that the item code is “A1.”)
3. Use either the UNIT or ⬚ button to set the system No. to perform automatic address setting.
4. Then press the SET button.

   (Automatic address setting for one refrigerant system begins.)
   (When automatic address setting for one system is completed, the system returns to normal stopped status.) <Approximately 4 – 5 minutes is required.>
   (During automatic address setting, “SETTING” is displayed on the remote controller. This message disappears when automatic address setting is completed.)
5. Repeat the same steps to perform automatic address setting for each successive system.

Display during automatic address setting

● On outdoor main unit PCB

LED 2 1

Blink alternately

* Do not short-circuit the automatic address setting pin (CN51) again while automatic address setting is in progress. Doing so will cancel the setting operation and will cause LEDs 1 and 2 to turn OFF. (LED 1 is D042. LED 2 is D043.)

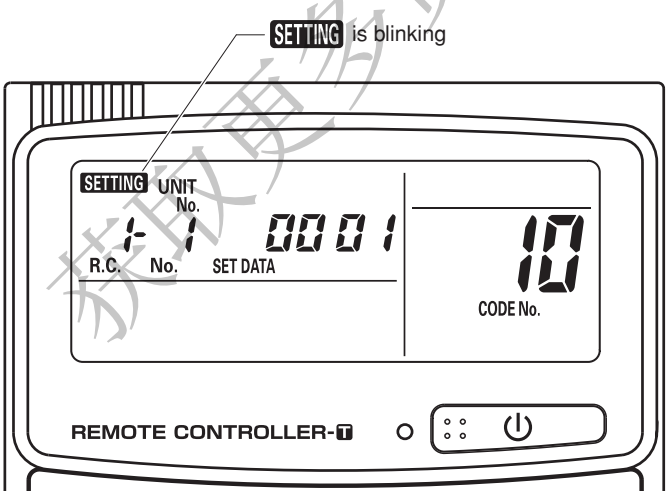
* When automatic address setting has been successfully completed, both LEDs 1 and 2 turn OFF. If automatic address setting is not completed successfully, refer to the table below and correct the problem. Then perform automatic address setting again.

● Display details of LEDs 1 and 2 on the outdoor unit control PCB

(☼: ON ✷: Blinking ●: OFF)

LED 1	LED 2	Display meaning
☼	☼	After the power is turned ON (and automatic address setting is not in progress), no communication with the indoor units in that system is possible.
●	☼	After the power is turned ON (and automatic address setting is not in progress), 1 or more indoor units are confirmed in that system; however, the number of indoor units does not match the number that was set.
✷ Alternating	✷ Alternating	Automatic address setting is in progress.
●	●	Automatic address setting completed.
✷ Simultaneous	✷ Simultaneous	The number of indoor units did not match the number that was set.
✷ Alternating	✷ Alternating	Refer to “Table of Self-Diagnostic Functions and Description of Alarm Displays.” Alarm display LED 1 blinks M times, then LED 2 blinks N times. The cycle then repeats. M = 2: P alarm 3: H alarm 4: E alarm 5: F alarm 6: L alarm N = Alarm No. Example: LED 1 blinks 2 times, then LED 2 blinks 17 times. The cycle then repeats. Alarm is “P05.”

● Remote controller display



Request concerning recording the indoor/outdoor unit combination Nos. after automatic address setting has been completed, be sure to record them for future reference.

Indicate the indoor/outdoor unit combination Nos. in a location which is easily visible on the indoor unit.

Example: (Outdoor) 1 – (Indoor) 1-1, 1-2, 1-3… (Outdoor) 2 – (Indoor) 2-1, 2-2, 2-3…

These numbers are necessary for later maintenance. Please be sure to indicate them.

3. Auto Address Setting

Checking the indoor unit addresses

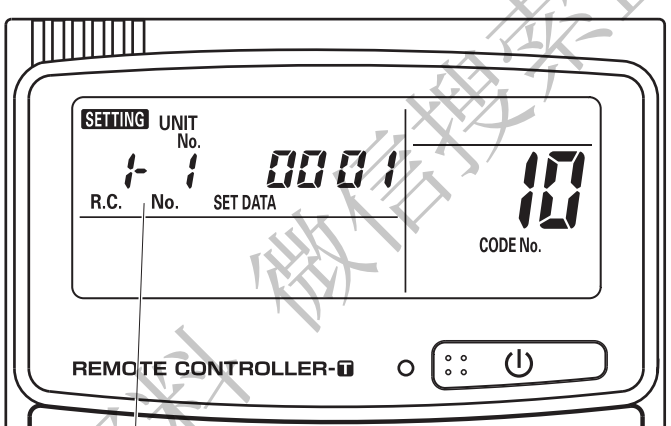
Use the remote controller to check the indoor unit address.

<If 1 indoor unit is connected to 1 remote controller>

1. Press and hold the button and button for 4 seconds or longer.
2. The address is displayed for the indoor unit that is connected to the remote controller.
   (Only the address of the indoor unit that is connected to the remote controller can be checked.)
3. Press the button again to return to normal remote controller mode.

<If multiple indoor units are connected to 1 remote controller (group control)>

1. Press and hold the button and button for 4 seconds or longer.
2. “ALL” is displayed on the remote controller.
3. Next, press the UNIT button.
4. The address is displayed for 1 of the indoor units which is connected to the remote controller. Check that the fan of that indoor unit starts and that air is blown out.
5. Press the UNIT button again and check the address of each indoor unit in sequence.
6. Press the button again to return to normal remote controller mode.



Number changes to indicate which indoor unit is currently selected.

2. REMOTE CONTROLLER FUNCTIONS

1. Remote Controller Test Run Settings

Wired Remote Controller Test Run Settings

1. Press the remote controller button for 4 seconds or longer.
2. “TEST” appears on the LCD display while the test run is in progress.
3. Then press the button.

- The temperature cannot be adjusted when in Test Run mode.
  (This mode places a heavy load on the machines. Therefore use it only when performing the test run.)
- The test run can be performed using the HEAT, COOL, or FAN operation modes.
  Note: The outdoor units will not operate for approximately 3 minutes after the power is turned ON and after operation is stopped.
- If correct operation is not possible, a error code is displayed on the remote controller LCD display.
  (Refer to “Table of Self-Diagnostic Functions” and correct the problem.)

4. After the test run is completed, press the button again. Check that “TEST” disappears from the LCD display.

- To prevent continuous test runs, this remote controller includes a timer function that cancels the test run after 60 minutes.
- The operation is possible even if the cassette-type ceiling panel has not been installed. (“P09” display does not occur.)

All settings except for the central control address were completed at the time of shipment. The following procedures are necessary only when the functions are changed.
The functions cannot be changed in the case of a wireless remote controller or a system with no remote controller.
Change the functions using the wired remote controller (RCS-TM80BG).

<Function>

This allows the filter lifetime, operating mode priority change, central control address, and other settings to be made for an individual or group-control indoor unit to which the remote controller used for simple settings is connected.

CAUTION

These settings are for items that are extremely important for system operation. Serious trouble may occur if they are set incorrectly. Please use sufficient caution when changing the settings. Some item codes which do not appear in the list are also displayed. These item codes were set at the time of shipment from the factory to the optimal settings for that model; do not change them. Do not change any settings data which does not appear in this list.

<Procedure>

(Perform these steps with the unit stopped.)

① Press and hold the (TEST/CHK) and (VENTILATION) buttons simultaneously for 4 seconds or longer. Check that the SETTING (SETTING) display on the remote controller begins to blink.

② If group control is in effect, press the UNIT (UNIT SELECT) button and select the address (unit No.) of the indoor unit to set. At this time, the indoor unit fan begins operating.

* If unit No. "ALL" is displayed, the same setting will be made for all indoor units.

③ Press the temperature setting / buttons to select the item code to change.

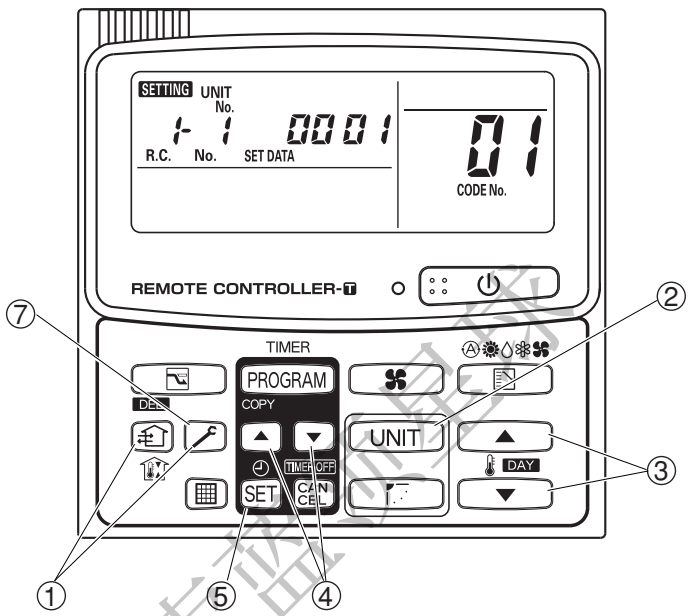


Fig. 1

④ Press the timer time / buttons to select the desired setting data.

* For item codes and setting data, refer to the following page.

⑤ Press the SET (SET) button. The SETTING (SETTING) display stops blinking and remains lit, and setting is completed. (If the SET (SET) button is not pressed, the settings data will not be changed.)

⑥ Repeat steps (2) – (5) and change the settings.

<Restoring normal mode>

⑦ Press the (TEST/CHK) button. Check that the remote controller display disappears.

List of Simple Setting Items

Item code	Item	Setting data		
		No.	Description	
01	Filter sign ON time (filter lifetime)	0000	Not displayed (The optimal setting for that model was set at the time of shipment.)	
		0001	150 hours	
		0002	2,500 hours	
		0003	5,000 hours	
		0004	10,000 hours	
		0005	Use the filter clogging sensor.	
03	Central control address	0001	Central control address 1	
		0002	Central control address 2	
		0003	Central control address 3	
		≀	≀	
		0064	Central control address 64	
		0099	No central control address set (setting at time of shipment)	
05	Fan speed when heating thermostat is OFF		Compressor ON	Compressor OFF
		0000	MED 1 min., LO 3 min.	LO
		0001	MED	LO
		0002	LO	LO
		0004	MED 1 min., LO 3 min.	MED
		0005	MED	MED
		0006	LO	MED
06	Heating intake temperature shift	0000	No shift	
		0001	Shifts intake temperature 1°C down.	
		0002	Shifts intake temperature 2°C down.	
		0003	Shifts intake temperature 3°C down.	
		0004	Shifts intake temperature 4°C down.	
		0005	Shifts intake temperature 5°C down.	
		0006	Shifts intake temperature 6°C down.	
0F	Cooling-only	0000	Normal (Setting at time of shipment)	
		0001	Cooling only	

NOTE

- In order to avoid water leakage and damage to the fan, do not set for humidifying when the thermostat is OFF unless a vaporizing humidifier is used.
- Consider the device purpose and type when changing the settings. Incorrect settings may result in malfunction.
- Do not change any setting data that does not appear in this list.

All settings except for the system address, indoor unit address, and group address were set at the time of shipment. The following procedures are necessary only when the functions are changed.
The functions cannot be changed in the case of a wireless remote controller or a system with no remote controller.
Change the functions using the wired remote controller (RCS-TM80BG).

<Function>
Sets items which are highly important for system operation, such as the system address, indoor unit address, and group address, at the individual or group-control indoor unit(s) where the remote controller that is used for making detailed settings is connected.

CAUTION

These settings are for items that are extremely important for system operation. Serious trouble may occur if they are set incorrectly. Please use sufficient caution when changing the settings. Some item codes which do not appear in the list are also displayed. These item codes were set at the time of shipment from the factory to the optimal settings for that model; do not change them. Do not change any settings data which does not appear in this list.

<Procedure>
(Perform these steps with the unit stopped.)

① Press and hold the [TEST/CHK] (TEST/CHK) button, the [SET] (SET) button and [CANCEL] (CANCEL) button simultaneously for 4 seconds or longer. Check that the SETTING (SETTING) display on the remote controller begins to blink.

② If group control is in effect, press the [UNIT] (UNIT SELECT) button and select the address (unit No.) of the indoor unit to set. At this time, the indoor unit fan begins operating.

③ Press the temperature setting [▲] / [▼] buttons to select the item code to change.

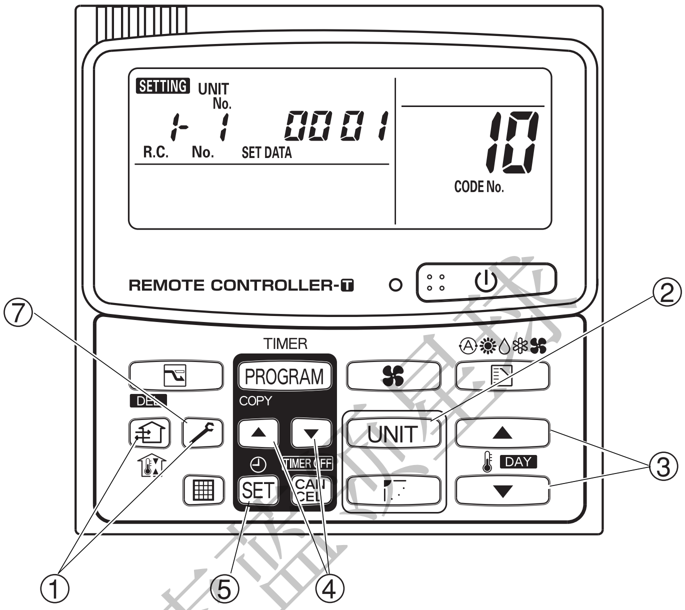


Fig. 2

④ Press the timer time [▲] / [▼] buttons to select the desired setting data.

* For item codes and setting data, refer to the following page.

⑤ Press the [SET] (SET) button. The SETTING (SETTING) display stops blinking and remains lit, and setting is completed. (If the [SET] (SET) button is not pressed, the settings data will not be changed.)

⑥ Repeat steps (2) – (5) and change the settings.

<Restoring normal mode>

⑦ Press the [TEST/CHK] (TEST/CHK) button. Check that the remote controller display disappears.

List of Detailed Setting Items

Item code	Item	Setting data					
		No.	Description	No.	Description	No.	Description
10	Type	0000	1-Way Air Discharge Semi-Concealed	0001	4-Way Air Discharge Semi-Concealed	0002	2-Way Air Discharge Semi-Concealed
		0003	1-Way Air Discharge Semi-Concealed Slim	0005	Concealed-Duct	0006	Concealed-Duct High Static Pressure
		0007	Ceiling-Mounted	0008	Wall-mounted	0010	Perimeter floor mounted
		0011	Perimeter embedded	0013	Floor mounted	0034	Floor-mounted plenum (8,10 hp)
11	Indoor unit capacity	0000	disabled	0001	22	0002	25
		0003	28	0004	32	0005	36
		0006	40	0007	45	0008	50
		0009	56	0010	63	0011	71
		0012	80	0013	90	0014	100
		0015	112	0016	125	0017	140
		0018	160	0020	200	0021	224
		0023	280				
12	System address (Outdoor unit)	0001	Unit No. 1 (Outdoor unit system (outdoor unit) address is “1.”)				
		0002	Unit No. 2 (Outdoor unit system (outdoor unit) address is “2.”)				
		0003	Unit No. 3 (Outdoor unit system (outdoor unit) address is “3.”)				
		≀	≀				
		0030	Unit No. 30 (A setting which exceeds this number of units is not possible.)				
		0099	System (outdoor unit) address is undefined. (In this case, the system (outdoor unit) address must be set.)				
13	Indoor unit address	0001	Unit No. 1				
		0002	Unit No. 2				
		0003	Unit No. 3				
		≀	≀				
		0064	Unit No. 64 (A setting which exceeds this number of units is not possible.)				
		0099	Indoor unit address is undefined. (In this case, the indoor unit address must be set.)				
14	Group address	0000	Individual (indoor units where group control wiring has not been connected)				
		0001	Main unit (one of the indoor units where group control is in effect)				
		0002	Sub units (all indoor units other than the main unit where group control is in effect)				
2E	T10 terminal switching	0000	HA terminal (At time of shipment)				
		0001	Used for OFF reminder				
		0002	Fire prevention input				
31	Operation of the ventilation fan from the remote controller	0000	Operation not permitted. (Setting at time of shipment)				
		0001	Operation permitted.				
32	Switching to the remote controller sensor	0000	Body sensor (setting at time of shipment)				
		0001	Remote controller sensor				

List of Simple Setting Items

Item code	Item	Description
01	Filter sign ON time setting (filter lifetime)	Changes the indoor unit filter lifetime when a high-performance filter or other optional product is installed.

Filter sign ON times for each model

Model data	Model	Filter sign ON time										Pressure differential switch
		Standard		Long-life		Super long-life		High performance 65		High performance 90		
		Standard	High fouling	Standard	High fouling	Standard	High fouling	Standard	High fouling	Standard	High fouling	
0000	1-Way Air Discharge Semi-Concealed	**150**	75	×	×	×	×	×	×	×	×	×
0001	4-Way Air Discharge Semi-Concealed	×	×	2500	1250	5000	2500	2500	1250	×	×	×
0002	2-Way Air Discharge Semi-Concealed	×	×	2500	1250	10000	5000	2500	1250	2500	1250	×
0003	1-Way Air Discharge Semi-Concealed Slim	×	×	2500	1250	×	×	×	×	×	×	×
0005	Concealed Duct	×	×	2500	1250	5000	2500	2500	1250	5000	2500	×
0006	Concealed Duct High Static Pressure	×	×	2500	1250	×	×	2500	1250	5000	2500	×
	Ceiling-Embedded (8,10 hp)	×	×	2500	1250	×	×	2500	1250	2500	1250	×
0007	Ceiling-Mounted	×	×	2500	1250	×	×	2500	1250	×	×	×
0008	Wall-Mounted	**150**	75	×	×	×	×	×	×	×	×	×
0010	Perimeter floor mounted	**150**	75	×	×	×	×	×	×	×	×	×
0011	Perimeter embedded	**150**	75	×	×	×	×	×	×	×	×	×

NOTE

- × indicates that there is no corresponding filter.
- **150** indicates the filter sign ON time that is set at the time of shipment.

Item code	Item	Description
03	Central control address	Set when using a central control device. Used when setting the central control address manually from the remote controller.
05	Fan speed setting when heating thermostat is OFF	Changes the fan speed setting when the heating thermostat is OFF.
06	Heating intake temperature shift	Shifts the intake temperature during heating. Can be set when the body thermostat is used.
0F	Cooling-only	This setting allows a heat pump indoor unit to be operated as a cooling-only unit.

List of Detailed Setting Items

Item code	Item	Description
10	Unit type	Set when the indoor unit EEPROM memory is replaced during servicing.
11	Indoor unit capacity	
12	System (outdoor unit) address	These are not set at the time of shipping from the factory. These must be set after installation if automatic address setting is not performed.
13	Indoor unit address	
14	Group address	
2E	T10 terminal input switching	Ordinarily, the T10 terminal is used as the HA terminal at the time of shipping. However, this setting is used when the T10 terminal is used for OFF reminder or for fire prevention input.
31	Ventilation fan operation from remote controller	It is possible to install a total heat exchanger and ventilation fan in the system, which can be started and stopped by the wired remote controller. The ventilation fan can operate linked with the start and stop of the indoor unit, or can be operated even when the indoor unit is stopped. Use a ventilation fan that can accept the no-voltage A contact as the external input signal. In the case of group control, the fans are operated together. They cannot be operated individually.
32	Switching to remote controller sensor	This setting is used to switch from the body sensor to the remote controller sensor. Check that “remote controller sensor” is displayed. Do not use this setting with models that do not include a remote controller sensor. Do not use this setting if both the body sensor and remote sensor are used.

Switching the No. 1 and No. 2 inputs of the Type A T10 terminal

This function can be changed by means of item code “2E” and the jumper (JP1) pulse/static setting on the indoor unit control PCB.

Description of function

(1) Setting 0000 (setting at time of shipment)

HA input terminal (start/stop)

Refer to “1-2. Remote Operation” for the control system of that indoor unit.

(2) Setting 0001

(Operation is changed by the jumper (JP1) pulse/static setting on the indoor unit control PCB.)

A. Jumper present (setting at time of shipment)

Refer to “1-3. Automatic OFF Control” for the control system of that indoor unit.

Used to prevent the unit from being left ON when the user leaves the room, in cases such as in a hotel.

B. Jumper not present

This setting enables potential energy savings by changing the setting temperature when the unit operates continuously.

When temperature control occurs, the temperature changes to the upper limit when in cooling mode, or to the lower limit when in heating mode.

(3) Setting 0002

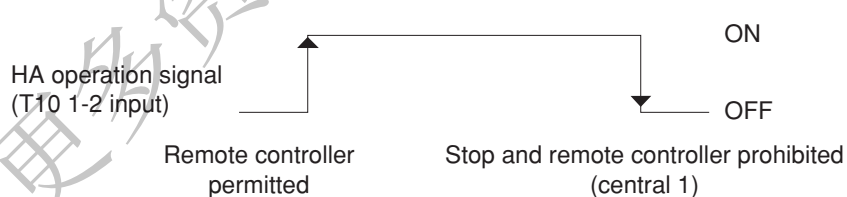
Used for fire prevention input.

Automatic OFF terminal (Setting data = 0001)

The pulse/static setting is used for input which changes the operation contents.
At the time of shipment from the factory, this is set to the pulse setting.
To change to the static setting, use nippers or a similar tool to cut the jumper (JP1) on the indoor unit control PCB.

(1) Operation when pulse input is used for automatic OFF

Description of operation: Remote controller use is permitted when the HA operation signal turns ON.
When this signal turns OFF, operation changes to stop and central 1 (start/stop by remote controller prohibited).

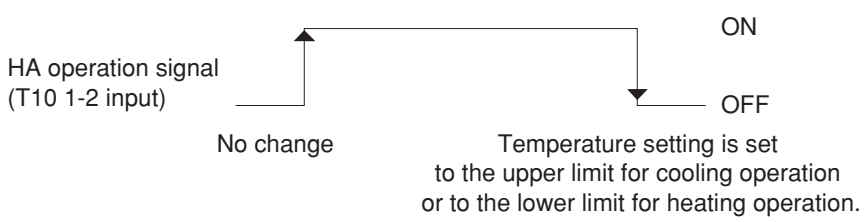


(2) Operation when static input is used to save energy

Description of operation: No changes occur when the HA operation signal is ON.

When the signal turns OFF, the temperature setting is set to the upper limit for cooling operation, or to the lower limit for heating operation.

No changes occur if the mode is fan or auto heat/cool operation.

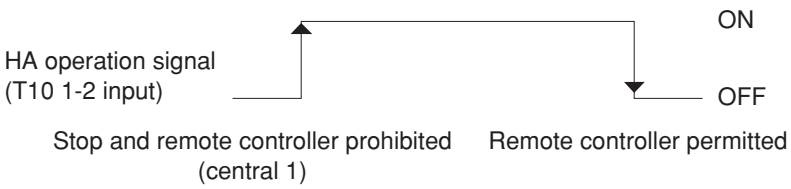


CAUTION **Be sure to set the same upper and lower limit temperatures at the main and the sub units.**

Fire prevention input terminal (Setting data = 0002)

The pulse/static setting is not necessary (disabled).

Description of operation: When the HA signal turns ON, operation changes to stop and central 1 (start/stop by remote controller prohibited). When this signal is OFF, use of the remote controller is permitted.



CAUTION

This function is used with Type A only.
Type U is not compatible with the fire prevention function. Therefore this function cannot be used in a system where both A and U units are present.

3. MONITOR FUNCTIONS

1. Calling the Sensor Temperature Display

<Description>

From the remote controller it is possible to engage service monitor mode to determine the temperature at the remote controller, indoor unit, and outdoor unit sensors.

<Procedure>

Refer to the remote controller display shown in Fig. 1

① Press and hold the CAN CEL (CANCEL) and (TEST/CHK) buttons simultaneously for 4 seconds or longer to engage service monitor mode. The service monitor illuminates. Initially, the main indoor unit No., and the temperature for item code 00, are displayed.

② Press the temperature setting ▲ / ▼ buttons to change the sensor number (item code) to the sensor you wish to monitor. The sensor numbers are listed on table 1 (below).

③ Press the UNIT (UNIT SELECT) button and change to the indoor unit that you wish to monitor. The sensor temperatures of the indoor units under group control and the corresponding outdoor unit are monitored.

④ Press the (TEST/CHK) button to return to normal display.

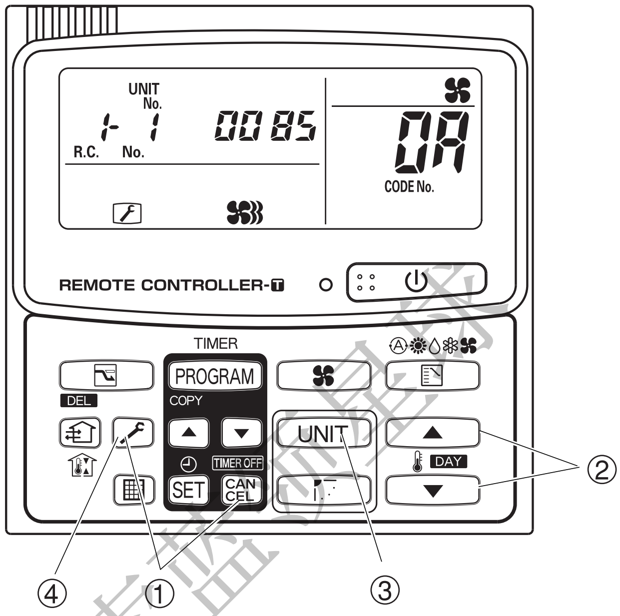


Fig. 1

Procedure:
① → ② → ③ → ④
Returns to normal display.

	Item code	Data name
Indoor Unit Data	00	Room temperature (control in effect) *
	01	Room temperature (remote controller)
	02	Indoor suction temperature
	03	Indoor heat exchanger temperature (E1)
	04	–
	05	Indoor heat exchanger temperature (E3)
	06	Discharge air temperature (BL)
	08	Position of indoor unit motor operated valve (MOV)
Outdoor Unit Data	0A	Discharge temperature (TD)
	0b	–
	0C	–
	0d	Suction temperature (TS)
	0E	Outdoor heat exchanger temperature (C1)
	11	Outdoor air temperature (TO)

* Main unit only in the case of group control

Table 1

2. Calling the Failure History

<Description>

Calls the details of past failures.

<Procedure>

Refer to the remote controller display shown in Fig. 2.

① Press and hold the SET (SET) and (TEST/CHK) buttons simultaneously for 4 seconds or longer to engage service check mode. The service check display illuminates. Initially, item code 01, and the details of the most recent alarm, are displayed. The number of the indoor unit where the alarm occurred, and the details of the alarm, are displayed.

② To monitor a different failure history, press the temperature setting ▲ / ▼ buttons to change the failure history number (item code).

Item code 01 (most recent) → Item code 04 (oldest)

NOTE

4 items are stored in the failure history.

③ Press the CANCEL (CANCEL) button to clear all items from the indoor unit alarm history.

④ Press the (TEST/CHK) button to return to normal display.

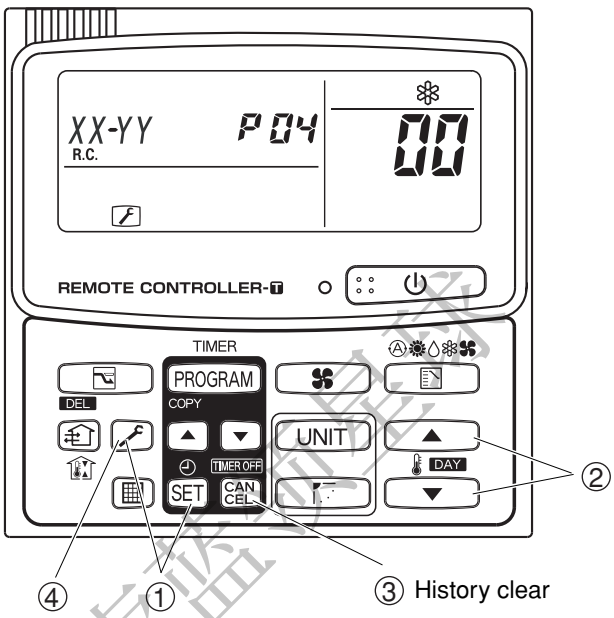
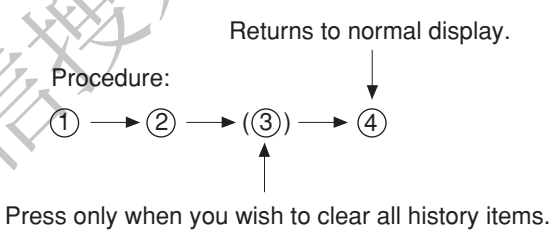


Fig. 2



3

4. ALARM DISPLAY

1. Meaning of Alarm Messages

Table of Self-Diagnostics Functions and Description of Alarm Displays

Alarm messages are indicated by the blinking of LED 1 and 2 (D042, D043) on the outdoor unit PCB. They are also displayed on the wired remote controller.

● Viewing the LED 1 and 2 (D042 and D043) alarm displays

LED 1	LED 2	Alarm contents
☼	☼	Alarm display LED 1 blinks M times, then LED 2 blinks N times. The cycle then repeats. M = 2: P alarm 3: H alarm 4: E alarm 5: F alarm 6: L alarm N = Alarm No. Example: LED 1 blinks 2 times, then LED 2 blinks 17 times. The cycle then repeats. Alarm is "P17."
Alternating		

(☼ : Blinking)

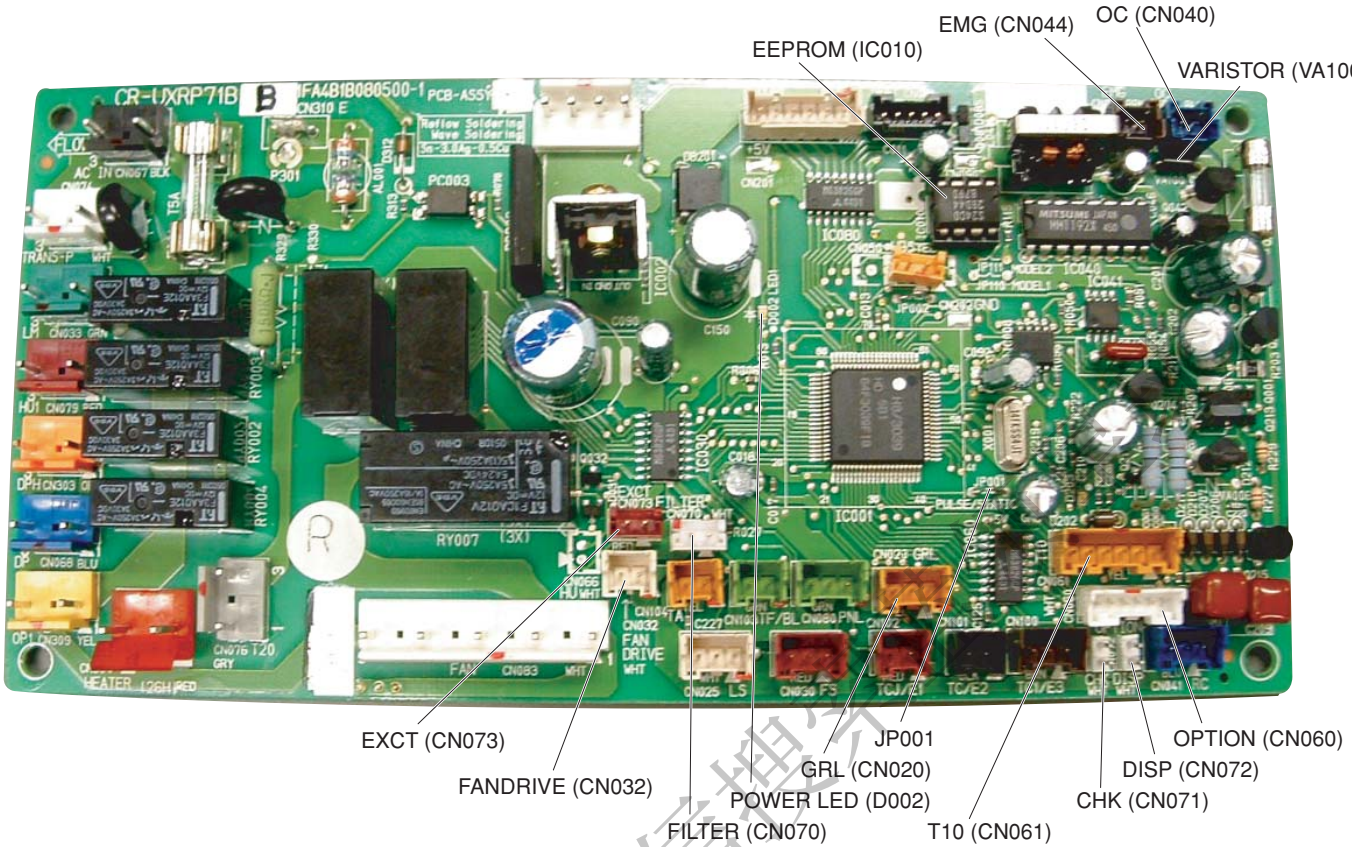
Possible cause of malfunction			Alarm message
Serial commu-nication errors Mis-setting	Remote controller is detecting error signal from indoor unit.	Error in receiving serial communication signal. (Signal from main indoor unit in case of group control) Ex: Auto address is not completed.	<E01>
		Error in transmitting serial communication signal.	<E02>
	Indoor unit is detecting error signal from remote controller (and system controller).		<<E03>>
	Indoor unit is detecting error signal from outdoor unit.	Error in receiving serial communication signal. When turning on the power supply, the number of connected indoor units does not correspond to the number set. (Except R.C. address is "0.")	E04
		Error of the outdoor unit in receiving serial communication signal from the indoor unit.	<E06>
	Improper setting of indoor unit or remote controller.	Indoor unit address setting is duplicated.	E08
		Remote controller address connector (RCU. ADR) is duplicated. (Duplication of main remote controller)	<<E09>>
	During auto. address setting, number of connected units does not correspond to number set.	Starting auto. address setting is prohibited. This alarm message shows that the auto address connector CN100 is shorted while other RC line is executing auto address operation.	E12
		Error in auto. address setting. (Number of connected indoor units is less than the number set)	E15
		Error in auto. address setting. (Number of connected indoor units is more than the number set)	E16
		No indoor unit is connected during auto. address setting.	E20
		Error of outdoor unit address setting.	E25
	Indoor unit communication error of group control wiring.	Error of main indoor unit in receiving serial communication signal from sub indoor units.	E18

Continued

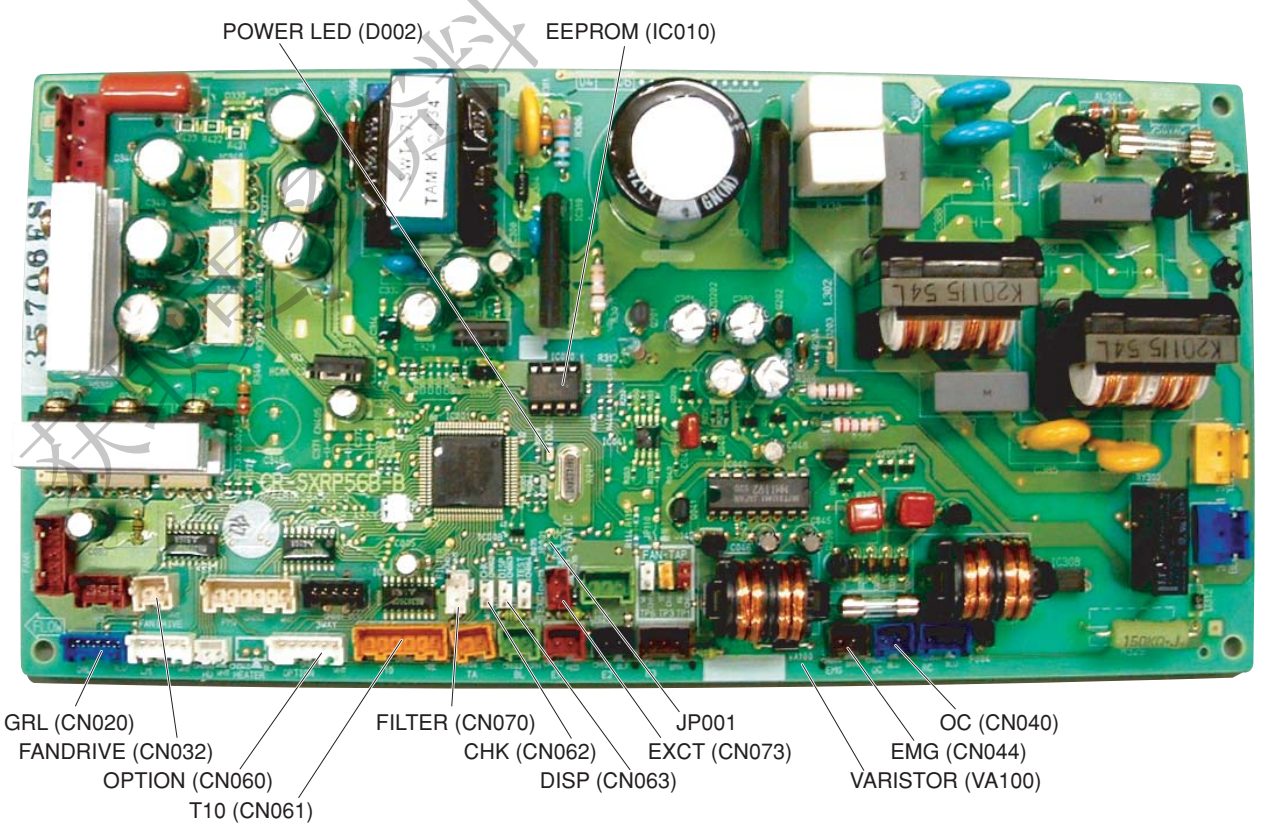
Possible cause of malfunction				Alarm message
Serial commu-nication errors Mis-setting	Improper setting.	This alarm message shows when the indoor unit for multiple-use is not connected to the outdoor unit.		L02
		Duplication of main indoor unit address setting in group control.		<L03>
		Duplication of outdoor R.C. address setting.		L04
		There are 2 or more indoor units controllers which have operation mode priority in refrigerant circuit.	Priority set remote controller	L05
			Non-priority set remote controller	L06
		Group control wiring is connected to individual control indoor unit.		L07
		Indoor unit address is not set.		L08
		Capacity code of indoor unit is not set.		<<L09>>
		Capacity code of outdoor unit is not set.		L10
		Mis-matched connection of outdoor units which have different kinds of refrigerant.		L17
		4-way valve operation failure		L18
Activation of protective device	Protective device in indoor unit is activated.	Thermal protector in indoor unit fan motor is activated.		<<P01>>
		Improper wiring connections of ceiling panel.		<<P09>>
		Float switch is activated.		<<P10>>
		Power supply voltage is unusual. (The voltage is more than 260 V or less than 160 V between L and N phase.)		P02
		Incorrect discharge temperature. (Comp. No. 1)		P03
		Negative (Defective) phase.		P05
		Operation of O_2 sensor		P14
		Outdoor unit fan motor is unusual.		P22
		Compressor running failure resulting from missing phase in the compressor wiring, etc. (Start failure not caused by IPM or no gas.)		P16
		Overcurrent at time of compressor runs more than 80Hz (DCCT secondary current or ACCT primary current is detected at a time other than when IPM has tripped.)		P26
		IPM trip (IPM current or temperature)		H31
		Inverter for compressor is unusual. (DC compressor does not operate.)		P29
Thermistor fault	Indoor thermistor is either open or damaged.	Indoor coil temp. sensor (E1)		<<F01>>
		Indoor coil temp. sensor (E2)		<<F02>>
		Indoor coil temp. sensor (E3)		<<F03>>
		Indoor suction air (room) temp. sensor (TA)		<<F10>>
		Indoor discharge air temp. sensor (BL)		<<F11>>
	Outdoor thermistor is either open or damaged.	Compressor 1 – Discharge temperature sensor trouble		F04
		Outdoor No. 1 coil liquid temp. sensor (C1)		F07
		Outdoor air temp. sensor (TO)		F08
		Compressor intake port temperature sensor (TS)		F12
		High pressure sensor		F16
EEPROM on indoor unit PCB failure				F29
Protective device for compressor is activated	Protective device for compressor No. 1 is activated.	EEP ROM on the outdoor unit PCB is a failure.		F31
		Current is not detected when comp. is ON.		H03

5. PCB AND FUNCTIONS

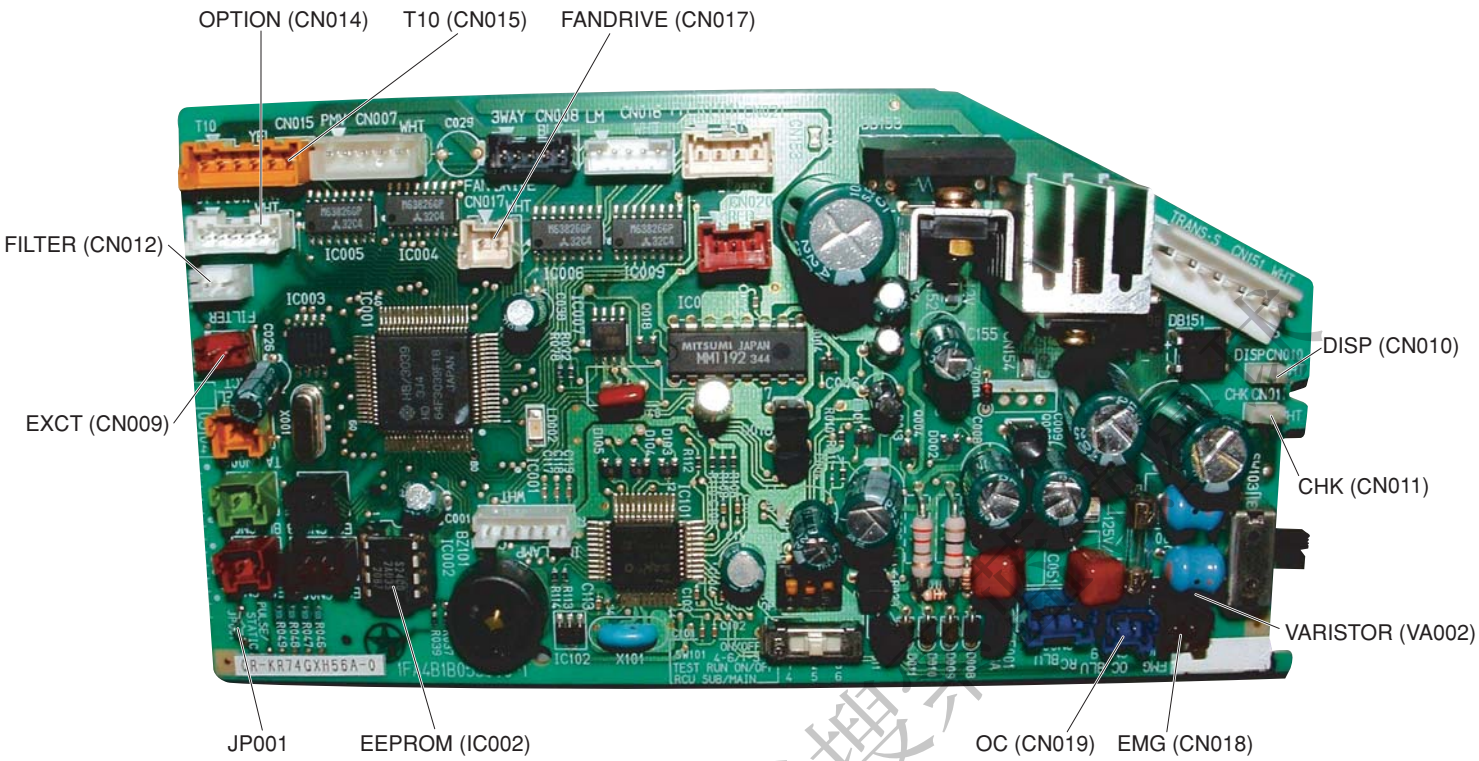
■ **For AC Fan Motor (CR-UXRP71B-B)**



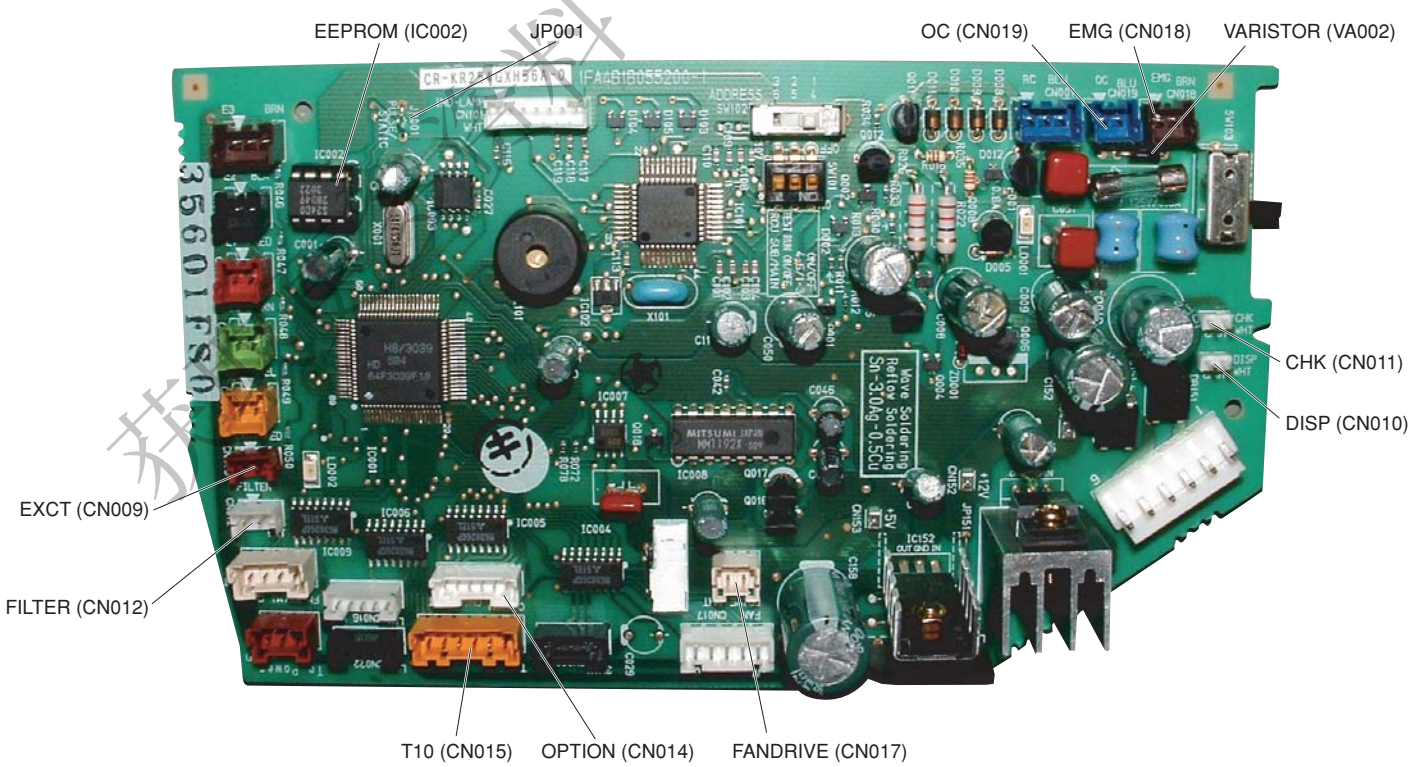
■ **For DC Fan Motor (CR-SXRP56B-B)**



■ For AC Fan Motor (CB-KR74GXH56A)



■ For AC Fan Motor (CB-KR254GXH56A)



5

1. Indoor Unit Control PCB

Indoor Unit Control PCB Switches and Functions

Indoor unit control PCB

T10: (CN061, 015) **6P plug (yellow):** Used for remote control. (Refer to the remote control section.)
Control items: (1) Start/stop input (2) Remote controller prohibit input
(3) Start signal output (4) Alarm signal output
■ Examples of wiring
(1) Relay junction PCB (ACC-DC24A)
(2) Power OFF reminder

EXCT: (CN073, 009) **2P plug (red):** Can be used for demand control. When input is present, forces unit to operate with the thermostat OFF.

DISP: (CN072, 063, 010) **2P plug (white):** Short-circuiting this plug allows the unit to be operated by the remote controller, even if it is not connected to an outdoor unit.
(In this case, alarm "E04," which indicates trouble in the serial communication between the indoor and outdoor unit, does not occur.)

CHK: (CN071, 011) **2P plug (white):** Test pin. Short-circuiting this pin allows the indoor FM (H fan speed), drain pump, flap motor (F1 position), and electronic expansion valve full-open position to be checked.
However this function turns OFF if the indoor unit protection mechanism is activated. The unit can be operated even if the remote controller and outdoor unit are not connected. However even if the remote controller is connected, it cannot be used to operate the unit. This function can be used for short-term tests.

JP001: **Jumper wire:** Allows selection of the T10 terminal start/stop signal. (Refer to the remote control section.)
Status at shipment: Pulse signal
Jumper wire cut: Static signal (continuous signal)

FANDRIVE (CN032, 017) **2P plug (white):** This terminal sends a signal to the ventilation fan when the FAN button on the wired remote controller is used to operate a commercially-available ventilation fan. (Refer to the remote control section.)
Use a ventilation fan which can accept no-voltage A contact as the external input signal.

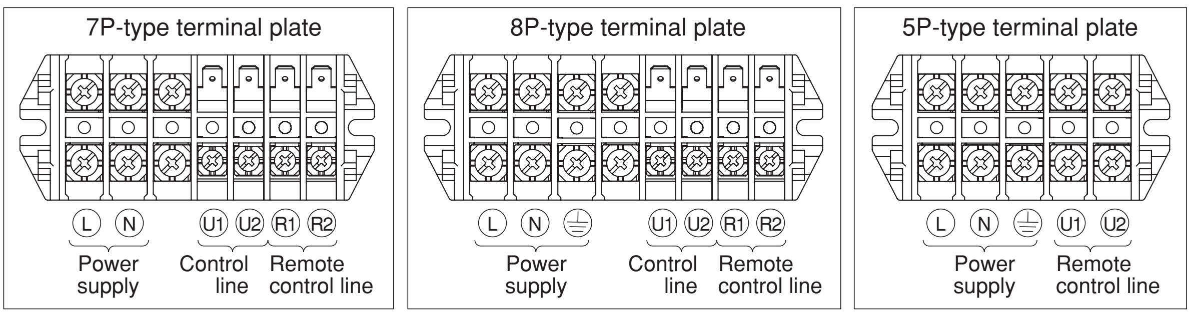
FILTER: (CN070, 012) **2P (white):** This terminal is used to connect contact input from the differential pressure switch which detects filter clogging. When the contacts turn ON, “FILTER” is displayed on the wired remote controller.

Power LED: **LED (red):** Illuminates when power is supplied. Blinks when there is a failure in the EEPROM (IC010, 002: nonvolatile memory).

EEPROM: (IC010, 002) **Nonvolatile memory:** Memory which stores the unit type data and other information. When the PCB is replaced, remove the EEPROM from the old PCB and install it on the new PCB. If an IC failure occurs, replace with the new IC which was provided with the service PCB, and set the necessary information from the wired remote controller. (For the procedure, refer to the servicing technical materials.)

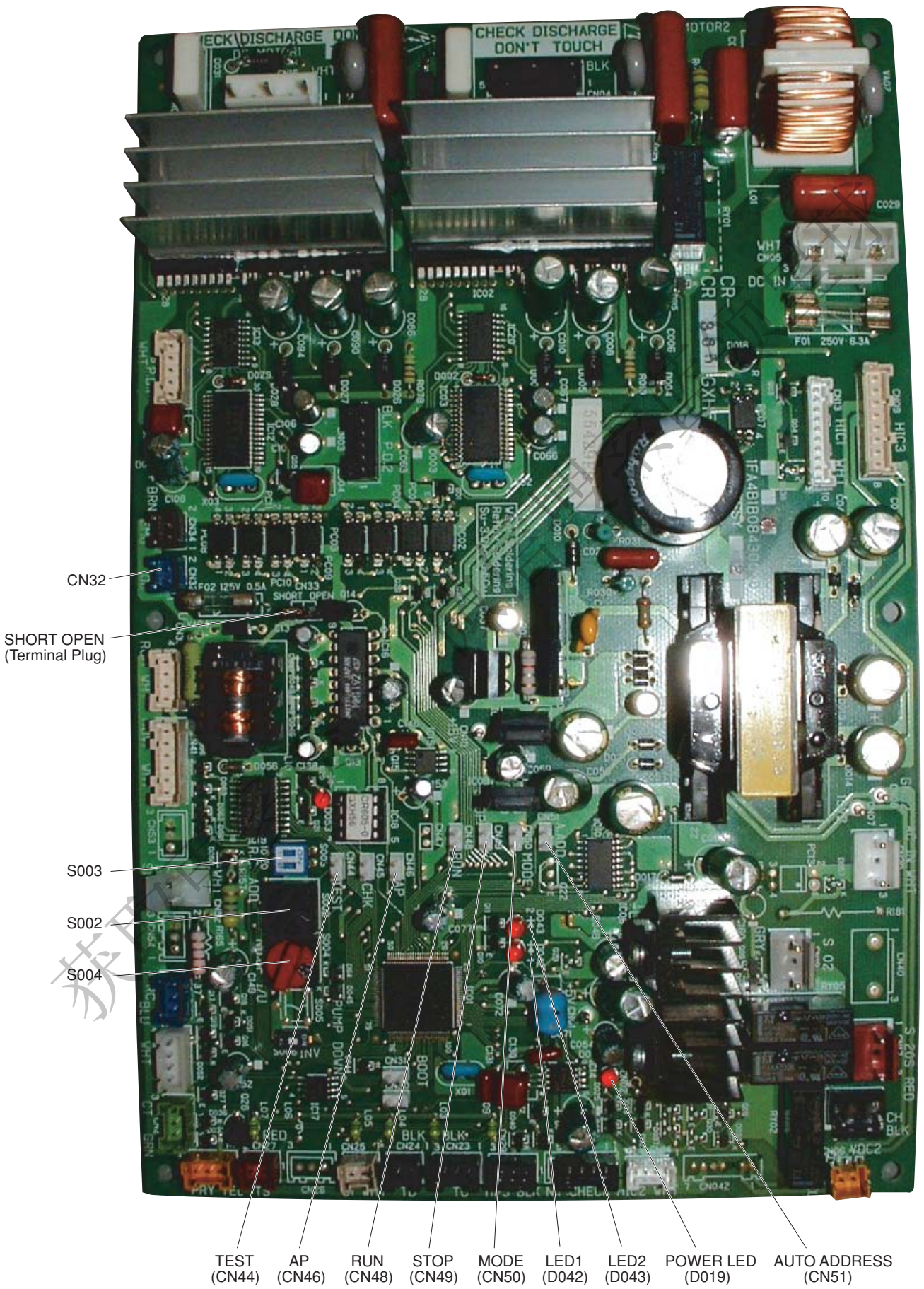
GRL: (CN020)
- For AC fan motor (CR-UXRP71B-B: 3P (yellow))
- For DC fan motor (CR-SXRP56B-B: 5P (blue))

- The indoor unit power terminal plate may be a 7P, 8P or 5P type. (Refer to the figure at below.) The basic wiring diagram shows the 7P-type terminal plate. Therefore the terminal plate may differ from the illustrations.

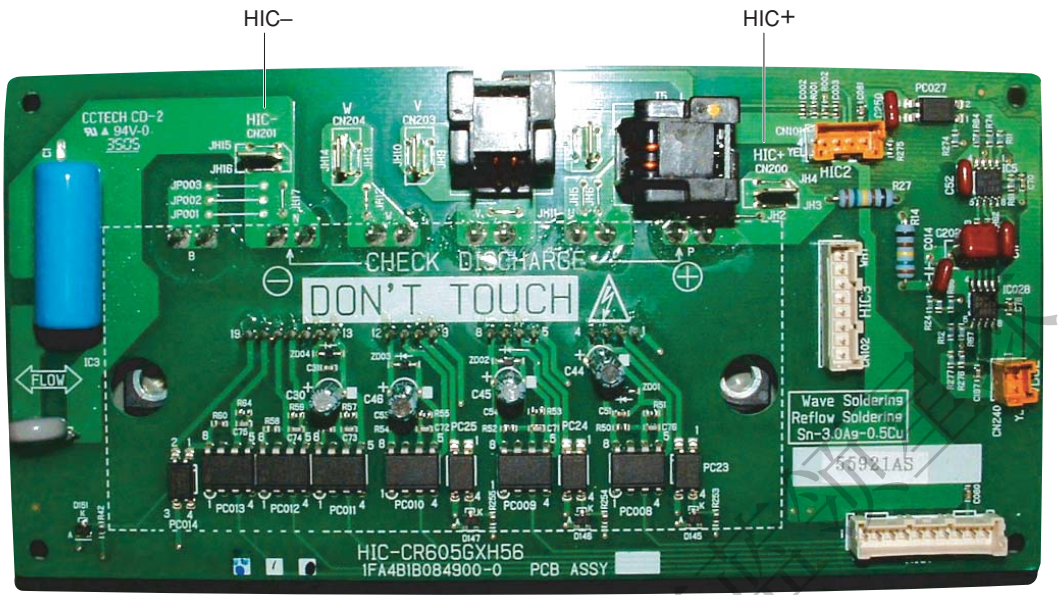


5

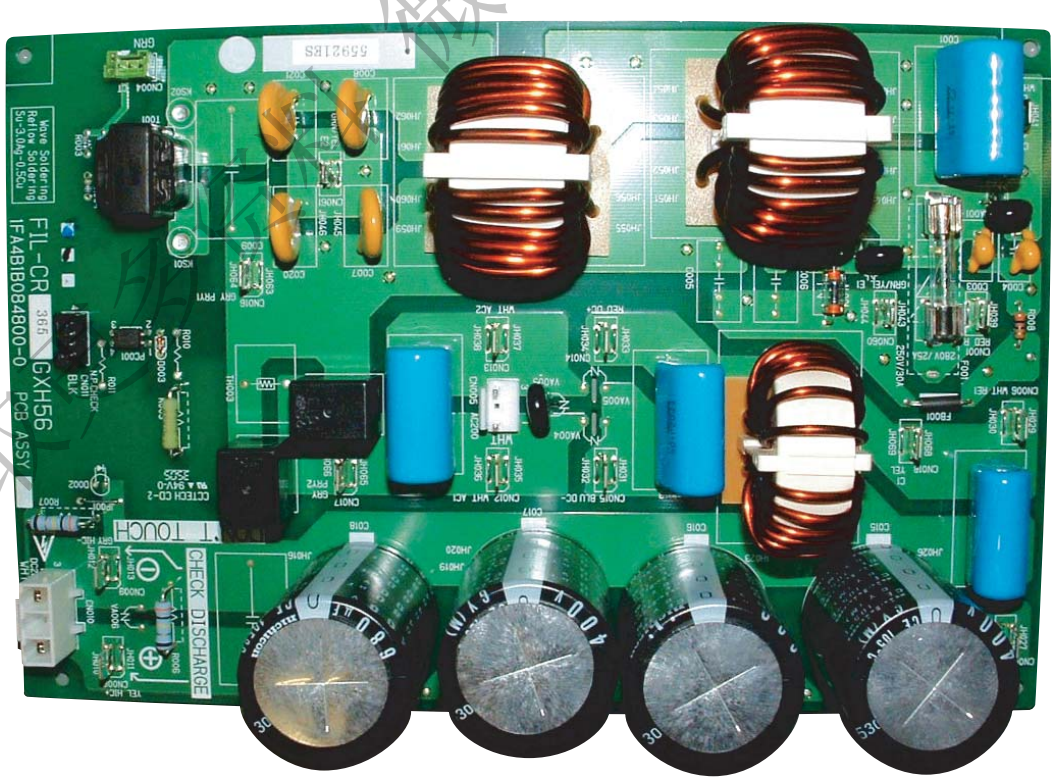
1-1. Outdoor Unit Control PCB: CR-CR365GXH56
CR-CR605GXH56



■ **PCB installed in the single-phase outdoor unit: HIC PCB**

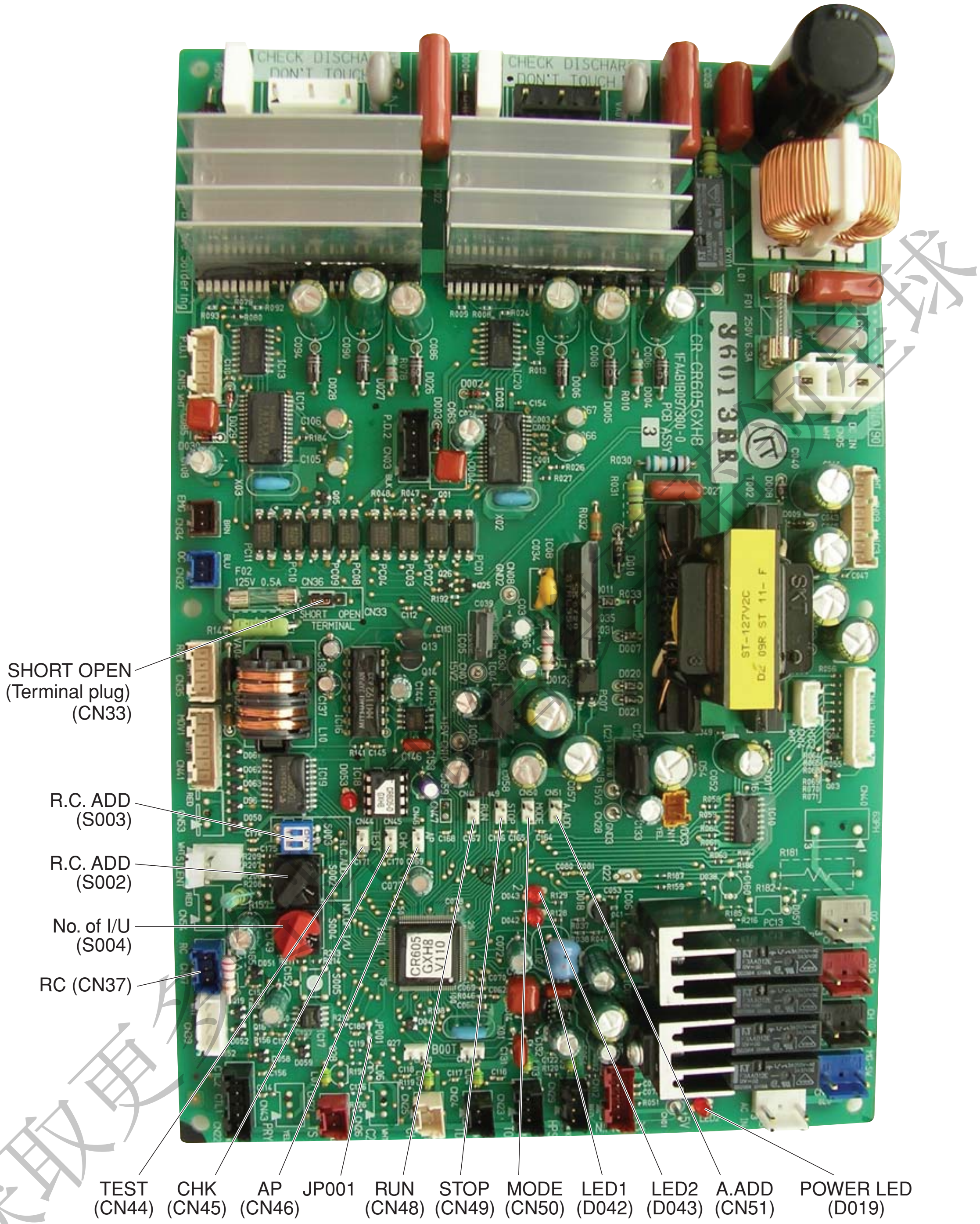


■ **PCB installed in the single-phase outdoor unit: FILTER PCB**



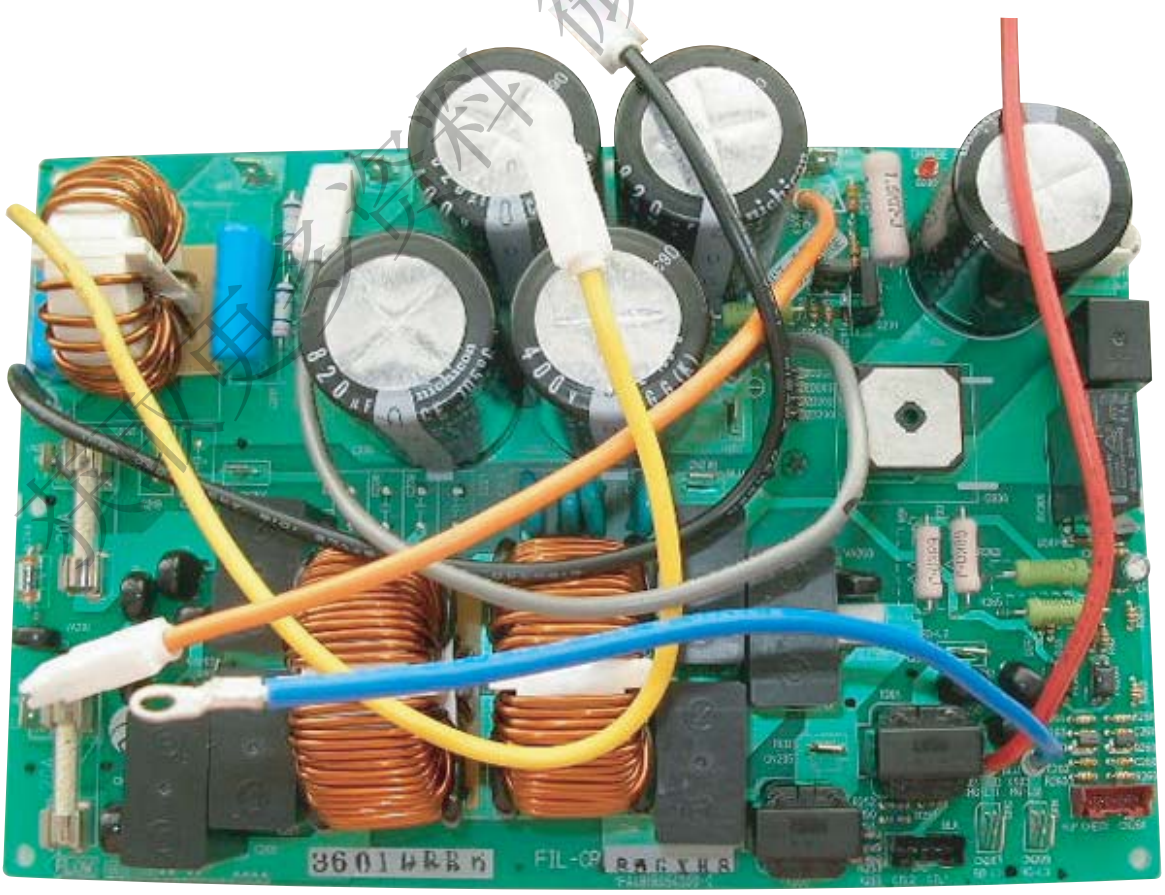
* Control PCBs for outdoor units consist of the Outdoor Unit Control PCB, HIC PCB, and Filter PCB.

1-2. Outdoor Unit Control PCB: CR-CR605GXH8



■ **PCB installed in the 3-phase outdoor unit: HIC PCB**

■ **PCB installed in the 3-phase outdoor unit: FILTER PCB**



2. Functions of Outdoor Unit PCB

Automatic address setting (CN51)	2P plug (white): Automatic address setting pin • Short-circuit this pin for 1 second or longer to automatically set the addresses at the indoor units that are connected to that outdoor unit and are within the same system. • The system address is “1” at the time of shipment. Automatic address setting is necessary even for communications lines in a single system where the inter-unit control wiring does not cross to any other systems. • While automatic address setting is in progress, the 2 LEDs (LED1, 2: red) on the outdoor unit control PCB blink alternately. (Short-circuiting this pin while automatic address setting is in progress will stop the automatic address setting operation.)
S002	Rotary switch (10 positions, black): Outdoor system address setting switch • The setting is “1” at the time of shipment. It is not necessary to change the setting if wiring is connected only to an outdoor unit and indoor units in a single system and the inter-unit control wiring does not cross multiple systems. • If wiring links the inter-unit control wiring for multiple systems to the same communications lines, then a different address must be set for each refrigerant tubing system. • If wiring links multiple systems, a maximum of 30 systems (up to 64 indoor units) can be connected. This setting can be set up to “39,” however control will be for 30 systems even if the setting is set to higher than 30. An alarm will be displayed if system addresses are duplicated. (For details, refer to Table 1.)
S003	DIP switch (2P, blue): Switches for setting system address 10s digit and 20s digit • If 10 systems or more are set, the setting is made by a combination of this DIP switch and S002. • If 10 – 19 systems are set, set switch 1 (10s digit) to ON. • If 20 – 29 systems are set, set switch 2 (20s digit) to ON, and set switch 1 (10s digit) to OFF. • If 30 systems are set, set both switch 1 (10s digit) and switch 2 (20s digit) to ON. (For details concerning S002 and S003, refer to Table 1.)
S004	Rotary switch (16 positions, red): Switch for setting the number of connected indoor units In order to allow the outdoor unit to manage indoor units in the same refrigerant system, set the number of connected indoor units. (For details, refer to Table 2.)
JP001	Jumper wire: 6HP PCB board – Present 4, 5 HP PCB board – Not present
Terminal plug	3P plug (black): For communications circuit impedance matching • A connecting socket (3P, black) is attached to the terminal plug at the time of shipment from the factory. • In the case of link wiring which combines the inter-unit control wiring for multiple systems into a single communications circuit, leave the connecting socket in place at only one of the outdoor units, and move the socket from the “SHORT” side to the “OPEN” side at all other outdoor units. If multiple connecting sockets are left in place, communications trouble will occur.

LED1, 2 (D042, D043)	LED (red × 2) • LED 1 and 2 blink alternately while automatic address setting is in progress. • Display the alarm contents for alarms that are detected by the outdoor unit.
Power LED (D019)	LED (red): Power indicator Indicates the DC 5V power on the outdoor unit control PCB.
RUN (CN48)	2P plug (white): Start pin Short-circuit this pin and apply a pulse signal to start all indoor units in that refrigerant system.
Stop (CN49)	2P plug (white): Stop pin Short-circuit this pin and apply a pulse signal to stop all indoor units in that refrigerant system.
AP (CN46)	2P plug (white): Vacuuming pin • To perform vacuuming of the outdoor unit, short-circuit this pin and then turn the power ON. All solenoid valves turn ON and vacuuming begins smoothly. (Do not perform automatic address setting at this time.) • Release the short-circuit to return the unit to normal status.
Mode change (CN50)	2P plug (white): Indoor unit Heating/Cooling mode change pin • When operating the compressors to perform automatic address setting, operation in Heating mode can be normally used. However, short-circuiting this pin performs operation in Cooling mode. (Static signal) • Short-circuiting this pin during ordinary operation changes the mode from Cooling to Heating (if the current mode is Cooling) or from Heating to Cooling (if the current mode is Heating).
Test (CN44)	2P plug (white) • This pin is used to test the PCB at the factory. • When the power is turned ON after this pin has been short-circuited, all output signals will be output in sequence. (Sequential output does not occur if this pin is short-circuited when the power is already ON.) Releasing this pin returns the unit to normal control.

Table 1. Setting the System Address [S002: Rotary switch (black), S003: 2P DIP (blue)]

	Outdoor system address No.	S002 setting (system address switch)	S003 setting	
			1P (10s digit)	2P (20s digit)
1 refrigerant system only	1	0	OFF	OFF
Link wiring	1	1	OFF	OFF
	2	2	OFF	OFF
	3	3	OFF	OFF
	4	4	OFF	OFF
	5	5	OFF	OFF
	6	6	OFF	OFF
	7	7	OFF	OFF
	8	8	OFF	OFF
	9	9	OFF	OFF
	10	0	ON	OFF
	11	1	ON	OFF
	12	2	ON	OFF
	13	3	ON	OFF
	14	4	ON	OFF
	15	5	ON	OFF
	16	6	ON	OFF
	17	7	ON	OFF
	18	8	ON	OFF
	19	9	ON	OFF
	20	0	OFF	ON
	21	1	OFF	ON
	22	2	OFF	ON
	23	3	OFF	ON
	24	4	OFF	ON
	25	5	OFF	ON
	26	6	OFF	ON
	27	7	OFF	ON
	28	8	OFF	ON
	29	9	OFF	ON
	30	0	ON	ON

Table 2. Setting the Number of Indoor Units [S004: Rotary switch (red)]

Number of Indoor Units	S004 Setting
1	1
2	2
3	3
9	9
10	A
11	B
12	C
13	D
14	E
15	F

3. Self-Diagnostics Function Table

• Causes and corrections in instances when automatic address setting cannot be started

Trouble	Cause and correction
The power LED on the outdoor unit control PCB does not turn ON.	Check for any errors in the power wiring to the outdoor unit, and check for a missing phase.
LED 1 and 2 on the outdoor unit control PCB do not turn OFF when the outdoor unit power is turned ON, and automatic address setting cannot be started.	Check the “Alarm Displays” table and correct the problem.
An alarm appears immediately when automatic address setting is started from the remote controller.	
Nothing happens when the operator attempts to start automatic address setting from the remote controller.	Check that the remote controller wiring and the inter-unit control wiring are connected correctly. Check that the indoor unit power is ON.

• Causes and corrections in instances when automatic address setting starts, but cannot be completed successfully

Trouble	Cause and correction
An alarm appears on the remote controller sometime from several seconds to several minutes after automatic address setting is started.	Check the “Alarm Displays” table and correct the problem.
LED 1 and 2 on the outdoor unit control PCB indicate that automatic address setting is in progress (the LEDs blink alternately) for several minutes after automatic address setting is started (the compressors may also start and stop several times), however LED 1 and 2 never indicate that automatic address setting is completed (turn OFF).	Check the alarm details on the “Outdoor Unit Control PCB LED 1 and 2 Alarms” table, then check the “Alarm Displays” table and correct the problem.

• If alarm E15, E16, or E20 appears after automatic address setting is started, check the following items.

Alarm display	Alarm description
E15	The number of indoor units detected during automatic address setting was smaller than the number of indoor units which was set with switch S004 on the outdoor unit PCB.
E16	The number of indoor units detected during automatic address setting was larger than the number of indoor units which was set with switch S004 on the outdoor unit PCB.
E20	The outdoor unit received no serial signals from indoor units within 90 seconds after automatic address setting was started.

Check items	E15	E16	E20
Check that the indoor unit power is turned ON.	○		○
Check that the inter-unit control wiring is connected correctly. (Check that there are no open circuits, short circuits, terminal plugs, incorrect wiring to the remote controller terminals, or similar problems.)	○	○	○
Check that the remote controller wiring is connected correctly. (Check that there are no open circuits, short circuits, incorrect wiring to the inter-unit control wiring terminals, group control crossover wiring, or similar problems.)	○		○
Check that the number of indoor units has been set correctly using switch S004 on the outdoor unit control PCB.	○	○	
Check that the amount of additional refrigerant charge is correct (if automatic address setting is performed with the compressors ON).	○		
Check that the refrigerant tubing connections are correct (if automatic address setting is performed with the compressors ON).	○	○	
Check that there are no problems with indoor unit sensors E1 and E3 (if automatic address setting is performed with the compressors ON).	○		
Check that there are no indoor units where the system address was already incorrectly set by manual or automatic address setting.		○	

- When automatic address setting is started from the outdoor unit control PCB or from the remote controller, SETTING (SETTING) appears on the remote controller at units where the inter-unit control wiring and remote controller wiring are connected correctly. LED 1 and 2 on the outdoor unit control PCB blink alternately.
- In the case of indoor unit group control, if there is a mistake in the remote controller crossover wiring, addresses may not be set even if SETTING (SETTING) appears.
- Even if alarm E15 or E16 appears, addresses are set at those indoor units which could be verified. The set addresses can be checked using the remote controller.

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- If one of the below alarms appears when the remote controller is operated after automatic address setting was completed (LED 1 and 2 on the outdoor unit control PCB are turned OFF), follow the instructions in the table below and correct the problem location.

Remote controller display	Cause
Nothing is displayed.	The remote controller is not connected correctly (power trouble). The indoor unit power was cut off after automatic address setting was completed.
E01	The remote controller is not connected correctly (remote controller receiving trouble). The remote controller of an indoor unit where the indoor unit address is not set is inadvertently operated. (Communications with the outdoor unit are not possible.)
E02	The remote controller is not connected correctly (trouble with sending of the signal from the remote controller to the indoor unit).
E09	The indoor unit ceiling panel connector is not connected correctly.

• The outdoor unit maintenance remote controller can be used to check the alarm display.
The number of times that LED 1 and 2 blink on the outdoor unit control PCB can be used to check the alarm display.
(Refer to “Checking the LED 1 and 2 Alarm Display on the Outdoor Unit Control PCB.”)

Remote controller display	Cause
E06	Trouble receiving the signal from the indoor unit at the outdoor unit
E12	Automatic address setting start-prohibit
E15	Automatic address setting alarm (too few units)
E16	Automatic address setting alarm (too many units)
E20	No indoor units when automatic address setting was started
E24	Trouble receiving the signal from the outdoor unit at the relay control unit
E25	Trouble with the outdoor unit address setting
E29	Trouble receiving the signal from the relay control unit at the outdoor unit
E30	Trouble with sending the outdoor unit serial signal
F04	Compressor 1 – Discharge temperature sensor trouble (TD)
F07	Outdoor coil liquid temperature sensor trouble (C1)
F08	Outside air temperature sensor trouble (TO)
F12	Compressor inlet temperature sensor trouble (TS)
F16	High-pressure sensor trouble (HPS)
F31	Outdoor unit non-volatile memory (EEPROM) trouble
H03	Compressor 1 – CT sensor disconnected or short circuit
H31	Compressor HIC alarm (Also check the description of alarm P29.)
L05	Duplicated indoor unit priority (priority indoor unit)
L06	Duplicated indoor unit priority (non-priority indoor unit) and outdoor unit
L10	Outdoor unit capacity not set.
L17	Outdoor unit type mismatch
P03	Compressor 1 – Abnormal discharge temperature
P13	Out of step detected
P14	O_2 sensor activated.
P16	DCCT or ACCT overcurrent at less than 80 Hz
P22	Outdoor unit fan trouble (IPM damage, overcurrent, inverter trouble, DC fan lock, Hall IC missing phase)
P26	DCCT or ACCT overcurrent at 80 Hz or higher
P29	Start trouble (CD compressor start trouble) caused by a compressor wiring missing phase or DCCT trouble

6. SERVICE CHECKER

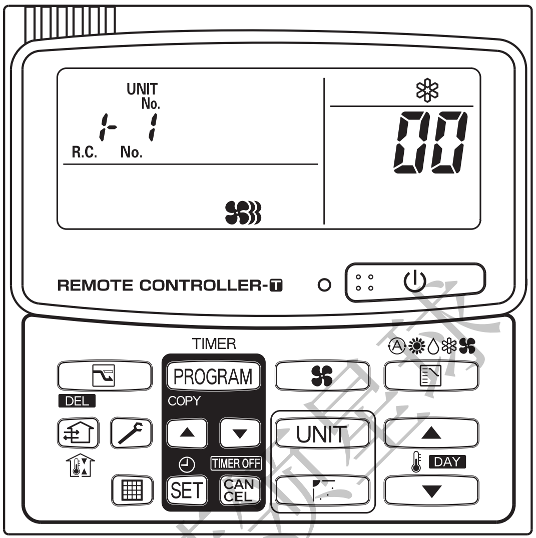
OUTDOOR UNIT MAINTENANCE REMOTE CONTROLLER (RCS-TM80BG) for Mini ECO-i

[Service Checker Section]

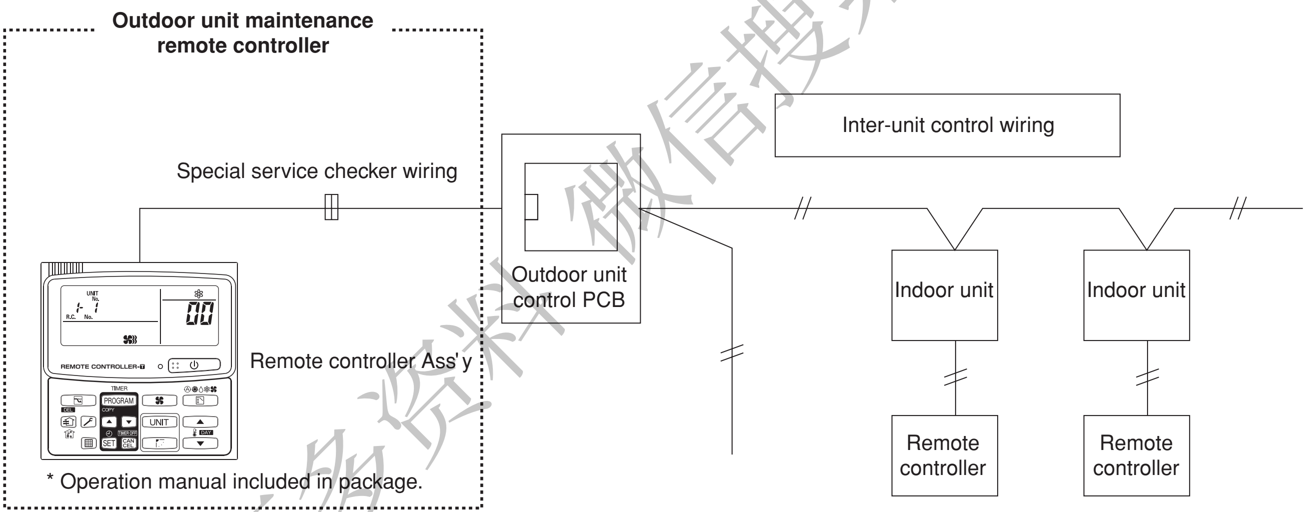
■ About the outdoor unit maintenance remote controller

The outdoor unit utilizes nonvolatile memory (EEPROM) on its PCB. This allows EEPROM data to replace the setting switches that were present on previous PCBs. The outdoor unit maintenance remote controller is used to set and change these EEPROM settings.

In addition to setting and checking the outdoor unit EEPROM settings, this remote controller can also be used to monitor the outdoor unit alarm history, monitor the various indoor and outdoor temperatures, and check the indoor unit connection status (number of units, operating mode, etc.).



System Diagram



- The special service checker wiring is required in order to connect the outdoor unit maintenance remote controller to the outdoor unit PCB.
- Ordinary remote controllers or other controllers are still required for the indoor units, even when the outdoor unit maintenance remote controller is connected.

6

■ **Functions on the ordinary display**

(1) Press the buttons to execute the following functions.
- All indoor units stop/start
- Cooling/heating change
- All indoor units test run
- Outdoor unit double-speed (Do not use for actual operation. Doing so may damage the devices.)

(2) Display: The following displays are possible.
- Alarm display
- No. of indoor/outdoor units
- Unit Nos. of connected indoor/outdoor units
- Operating status of indoor/outdoor units (Blinks when alarm occurs.)
- Indoor thermostat ON
- Display of individual outdoor unit alarms
- Total operating time of outdoor unit compressors
- Oil level of the outdoor unit oil sensor
- Total outdoor unit power ON time
- Outdoor unit microcomputer version

■ **Temperature monitor**

Displays the temperature from each indoor/outdoor sensor.

■ **Outdoor unit alarm history monitor**

Displays the outdoor unit alarm history.

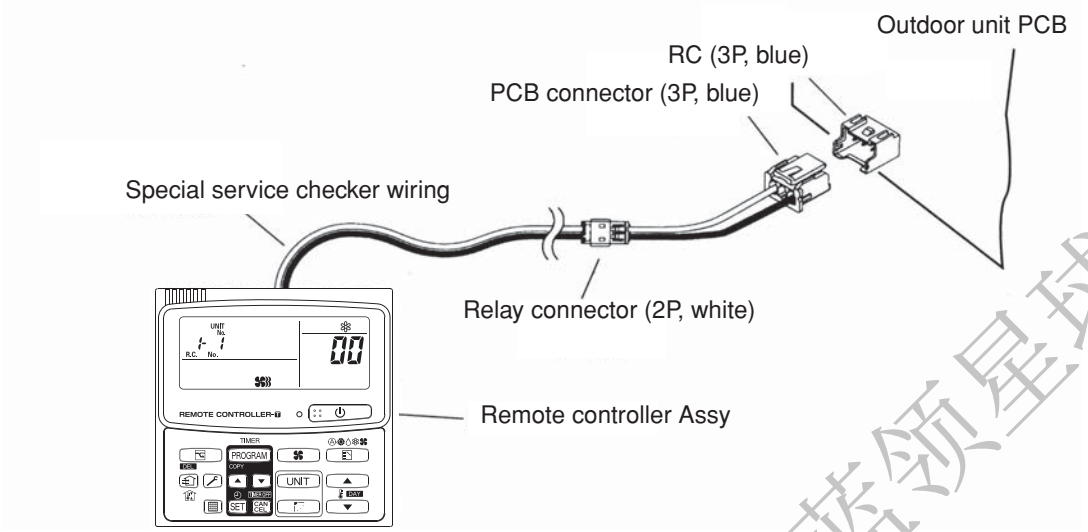
■ **Settings mode**

Settings mode 1 and settings mode 2 can be used to make outdoor unit EEPROM settings.

■ **Functions on the ordinary display**

Connect the special service checker wiring to the outdoor unit PCB.

The connection diagram is shown below.



- If the communications line in the inter-unit control wiring is connected, it can be left as-is.
- In the case of an independent outdoor unit (1 maintenance remote controller connected to 1 outdoor unit, automatic address setting for indoor units not completed), both setting mode 1 and setting mode 2 can be used.
- The overall system status for that refrigerant system is displayed.

All units start/stop (Fig. 1)

<Operation>

The (ON/OFF operation) button can be used to start and stop all indoor units.

- The LED illuminates if any indoor unit is operating.
- The LED blinks if an alarm occurs at any of the operating indoor units.

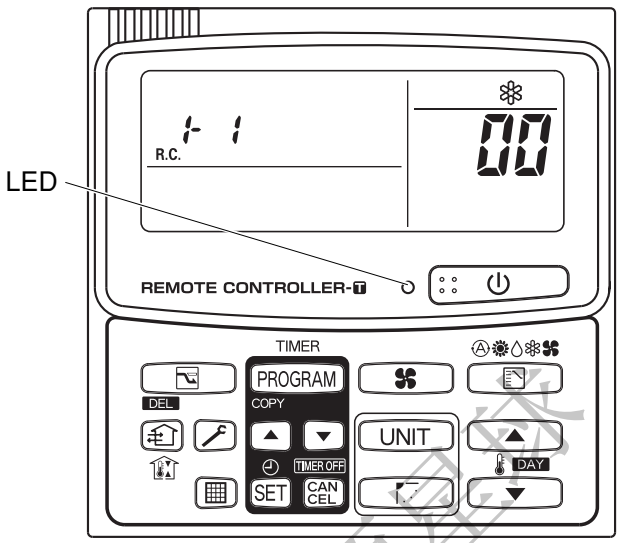


Fig. 1

Cooling/heating change (Fig. 1)

<Operation>

The (MODE) button can be used to change between heating and cooling operation.

- The specifications are equivalent to the cooling / heating inputs on the previous outdoor unit PCBs.
- The display indicates the operating mode of the indoor unit with the lowest unit No.

All units test run (Fig. 2)

<Operation>

The (CHECK) button can be used to start and stop a test run for all units. (To start, press and hold the button for 4 seconds.)

During the test run, “TEST” is displayed.

- The status of test runs performed from the indoor unit remote controller is not displayed on the outdoor unit maintenance remote controller.

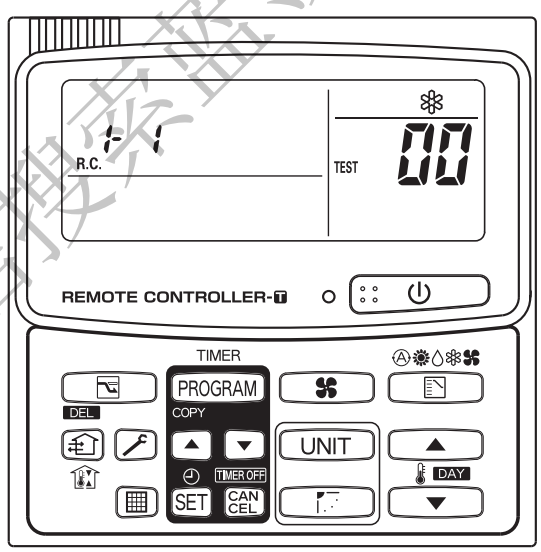


Fig. 2

Double-speed (Fig. 3)

- Do not use for actual operation. (Doing so may damage the devices.)

<Operation>

The time button is used to switch between double-speed and normal operation.

- During double-speed operation, the repeat timer mark is displayed.

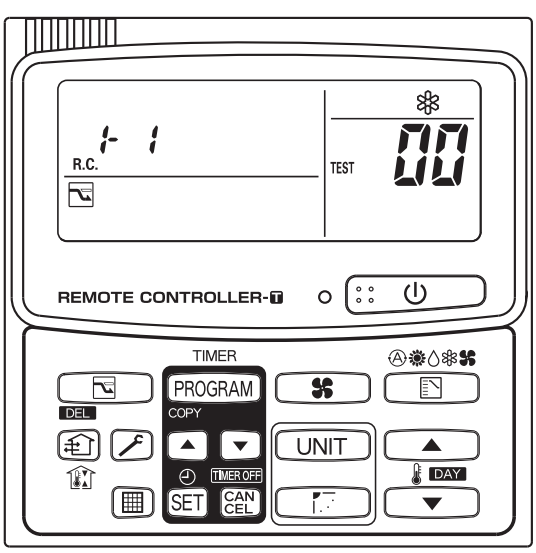


Fig. 3

■ Display (functions)

- The item codes can be changed with the「▲」and「▼」buttons.

Item code ①	Item ②	Remarks
00	Outdoor unit alarm	Alarm code display
01	No. of connected indoor units	Quantity
02	Unit Nos. of connected indoor units	7-segment display
03	Operating status of indoor unit	7-segment display
04	Thermostat ON status of indoor unit	7-segment display
05	No. of connected outdoor units	1
06	Unit Nos. of connected outdoor units	7-segment display
07	Operating status of outdoor unit compressor	7-segment display
08		
09		
10	Total operating time of compressor	0 – 99999999 hrs
16	Total operating time of outdoor unit	0 – 99999999 hrs
17	Compressor operation count	0 – 65535 times
F0	Alarm history 1 (most recent)	Display only. Alarm code and unit No. of unit where alarm occurred are displayed alternately. 0 = CCU 1 – 4 = Outdoor unit
F1	Alarm history 2	
F2	Alarm history 3	
F3	Alarm history 4	
F4	Alarm history 5	
F5	Alarm history 6	
F6	Alarm history 7	
F7	Alarm history 8 (oldest)	
FE	Firmware version	Displays the version No. × 100.
FF	Program version	Displays the version No. × 100.

③ **XX-YY system**
Displays the outdoor unit sub-bus address which is currently selected.
XX = Outdoor unit system address on main bus line (1 – 30)
YY = Outdoor unit sub-bus address (1)

The locations where ①, ② and ③ are displayed are shown in Fig. 4

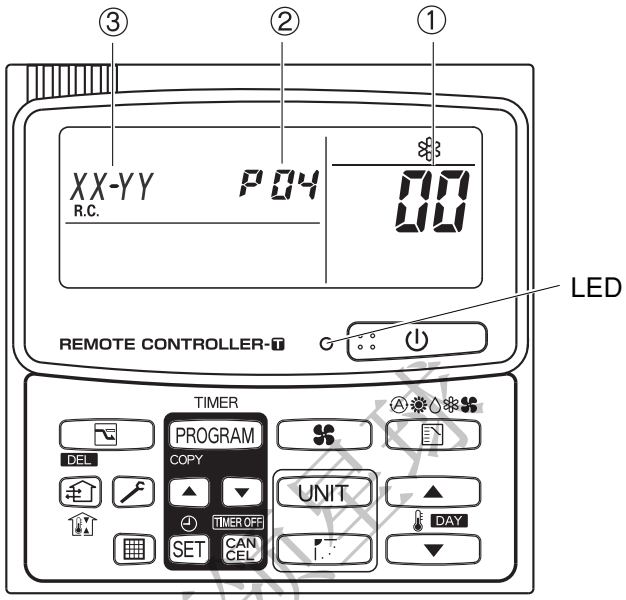
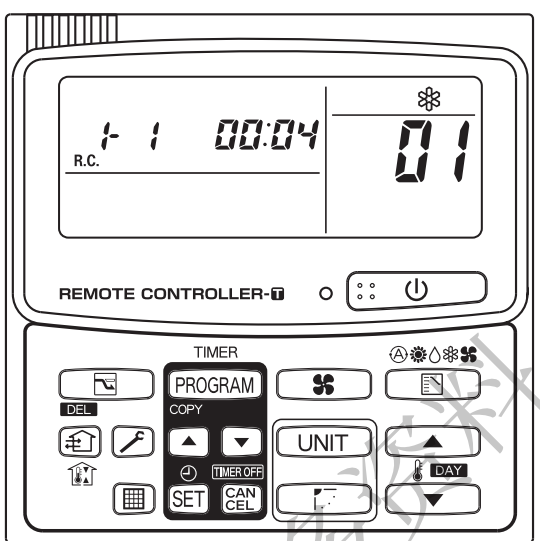


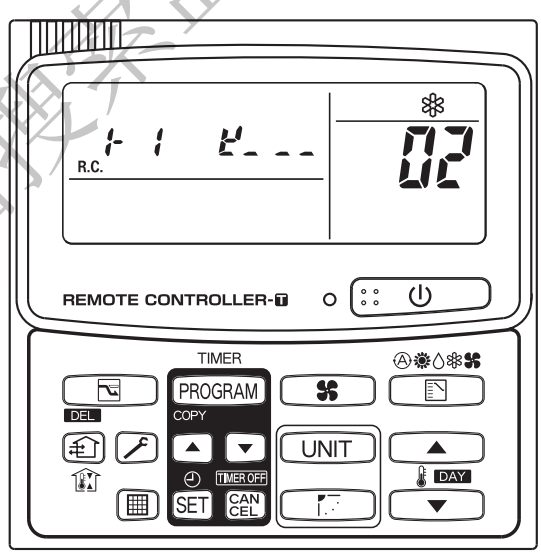
Fig. 4

Sample displays (Fig. 5, Fig. 6)



01 : <No. of connected indoor units>
4 units connected

Fig. 5



02 : <Indoor Unit Nos. 1, 2, 3, 4 connected>

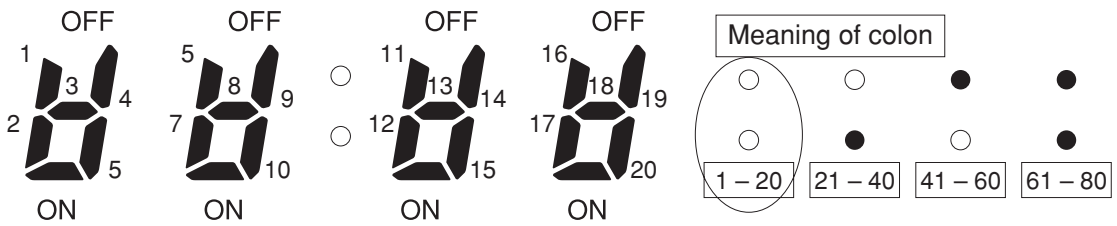
Fig. 6

6

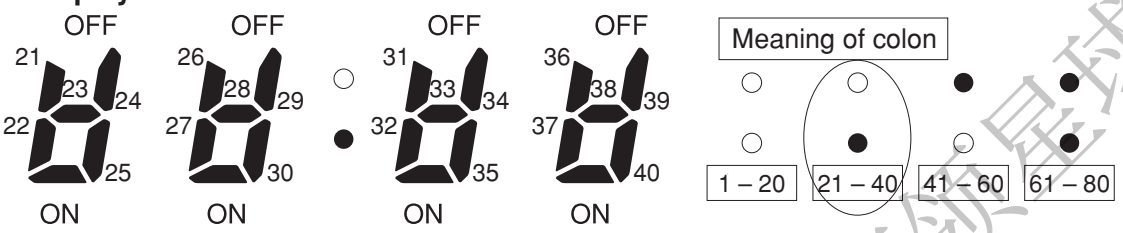
■ Concerning the 7-segment 4-digit display of remote controller timer time

The unit Nos. of connected units are indicated by four 7-segment digits (88 : 88) and a colon.

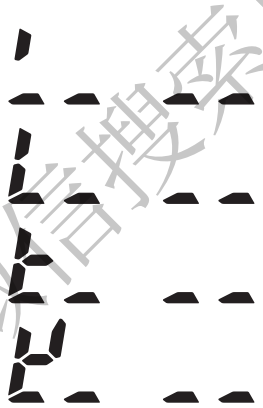
- **Display of unit Nos. 1 – 20**



- **Display of unit Nos. 21 – 40**



- The meaning of the colon changes in the same way to indicate unit Nos. up to 80.
- Sample displays of connected indoor unit Nos.
  - Display of unit No. 1
  - Display of unit Nos. 1 and 2
  - Display of unit Nos. 1, 2, and 3
  - Display of unit Nos. 1, 2, 3, and 4



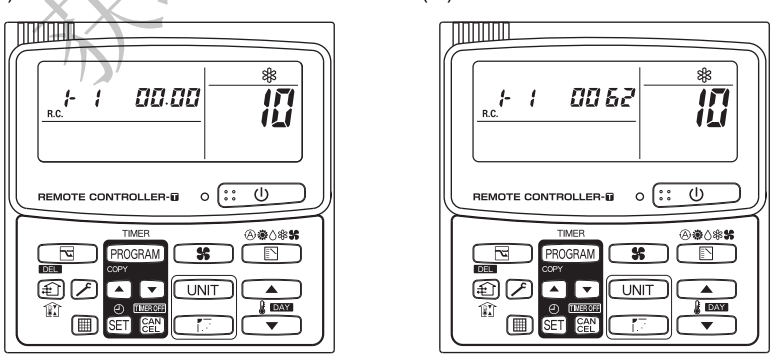
NOTE

The change of the colon display (between unit Nos. 1 – 20 to unit Nos. 21 – 40) occurs automatically every 10 seconds. (However the display does not change if there are no higher-number units connected.) To change the display to the higher-number units before 10 seconds have passed, press the (FLAP) button.

■ An 8-digit display is used for display of the compressor total operating time (in 1-hour units).

- When the first 4 digits are displayed, the bottom dot of the colon is illuminated. (Figure (A))
- When the last 4 digits are displayed, the colon dot is OFF. (Figure (B))
- The display of the first 4 digits and last 4 digits changes automatically after 10 seconds. The display can also be changed by pressing the (FLAP) button.

(A) (B)



10 : <Compressor total operating time>: (A) and (B) are displayed alternately (The example here (0000, 0062) indicates 62 hours.).

NOTE

The remote controller check function does not function with the outdoor unit maintenance remote controller (when it is connected to the outdoor unit).

Displays the indoor unit and outdoor unit sensor temperatures.

<Operating procedure>

① Press and hold the (CHECK) and (CANCEL) buttons simultaneously for 4 seconds or longer to engage temperature monitor mode.

During temperature monitoring, (CHECK) illuminates.

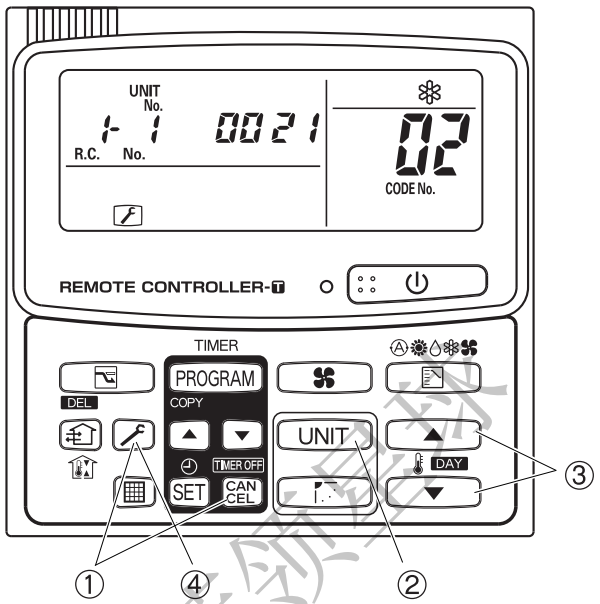
(The display and operations are the same as for monitor mode using the indoor unit remote controller.)

② Press the UNIT (UNIT) button and select the indoor unit to monitor.

③ Press the temperature setting ▲ / ▼ buttons and select the item code of the temperature to monitor.

The unit No. of the selected indoor unit, and the temperature data, are displayed.

④ To end monitoring, press the (CHECK) button. Return to normal display mode.



NOTE

The display does not blink.

■ Display of unit No. 1 (main unit)

DN	Description	Remarks	
02	Intake temp.	°C	
03	E1	°C	
04	E2	°C	
05	E3	°C	**Indoor unit**
06	Discharge temp.	°C	
07	Discharge temp. setting	°C	
08	Indoor unit electronic control valve position	STEP	
0A	Discharge temp. 1	°C	
0C	High-pressure sensor temp.	°C	
0d	Heat exchanger gas 1	°C	
0E	Heat exchanger liquid 1	°C	
11	Outdoor air temp.	°C	**Outdoor unit**
12	Not used		
13	Inverter primary current	A	
15	MV1 pulse		
19	Actual operating frequency	Hz	

5. Outdoor Unit Alarm History Monitor

Recalls and displays the outdoor unit alarm history.

NOTE

- This is for the outdoor unit only. Indoor unit alarms cannot be recalled.
- The indoor unit alarm history can be viewed on the indoor unit remote controller or other controller.

<Operation procedure>

① Press and hold the (CHECK) button and (SET) button simultaneously for 4 seconds or longer to engage outdoor unit alarm history mode.

During temperature monitoring, (CHECK) illuminates.

② Press the temperature setting ▲ / ▼ buttons and select the item code for the alarm history. The selected outdoor unit address, the item code, and the alarm history (alarm data) are displayed.

The outdoor unit address is displayed as R.C. XX – YY.

(R.C. XX = Outdoor unit system address)

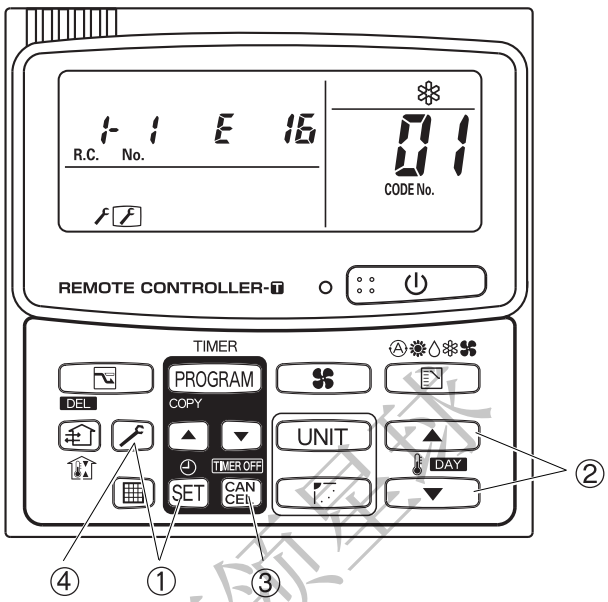
YY = Outdoor unit sub-bus address (always “1” for Mini ECO-i units)

Unit codes 01 – 08 are displayed. 01 indicates the most recent alarm.

The alarm history displays the alarm code. (If no alarms are present, then -- -- is displayed.)

③ To clear the alarm history, press the (CANCEL) button. (The outdoor unit alarm history will be cleared.)

④ To exit, press the (CHECK) button. Return to normal display mode.



6

This function is used to make the outdoor unit EEP-ROM settings.

■ **Setting mode 1**

① Press the [🔧] (CHECK) button and the [🏠] (VENTILATION) button simultaneously for 4 seconds or longer.

② Press the temperature setting [▲] / [▼] buttons to change the item code. The item codes and setting data are shown in the table below.

③ Press the timer time [▲] / [▼] buttons to change the setting data.

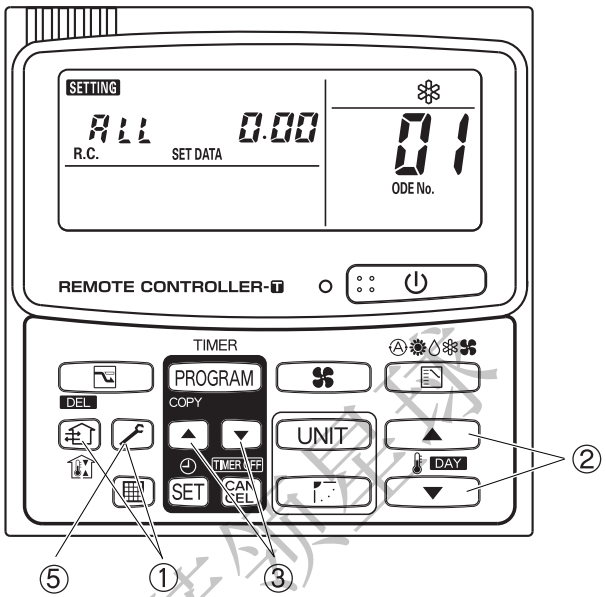
To confirm the changed setting data, press the [SET] (SET) button.

(At this time, the **SETTING** (SETTING) display stops blinking and remains lit.)

④ **SETTING** (SETTING) blinks when this mode is engaged, and "ALL" appears in the outdoor unit address section. The item code number (values shown in the table below) and the corresponding setting data (6 digits) are also displayed. (The 6 digits of the setting data are displayed by changing between the first 3 digits (Fig. A) and the last 3 digits (Fig. B). When the first 3 digits are displayed, the bottom dot of the colon is illuminated.)

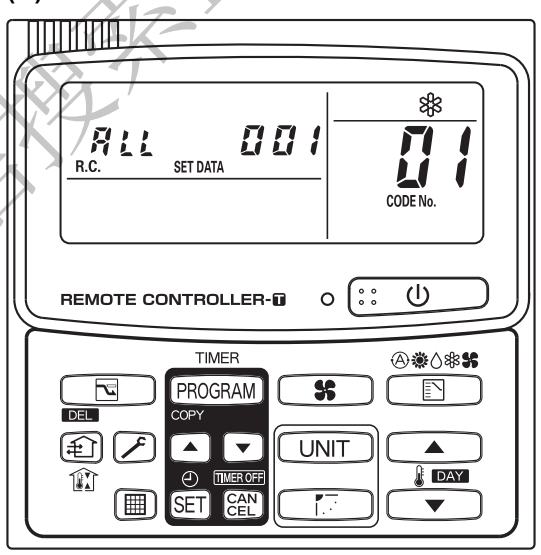
⑤ To exit setting mode, press the [🔧] (CHECK) button. Return to normal display mode.

(A)



(A) and (B) are displayed alternately.

(B)



DN	Parameter	Description
04	Snowfall sensor usage	0 = Sensor input not present. Control is performed. 1 = Sensor input present. Control is performed. 2 = Sensor input not present. Control is not performed. 3 = Sensor input present. Control is not performed.
05	Outdoor unit fan Quiet mode	0 = Disabled 1 = Quiet mode 1 2 = Quiet mode 2 3 = Quiet mode 3 4 = Quiet mode 4
18	Energy Saving mode	0 = None 1 = Discharge temp. control only (Mode 3) 2 = Demand only (Mode 2) 3 = Discharge temp. control + Demand (Mode 1)
19	Energy saving operation plug	0 = Independent 1 = All indoor units linked
1A	Demand 1 current	0 = 0% 1 = 40 … 4 = 70 7 = 100 8 = 120 9 = 140 10 = 160 11 = 200 12 = –1 (no limit)
1b	Demand 2 current	0 = 0% 1 = 40 … 4 = 70 7 = 100 8 = 120 9 = 140 10 = 160 11 = 200 12 = –1 (no limit)

■ **Setting mode 2**

① Press the (CHECK) button, SET (SET) button and the CANCEL (CANCEL) button simultaneously for 4 seconds or longer.

② Press the temperature setting ▲ / ▼ buttons to change the item code. The item codes and setting data are shown in the table on the next page.

③ Press the timer time ▲ / ▼ buttons to change the setting data.

To confirm the changed setting data, press the SET (SET) button.

(At this time, the **SETTING** (SETTING) display stops blinking and remains lit.)

④ **SETTING** (SETTING) blinks when this mode is engaged, and the address of the outdoor unit that is being set "System XX-YY" (System XX = System address, YY = 1), the item code No. (values from the table in the next page), and the corresponding settings data (6 digits) are displayed. The item code number (values shown in the table in the next page) and the corresponding setting data (6 digits) are also displayed. (The 6 digits of the setting data are displayed by changing between the first 3 digits (Fig. A) and the last 3 digits (Fig. B). When the first 3 digits are displayed, the bottom dot of the colon is illuminated.)

⑤ To exit setting mode, press the (CHECK) button. Returns to normal display mode.

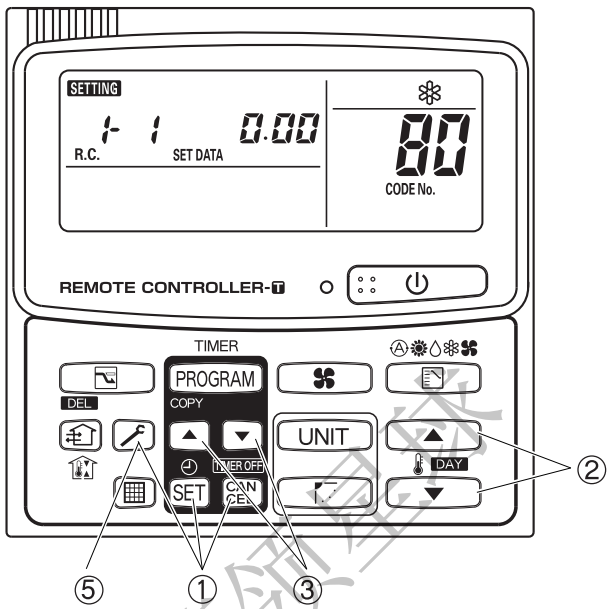
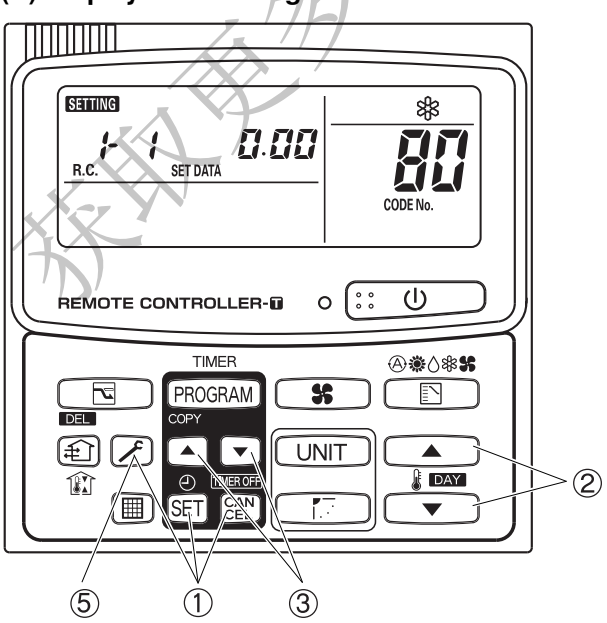
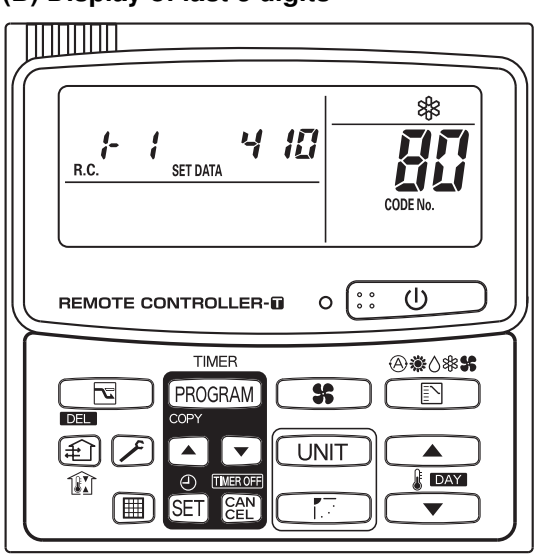


Fig. 7

(A) Display of first 3 digits



(B) Display of last 3 digits



: **Refrigerant type**: (A) and (B) are displayed alternately.
The example here (000, 410) indicates R410A.

DN	Parameter	Description
01	Outdoor unit capacity	0 = Disabled 22 25 28 32 36 40 45 50 56 63 71 80 90 100 112 125 140 160 180 200 224 250 280 340 355 400 450 500 560 600 630 670 710 800 840

* In the table above, 112, 140 and 160 respecteively refer to 365, 485 and 605 types.

7. REMOTE CONTROL FUNCTIONS

1-1. Remote Control (Interface Cable Between the Indoor Unit and the Remote Monitor)

- In the case of flexible control, operation is possible when the wiring is connected to any of the indoor units.

1-1-1. Control items

(1) Start/stop (input): . . . . . Starts and stops unit operation.
(2) Central/individual switching (input): . . . Selects central control (remote-controller prohibited) or individual control (remote controller permitted).
(3) Operating signal (output): . . . . . This signal is output during operation (Not output when an alarm occurs.)
(4) Alarm signal (output): . . . . . This signal is output when an alarm is active (serial communications trouble, indoor/outdoor unit protection device).

1-1-2. Control content

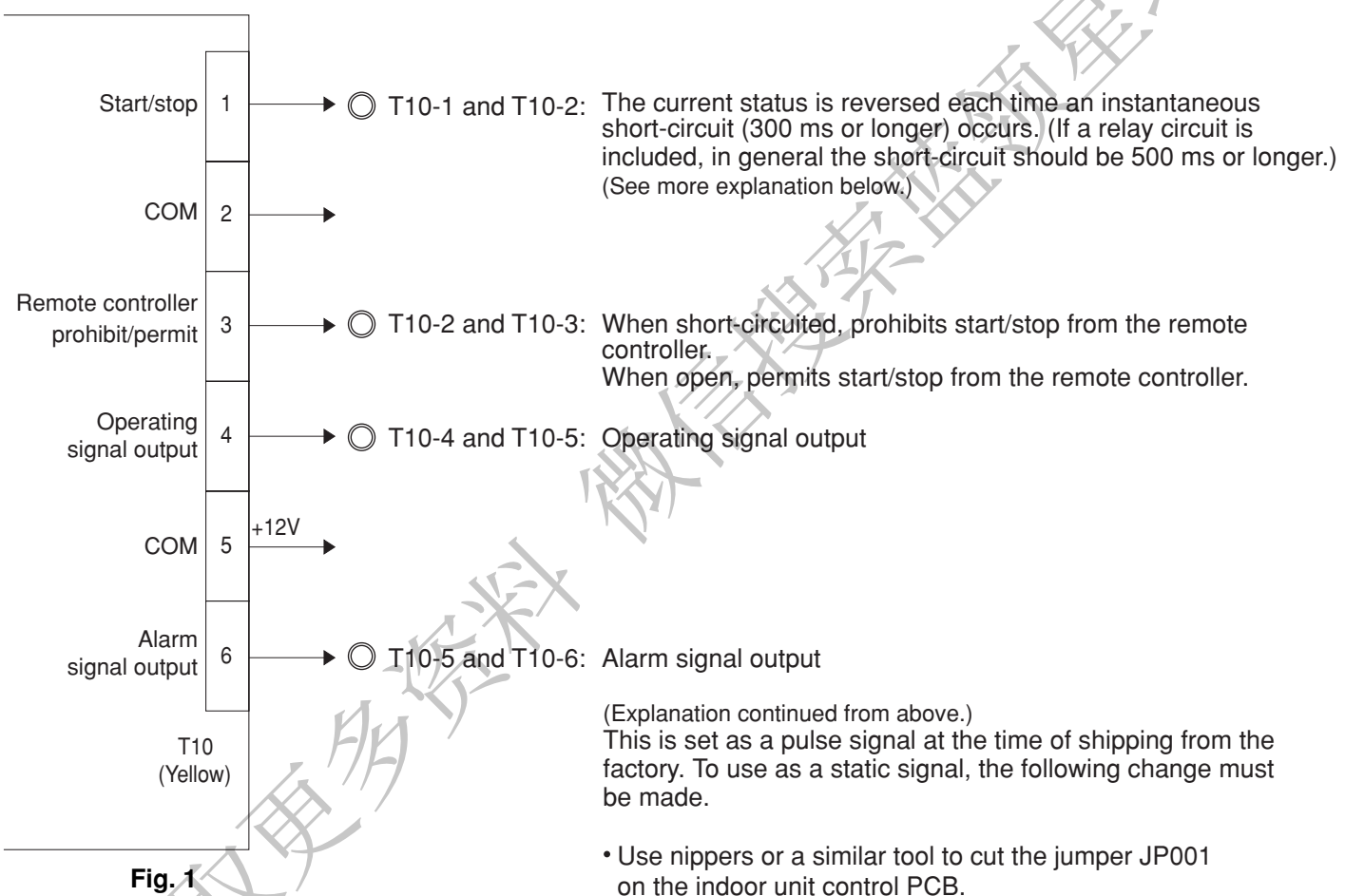


Fig. 1

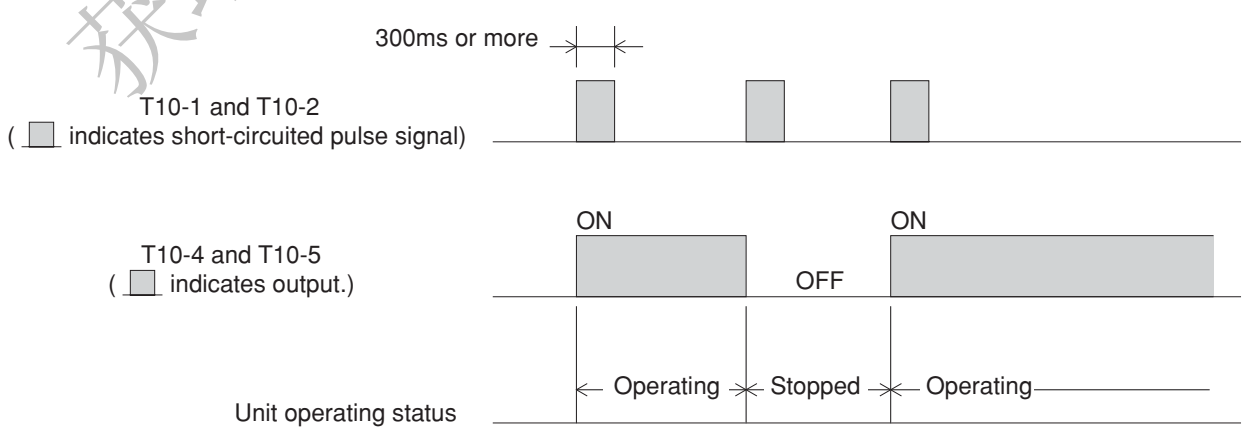


Fig. 2

1-1-3. Example of circuit wiring (using the operating signal for remote monitoring)

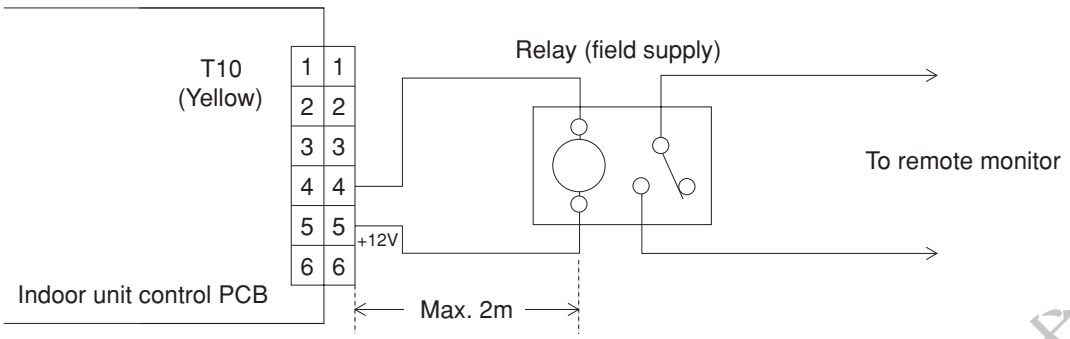


Fig. 3

NOTE

1. This cable includes the wiring from the indoor unit control PCB to the relay. The maximum wiring length is 2 m. Lead wire with 6P plug (Service part: Part code/623 182 1650)
2. Do not use a relay which includes a built-in diode.

1-2. OFF-Reminder Control

[Functions]

- This method is used to control the indoor units individually. Connect the wiring to the indoor unit control PCB.
- For group control, connect the wiring to the indoor unit (control PCB), then set item code 2E at the indoor unit where the wiring was connected.
- This can be used when external start control is not necessary, but external stop control is needed.
- If a card switch box, card lock, or similar device is used, this function can prevent cases in which the user forgets to turn OFF the indoor unit.
  - When the card is inserted, start/stop control from the remote controller is permitted.
  - When the card is removed, the indoor unit stops if it is operating, and start/stop control from the remote controller is prohibited.

1-2-1. Control items

(1) External contact ON: Start/stop control from the remote controller is permitted.
(Card is inserted into the card switch box.)

(2) External contact OFF: Indoor unit is forced to stop if it is operating. (Control by remote controller is prohibited.)
(Card is removed from the card switch box.)

* If the card switch box does not allow the above contact operation, replace with a relay that includes a “b” contact.

1-2-2. Procedure

Perform the following steps from the wired remote controller. *Perform when unit is stopped.

(1) Press and hold the [SET] (SET), [CANCEL] (CANCEL), and [CHECK] (CHECK) buttons for 4 seconds or longer.

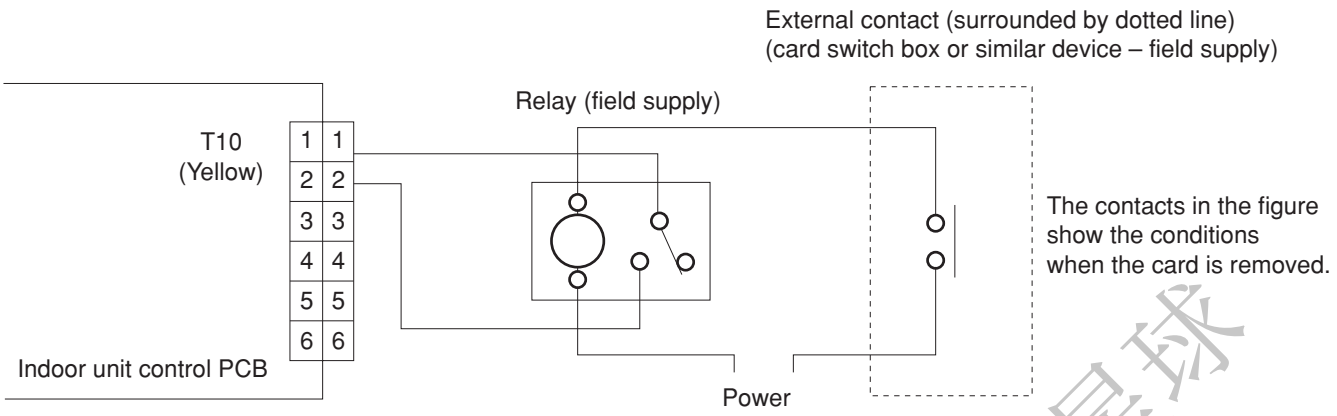
(2) Press the temperature setting [▲] / [▼] buttons and set item code 2E .

(3) Press the timer time [▲] / [▼] buttons and select 0001 for the setting data.

(4) Press the [SET] (SET) button.

(5) Press the [CHECK] (CHECK) button. (The remote controller returns to normal remote controller mode.)

1-2-3. Wiring



NOTE

The maximum wiring length from the indoor unit control PCB to the relay is 2 m.
Lead wire with 6P plug (Service part: Part code/623 176 6814)

1-3. Operating the ventilation fan from the remote controller

[Functions]

- Total heat exchangers and ventilation fans can be installed in the system and can be started and stopped from the wired remote controllers.
- The ventilation fan can be operated even when the indoor unit is stopped.
- Use a ventilation fan which can accept the no-voltage contact A as the external input signal.
- In the case of group control, all fans will operate together. They cannot be operated individually.

1-3-1. Procedure

Perform the following steps from the wired remote controller. *Perform when unit is stopped.

* Be sure to set at the main unit in the case of group control.

* In the case of group control, when a main unit is set, then it becomes possible to operate both the main unit and sub units at the same time.

(1) Press and hold the [SET] (SET), [CANCEL] (CANCEL), and [CHECK] (CHECK) buttons for 4 seconds or longer.

* The unit No. which appears first is the indoor unit address of the main unit for group control.
At this time, the fan at the selected indoor unit turns ON.

(2) Each time the [UNIT] (UNIT) button is pressed, the display changes to the next indoor unit No. for group control.

* At this time, the fan at the selected indoor unit turns ON.

(3) Press the temperature setting [▲] / [▼] buttons and set item code 31 .

(4) Press the timer time [▲] / [▼] buttons to select the setting.
(The setting is 0000 at the time of shipment.)
The setting data is as shown below.

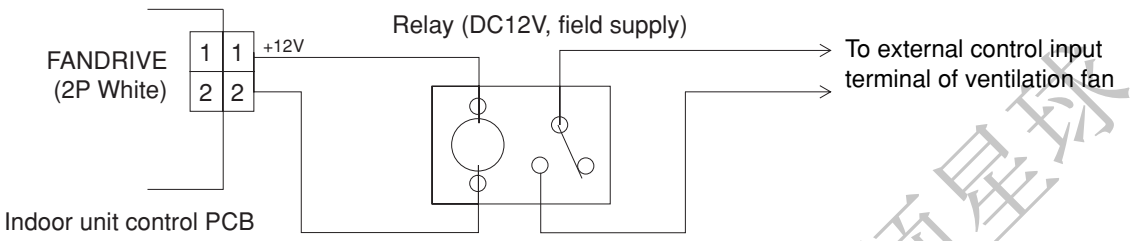
Setting data	Operation of the total heat exchanger or ventilation fan
0000	Cannot be used (setting at time of shipment).
0001	Can be used.

(5) Press the [SET] (SET) button. (OK when display appears.)

To change the selected indoor unit, go to step (2).
To change the setting item, go to step (3).

(6) Press the [✓] (CHECK) button to return to normal stopped status.

1-3-2. Wiring



NOTE

1. This cable includes the wiring from the indoor unit control PCB to the relay. The maximum wiring length is 2 m. Lead wire with 6P plug (Service part: Part code/623 162 4435)
2. Do not use a relay which includes a built-in diode.

Procedures and Technical Points for Test Run

Warnings and Cautions

The precautions given in this manual consist of specific “Warnings” and “Cautions.” They provide important safety-related information and are important for your safety, the safety of others, and trouble-free operation of the system. Be sure to strictly observe all safety procedures. The labels and their meanings are as described below.

⚠ Warning — This symbol refers to a hazard or unsafe procedure or practice which can result in severe personal injury or death.

⚠ Caution — This symbol refers to a hazard or unsafe procedure or practice which can result in personal injury or product or property damage.

* After installation is completed, perform a test run to check for operating trouble. As you do, use the central control device Operation Manual and explain operating procedures to the customer. Then request that the customer store the Procedures and Technical Points for Installation of LonWorks Interface (Electrical Work) together with the central control device Operation Manual.

⚠ Warning

* Be sure to arrange installation from the dealer where the system was purchased or using a professional installer. Electric shock or fire may result if an inexperienced person performs any installation or wiring procedures incorrectly.
* Only a qualified electrician should attempt to connect this system, in accordance with the instructions in “technical standards related to electrical design,” “local wiring regulations,” and this manual. Electric shock or fire may result if electrical work is not correctly done.

ELECTRICAL WIRING REQUIREMENTS

Precautions regarding electrical wiring

* Use a dedicated electrical circuit. If the electrical circuit capacity is insufficient a danger of electric shock and fire may be present.
* Use the specified cables (type and wiring diameter) for the electrical connections, and connect the cables securely. Run and fasten the cables securely so that external forces or pressure placed on the cables will not be transmitted to the connection terminals. Overheating or fire may result if connections or attachments are not secure.

⚠ Caution

* Depending on the installation conditions and location, an earth leakage breaker may be required.
  If an earth-leakage breaker is not installed, there is a danger of electric shock or fire.

2. Outdoor Parallel I/O Interface (ACC-XSP4U1G(B))

1. Installing the Outdoor Parallel I/O Interface

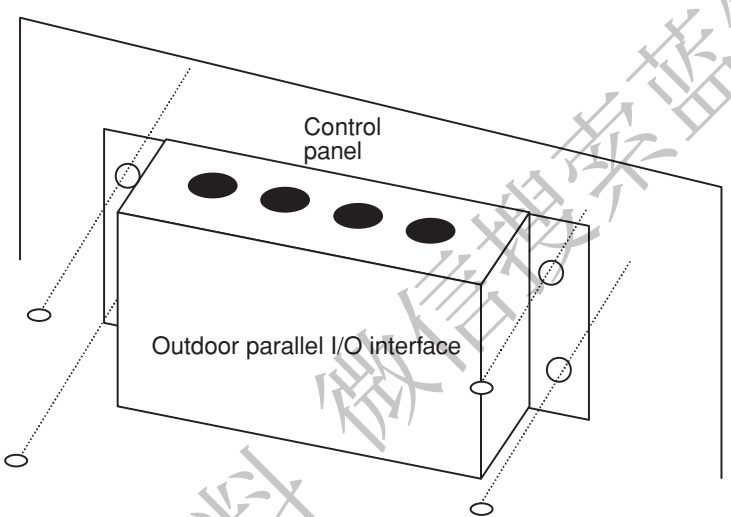
<Note 1> Do not run the indoor/outdoor control lines, input/output lines, and power cables through the same conduit, or place the cables near one another. Doing so can cause malfunction.

<Note 2> Install the outdoor parallel I/O interface away from any sources of electrical noise.

<Note 3> Avoid installing in any locations where the interface may come into contact with water, in locations where water accumulates, or in any extremely humidlocations.

<Note 4> Avoid installing in any location that is subject to excessive vibration or physical impacts.

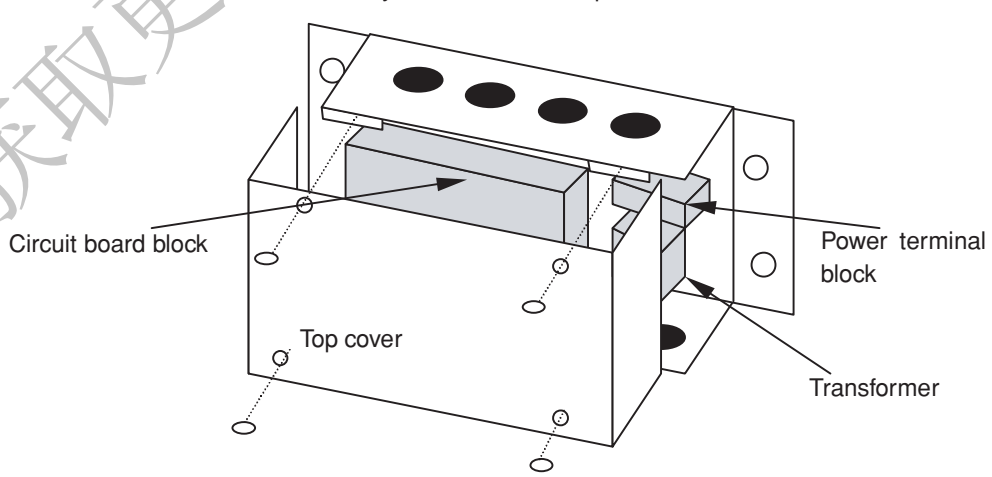
Note that when the outdoor parallel I/O interface is used incorporated in the control panel, it is necessary to make local procurement of the control panel that can accommodate required number of the outdoor parallel I/O interface unit.



2. Wiring for the Outdoor Parallel I/O Interface

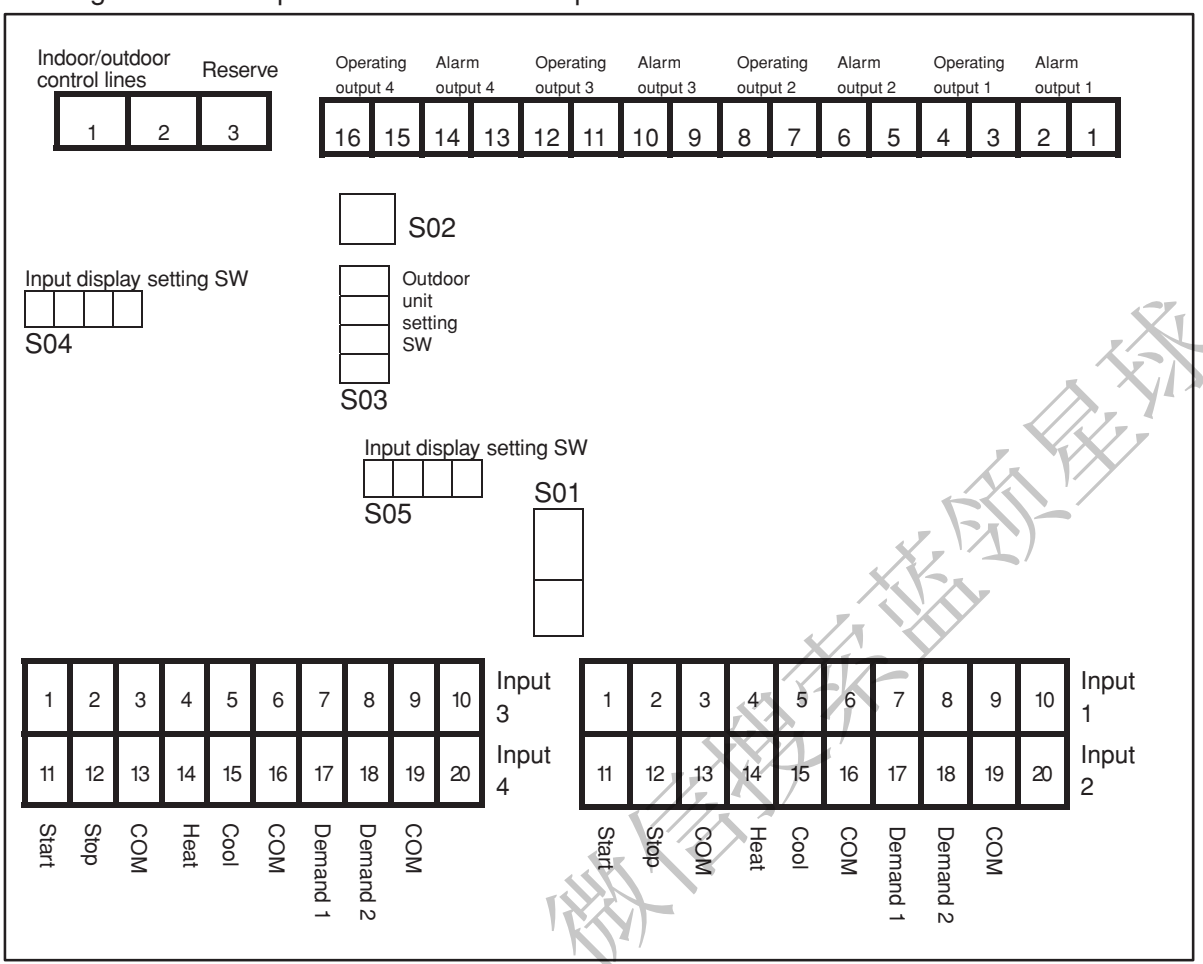
For safety, turn off the main power supply (breaker) before installing or removing theoutdoor parallel I/O interface.

Remove the 4 screws from the body and remove the top cover.



2. Outdoor Parallel I/O Interface (ACC-XSP4U1G(B))

<Arrangement of components on the outdoor parallel I/O interface board>



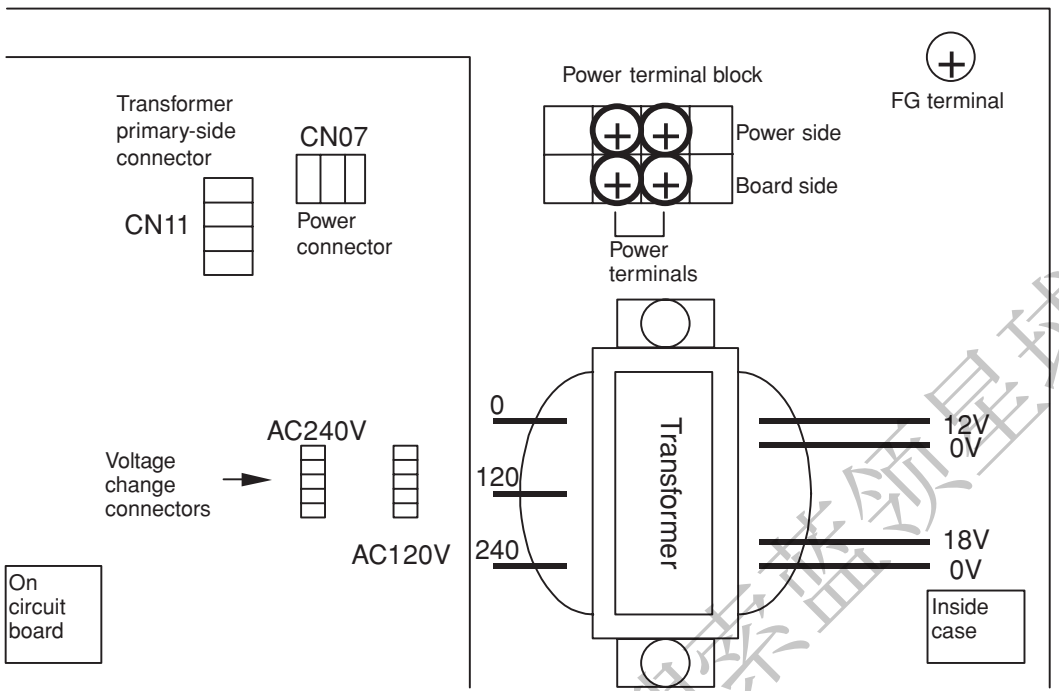
(1) Connecting the power

This interface can use either AC 110-120V power or AC 220-240V power. Insert thetransformer primary-side (red 5P connector) into either the AC 110V CN (red connectorlabeled “AC 110V”) or the AC 220V CN (red connector labeled “AC 220V”) on theACC-XSP4U1G board. Check the power voltage that will be used before changing it. It is initially set for AC 220V power.

Caution

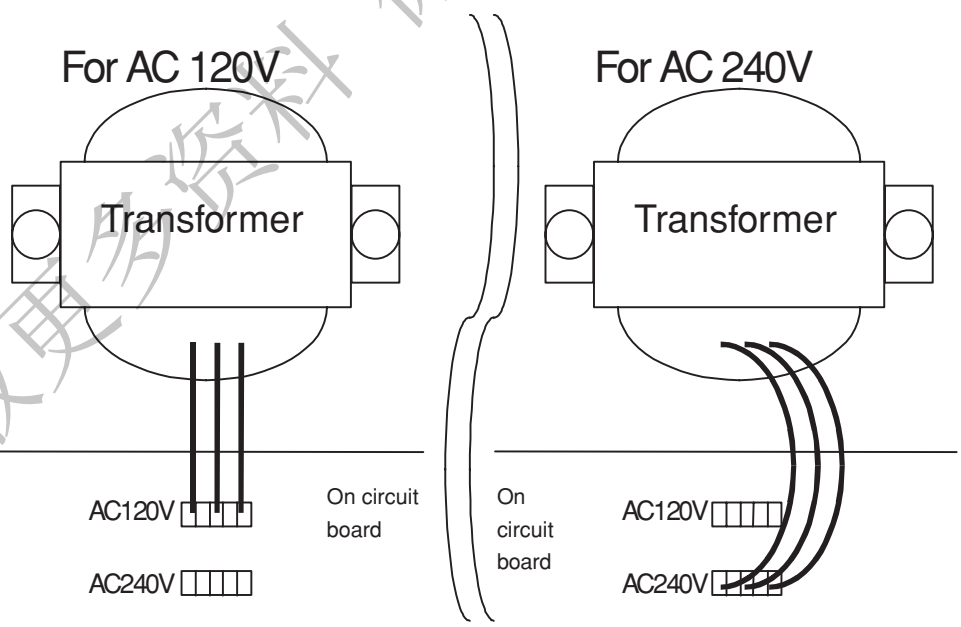
- Be careful: If the combination of the power voltage and the transformer primary-side selection is incorrect, the interface may be damaged.
- Turn the power off before changing the connector.
- This is a high-voltage circuit, and there is danger of electric shock. Do not touch the circuit when the power is on.
- Do not touch the power connector or any other protruding metal parts when the power is on.

<Arrangement of transformer, power connector, and terminal block>



Changing the voltage:

- For AC 120V specifications, connect the 5P connector from the transformer to the AC 120 V side, as shown in the figure below. (Because of the danger of electric shock, turnthe power off before changing the connector.)



(2) Connecting the outdoor parallel I/O interface and the indoor/outdoor control lines

- Use the indoor/outdoor control lines to connect the outdoor parallel I/O interface to the A/C units.
- For the indoor/outdoor control lines, use twin-core 0.5 – 2 mm_2 wires. (Maximum length 1 km.) There is no polarity to the signal wires.Do not use the same cable for the indoor/outdoor control lines and power cables. Do not run them through the same conduit or place the cables near one another. For theindoor/outdoor control lines, use signal wires that are clearly differentiated from the power cables.

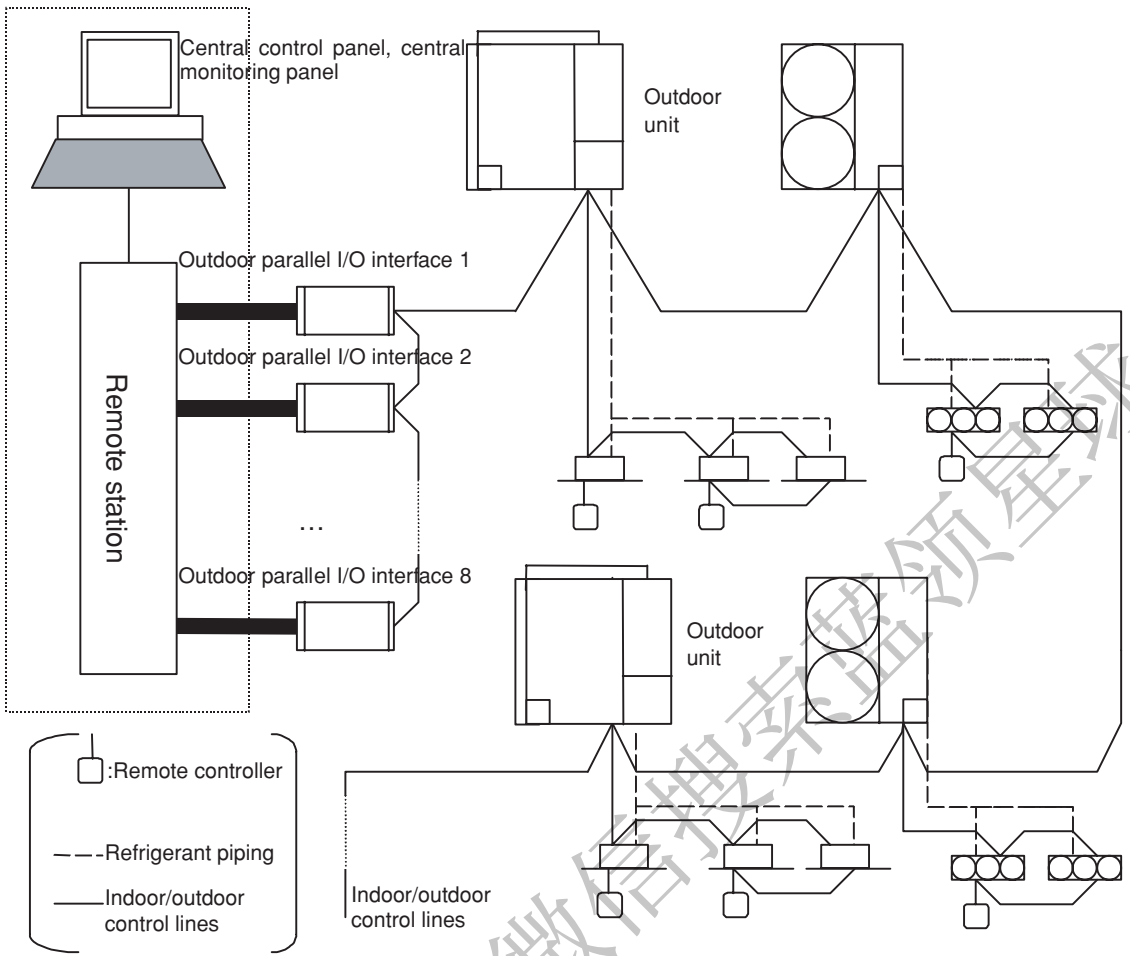
<Signal wire type> Thickness: 0.5 – 2.0 mm^2

- CCV (JIS C3401) Vinyl-insulated vinyl-sheath control cable
- VCTF (JIS C3306) Vinyl cabtyre round cable
- VCT (JIS C3401) 600V vinyl cabtyre cable
- VVR (JIS C3342) Vinyl-insulated vinyl-sheath round cable
- MVVS Braided shielded instrumentation cable
- CPEVS Shielded polyethylene-insulated vinyl-sheath cable

<Basic wiring diagram>

- The diagram below shows a sample wiring arrangement of indoor/outdoor control lines for the outdoor parallel I/O interface.
- One system can include a maximum of 30 connected outdoor units and 64 connected indoor units.
- One outdoor parallel I/O interface can be connected to a maximum of 4 outdoor units in 1 system. A maximum of 8 outdoor parallel I/O interfaces can be connected to control up to 30 outdoor units.

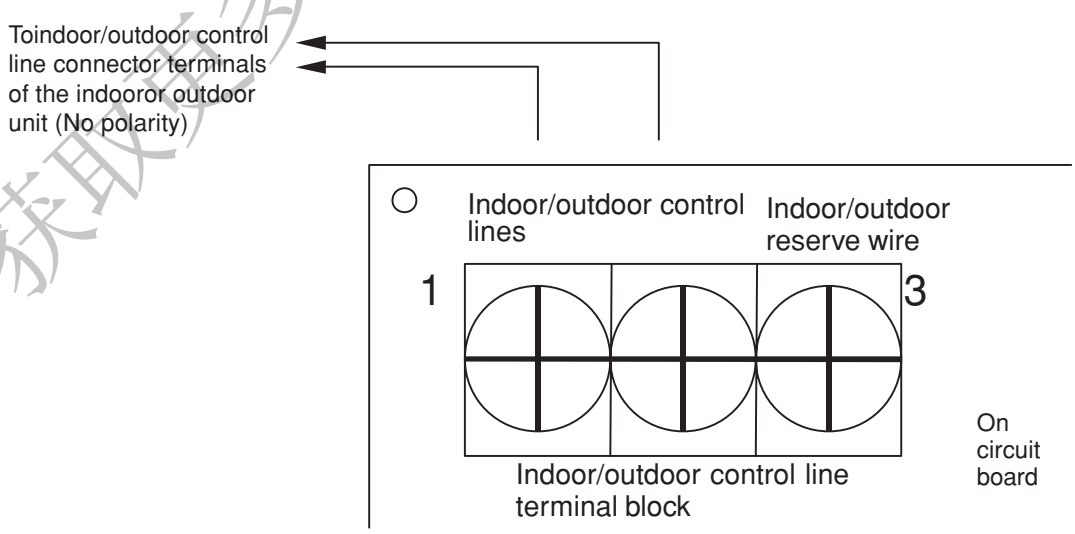
2. Outdoor Parallel I/O Interface (ACC-XSP4U1G(B))



<Wiring procedure>

• Indoor/outdoor control lines

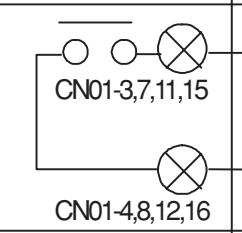
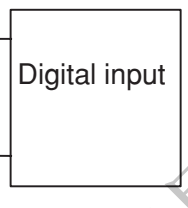
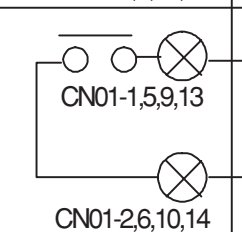
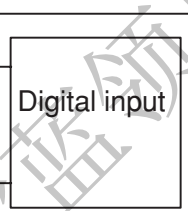
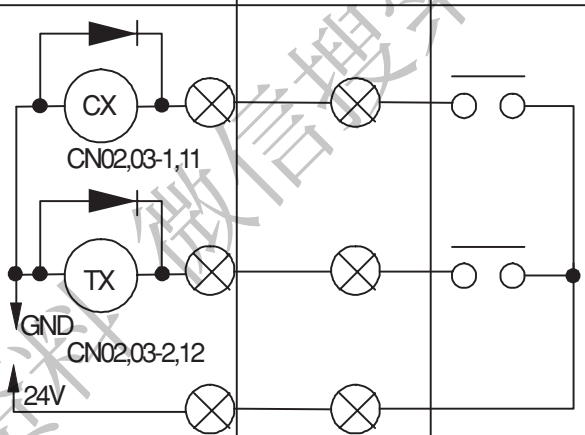
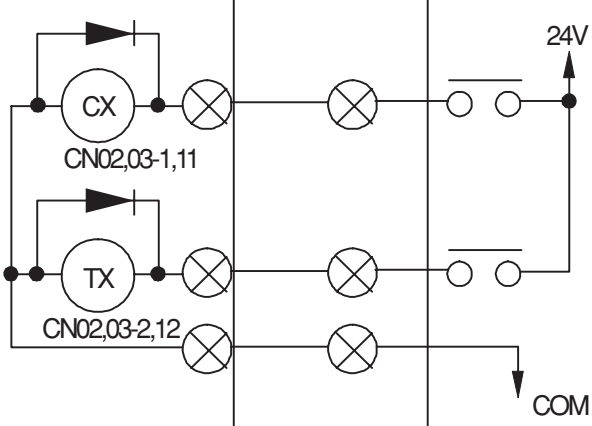
Connect the indoor/outdoor control line connector terminals for the indoor or outdoor unit to CN05 1 and 2 on the board's indoor/outdoor control line terminal block (for communications).

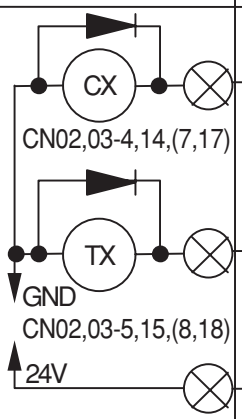
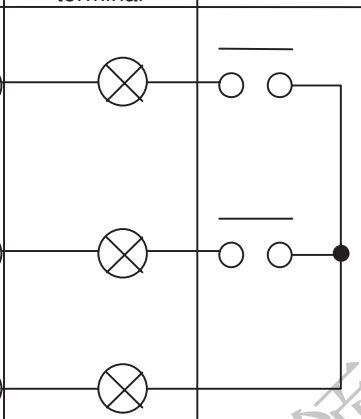
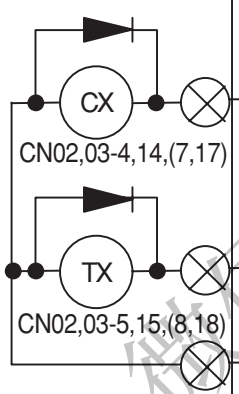
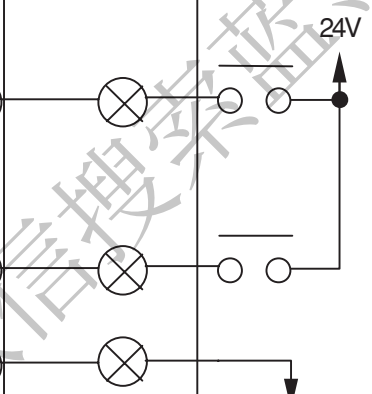


7

Check that the power cable (AC 120/240V) has not been wired to the indoor/outdoor control line terminal block. If power is accidentally applied here, the board fuse (F01) will blow in order to protect the circuit board. After correcting the power cable connection, wire by connecting the indoor/outdoor control line to CN05 1 to 3 (using the indoor/outdoor reservewire).
(Be sure to turn the power off before beginning work.)

(3) Connections between the outdoor parallel I/O interface and external connectors (centralcontrol panel, central monitoring panel)

Name	Input/output item	Outdoor parallel I/O interface side		Equipment (central control panel, central monitoring panel) side		
		Input/output condition	Treminal No.	Separation terminal	Sample circuit	Input/output condition
Contact input/output terminal	Status output	Operating output 1 - 4 No-voltage a-contact output Allowable contact voltage and current: 30 V, 1 A Minimum applied load: 1V, 1 mA				Response time for start/stop input: Max. 20 s
		Alarm output 1 - 4 No-voltage a-contact output Allowable contact voltage andcurrent: 30 V, 1 A Minimum applied load: 1V, 1 mA				Response time for start/stop input: Max. 20 s
	Control input	All-start input (pulse/static) Photocoupler input Allowable contact voltage and current: DC 24V, 10 mA Switch 01 is set as a no-voltage contact (setting when unit is shipped).				Pulse width: 300 ms or more No-voltage a-contact output
		All-start input All-stop input (pulse/static) Photocoupler input Allowable contact voltage and current: DC 24 V, 10 mA Switch 01 is set as DC 24 V contact.				Pulse width: 300 ms or more No-voltage a-contact output

Name	Input/output item	Outdoor parallel I/O interface side		Equipment (central control panel, central monitoring panel) side		
		Input/output	Terminal No.	Separation terminal	Sample circuit	Input/output condition
Contact input/output terminal	Control input (static)	Cool input Heat input (Demand 1, demand 2) Photocoupler input Allowable contact voltage and current: DC 24 V, 10 mA Switch 01 is set as a no-voltage contact (setting when unit is shipped).				Pulse width: 300 ms or more No-voltage a-contact output
		Cool input Heat input (Demand 1, demand 2) Photocoupler input Allowable contact voltage and current: DC 24 V, 10 mA Switch 01 is set as DC 24 V contact.				Pulse width: 300 ms or more No-voltage a-contact output

Note: Demand 1 and 2 (shown in parentheses) are listed together because their structure is the same as cool/heat input.

- The length of digital signal wiring between the outdoor parallel I/O interface and the equipment side must be 100 m or less.

* Input terminal block table

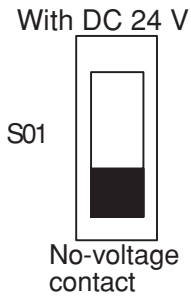
	Input 1	Input 2	Input 3	Input 4
All-start	CN 02 upper-level start COM	CN 02 lower-level start COM	CN 03 upper-level start COM	CN 03 lower-level start COM
All-stop	CN 02 upper-level stop COM	CN 02 lower-level stop COM	CN 03 upper-level stop COM	CN 03 lower-level stop COM
Cool	CN 02 upper-level cool COM	CN 02 lower-level cool COM	CN 03 upper-level cool COM	CN 03 lower-level cool COM
Heat	CN 02 upper-level heat COM	CN 02 lower-level heat COM	CN 03 upper-level heat COM	CN 03 lower-level heat COM
Demand 1/thermostat OFF	CN 02 upper-level demand 1/thermostat OFF COM	CN 02 lower-level demand 1/thermostat OFF COM	CN 03 upper-level demand 1/thermostat OFF COM	CN 03 lower-level demand 1/thermostat OFF COM
Demand 2/remote-controller inhibit	CN 02 upper-level demand 2/remote-controller inhibit COM	CN 02 lower-level demand 2/remote-controller inhibit COM	CN 03 upper-level demand 2/remote-controller inhibit COM	CN 03 lower-level demand 2/remote-controller inhibit COM

* Polarity for input wiring

	Input (start, stop, cool, heat, demand 1/thermostat OFF demand 2/remote-controller inhibit)	COM
S01-direction no-voltage contact	Because it is a no-voltage contact, there is no polarity.	Because it is a no-voltage contact, there is no polarity.
S01-direction DC 24 V contact	Positive	COM

3. Setting Switches

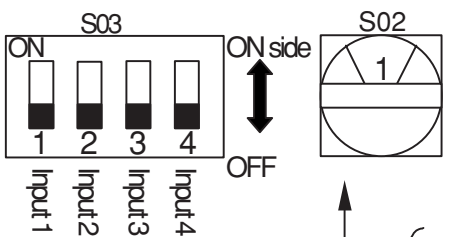
• Setting switch S01 (Change the voltage before turning on the power.)



• S01 (contact input voltage change SW) (Set as a no-voltage contact when unit is shipped.)

1. When using the input terminal as a no-voltage a-contact, set switch S01 to the no-voltage contact side.
2. When using the input terminal as a DC 24 V contact, set switch S01 to the DC 24 V voltage side.

• Setting switches S02 and S03



• S02 (outdoor SP address setting SW)
This switch sets the outdoor parallel I/O interface address. (Refer to *1.)

• S03 (outdoor unit setting SW)
This switch sets the connected outdoor units. Be sure to turn the SW to the ON side for each input that will be used. (Note: If input is turned OFF, no input or output occurs.)

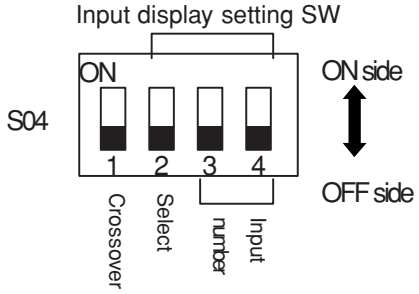
1: System addresses 1 - 4 2: System addresses 5 - 8
3: System addresses 9 - 12 4: System addresses 13 - 16
5: System addresses 17 - 20 6: System addresses 21 - 24
7: System addresses 25 - 28 8: System addresses 29 - 30
(0 is set the same as 1. 9 is set the same as 8.)

(*1) Relationship between the input/output terminal block (input/output 1 - 4) and the system address when S02 (outdoor SP address setting SW) is changed

S02 (outdoor SP address setting SW)	Input/output terminal block number				
	1	2	3	4	
1	1	2	3	4	System address (outdoor unit address)
2	5	6	7	8	
3	9	10	11	12	
4	13	14	15	16	
5	17	18	19	20	
6	21	22	23	24	
7	25	26	27	28	
8	29	30	30	30	

• Setting switch S04

Input display setting SW



• S04-1 (OFF when unit is shipped.)

Crossover	OFF	No crossover process (normal)
	ON	Crossover process performed (Connect only to terminal blockinput 1.)

* Crossover process: Performs the same process as if terminal block inputs 1 - 4 were wired across one another. (Processing proceeds as if inputs 2 - 4 were the same as input 1.) Even if there is crossover input, input and output operations are not performed if the S03 input is turned OFF.

• S04-2 (OFF when unit is shipped.)

Select	OFF	Displays the status of communications with the outdoor unit corresponding to LED 1 - 4.
	ON	Using the LED (6), displays the input status (start, stop, etc.) for the terminal block with the input numberselected.

• S04-3 and 4 input number selection: Select the input number to check.

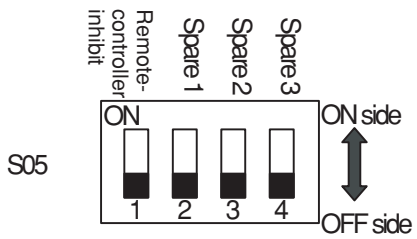
	S04-3	S04-4
Input 1	OFF	OFF
Input 2	OFF	ON
Input 3	ON	OFF
Input 4	ON	ON

* The following information is displayed by the LED, according to the settings of S04-2 (select) and S04-3 and 4 (input number).
(If the select switch is ON, the LED illuminate according to the signal that is being input at the input terminal block with the selected number.)

Select	OFF (normal)	ON (for checking input)
LED explanation	1 ○ 2 ○ 3 ○ 4 ○ ○ ○ Status of communications with the outdoor unit corresponding to each number Normal: Lit Trouble: Flashing	Start ○ Stop ○ Cool ○ Heat ○ Demand 1 ○ Demand 2 ○ Input present: Lit No input: Not lit

Note: If S04-2 (select) is ON, there are cases when communications errors may go unnoticed. Therefore, leave this switch OFF when checking normal communications.

• Setting switch S05

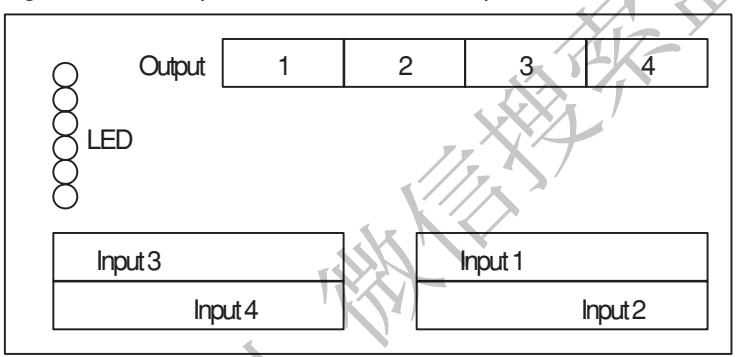


• S05-1 (OFF when unit is shipped.)
Changes the remote-controller inhibit switch input as shown below.

Remote-controller prohibit	OFF	Demand 1/demand 2
	ON	Thermostat OFF (*1)/remote-controller inhibit

*1 This input forces the thermostat to turn OFF (100% demand).

<Arrangement of components on the outdoor parallel I/O interface circuit board>

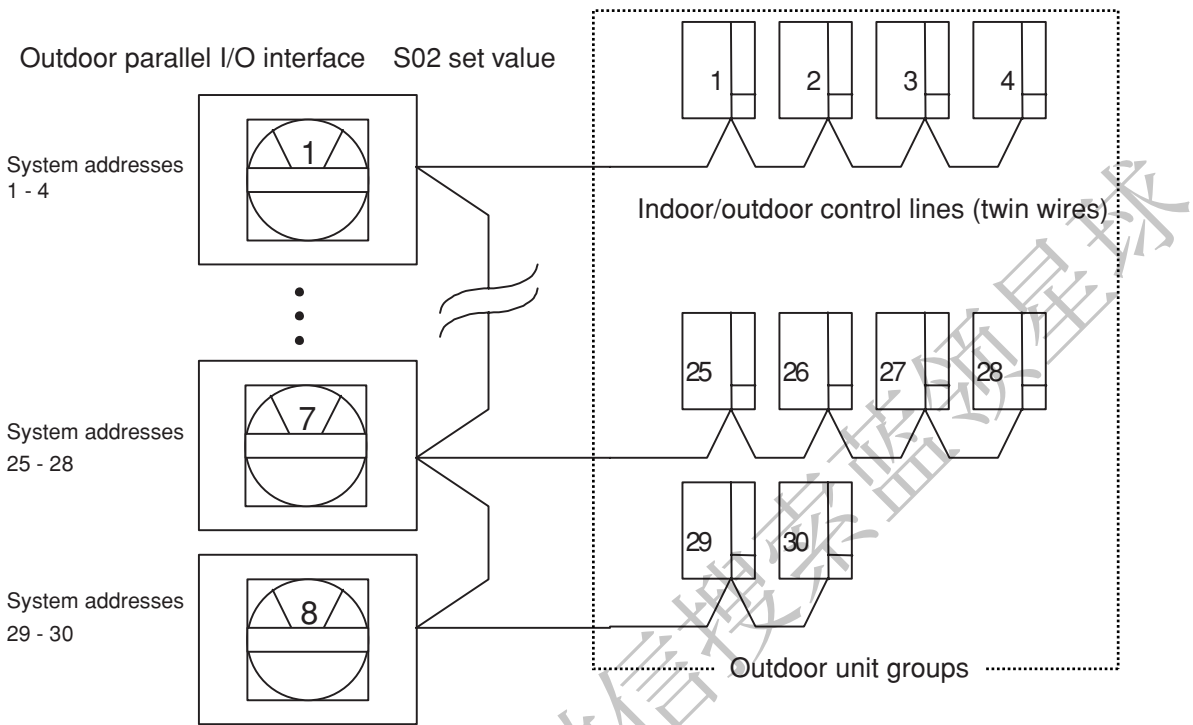


7

4. Detailed Explanation of Address Setting SW (S02)

The outdoor parallel I/O interface addresses must be set (S02) when connecting and using multiple outdoor parallel I/O interfaces.

* The example here shows 8 outdoor parallel I/O interfaces and 30 outdoor units connected.

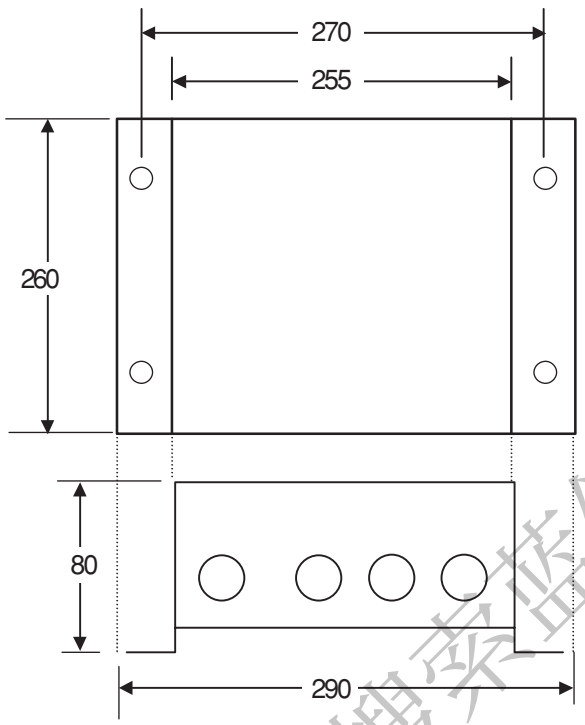


5. Test Run

1. Turn on the power to all A/C. Check that all test-runs are completed.
2. After the A/C test-runs are completed, follow the procedure below.
3. Turn on the power to the outdoor parallel I/O interface. (Complete settings before turning on the power.)
4. If there is no trouble with communications between the outdoor parallel I/O interface and the outdoor units, then generate all-start input from the outdoor parallel I/O interface. (Connect "Start" and "COM" on the input terminal block.) Check the operating lamps. Check all inputs in the same way. To check inputs, set the input number that you wish to check with settings switches S04-3 and 4 (input number switches). Then switch S04-2 (select switch) to ON and check the input. (Refer to 3. Setting Switches .)

• Approximately 3 minutes after trouble occurs in the communications between the outdoor parallel I/O interface and the outdoor units, the communications-check LEDs will begin flashing. When these LEDs are flashing, check and correct the communications line connections and power for the outdoor units which correspond to the flashing LEDs.

6. External Dimensions



H80 × W290 × D260

7. Product Specifications

Specifications

Rated voltage:	Single-phase 240/120V
Rated frequency:	50/60 Hz
Power consumption:	Approx. 30VA
Weight:	3.2 kg

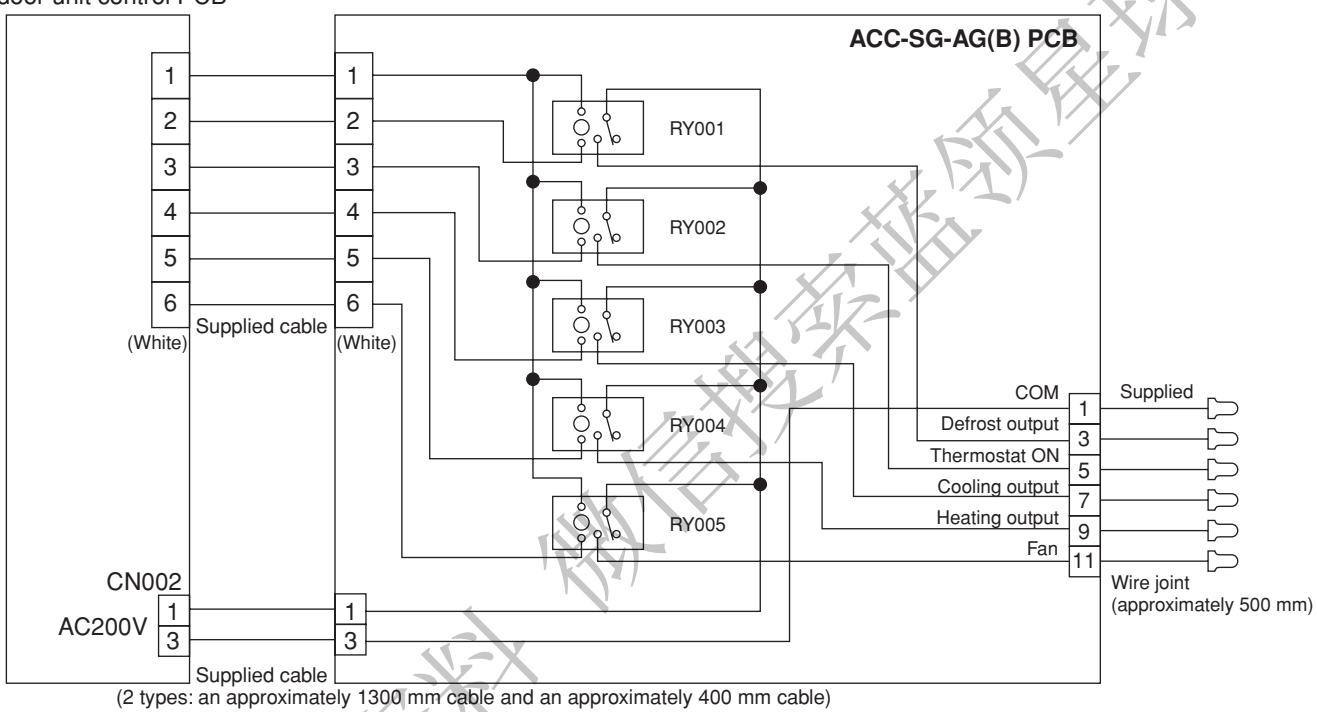
3. Obtaining the Signal from the Indoor Unit (ACC-SG-AG(B))

It is possible to output the following signals externally from the indoor unit control PCB, through the signal output PCB (ACC-SG-A) (purchased separately). For details concerning installation, refer to the manual provided with the product.
Depending on the purpose of use, the fan output may be switched. Refer to item code “3D” in the Remote Controller Functions Section.

Installing the relay PCB

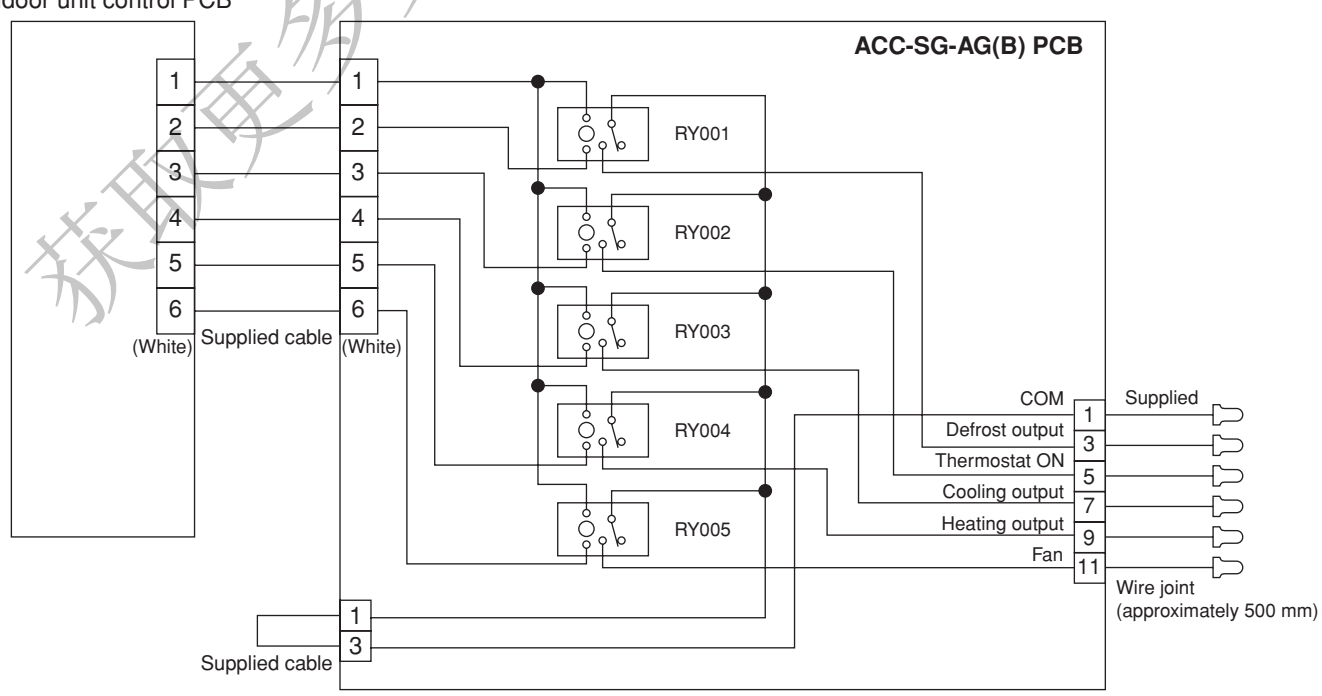
Install the PCB spacers (4) into the electrical component box, then install the signal output PCB and connect the provided lead wire (with connector). For details concerning installation, refer to the manual provided with the product.

(1) Voltage (AC 200 V) output



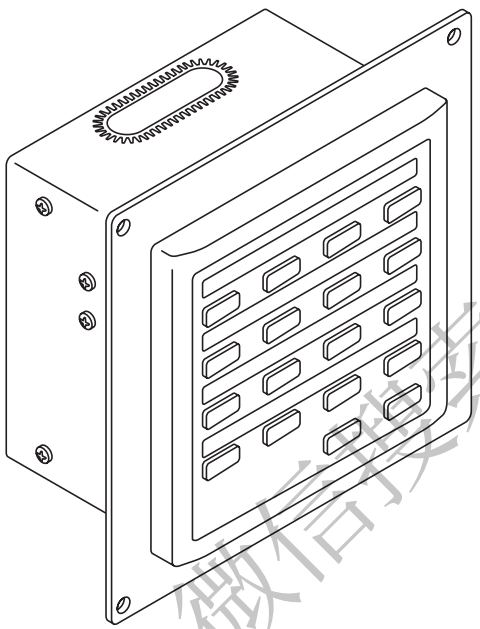
(2 types: an approximately 1300 mm cable and an approximately 400 mm cable)

(2) No-voltage output



(If this PCB is used together with the solenoid valve output PCB (ACC-3WAY-A), only no-voltage signal output is available.)

Save These Instructions!



SHA-KC16KAG(B)

INSTALLATION INSTRUCTIONS

Contents

Product Information

If you have problems or questions concerning your Air Conditioner, you will need the following information. Model and serial numbers are on the nameplate on the bottom of the cabinet.

Model No. SHA-KC16KAG(B) Serial No. _____

Date of purchase _____

Dealerís address _____

Phone number _____

DECLARATION OF CONFORMITY
This product is marked "CE" as it satisfies EEC Directive No. 89/336/EEC, 73/23/EEC and 93/68/EEC.
This declaration will become void in case of misusage and/or from non observance though partial of Manufacturerís installation and/or operating instructions.

Alert Symbols

The following symbols used in this manual, alert you to potentially dangerous conditions to users, service personnel or the appliance:

This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.

This symbol refers to a hazard or unsafe practice which can result in personal injury or product or property damage.

Installation Location

- We recommend that this ON/OFF controller be installed properly by qualified installation technicians in accordance with the Installation Instructions provided with the ON/OFF controller.

WARNING

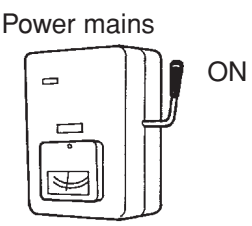
- Do not install this ON/OFF controller where there are fumes or flammable gases, or in an extremely humid space such as a greenhouse.
- Do not install the ON/OFF controller where excessively high heat-generating objects are placed.

Electrical Requirements

1. All wiring must conform to the local electrical codes. Consult your dealer or a qualified electrician for details.
2. Wiring must be done by a qualified electrician.

CAUTION

To warm up the system, the power mains must be turned on at least five (5) hours before operation. Leave the power mains ON unless you will not be using this appliance for an extended period.



Safety Instructions

- Read this booklet carefully before using this ON/OFF controller. If you still have any difficulties or problems, consult your dealer for help.
- The air conditioner is designed to give you comfortable room conditions. Use this only for its intended purpose as described in the Instruction Manual.

WARNING

- Never touch the unit with wet hands.
- Never use or store gasoline or other flammable vapor or liquid near the air conditioner – it is very dangerous.
- The air conditioner has no ventilator for intaking fresh air from outdoors. You must open doors or windows frequently when you use gas or oil heating appliances in the same room, which consume a lot of oxygen from the air. Otherwise there is a risk of suffocation in an extreme case.

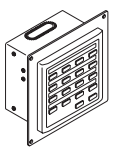
CAUTION

- Do not turn the air conditioner on and off from the power mains switch. Use the ON/OFF operation button.
- Do not stick anything into the air outlet of the outdoor unit. This is dangerous because the fan is rotating at high speed.
- Do not let children play with the air conditioner.
- Do not cool or heat the room too much if babies or invalids are present.

1. General

This booklet briefly outlines where and how to install the ON/OFF controller. Please read over the entire set of instructions for the indoor and outdoor units and make sure all accessory parts listed are with the controller before beginning.

NOTE Give these instructions to the customer after finishing the installation.

Part Name	Figure	Q'ty	Remarks
ON/OFF controller		1	
Tapping screw	Truss-head Phillips 4 × 16 mm 	4	For securing the system controller
Rawl plug		4	For securing the system controller
Manual		1	For installation
		1	For operation

2. Installation site selection

- Install the ON/OFF controller at a height of between 1 and 1.5 meters above the floor.
- Do not install the ON/OFF controller in a place where it will be exposed to direct sunlight or near a window or other place where it will be exposed to the outside air.
- Be sure to install the ON/OFF controller vertically, such as on a wall.

3. How to install the ON/OFF controller

CAUTION

- Do not twist the control wiring together with the power wiring or run it through the same metal conduit, because this may cause a malfunction.
- Install the ON/OFF controller away from sources of electrical noise.
- Install a noise filter or take other appropriate action if electrical noise affects the power supply circuit of the unit.

WARNING Do not supply power to the unit or try to operate it until the tubing and wiring to the outdoor unit is completed.

Overview of the ON/OFF controller

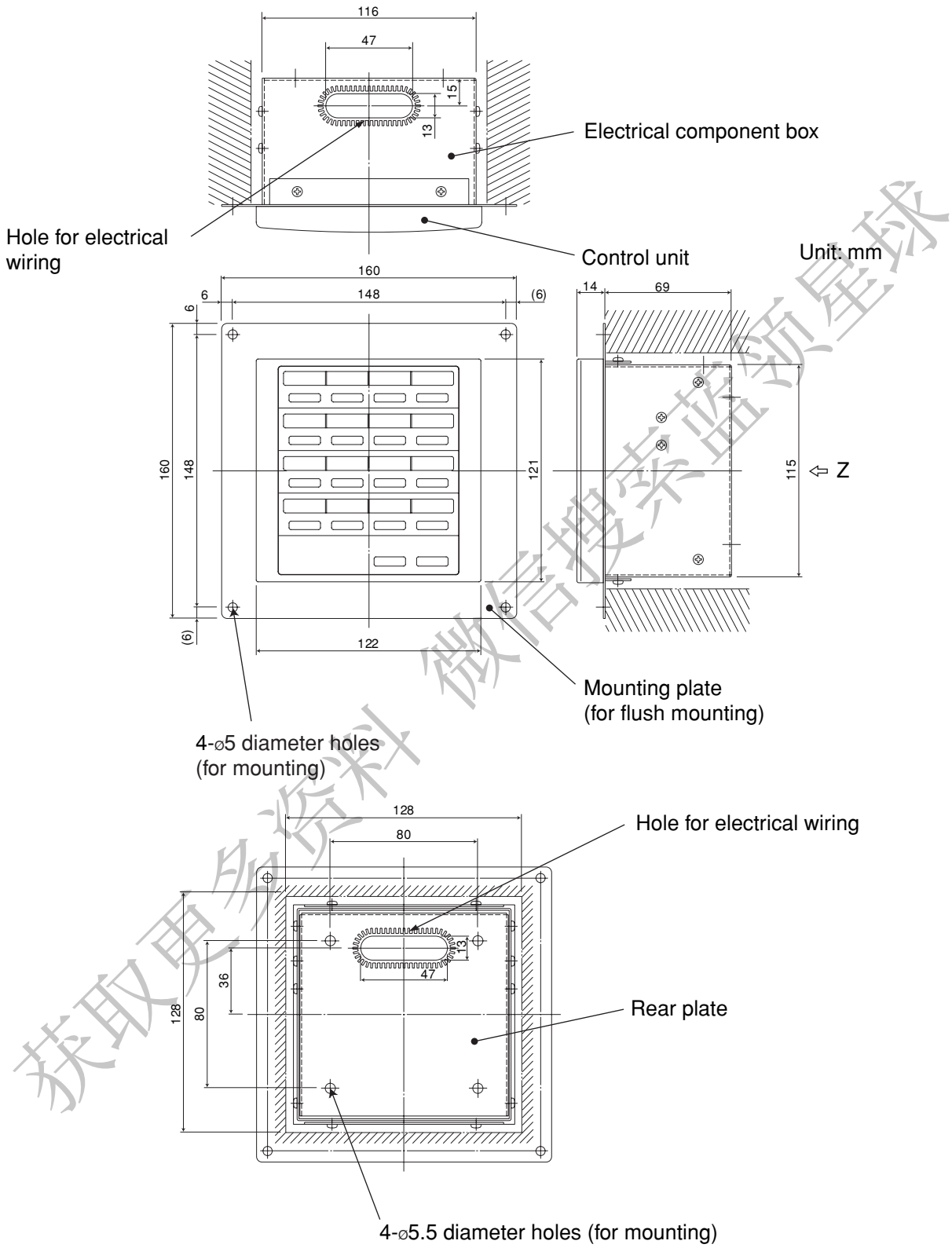
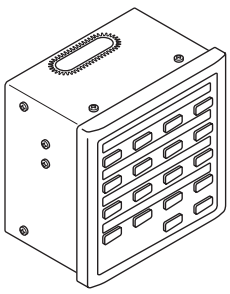


Fig. 1

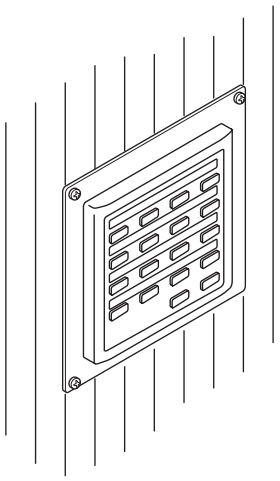
Z-view (back side)

* In order to mount the ON/OFF controller flush with the wall, an opening measuring 128 mm ×128 mm is necessary.

Installation procedure



a): Normal mounting



b): Flush mounting

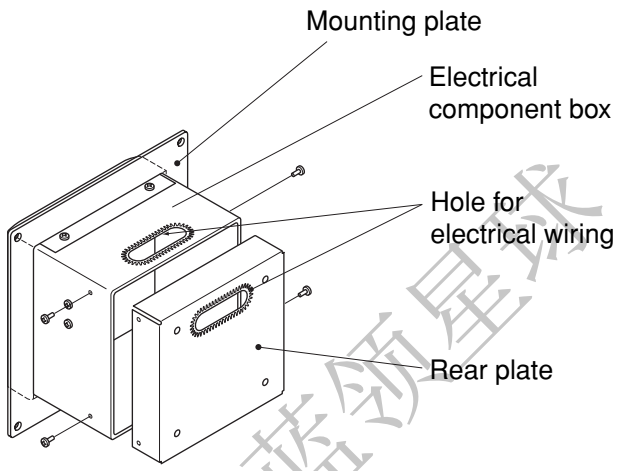
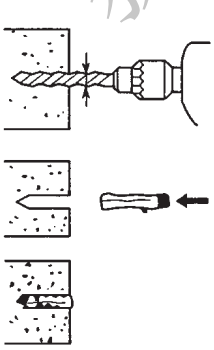


Fig. 2

1. Decide how the ON/OFF controller will be mounted: in the normal manner or flush with the wall.
   a) To mount the ON/OFF controller in the normal manner, remove the mounting plate. Then reattach the four screws to the electrical component box.
   b) To mount the ON/OFF controller flush with the wall, make an opening in the wall measuring 128 mm × 128 mm. The opening must be at least 85 mm deep as measured from the outside surface of the wall.

2. Remove the rear plate and connect the electrical wiring.
   1) Remove the four screws located on both sides of the rear plate.
   2) Either the hole in the top of the electrical component box or the hole in the rear plate may be used to feed the electrical wiring.
   3) If the hole on top is used, the rear plate should be turned upside down.

3. Secure the ON/OFF controller in place.
   a) If the ON/OFF controller is being mounted in the normal manner, first attach the rear plate to the wall using the screws and Rawl plugs provided. Next, place the body of the ON/OFF controller over the rear plate and secure it in place using four screws.
   b) If the ON/OFF controller is being mounted flush with the wall, fit it through the mounting plate on the wall and secure it in place using the screws and Rawl plugs provided.



NOTE To mount the ON/OFF controller on a wall made of cinder block, brick, concrete, or a similar material, drill 4.8 mm diameter holes in the wall and insert Rawl plugs to anchor the mounting screws.

Layout of electrical terminals

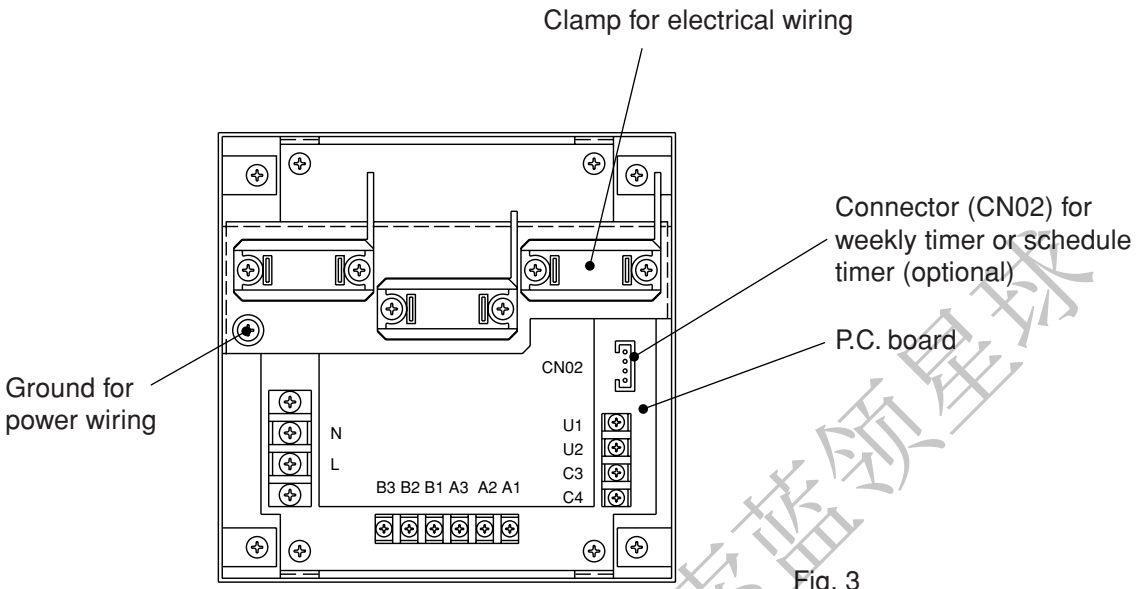


Fig. 3

How to connect electrical wiring

1) Basic wiring

N: ┐
L: ┘ Power supply (∿ 50 Hz/60 Hz, 220 – 240 V)

U1: ┐
U2: ┘ Inter-unit control wiring. (Low voltage)

C3: Auxiliary

C4: Ground for inter-unit control wiring

2) Terminals for remote monitoring

A1: Input for turning on air conditioners concurrently.

A2: Input for turning off air conditioners concurrently.

A3: Common input for turning air conditioners on or off.

B1: On operation state indicator output.

B2: Alarm indicator output.

B3: Common indicator output.

7

Basic wiring diagram

CAUTION

Ensure that wiring connections are correct.
(Incorrect wiring will damage the equipment.)

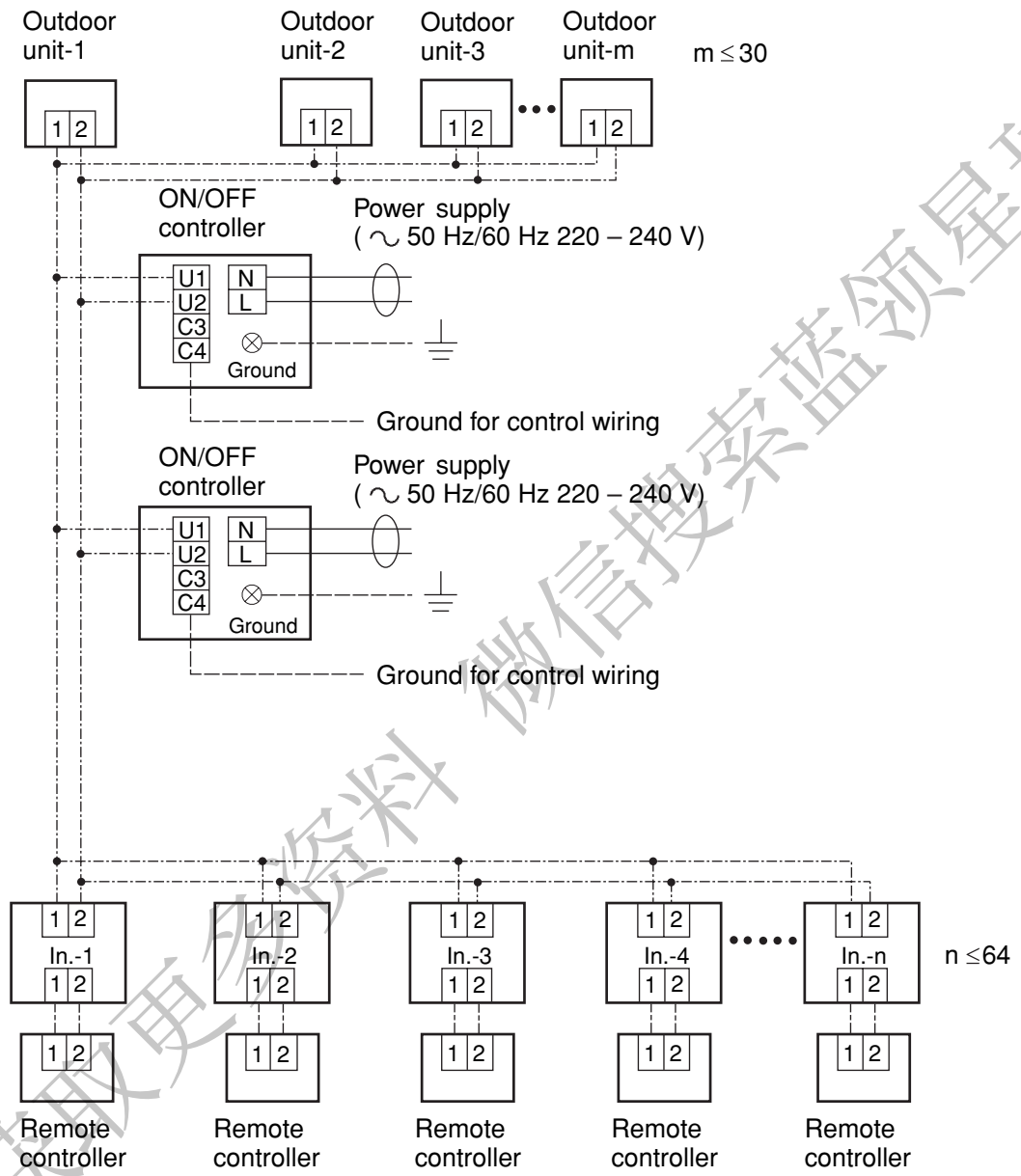
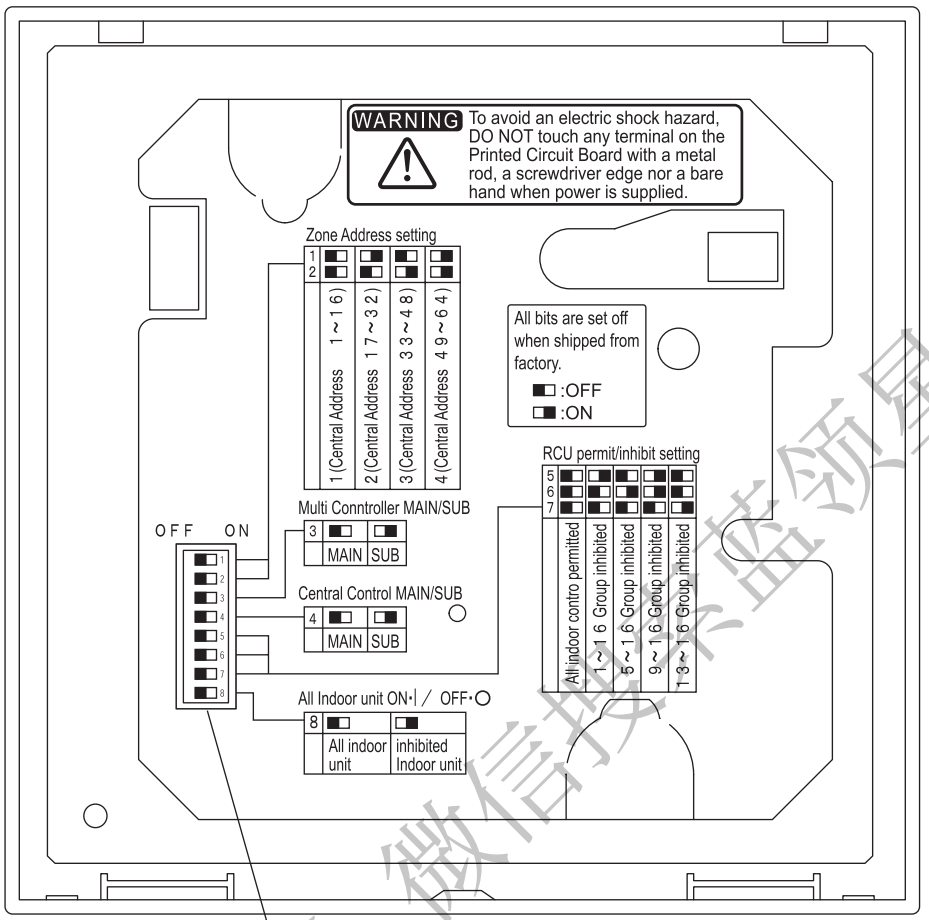


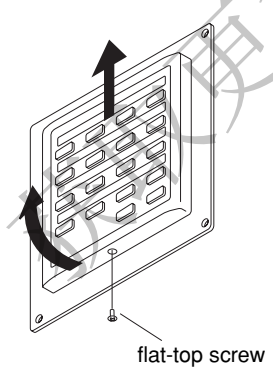
Fig. 4

NOTE

1. Lines consisting of dots and dashes (–·–·–) indicate inter-unit control wirings.
2. In. means indoor unit.
3. One ON/OFF controller can connect up to two units – one main unit and one sub unit – for each zone.

4. Dip switch setting

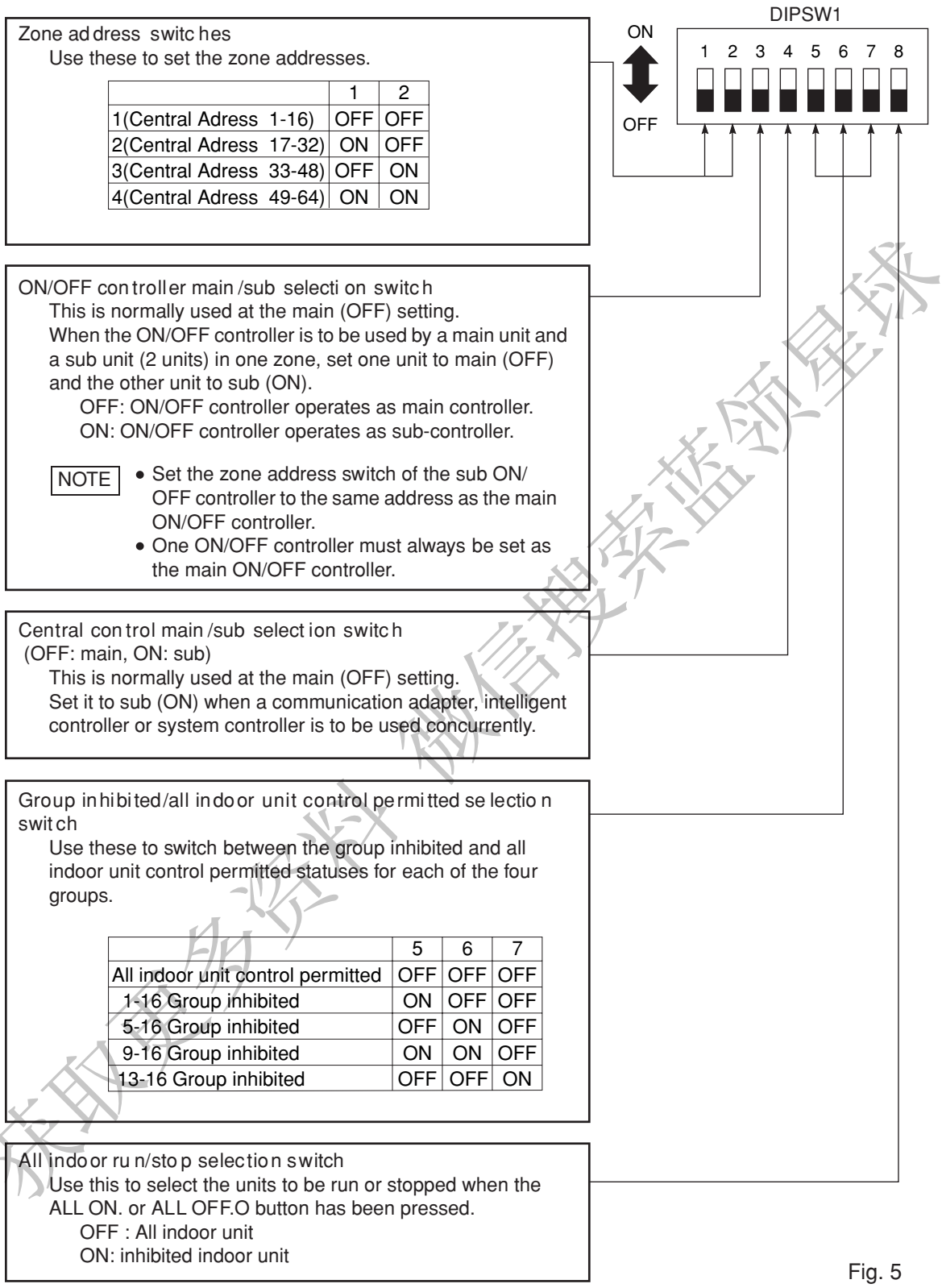




How to reach the P.C. board
Remove the flat-top screw on the bottom of the back case.
Raise the bottom of the control unit, and now remove the unit by sliding it upward.
The P.C. board on the back of the control unit is now visible.

NOTE Do not force the bottom of the control unit open. Doing so may damage the notch at the top and make it impossible to install the control unit.

DIPSW1



Zone address switches
Use these to set the zone addresses.

	1	2
1(Central Adress 1-16)	OFF	OFF
2(Central Adress 17-32)	ON	OFF
3(Central Adress 33-48)	OFF	ON
4(Central Adress 49-64)	ON	ON

ON/OFF controller main/sub selection switch
This is normally used at the main (OFF) setting.
When the ON/OFF controller is to be used by a main unit and a sub unit (2 units) in one zone, set one unit to main (OFF) and the other unit to sub (ON).
OFF: ON/OFF controller operates as main controller.
ON: ON/OFF controller operates as sub-controller.

NOTE
- Set the zone address switch of the sub ON/OFF controller to the same address as the main ON/OFF controller.
- One ON/OFF controller must always be set as the main ON/OFF controller.

Central control main/sub selection switch
(OFF: main, ON: sub)
This is normally used at the main (OFF) setting.
Set it to sub (ON) when a communication adapter, intelligent controller or system controller is to be used concurrently.

Group inhibited/all indoor unit control permitted selection switch
Use these to switch between the group inhibited and all indoor unit control permitted statuses for each of the four groups.

	5	6	7
All indoor unit control permitted	OFF	OFF	OFF
1-16 Group inhibited	ON	OFF	OFF
5-16 Group inhibited	OFF	ON	OFF
9-16 Group inhibited	ON	ON	OFF
13-16 Group inhibited	OFF	OFF	ON

All indoor run/stop selection switch
Use this to select the units to be run or stopped when the ALL ON. or ALL OFF.O button has been pressed.
OFF : All indoor unit
ON: inhibited indoor unit

Fig. 5

*All switches are OFF position at shipment.

5. Zone address setting

The zone addresses must be set (using #1 and #2 of DIPSW1) when the ON/OFF controllers are to be controlled in a multiple number of zones.

- Set to zone 1 when the ON/OFF controller is to be used in one zone only.
- When the ON/OFF controllers are to be used in a multiple number of zones, one of them must be set to zone 1 without fail.

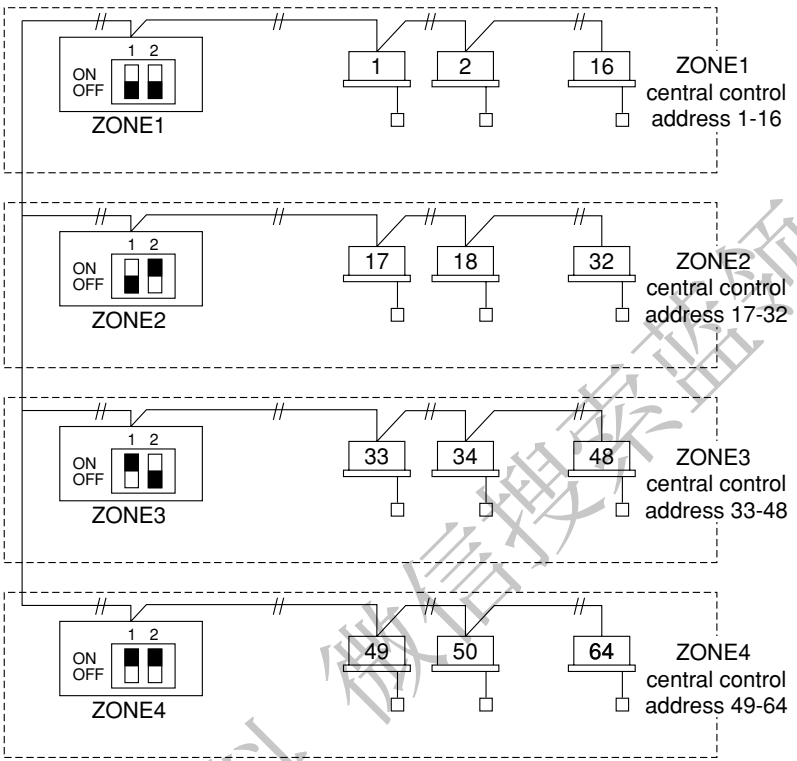


Fig. 6

6. How to perform zone registration

To operate the ON/OFF controller properly, zone registration is required after finishing the test run (and after setting all indoor unit addresses) using one of the following methods.

(a) Zone registration using the remote controller (RCS-TM80BG)
Refer to page **7** - 35

(b) Zone registration using the system controller (SHA-KC64AG(B))
Refer to page **7** - 36

(c) Automatic zone registration using the system controller (SHA-KC64AG(B))
Refer to page **7** - 37

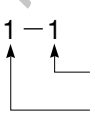
For methods (a) and (b), you should make a zone registration table manually before performing the registration as shown on the page **7** - 34.

For method (c), zone registration is executed automatically, proceeding from small indoor unit address and small central addresses to larger numbers in numerical order. For example:

Centrala ddress	1	2	3	4	5	6	
ZONE-group	1-1	1-2	1-3	1-4	1-5	1-6	
Indoor unit address	1-1	1-2	2-1	2-2	2-3	3-1	

NOTE

1. An indoor unit address is assigned to each indoor unit during automatic address operation. Each indoor unit address combines an R.C. address and indoor unit number as follows:

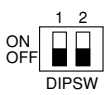
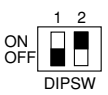
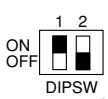
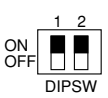


: Indoor unit address (UNIT No.)
Indoor unit No.
Refrigerant circuit No. (R.C. address)

This address is displayed on remote controller for UNIT No. when the UNIT button is pressed.

2. The central address represents the zone and group number. These addressed are assigned in ascending numerical order.

ZONE registration table

ZONE	GROUP	Central address	Indoor unit address (UNIT No.)	Unit location	ZONE	GROUP	Central address	Indoor unit address (UNIT No.)	Unit location
1 	1	1			3 	1	33		
	2	2				2	34		
	3	3				3	35		
	4	4				4	36		
	5	5				5	37		
	6	6				6	38		
	7	7				7	39		
	8	8				8	40		
	9	9				9	41		
	10	10				10	42		
	11	11				11	43		
	12	12				12	44		
	13	13				13	45		
	14	14				14	46		
	15	15				15	47		
	16	16				16	48		
2 	1	17			4 	1	49		
	2	18				2	50		
	3	19				3	51		
	4	20				4	52		
	5	21				5	53		
	6	22				6	54		
	7	23				7	55		
	8	24				8	56		
	9	25				9	57		
	10	26				10	58		
	11	27				11	59		
	12	28				12	60		
	13	29				13	61		
	14	30				14	62		
	15	31				15	63		
	16	32				16	64		

NOTE

1. Assign indoor unit addresses to the desired positions (central addresses) manually.
2. For group control, only the main indoor unit should be assigned. Sub indoor units cannot be assigned.

(a) Zone registration using the remote controller (RCS-TM80BG) (Determination of central address)

- In this case, after confirming which indoor unit is connected to the remote controller and that the air conditioner in the OFF state, you set the central addresses one at a time.
- If the system has no remote controller, connect a remote controller to the system temporarily. Then follow this procedure.

NOTE

The indoor unit address must already have been set before performing zone registration. If necessary, refer to the Installation Manual supplied with the outdoor unit.

(1) Press the [ ] and [ ] buttons at the same time of the remote controller for more than 4 seconds.

(2) Do not press [UNIT] button.

(3) Once in this mode, the UNIT No., CODE No., No. of SET DATA and SETTING indications will flash on the display as shown Fig. 7.

NOTE

In case of group control "ALL" instead of "UNIT No." will flash on the display. Select the main indoor unit address by pressing the [UNIT] button once.

(4) Set CODE No. to 03 using the [ ] and [ ] ( ) buttons.

NOTE

The CODE No. 03 must be selected to perform zone registration using the remote controller.

(5) Set the Central address which you want to assign to the indoor unit address using the [ ] and [ ] ( ) buttons according to the zone registration table.

(6) Press the [SET] button. The CODE No. and Central address changes from flashing to ON state. If you make mistake, then press the [CL] button and reset the central address.

(7) Press the [ ] button to finish zone registration.

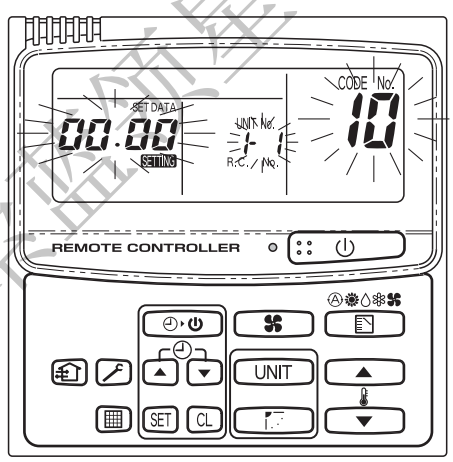
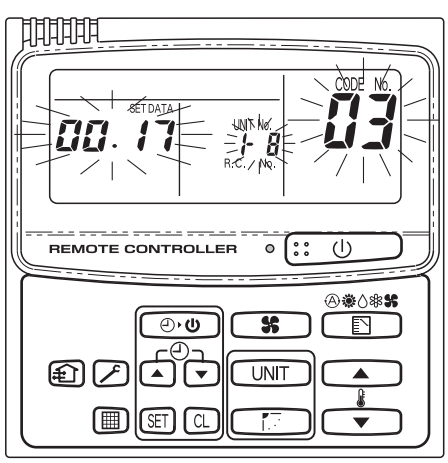


Fig. 7



For example, in this case
Indoor unit address: 1-8
Central address : 17 (ZONE 2, GROUP 1)

Fig. 8

(b) Zone registration using the system controller (SHA-KC64AG(B))

- In this case, you set all Central addresses by system controller at once manually.

(1) Press the [🔧] and [ZONE] buttons at the same time for more than 4 seconds.
SETTING and CODE No. C1 will flash.

(2) After confirming that CODE No. C1 is displayed, press the [SET] button. Once in this mode, a change takes place as Fig. 9.

(3) Select the zone and group No. which you want to set with [ZONE] and [◄] [►] (GROUP) buttons.
If already set, press the [CL] buttons.

(4) Set the unit No. (Indoor unit address) with [📻] and [⁝⁝] buttons, according to the zone registration table.

R.C. No. ..... [📻] button

Indoor unit No. ..... [⁝⁝] button

(5) Press the [SET] button.
GROUP No. turns ON and UNIT No. (Indoor unit address) changes from flashing to ON state. UNIT No. is registered to selected ZONE No. and GROUP No.
If you make mistake, then press the [CL] button and reselect the ZONE, GROUP and UNIT No.

(6) Register the other UNIT No. in the same way by following the steps (3) to (5).

(7) Finally, complete the registration by pressing the [🔧] button.
SETTING flashes for a few minutes, then OFF.

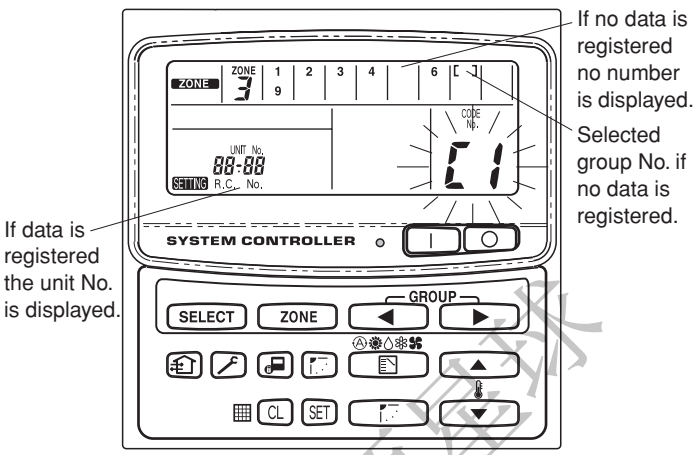
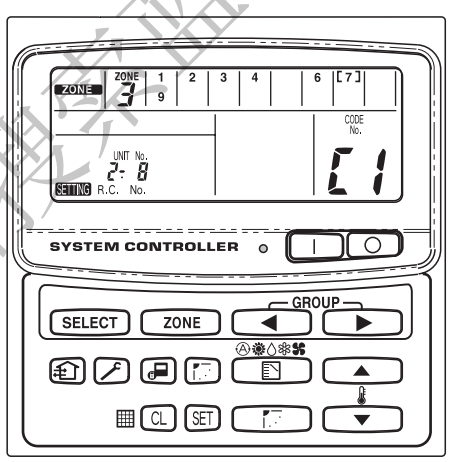


Fig. 9



For example, in the case at left
Zone 3, group No. 7
Unit No. (indoor unit address) 2-8

Unit No. 2-8 is registered to zone 3-group 7.

Fig. 10

(c) Automatic zone registration using the system controller (SHA-KC64AG(B))

(1) Press the [🔧] and [ZONE] buttons at the same time for more than 4 seconds.
SETTING and CODE No. C1 will flash.

(2) Select CODE. No. C2 by pressing [▲] and [▼] (🌡) button and press the [SET] button.
C2 changes from flashing to ON state and automatic zone registration will start.

(3) Registered GROUP No. will be disappeared all.

(4) Central address will be assigned from small indoor unit address to large one in numerical order automatically.
Finishing automatic zone registration, SETTING changes from flashing to OFF.

(5) If the error is happened, the “CHECK” starts flashing and zone registration finishes at this time. Press the [CL] button.

(6) Finally, complete automatic zone registration mode by pressing the [🔧] button.
SETTING flashes for a few minutes, then OFF.

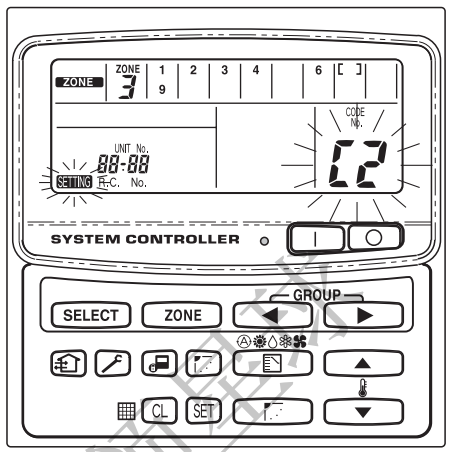


Fig. 11

7. How to check overlapping of central address no.

(1) Press the [🔧] and [ZONE] buttons at the same time for more than 4 seconds.
SETTING and CODE No. C1 will flash.

(2) Select CODE. No. C3 by pressing [▲], [▼] (🌡) button and press the [SET] button.
C3 changes from flashing to ON state and SETTING will flash. Then auto. overlap checking will start.

(3) If C3 changes from ON to flashing and SETTING stops flashing and disappears, there is no overlapping.
Then finally, complete the auto overlap checking mode by pressing the [🔧] button.

(4) If some of GROUP No., ZONE No. and UNIT No. flash, you should try again the zone registration.

① Select CODE No. C1 by pressing [▲], [▼] (🌡) button and press the [SET] button.
② Select the flashing GROUP No. with ZONE and GROUP button. Then press the [CL] button and reselect the ZONE, GROUP and UNIT No.
③ Then finally, complete the auto. overlap checking mode by pressing the [🔧] button.

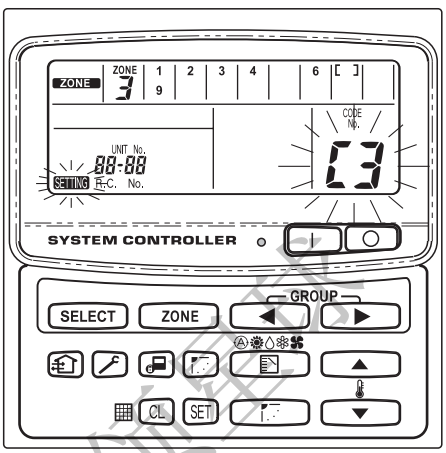
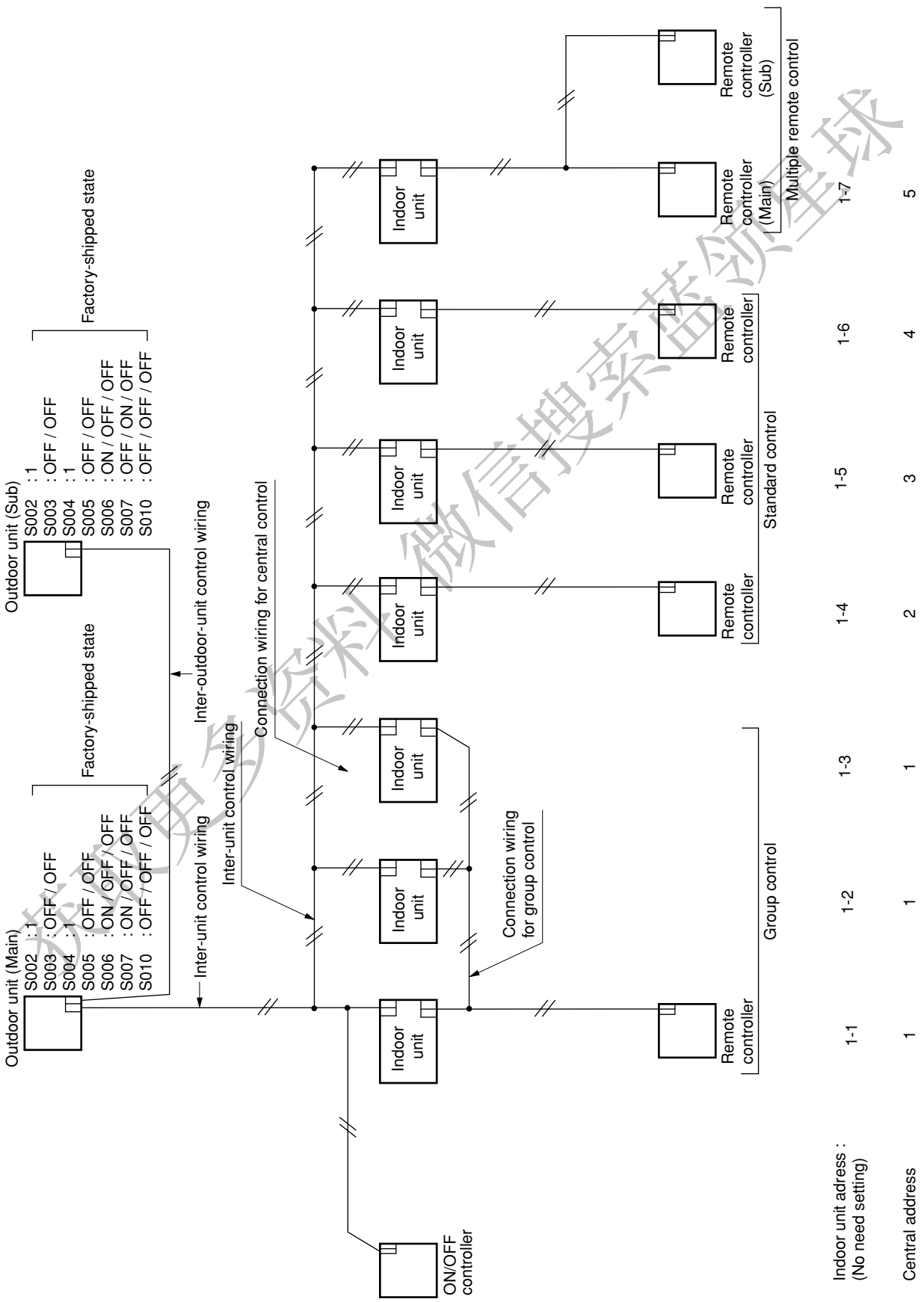


Fig. 12

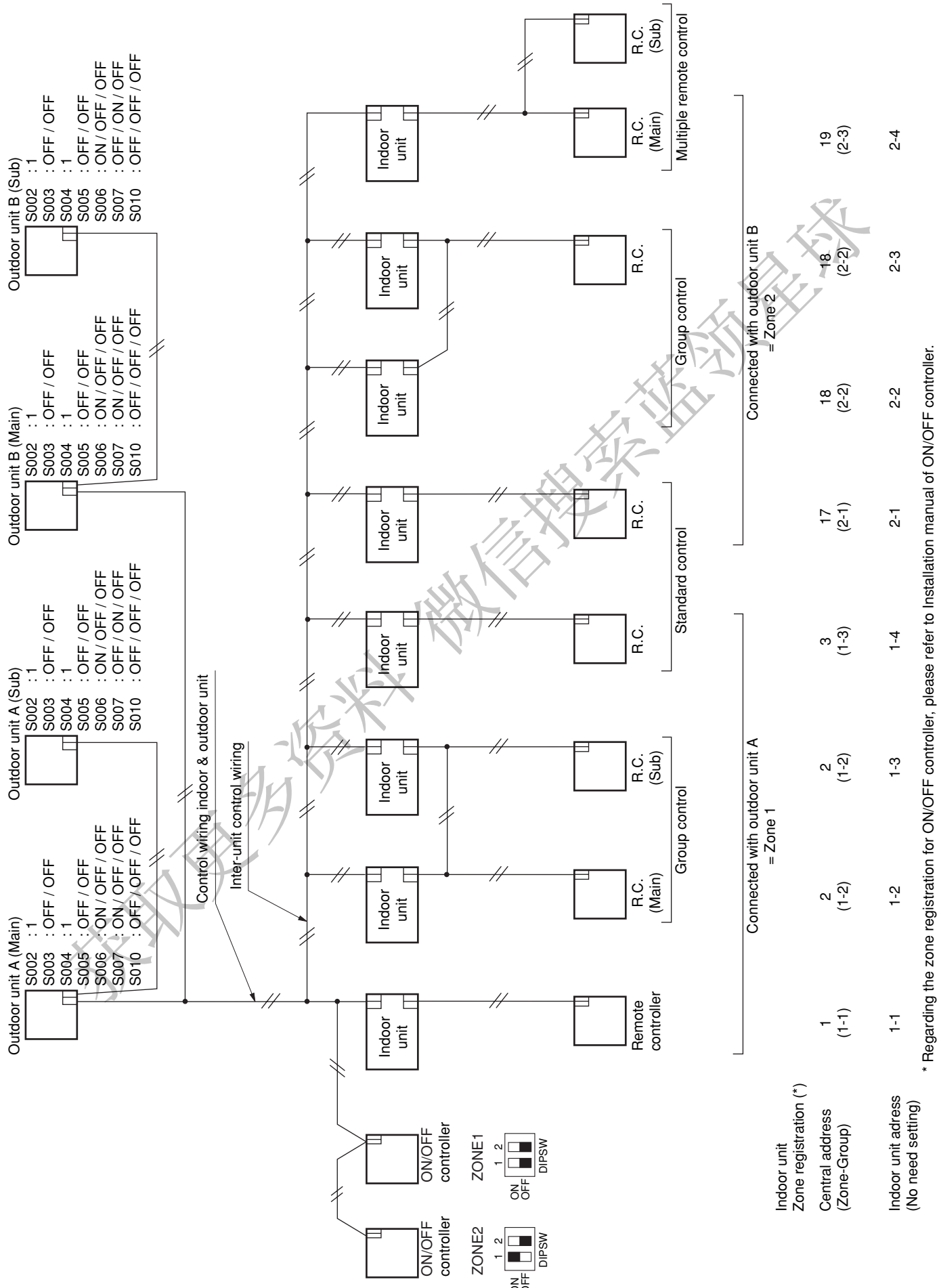
8. System examples

The following diagrams show system examples and the correct setting of the switches on the PCB.

(1) For a system without link

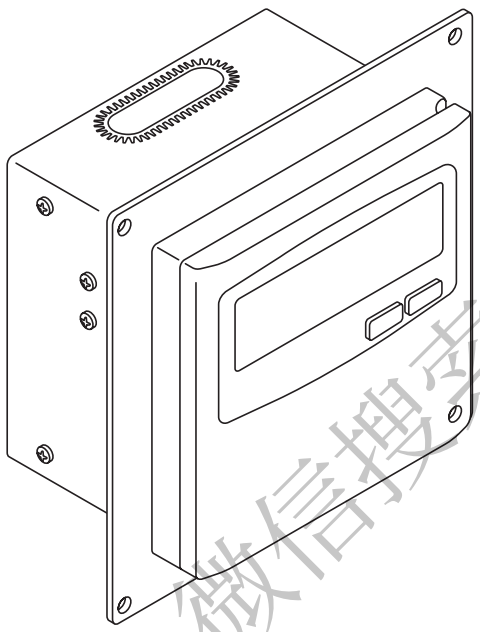


(2) For a system with link



* Regarding the zone registration for ON/OFF controller, please refer to Installation manual of ON/OFF controller.

Save These Instructions!



SHA-KC64AG(B)

INSTALLATION INSTRUCTIONS

Contents

Product Information

If you have problems or questions concerning your Air Conditioner, you will need the following information. Model and serial numbers are on the nameplate on the bottom of the cabinet.

Model No. SHA-KC64AG(B) Serial No. _____

Date of purchase _____

Dealer s address _____

Phone number _____

DECLARATION OF CONFORMITY
This product is marked « CE » as it satisfies EEC Directive No. 89/336/EEC, 73/23/EEC and 93/68/EEC.
This declaration will become void in case of misusage and/or from non observance though partial of Manufacturer s installation and/or operating instructions.

Alert Symbols

The following symbols used in this manual, alert you to potentially dangerous conditions to users, service personnel or the appliance:

This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.

This symbol refers to a hazard or unsafe practice which can result in personal injury or product or property damage.

Installation Location

- We recommend that this system controller be installed properly by qualified installation technicians in accordance with the Installation Instructions provided with the system controller.

WARNING

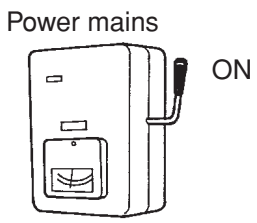
- Do not install this system controller where there are fumes or flammable gases, or in an extremely humid space such as a greenhouse.
- Do not install the system controller where excessively high heat-generating objects are placed.

Electrical Requirements

1. All wiring must conform to the local electrical codes. Consult your dealer or a qualified electrician for details.
2. Wiring must be done by a qualified electrician.

CAUTION

To warm up the system, the power mains must be turned on at least five (5) hours before operation. Leave the power mains ON unless you will not be using this appliance for an extended period.



Safety Instructions

- Read this booklet carefully before using this system controller. If you still have any difficulties or problems, consult your dealer for help.
- The air conditioner is designed to give you comfortable room conditions. Use this only for its intended purpose as described in the Instruction Manual.

WARNING

- Never touch the unit with wet hands.
- Never use or store gasoline or other flammable vapor or liquid near the air conditioner — it is very dangerous.
- The air conditioner has no ventilator for intaking fresh air from outdoors. You must open doors or windows frequently when you use gas or oil heating appliances in the same room, which consume a lot of oxygen from the air. Otherwise there is a risk of suffocation in an extreme case.

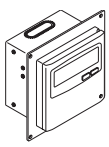
CAUTION

- Do not turn the air conditioner on and off from the power mains switch. Use the ON/OFF operation button.
- Do not stick anything into the air outlet of the outdoor unit. This is dangerous because the fan is rotating at high speed.
- Do not let children play with the air conditioner.
- Do not cool or heat the room too much if babies or invalids are present.

1. General

This booklet briefly outlines where and how to install the system controller. Please read over the entire set of instructions for the indoor and outdoor units and make sure all accessory parts listed are with the controller before beginning.

NOTE Give these instructions to the customer after finishing the installation.

Part Name	Figure	Q ty	Remarks
System controller		1	
Tapping screw	Truss-head Phillips 4 × 16 mm 	4	For securing the system controller
Rawl plug		4	For securing the system controller
Manual		1	For installation
		1	For operation

2. Installation site selection

- Install the system controller at a height of between 1 and 1.5 meters above the floor.
- Do not install the system controller in a place where it will be exposed to direct sunlight or near a window or other place where it will be exposed to the outside air.
- Be sure to install the system controller vertically, such as on a wall.

3. How to install the system controller

CAUTION

- Do not twist the control wiring together with the power wiring or run it through the same metal conduit, because this may cause a malfunction.
- Install the system controller away from sources of electrical noise.
- Install a noise filter or take other appropriate action if electrical noise affects the power supply circuit of the unit.

WARNING

Do not supply power to the unit or try to operate it until the tubing and wiring to the outdoor unit is completed.

■ Overview of the system controller

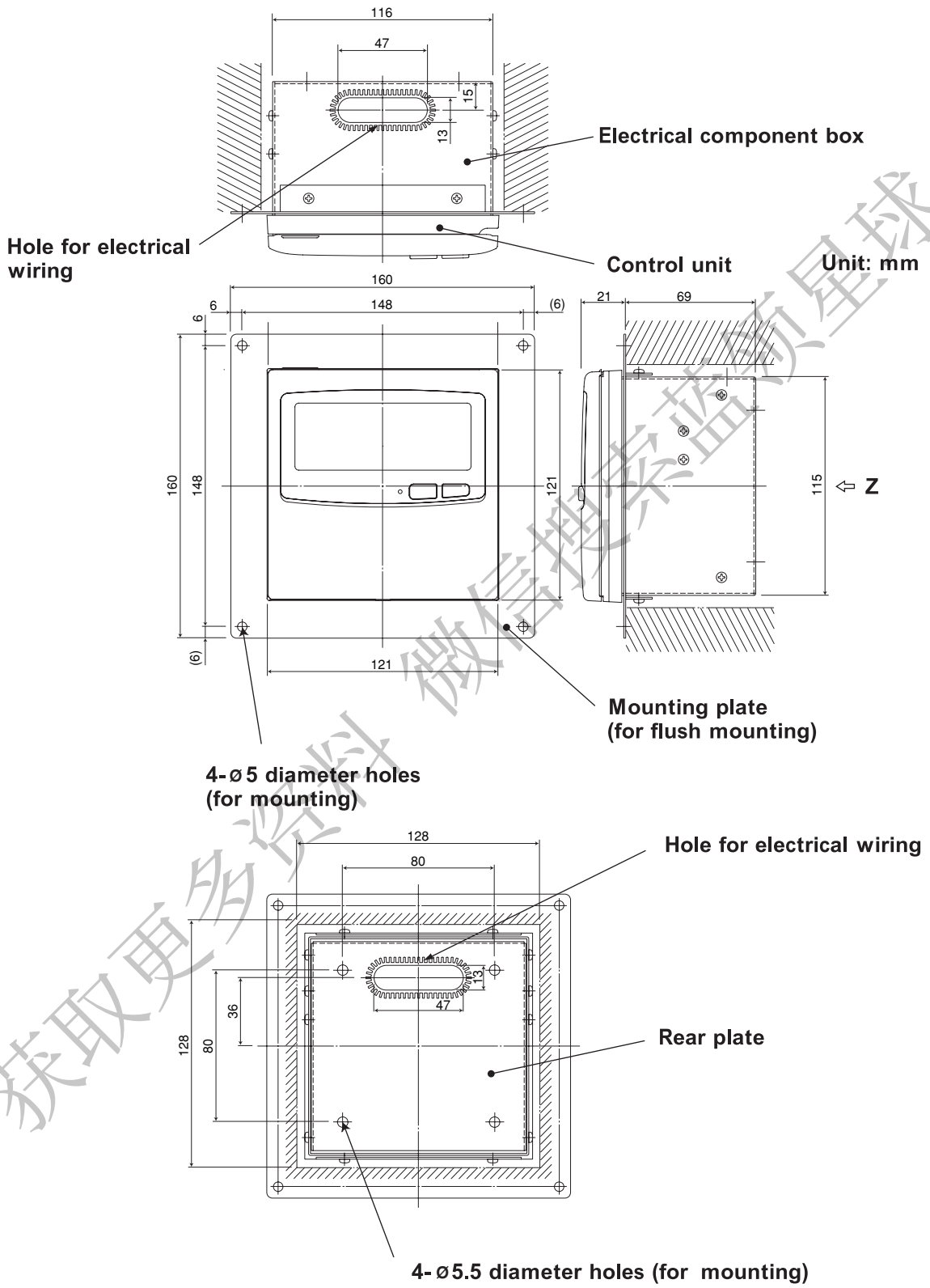
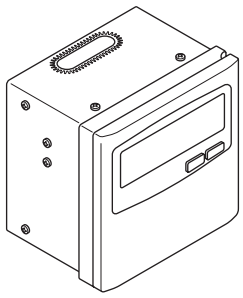


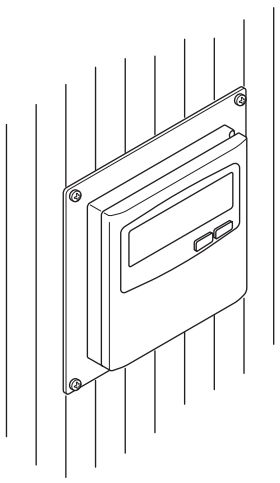
Fig. 1

* In order to mount the system controller flush with the wall, an opening measuring 128 mm ×128 mm is necessary.

■ Installation procedure



a): Normal mounting



b): Flush mounting

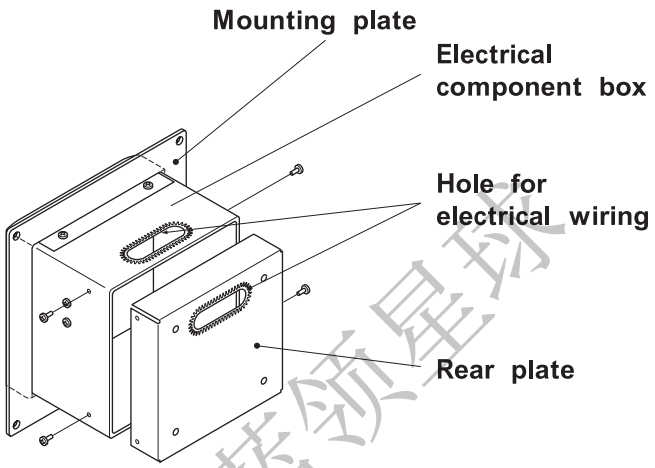


Fig. 2

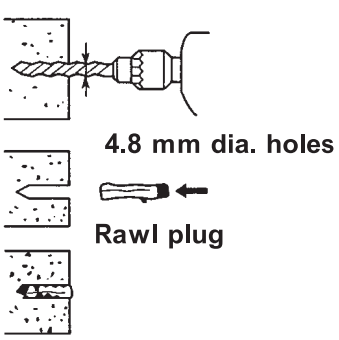
1. Decide how the system controller will be mounted: in the normal manner or flush with the wall.
   a) To mount the system controller in the normal manner, remove the mounting plate. Then reattach the four screws to the electrical component box.
   b) To mount the system controller flush with the wall, make an opening in the wall measuring 128 mm ×128 mm. The opening must be at least 85 mm deep as measured from the outside surface of the wall.

2. Remove the rear plate and connect the electrical wiring.
   1) Remove the four screws located on both sides of the rear plate.
   2) Either the hole in the top of the electrical component box or the hole in the rear plate may be used to feed the electrical wiring.
   3) If the hole on top is used, the rear plate should be turned upside down.

3. Secure the system controller in place.
   a) If the system controller is being mounted in the normal manner, first attach the rear plate to the wall using the screws and Rawl plugs provided. Next, place the body of the system controller over the rear plate and secure it in place using four screws.
   b) If the system controller is being mounted flush with the wall, fit it through the mounting plate on the wall and secure it in place using the screws and Rawl plugs provided.

NOTE

To mount the system controller on a wall made of cinder block, brick, concrete, or a similar material, drill 4.8 mm diameter holes in the wall and insert Rawl plugs to anchor the mounting screws.



■ Layout of electrical terminals

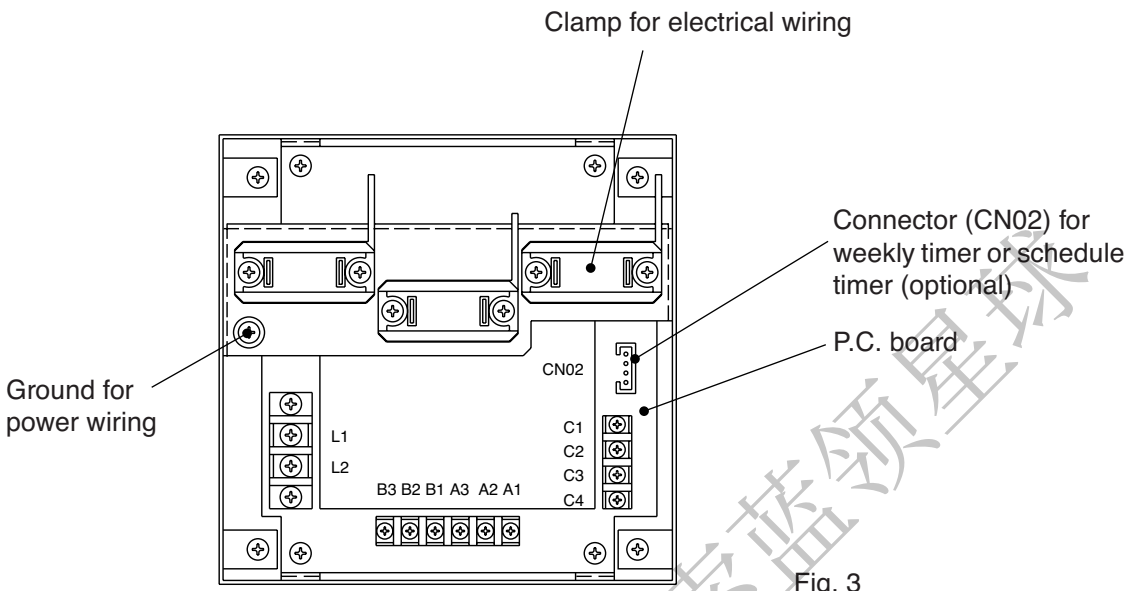


Fig. 3

How to connect electrical wiring

1) Basic wiring

L1: ┐
L2: ┘ Power supply (∿ 50 Hz/60 Hz, 220 – 240 V)

C1: ┐
C2: ┘ Inter-unit control wiring. (Low voltage)

C3: Auxiliary

C4: Ground for inter-unit control wiring

2) Terminals for remote monitoring

A1: Input for turning on air conditioners concurrently.

A2: Input for turning off air conditioners concurrently.

A3: Common input for turning air conditioners on or off.

B1: On operation state indicator output.

B2: Alarm indicator output.

B3: Common indicator output.

■ Basic wiring diagram

CAUTION

Ensure that wiring connections are correct. (Incorrect wiring will damage the equipment.)

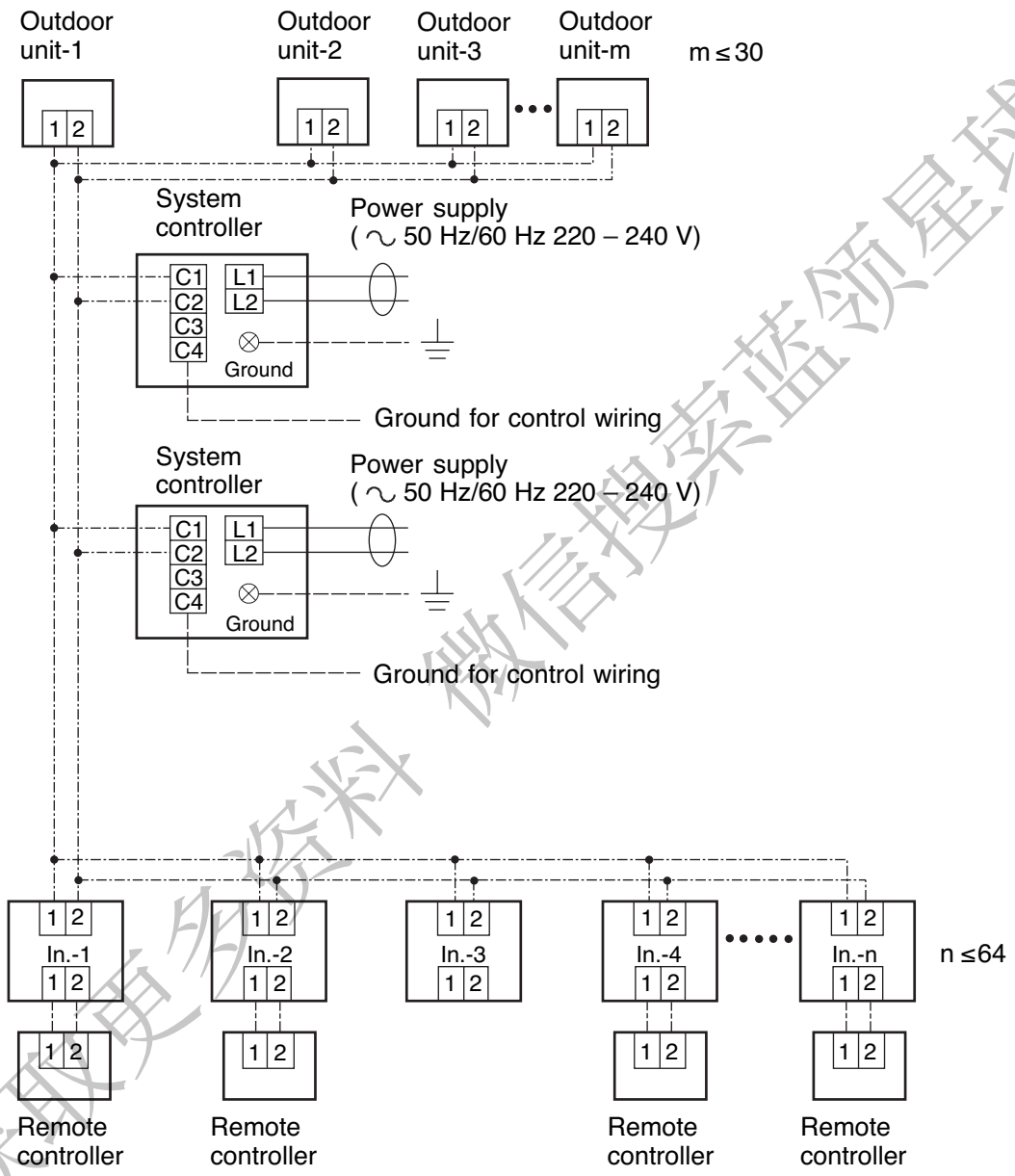
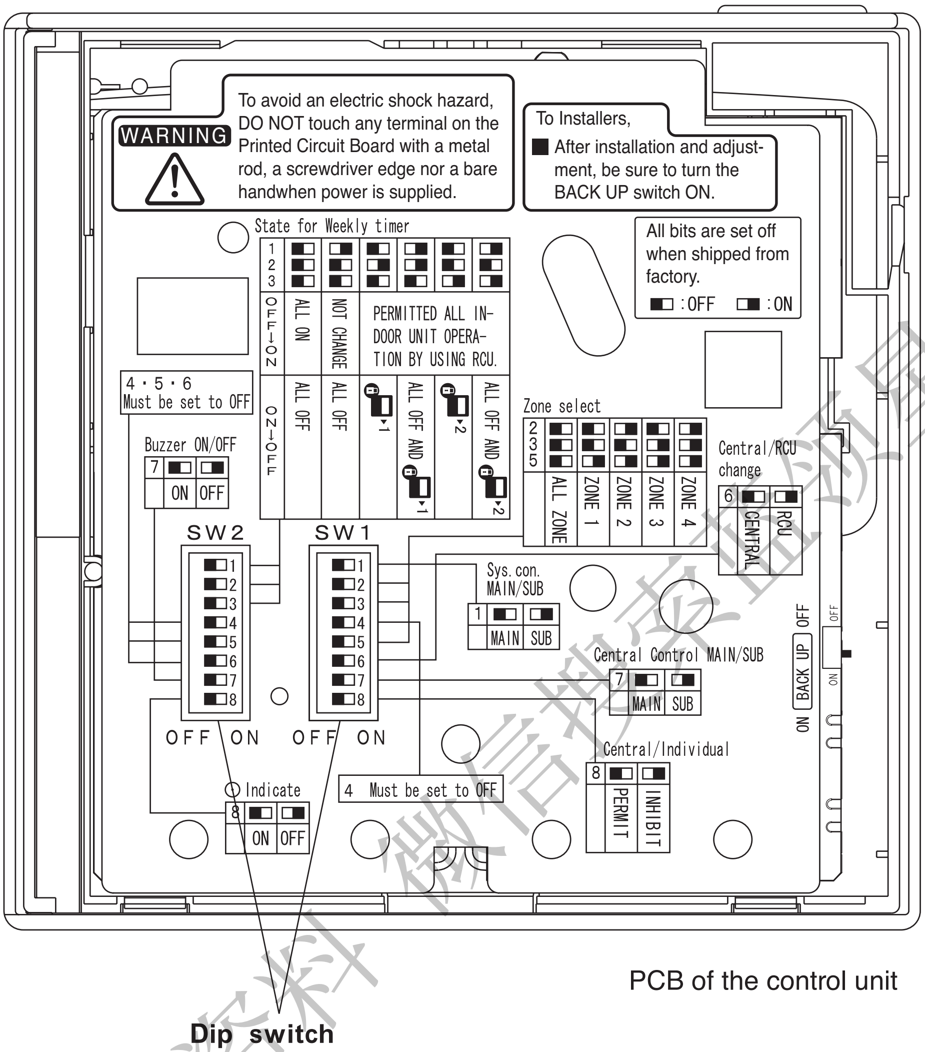


Fig. 4

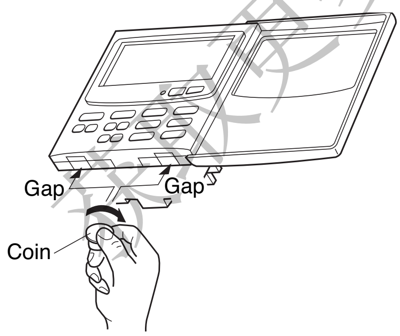
NOTE

1. Lines consisting of dots and dashes (–·–·–) indicate inter-unit control wirings.
2. In. means indoor unit.
3. Up to two system controllers may be connected to one control line system.

4. Address switch setting

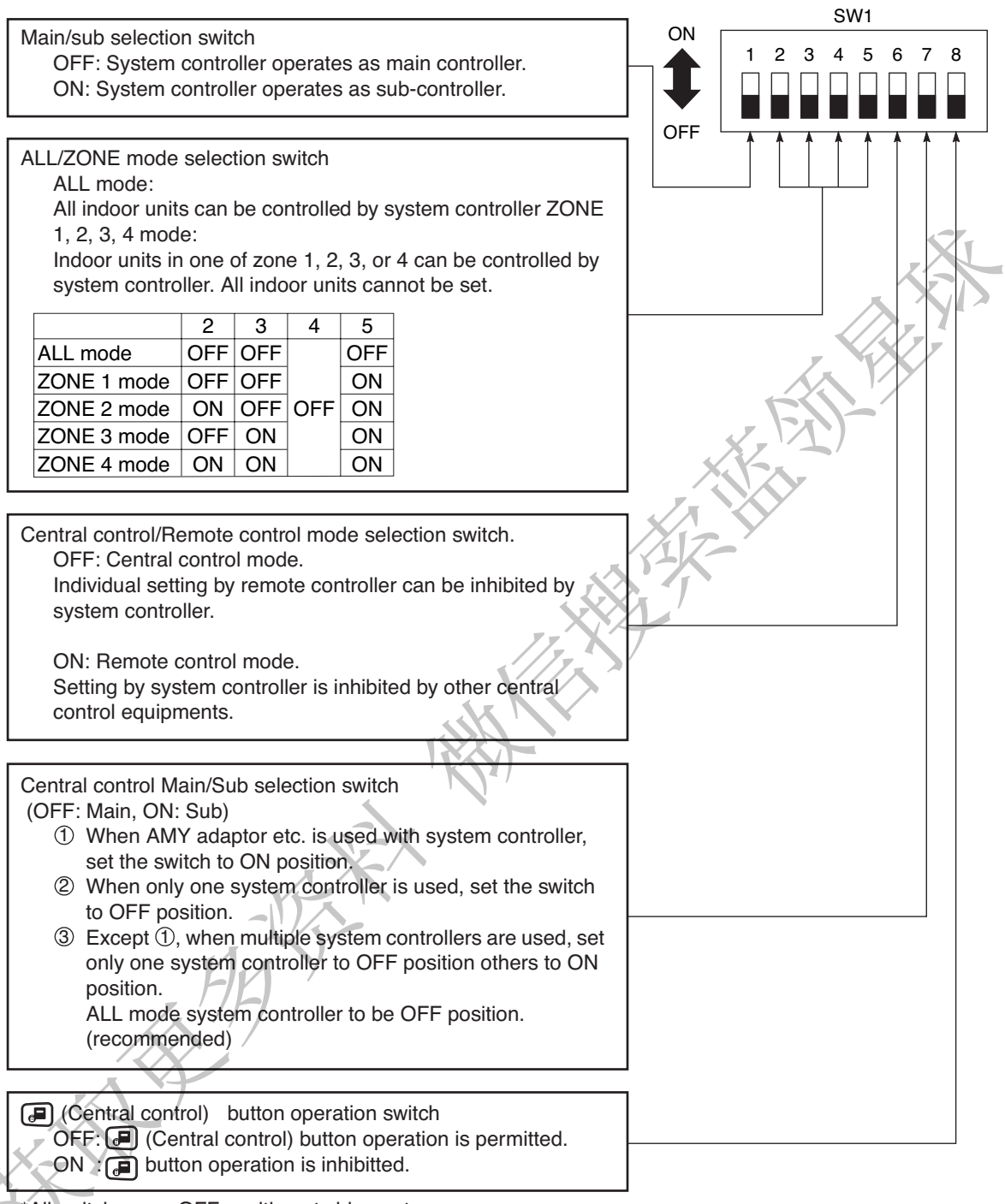


PCB of the control unit



How to reach the P.C. board
Remove the flat-top screw on the bottom of the back case. When you open up the decorative cover, you will see two notches under the control unit. Inset a coin or other flat object into these notches and pry off the back case. The P.C. board on the back of the control unit is now visible.

SW1



Main/sub selection switch
OFF: System controller operates as main controller.
ON: System controller operates as sub-controller.

ALL/ZONE mode selection switch
ALL mode:
All indoor units can be controlled by system controller ZONE 1, 2, 3, 4 mode:
Indoor units in one of zone 1, 2, 3, or 4 can be controlled by system controller. All indoor units cannot be set.

	2	3	4	5
ALL mode	OFF	OFF	OFF	OFF
ZONE 1 mode	OFF	OFF		ON
ZONE 2 mode	ON	OFF		ON
ZONE 3 mode	OFF	ON		ON
ZONE 4 mode	ON	ON		ON

Central control/Remote control mode selection switch.
OFF: Central control mode.
Individual setting by remote controller can be inhibited by system controller.

ON: Remote control mode.
Setting by system controller is inhibited by other central control equipments.

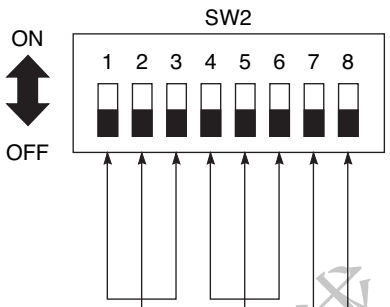
Central control Main/Sub selection switch
(OFF: Main, ON: Sub)
① When AMY adaptor etc. is used with system controller, set the switch to ON position.
② When only one system controller is used, set the switch to OFF position.
③ Except ①, when multiple system controllers are used, set only one system controller to OFF position others to ON position.
ALL mode system controller to be OFF position. (recommended)

(Central control) button operation switch
OFF: (Central control) button operation is permitted.
ON : button operation is inhibitted.

*All switches are OFF position at shipment.

Fig. 5

SW2



Weekly timer input switches.
System controller operation can be set when weekly timer activates (ON/OFF).

	System controller operation: Timer OFF→ON	Timer ON→OFF	Switch No. 1	2	3
①	All ON	All OFF	OFF	OFF	OFF
②	No change	All OFF	ON	OFF	OFF
③	Individual control of all indoor units to be permitted	All indoor units to be 1*1	OFF	ON	OFF
④	Ditto	All OFF and all indoor units to be 1*1	ON	ON	OFF
⑤	Ditto	All indoor units to be 2*2	OFF	OFF	ON
⑥	Ditto	All OFF and all indoor units to be 2*2	ON	OFF	ON

In case of Remote control mode, use ① or ②.
In case of ZONE 1, 2, 3, 4 mode, ALL, all indoor units means one of ZONE 1, 2, 3, 4.
*1: 1 (Central control 1) means ON/OFF operation cannot execute by remote controller.
*2: 2 (Central control 2) means ON/OFF, MODE change. Temp. setting cannot be executed by remote controller.

Auxilaly switch
Must be set to OFF position.

Beep tone switch
OFF: Beep tone when each button is pushed.
ON: No tone when each button is pushed.

⊙ Indication switch
Normally set to OFF position.
When set to ON position, ⊙ indication is not displayed on LCD of system controller.

*All switches are OFF position at shipment.

Fig. 6

7

5. Mode setting

According to function of each system controller, set SW1 as Fig. 7.

(1) Central control/Remote control mode

- Central control mode
  System controller is used as central control equipment.
  Individual setting by remote controller can be inhibitted by system controller
- Remote control mode
  System controller is used as remote controller.
  Setting by system controller is inhibitted by other central control equipments.

(2) ALL/ZONE mode

- ALL mode
  All indoor units can be controlled by system controller.
- ZONE mode
  Indoor units in one of ZONE 1, 2, 3 or 4 can be controlled by system controller

(3) Function of system controller is 10 types according to combination of central control/remote control mode and ALL/ZONE mode setting as the table 1.

(4) Stick the system controller unit label in a conspicuous position.

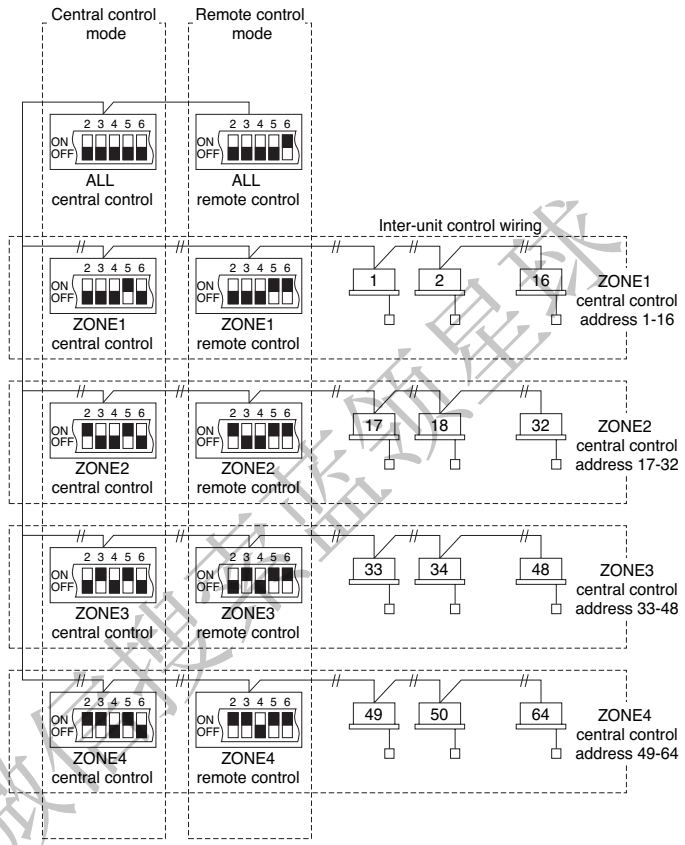


Fig. 7

Table 1

	Central control	Remote control
ALL	1. ALL/Central	6. ALL/Remote
ZONE1	2. ZONE1/Central	7. ZONE1/Remote
ZONE2	3. ZONE2/Central	8. ZONE2/Remote
ZONE3	4. ZONE3/Central	9. ZONE3/Remote
ZONE4	5. ZONE4/Central	10. ZONE4/Remote

6. How to perform zone registration

To operate the system controller properly, zone registration is required after finishing the test run (and after setting all indoor unit addresses) using one of the following methods.

(a) Zone registration using the remote controller (RCS-TM80BG)
Refer to page **7** - 55

(b) Zone registration using the system controller (SHA-KC64AG(B))
Refer to page **7** - 56

(c) Automatic zone registration using the system controller (SHA-KC64AG(B))
Refer to page **7** - 57

For methods (a) and (b), you should make a zone registration table manually before performing the registration as shown on the page **7** - 54.

For method (c), zone registration is executed automatically, proceeding from small indoor unit address and small central addresses to larger numbers in numerical order. For example:

Central address	1	2	3	4	5	6	
ZONE-group	1-1	1-2	1-3	1-4	1-5	1-6	
Indoor unit address	1-1	1-2	2-1	2-2	2-3	3-1	

NOTE

1. An indoor unit address is assigned to each indoor unit during automatic address operation. Each indoor unit address combines an R.C. address and indoor unit number as follows:

   1 — 1 : Indoor unit address (UNIT No.)
   Indoor unit No.
   Refrigerant circuit No. (R.C. address)

   This address is displayed on remote controller for UNIT No. when the UNIT button is pressed.

2. The central address represents the zone and group number. These addressed are assigned in ascending numerical order.

7

■ ZONE registration table

ZONE	GROUP	Central address	Indoor unit address (UNIT No.)	Unit location	ZONE	GROUP	Central address	Indoor unit address (UNIT No.)	Unit location
1	1	1			3	1	33		
	2	2				2	34		
	3	3				3	35		
	4	4				4	36		
	5	5				5	37		
	6	6				6	38		
	7	7				7	39		
	8	8				8	40		
	9	9				9	41		
	10	10				10	42		
	11	11				11	43		
	12	12				12	44		
	13	13				13	45		
	14	14				14	46		
	15	15				15	47		
	16	16				16	48		
2	1	17			4	1	49		
	2	18				2	50		
	3	19				3	51		
	4	20				4	52		
	5	21				5	53		
	6	22				6	54		
	7	23				7	55		
	8	24				8	56		
	9	25				9	57		
	10	26				10	58		
	11	27				11	59		
	12	28				12	60		
	13	29				13	61		
	14	30				14	62		
	15	31				15	63		
	16	32				16	64		

NOTE

1. Assign indoor unit addresses to the desired positions (central addresses) manually.
2. For group control, only the main indoor unit should be assigned. Sub indoor units cannot be assigned.

(a) Zone registration using the remote controller (RCS-TM80BG) (Determination of central address)

- In this case, after confirming which indoor unit is connected to the remote controller and that the air conditioner in the OFF state, you set the central addresses one at a time.
- If the system has no remote controller, connect a remote controller to the system temporarily. Then follow this procedure.

NOTE

The indoor unit address must already have been set before performing zone registration. If necessary, refer to the Installation Manual supplied with the outdoor unit.

(1) Press the [wrench] and [home] buttons at the same time of the remote controller for more than 4 seconds.

(2) Do not press [UNIT] button.

(3) Once in this mode, the UNIT No., CODE No., No. of SET DATA and SETTING indications will flash on the display as shown Fig. 8.

NOTE

In case of group control “ALL” instead of “UNIT No.” will flash on the display. Select the main indoor unit address by pressing the [UNIT] button once.

(4) Set CODE No. to 03 using the [▲] and [▼] ([thermometer]) buttons.

NOTE

The CODE No. 03 must be selected to perform zone registration using the remote controller.

(5) Set the Central address which you want to assign to the indoor unit address using the [▲] and [▼] ([clock]) buttons according to the zone registration table.

(6) Press the [SET] button. The CODE No. and Central address changes from flashing to ON state. If you make mistake, then press the [CL] button and reset the central address.

(7) Press the [wrench] button to finish zone registration.

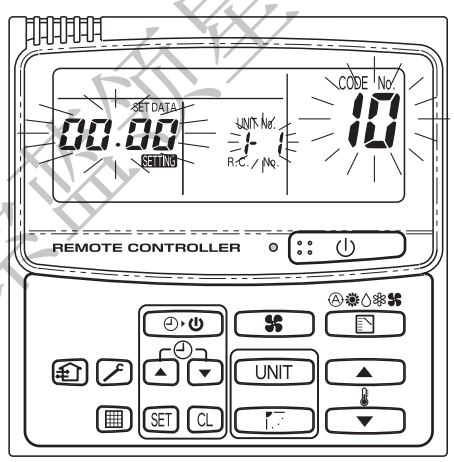
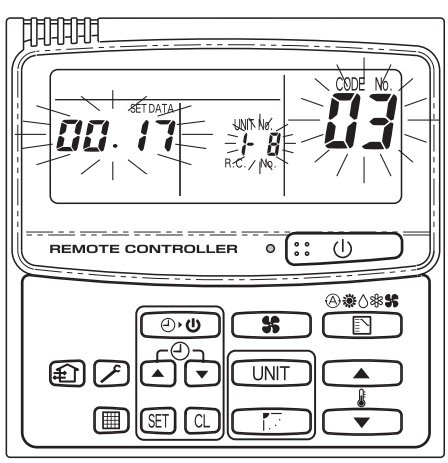


Fig. 8



For example, in this case
Indoor unit address: 1-8
Central address : 17 (ZONE 2, GROUP 1)

Fig. 9

(b) Zone registration using the system controller (SHA-KC64AG(B))

- In this case, you set all Central addresses by system controller at once manually.

(1) Press the [🔧] and [ZONE] buttons at the same time for more than 4 seconds.
SETTING and CODE No. C1 will flash.

(2) After confirming that CODE No. C1 is displayed, press the [SET] button. Once in this mode, a change takes place as Fig. 10.

(3) Select the zone and group No. which you want to set with [ZONE] and [◄] [►] (GROUP) buttons.
If already set, press the [CL] buttons.

(4) Set the unit No. (Indoor unit address) with [📻] and [🌡] buttons, according to the zone registration table.

R.C. No. ..... [📻] button

Indoor unit No..... [🌡] button

(5) Press the [SET] button.
GROUP No. turns ON and UNIT No. (Indoor unit address) changes from flashing to ON state. UNIT No. is registered to selected ZONE No. and GROUP No.
If you make mistake, then press the [CL] button and reselect the ZONE, GROUP and UNIT No.

(6) Register the other UNIT No. in the same way by following the steps (3) to (5).

(7) Finally, complete the registration by pressing the [🔧] button.
SETTING flashes for a few minutes, then OFF.

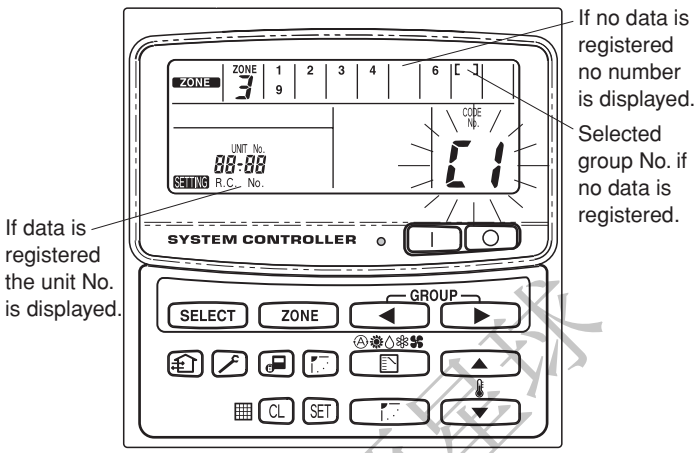
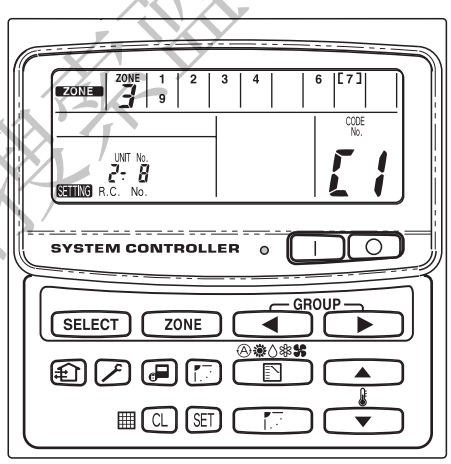


Fig. 10



For example, in the case at left
Zone 3, group No. 7
Unit No. (indoor unit address) 2-8

Unit No. 2-8 is registered to zone 3-group 7.

Fig. 11

(c) Automatic zone registration using the system controller (SHA-KC64AG(B))

(1) Press the [🔧] and [ZONE] buttons at the same time for more than 4 seconds.
SETTING and CODE No. C1 will flash.

(2) Select CODE. No. C2 by pressing [▲] and [▼] (🌡) button and press the [SET] button.
C2 changes from flashing to ON state and automatic zone registration will start.

(3) Registered GROUP No. will be disappeared all.

(4) Central address will be assigned from small indoor unit address to large one in numerical order automatically.
Finishing automatic zone registration, SETTING changes from flashing to OFF.

(5) If the error is happened, the “CHECK” starts flashing and zone registration finishes at this time. Press the [CL] button.

(6) Finally, complete automatic zone registration mode by pressing the [🔧] button.
SETTING flashes for a few minutes, then OFF.

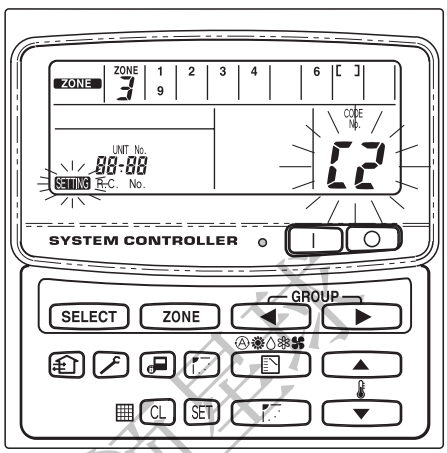


Fig. 12

7. How to check overlapping of central address no.

(1) Press the [🔧] and [ZONE] buttons at the same time for more than 4 seconds.
SETTING and CODE No. C1 will flash.

(2) Select CODE. No. C3 by pressing [▲], [▼] (🌡) button and press the [SET] button.
C3 changes from flashing to ON state and SETTING will flash. Then auto. overlap checking will start.

(3) If C3 changes from ON to flashing and SETTING stops flashing and disappears, there is no overlapping.
Then finally, complete the auto overlap checking mode by pressing the [🔧] button.

(4) If some of GROUP No., ZONE No. and UNIT No. flash, you should try again the zone registration.

① Select CODE No. C1 by pressing [▲], [▼] (🌡) button and press the [SET] button.
② Select the flashing GROUP No. with ZONE and GROUP button. Then press the [CL] button and reselect the ZONE, GROUP and UNIT No.
③ Then finally, complete the auto. overlap checking mode by pressing the [🔧] button.

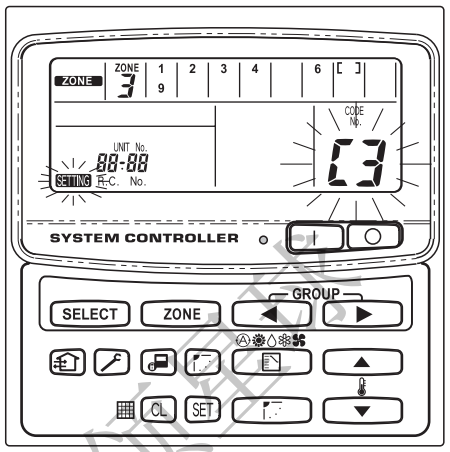


Fig. 13

8. Memory back up switch

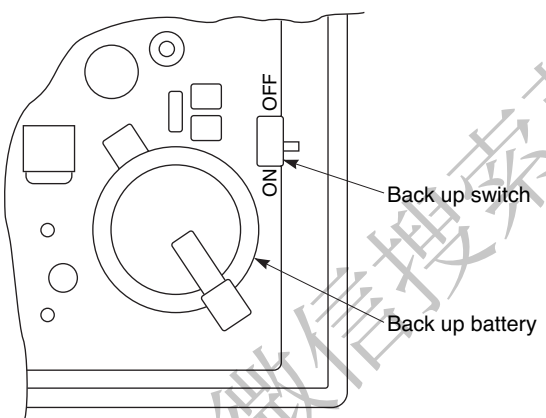
Check the back up switch is ON for back side of system controller PCB.

9. Test run

(1)Power on for all indoor units. Next, power on for system controller.
SETTING will flash, checking the indoor unit address automatically.

(2)If group No. displayed on system controller is not same as indoor unit No.* which is connected, see Fig. 7 and setting again.

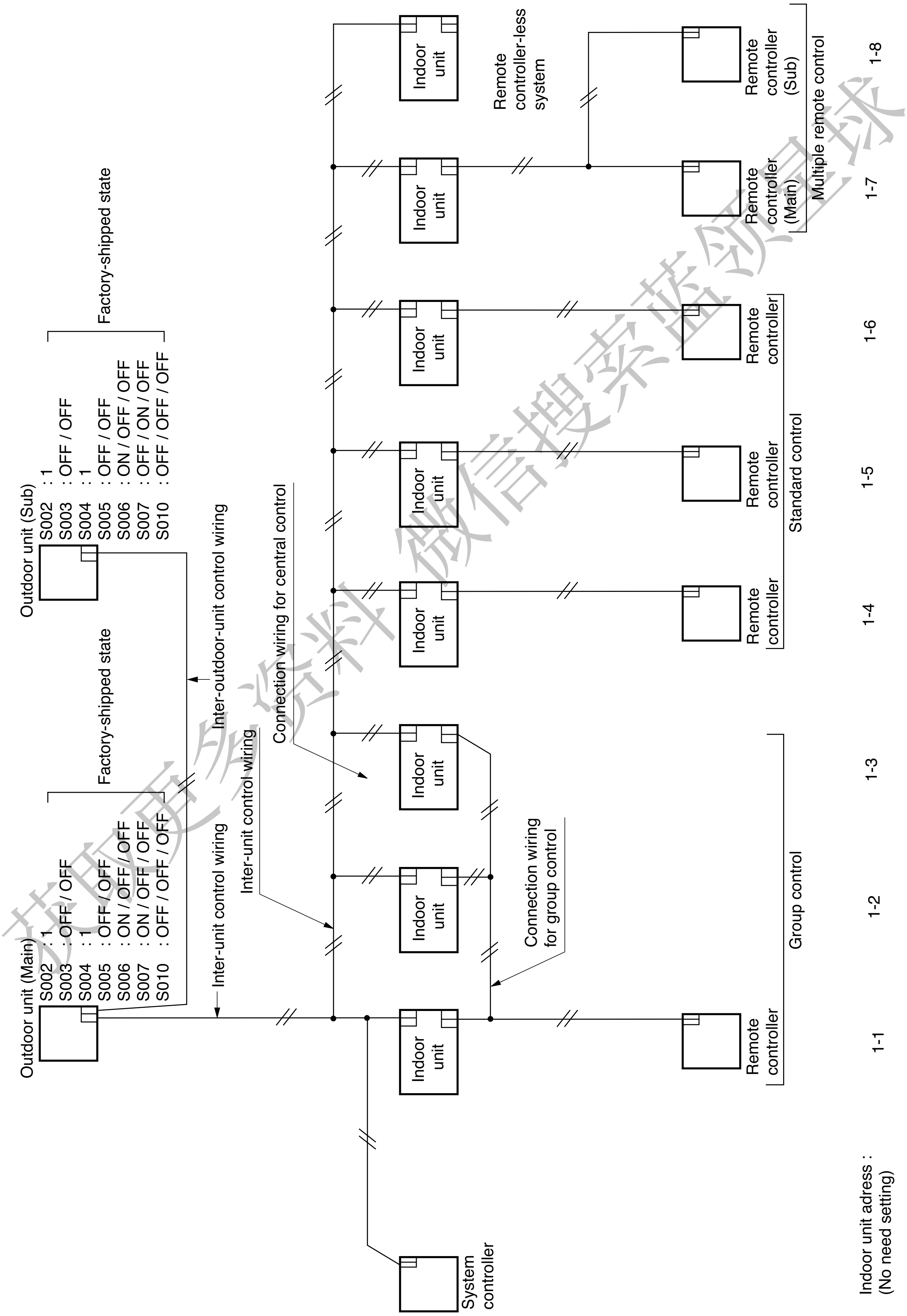
*In case of group control, main unit No. only.



10. System examples

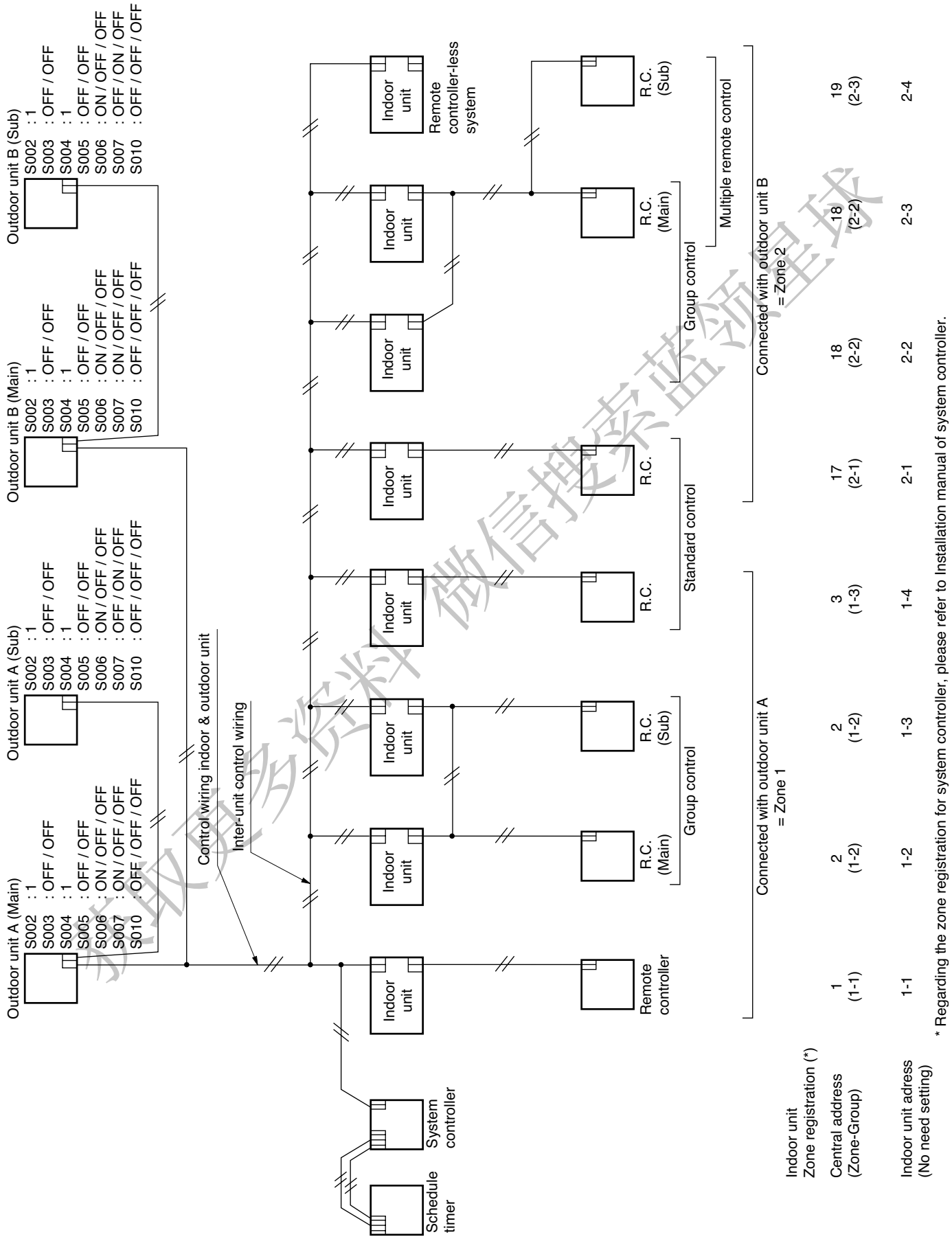
The following diagrams show system examples and the correct setting of the switches on the PCB.

(1) For a system without link



7

(2) For a system with link



* Regarding the zone registration for system controller, please refer to Installation manual of system controller.

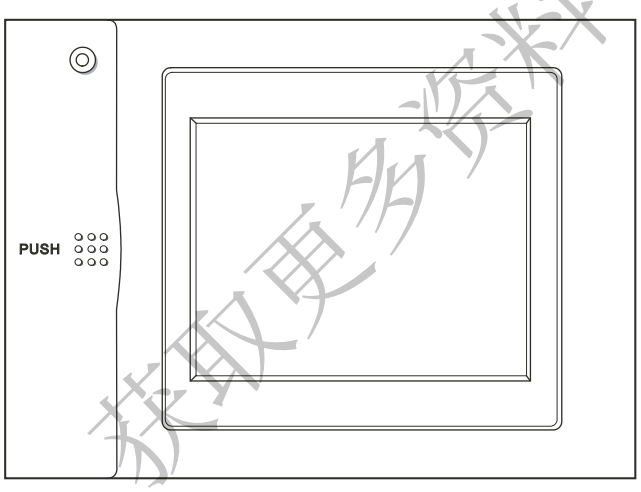
Sanyo Centralized Control System

SHA-KT256BG

Operation Manual

INTELLIGENT CONTROLLER

Thank you for choosing the SHA-KT256BG Intelligent Controller.
Before using the system, be sure to read this manual carefully. In particular, be sure to read the “Important Safety Instructions”.
After reading this manual, store it in a convenient place.



Contents

Contents

Main 5 Sub 1 refers to the explanation of main menu 5, sub menu 1.

1 Important Safety Instructions

Before using the system, be sure to read these "Important Safety Instructions".

The precautions given in this manual consist of specific "⚠ Warnings" and "⚠ Cautions". They provide important safety related information and are important for your safety, the safety of others, and trouble-free operation of the system. Be sure to strictly observe all safety procedures.

- The labels and their meanings are as described below.

⚠Warning	This refers to a hazard or unsafe procedure or practice which can result in severe personal injury or death.
⚠Caution	This refers to a hazard or unsafe procedure or practice which can result in personal injury or product or property damage.

- Meaning of symbols

⚠	Indicates "Warning" or "Caution".
⃠	Indicates "Prohibited".
❗	Indicates an action that should always be performed.

- After reading this manual, save it in a convenient place.
  Be sure to provide this manual to any person who may use the product.

Installation Precautions

⚠ Warning

Do not install yourself	Use only specified air conditioners
Installation should always be performed by your dealer or a professional service provider. Electric shock or fire may result if an inexperienced person performs any installation or wiring procedures incorrectly. Have dealer install	Always use only air conditions specified by Sanyo. Specified air conditioners

Electrical Work

⚠Warning

Electrical work must be carried out by qualified personnel

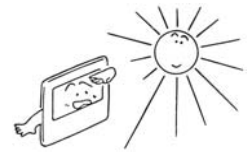
Contact your dealer for installation. Do not attempt to install the product yourself.

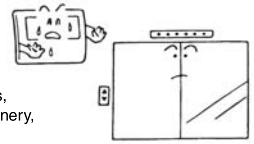
Contact your dealer for installation.

1 Important Safety Instructions

Location

⚠ Caution

Do not install in damp locations or locations subject to vibrations	Do not install under direct sunlight or in places near heat sources
Damage to the product can result. 	The product may be damaged. 

Do not install near sources of noise	Avoid static electricity during cabling work
Malfunctions can result.  Elevators, Automatic doors, Industrial machinery, etc	Before starting cabling work, touch ground to discharge static electricity from the body.

Avoid installation in the following locations	Keep televisions, radios, PCs, etc, at least 1m away from the central controller, indoor units, and remote controls
● Locations subject to inflammable gas leakage ● Near beaches or other places with a large amount of salt ● Hot springs or other locations subject to sulfuric gas ● Locations near water and oil (including industrial lubricants), and water and oil sprays ● Locations with large changes in voltage ● Near machines generating electromagnetic waves ● Locations close to organic solvents	Picture breakup and noise can occur.

Do not use heaters near the Intelligent Controller

Plastic parts of the Intelligent Controller may be deformed or discolored.

Precautions for Use

⚠ Warning

Do not touch switches with wet hands

Prohibited

Electric shock and damage to the system can result.

Protect the Intelligent Controller from water

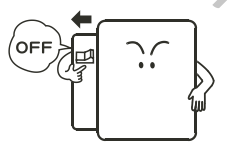
Prohibited

Damage to the system can result.

Stop the system and turn the power off if you sense unusual smells or other irregularities

Turn off the power.

Continuing operation when the system is out of order can result in electric shock, fire, and damage to the system.
Contact your dealer



⚠ Caution

Do not drop the system or subject it to strong shocks

Prohibited

Damage to the system can result.

Use only fuses with the correct capacity

Prohibited

Use of pins or copper wire can result in fire and damage to the system.

Use only the specified power source

Use of any other power source can result in fire and damage to the system.Use single-phase 100-240V power.

⚠ Caution

Use the special supplied touch pen

Prohibited

Touching the touch panel with any pen other than the supplied touch pen can damage the system.

Moving and Repair Precautions

⚠ Warning

Do not repair

Prohibited

Never repair the system yourself. Contact your dealer for repair. Electric shock or fire may result if an inexperienced person attempts to repair the system.

Contact your dealer before moving the system

Contact your dealer

Contact your dealer or a professional service provider about moving and reinstalling the system. Electric shock or fire may result if an inexperienced person performs any installation procedures incorrectly.

2 Features of the System

The Intelligent Controller (SHA-KT256BG) is a centralized air conditioning management system dedicated to PAC and GHP for small and medium sized buildings.

- ● Number of connectable units ····· • By connecting communication adaptors to one Intelligent Controller, up to 256 indoor units can be connected.
  • Up to 120 outdoor units can be connected.
- ● Display ····· • Touch panel type 6.5-inch TFT color (640x480 pixel VGA) LCD display
- ● Operation functions ····· • Start and stop, temperature settings, operation mode selection, fan speed settings, fan direction settings, ventilation etc.
- ● Operating monitoring ····· • All unit monitoring of operation status (operating/stopped, operation mode, alarms)
  • Display of alarm logs
  • One-operation checking of all filter cleaning signs and engine oil inspection signs
  • External output of all errors, external output of all operations (relay connections)
- ● Program timers ····· • Up to 50 types of weekly timers can be programmed by combining 50 types of daily timers (50 times per day).
- ● Air conditioning energy distribution ····· • Recording and display of accumulated operating time and total number of operations for each indoor unit.
  • Calculation of gas and electricity distribution ratios for each indoor unit and each tenant.
  • Distributions are available in two modes: the “simple distribution” calculated based on the operating time and “loaded distribution” calculated based on the actual air conditioning capacity, respectively. (In order to make operation in the “Loaded distribution” mode, the air conditioner side needs to be adaptable to the “Loaded distribution”.
  • Distribution by time zones (regular hours, out of hours, special days).
  • Recording of up to past 24 months of cut-off data.
- ● Printing display ····· • All operating screens can be printed out with a dedicated printer connected (hardcopy).

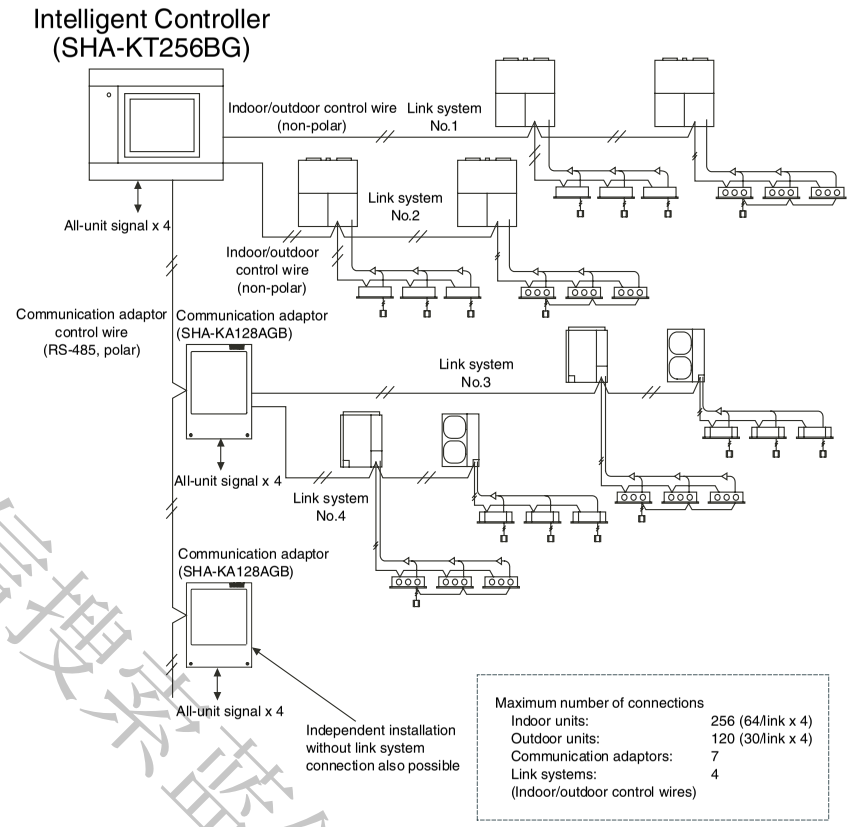
Terms and abbreviations used in this manual and in the system software

Full term	Abbreviation
Adaptor address	Adaptor
Link system address	Link system
Outdoor unit system address	Outdoor unit system, Outdoor unit, Outdoor system, Outdoor, O/D
Indoor unit address	Indoor unit, Indoor, I/D
Distribution group number	Distribution group No., Distribution group
Tenant number	Tenant No., Tenant
Zone number	Zone No., Zone
Unit name	Unit
Air conditioning distribution ratio	Distribution ratio, Distr. ratio
Central control address	Central address, CNTR
Thermostat	T/S

* For more information about terms, see “11 Terms”.

3 System Configuration

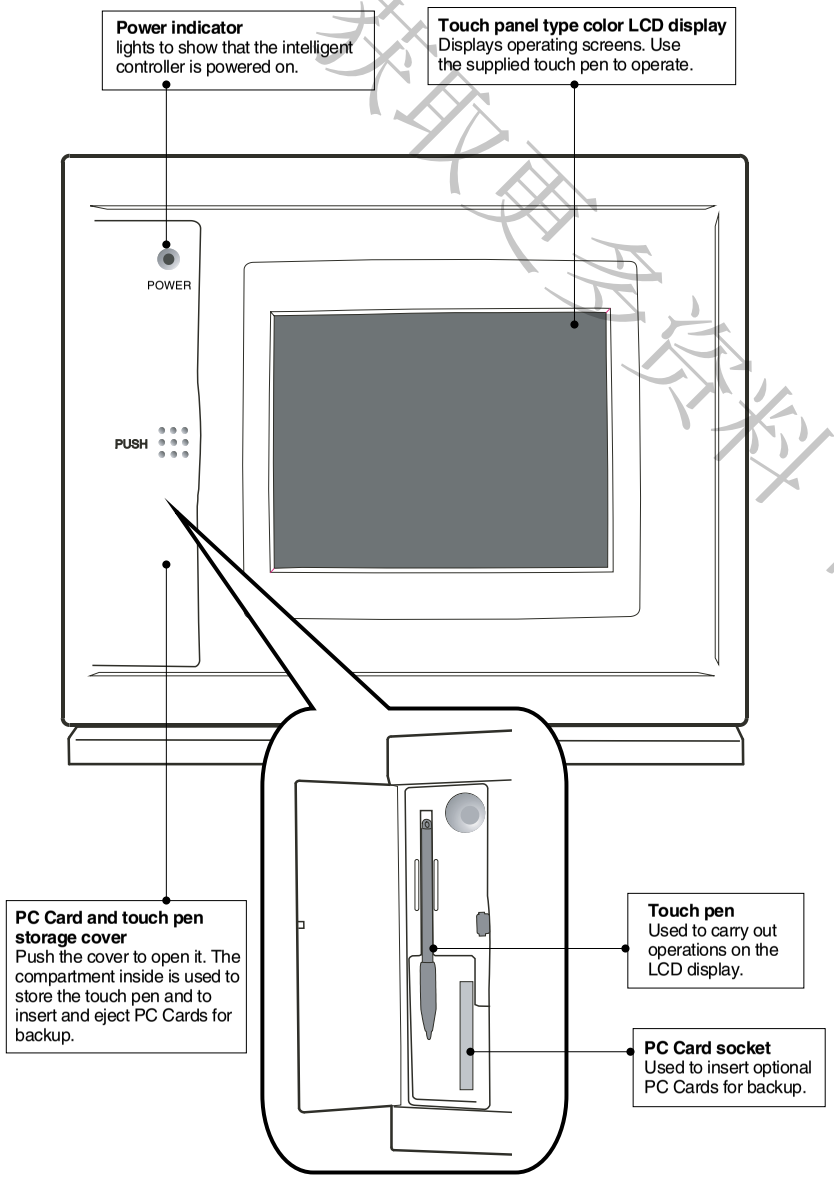
System Configuration Example



* When connecting link systems (indoor and outdoor unit control wires), always connect beginning with LINK1 and LINK2 on the Intelligent Controller. Up to 4 link systems can be connected.

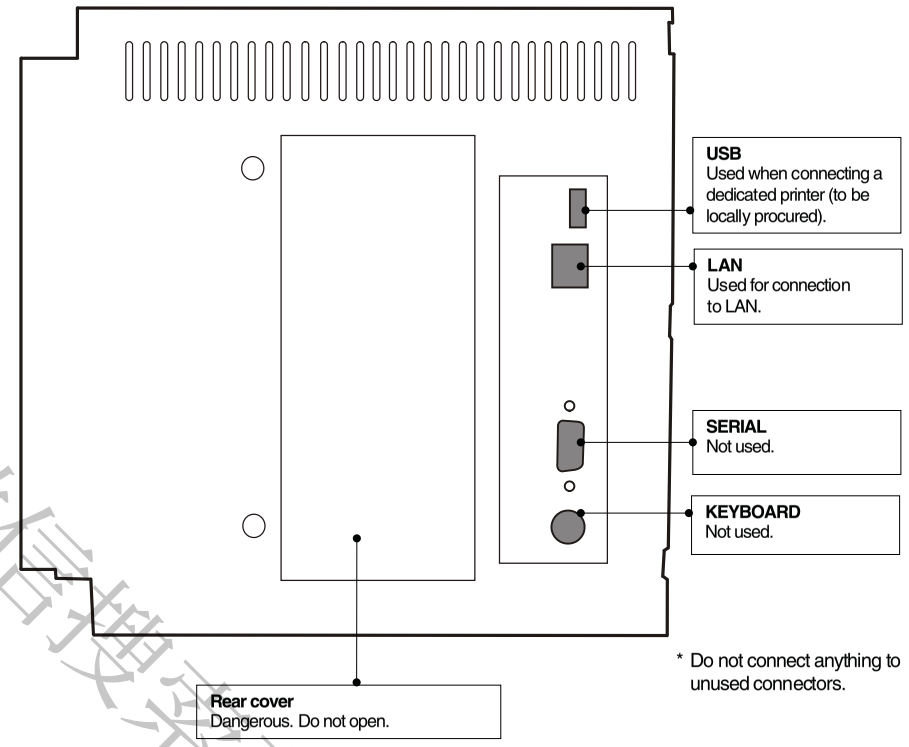
4 Names and Functions of Parts

● Front Panel



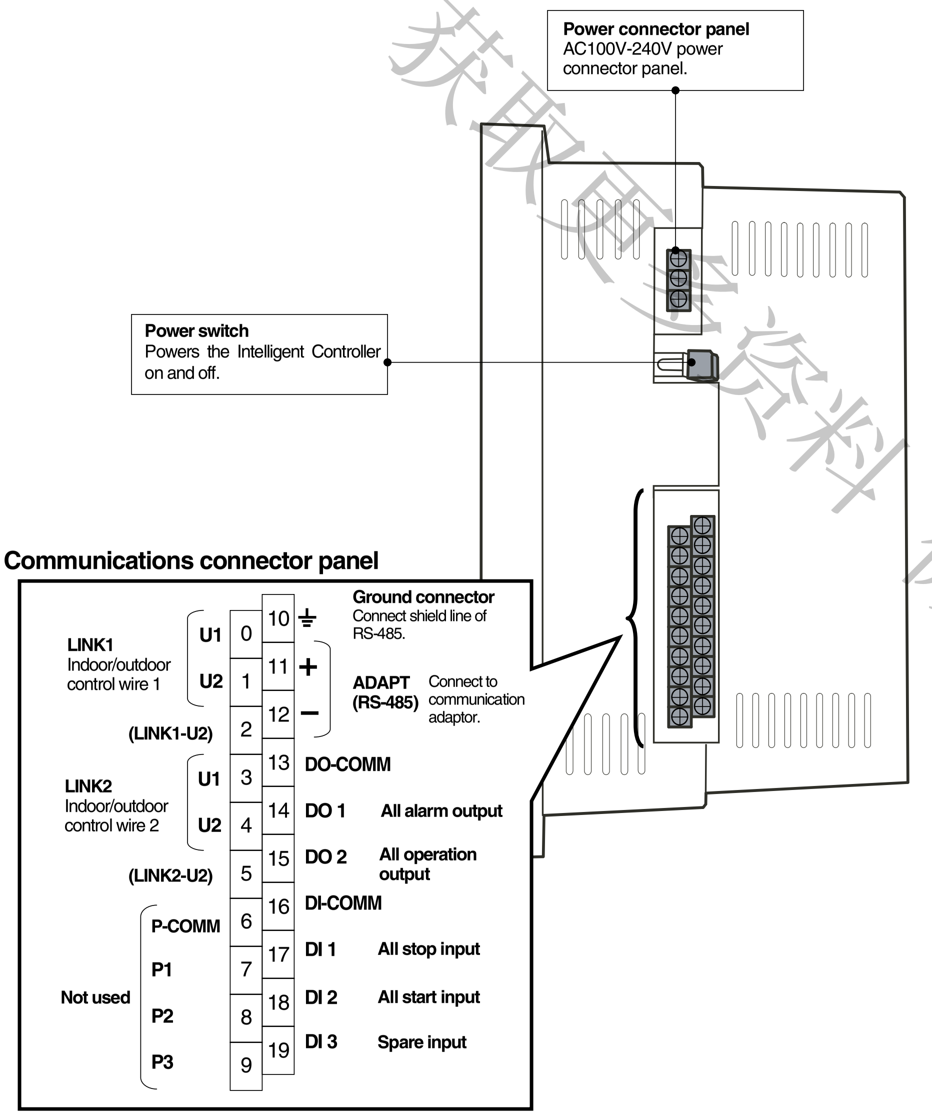
4 Names and Functions of Parts

● Rear Panel



4 Names and Functions of Parts

● Right side panel



5 Quick Reference

Menu List

Main Menu

1.Status/Control
2.Total data/Cut-off
3.Distrib. ratio
4.Maintenance/Test Run
5.Initial settings
6.Auxiliary settings

Sub Menu

1. Status/Control (C)
- 1.Each tenant ➢page 28
- 2.Each tenant details ➢page 32
- 3.Each zone ➢page 33
- 4.Each zone details ➢page 34
- 5.All units ➢page 35

2. Total data/Cut-off
- 1.Each I/D unit ➢page 36 (B)
- 2.Each tenant ➢page 37 (B)
- 3.Each O/D unit ➢page 38 (B)
- 4.Cut-off/Data backup ➢page 39 (A)

3. Distr. ratio (B)
- 1.Each I/D unit ➢page 42
- 2.Each tenant ➢page 43

4. Maintenance/Test Run
- 1.Inspection sign ➢page 45
- 2.Alarm log ➢page 46
- 3.Test run ➢page 47 (A)

5. Initial settings (A)
- 1.Date/Distrib. ➢page 21
- 2.CNTR/Unit/Ten. No. ➢page 23
- 3.Ten. name/Distrib. Gr. ➢page 25
- 4.Clear accum. data ➢page 27

Start the Initial settings first.

6. Auxiliary settings (A)
- 1.Zone name ➢page 48
- 2.ZoneNo./Mng.target ➢page 49
- 3.Program timer ➢page 51
- 4.Ten.Ho/TimerSp.Day ➢page 55
- 5.Prohibit R/C ➢page 56
- 6.Distribution time zone ➢page 57
- 7.Special distrib. day ➢page 58
- 8.I/D unit settings ➢page 59
- 9.Other settings ➢page 60
- 10.WEB settings ➢page 63
- 11.User settings ➢page 64

(A) ▭ shows screens protected using "Setting" password.

(B) ⬚ shows screens protected using "Distribution" password.

(C) ⬚ shows screens protected using "Operation" password. (Only the soft-remote controller is protected. The status is visible.)

5 Quick Reference

Menu List

Listed are only typical functions.

How to operate air conditioners		Page
Operating all units collectively desired	→ 6.4.1.3 Operating all connected units	☞ 7 - 77
Operating units individually desired	→ 6.4.1.1 Operating units individually	☞ 7 - 76
Operating units by tenant desired	→ 6.4.1 Displaying general information by tenant	☞ 7 - 76
Operating units by zone desired	→ 6.4.3 Displaying general information by zone	☞ 7 - 78
Varying operation modes desired	→ 6.4.1.1 Operating units individually	☞ 7 - 76
Varying setting temperatures desired	→ 6.4.1.1 Operating units individually	☞ 7 - 76
Resetting filter signs desired	→ 6.4.1.1 Operating units individually	☞ 7 - 76
Varying fan direction and speed	→ 6.4.1.1 Operating units individually	☞ 7 - 76
Prohibiting remote controlling desired	→ 6.4.1.1 Operating units individually	☞ 7 - 76
Monitoring status of air conditioner operation		
Monitoring status of inspection signs desired	→ 6.7.1 Checking inspection signs	☞ 7 - 84
Monitoring operation status collectively desired	→ 6.4.5 Displaying and operating all indoor units	☞ 7 - 79
Checking the alarm history desired	→ 6.7.2 Checking the alarm logs of indoor units	☞ 7 - 85
Checking current and past total calculation times desired	→ 6.5.1 Displaying total data by indoor unit	☞ 7 - 80
Checking current and past distribution ratios and energy consumption desired	→ 6.6.1 Displaying distribution ratios by indoor unit	☞ 7 - 83
Setting the system		
Changing the unit names desired	→ 6.3.3 Setting central addresses, unit names and tenant numbers	☞ 7 - 73
Changing tenant names desired	→ 6.3.4 Setting tenant names and distribution groups	☞ 7 - 74
Changing zone names desired	→ 6.8.1 Registering zone names	☞ 7 - 86
Adjusting dates and times desired	→ 6.3.2 Setting the date, cut-off date, and distribution ratio calculation method	☞ 7 - 72
Setting timer operation desired	→ 6.8.3 Programming timers	☞ 7 - 87
Setting security displayed on the screen desired	→ 6.8.9.2 Registering passwords	☞ 7 - 92
Stopping or sounding the buzzer	→ 6.8.9.4 Buzzer sounds	☞ 7 - 92
Others		
Backing up PC cards desired	→ 6.5.4.4 Restoring data	☞ 7 - 82
Powering off Intelligent Controllers desired	→ 6.8.9.8 Power off button	☞ 7 - 93
Outputting distribution in progress desired	→ 6.5.4.3 Outputting distribution data in progress	☞ 7 - 82
Printing desired	→ 9. Printing	☞ 7 - 98
Calibrating touch panel deviations	→ 6.8.9.7. Calibrating touch panels	☞ 7 - 93

6 Using the System

6.1 Powering the System On

Check the wiring, (air conditioners, communication adaptors, etc.) and then turn the power switch on (see page 12). The system starts automatically.
When the system is powered on for the first time, about 10 minutes are required for the normal system screen to appear. Wait until it appears.

6.2 Names and Functions of Screen Parts

6.2.1 Initial communications screen

The figure below shows the initial communications screen, which appears when the Intelligent Controller starts.

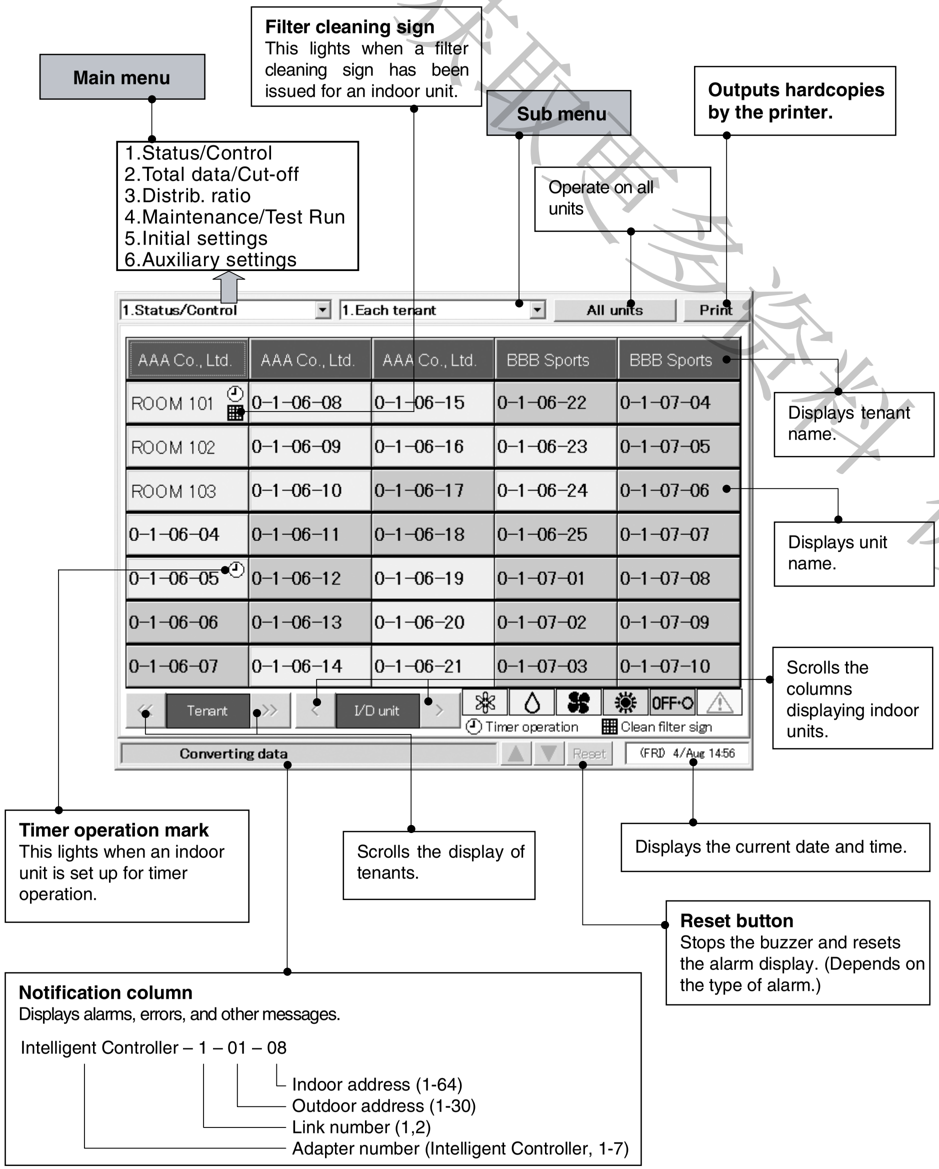
★ System power off procedure ★

Always use the following procedure to power the Intelligent Controller off.

In the "Other settings" menu (Main 6 Sub 9), select the last item, [Power off].
⇩
The message "Exit this program?" appears. Press the [OK] button.
⇩
The message "It is now safe to turn off the Intelligent Controller." appears (*). Turn the power off.
(* Several minutes may be required before the message appears.)

6.2.2 Operating screen example

The figure below shows a typical operating screen.



Filter cleaning signs are issued only as approximate guides. We recommend that filters be cleaned regularly, even if no sign has been issued.

6.3 Initial Settings

The items in the “Initial settings” menu (main menu 5) must be set in order to use the Intelligent Controller. Be sure to set these items.
Before making the settings, read the following and decide what kind of information you want to obtain from the system.

(1) Setting central addresses
Central addresses must be set on the “CNTR/Unit/Ten.No.” screen (Main 5 Sub 2).
Be aware that using them along with the system controller, ON/OFF-controller and so on, may affect zone control classification.

(2) Decide whether or not to use distribution ratios. (See “6.3.2 Setting the date, cut-off date, and distribution ratio calculation method”.)
Question: Do you need to display and record **distribution ratios** for each indoor unit and each tenant?
Yes → Select “T/S ON+OFF time” or “T/S ON time” as calculation target of power distribution.
No → Select “No Distrib.” as calculation target of power distribution.

If all you need to do is to monitor air conditioning status, operate the system, and view total data for operating time and so on, you should select “No”. (Information you do not need will not be displayed.)
When you select “No”, the following displays are disabled.
Setting items : Distribution group registration in Main 5 Sub 3.
Display items : Time zones in Main 2 Sub 1 and Main 2 Sub 2.
Menus : Main 3 Sub 1 and Main 3 Sub 2, Main 6 Sub 6, Main 6 Sub 7, and Main 6 Sub 8

(3) If you will be using distribution ratios, decide which **calculation method** to use. (See “6.3.2 Setting the date, cut-off date, and distribution ratio calculation method”.)
Question: Do you need to consider electricity of indoor units?
Yes → Select “T/S ON+OFF time” as calculation target of power distribution.
No → Select “T/S ON time” as calculation target of power distribution.

You can remove connected units from management by this system. For details, see “6.8.2 Setting zone numbers and management targets”.

6.3.1 System setting flow

❍: Settings are necessary.
▲: Settings are necessary depending on circumstances.
×: Settings are unnecessary.

Basic settings are completed by setting items of "❍" one by one in accordance with the system management of the customer.
Items of "▲" need to be set only when making necessary settings and maintenance upon customer request regardless of the said management.

	Air conditioner operation only	Displaying distribution ratios (simple distribution)	Displaying distribution ratios (loaded distribution)
START			
↓			
Main 5 Sub 1 Date/Distrib.			
(1) Setting the current date	❍	❍	❍
(2) Setting the cut-off date	▲ *Note 1*	❍	❍
(3) Calculation target of power distribution	×	❍	❍
(4) Setting the energy saving distribution	×	×	▲ *Note 2*
(5) Language	❍	❍	❍
↓			
Main 5 Sub 2 CNTR/Unit/Ten.No.			
(1) Central addresses **Note 8**	❍	❍	❍
(2) Unit name	❍	❍	❍
(3) Tenant No.	▲ *Note 3*	❍	❍
↓			
Main 5 Sub 3 Ten.name/Distrib.Gr.			
(1) Tenant name	▲ *Note 3*	❍	❍
(2) Distribution group	×	❍	❍
Product type	×	▲ *Note 4*	▲ *Note 5*
Distribution "Loaded" or "Simple" **Note 14**	×	×	❍
↓			
Main 5 Sub 4 Clear accum.data **Note 6**	▲ *Note 1*	❍	❍

	Air conditioner operation only	Displaying distribution ratios (simple distribution)	Displaying distribution ratios (loaded distribution)
↓			
Main 6 Sub 1 Zone name **Note 7**	▲	▲	▲
↓			
Main 6 Sub 2 ZoneNo./Mng.target **Note 7**			
(1) Zone No.	▲	▲	▲
(2) Management target	▲	▲	▲
↓			
Main 6 Sub 3 Program timer			
(1) Daily timer	▲	▲	▲
(2) Weekly timer	▲	▲	▲
↓			
Main 6 Sub 4 Ten.Ho/TimerSp.Day	▲	▲	▲
↓			
Main 6 Sub 5 Prohibit R/C	▲	▲	▲
↓			
Main 6 Sub 6 Distribution time zone	×	▲	▲
↓			
Main 6 Sub 7 Special distrib. day	×	▲	▲
↓			
Main 6 Sub 8 I/D unit setting			
(1) Indoor unit capacity **Note 9**	×	▲	×
(2) Electric heater capacity **Note 10**	×	×	▲
↓			
Main 6 Sub 9 Other settings			
(1) Checking system configuration	▲	▲	▲
(2) Set/Clear password			
(3) No-communications mode **Note 11**			
(4) Buzzer			
(5) Initialization **Note 12**			
(6) Auto display off			
(7) Touch panel calibration **Note 15**			
(8) Power off			

	Air conditioner operation only	Displaying distribution ratios (simple distribution)	Displaying distribution ratios (loaded distribution)
↓			
Main 6 Sub 10 WEB settings *Note 17*	▲	▲	▲
↓			
Main 6 Sub 11 User settings *Note 17*	▲	▲	▲
↓			
Main 2 Sub 4 Cut-off/Data backup			
(1) Manual cut-off *Note 6*			
(2) Data backup *Note 13*	×	○	○
(3) Restore *Note 13 and 16*	▲	▲	▲
↓	▲	▲	▲
END			

Note 1 Settings are necessary when you would like to monitor operation accumulated time only and distribution ratio is not needed.

Note 2 Settings are necessary only when air-conditioners include a 3-Way type unit.

Note 3 Make settings even when no distribution is made, if you would like to control units as a bundle of the group of tenants.

Note 4 Settings are necessary only when the indoor unit has a local adapter (SHA-KL4UGB) and is set at almighty.

Note 5 Settings are necessary only for the indoor unit set at almighty.

Note 6 Immediately before delivery, execute "Clear accum.data" to clear total data taken during test runs. When clearing the test run data after storing it, make "Cut-off" (Main 2 Sub 4) manually.

Note 7 Make the settings when you would like to operate the unit by optional grouping.

Note 8 When using the unit along with the system controller or ON/OFF-controller, the controller-side control classification needs to be taken into consideration.
The system controller or ON/OFF-controller-side zone varies as varying central addresses from the Intelligent Controller.

Note 9 Settings are necessary only for local adapters (SHA-KL4UGB).

Note 10 Settings are unnecessary for the simple distribution as they will be taken into consideration in calculation only for the loaded distribution.

Note 11 Always set the mode at "NO (Normal)".

Note 12 Do not make any initialization imprudently as it may cause missing of all the set and cut-off data.

Note 13 The system works only with the backup PC card inserted, which is separately available.

Note 14 Always manually make the cut-off processing in advance to vary the method of distribution.

Note 15 Although the touch panel is adjusted before factory shipment, calibrate deviations if any.

Note 16 Do not restore any data imprudently as it may return them to their backed-up status.

Note 17 Settings are necessary when you would like to control/monitor the unit via network.

6.3.2 Setting the date, cut-off date, and distribution ratio calculation method

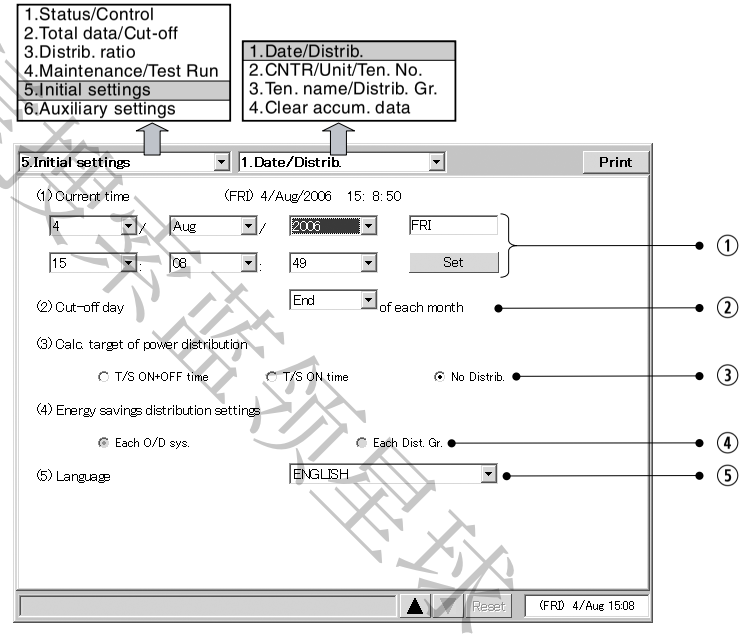
Use this screen to set the current date and time, and make settings related to time.
These settings are needed for program timers and distribution ratio calculation, **so be sure to make them before starting operation of the system**.

Procedure

Select 5.Initial settings in the main menu and 1.Date/Distrib. in the sub menu, then proceed as follows.

① Set the current date and time.
Under "(1) Current time", select the current year, month, day, hour, minute, and second from the drop-down lists(▼).
The day of the week is shown automatically.
Press the Set button to set the settings.

② Set the monthly cut-off day.
Under "(2) Cut-off day", select a number from 1 to 28 or End (to select the last day of the month) from the drop-down list(▼).



6 Using the System

Main5 Sub1

③ Select the calculation target of power distribution.

(3) Select T/S ON+OFF time, T/S ON time, or No Distrib..

- T/S ON + OFF time
  To be selected when taking power both for the outdoor and indoor units to make distribution calculation.
- T/S ON time
  To be selected when taking power only for the outdoor unit to make distribution calculation.
- No Distrib.
  To be selected when distribution calculation for gas and electricity is unnecessary.

④ Select the energy savings distribution settings.

(4) Select Each O/D sys. or Each Dist. Gr..

This item cannot be selected when No Distrib. has been set for “(3) Calc. target of power distribution”.
Select a range where the energy savings effect in 3 WAY units can be reflected on the distribution calculation.

- Each O/D sys.
  The energy savings operation in 3 WAY units is reflected only on the air conditioning distribution for the tenant for the outdoor system.
- Each Dist.Gr.
  The energy savings operation in 3 WAY units is reflected on air conditioning distributions for all the tenants in the overall distribution group including them.
  (However, this is effective only when plural distribution groups have been set.)

⑤ In the Language pull-down menu (5), select the language you would like to use.

6 Using the System

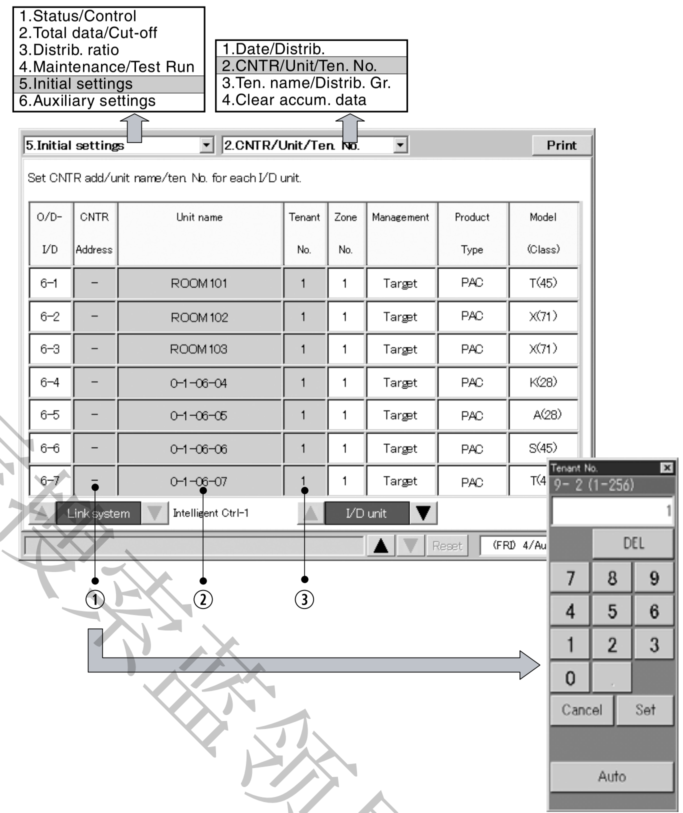
Main5 Sub2

6.3.3 Setting central addresses, unit names and tenant numbers

Use this screen to set central addresses, names of units connected to the system and tenant numbers.

Procedure

Select 5.Initial settings in the main menu and 2.CNTR/Unit/Ten. No. in the sub menu, then proceed as follows.

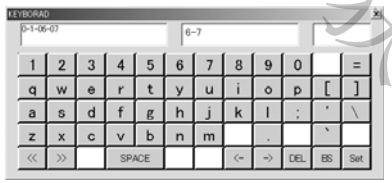


① When you touch a central address column, a screen will be displayed as shown on the right.
Input a number 1 to 64 to set central address.
When you touch [Auto], the central address will be automatically set.

> Two identical central address settings cannot be used within a link system. If you input an existing address, the input data is cancelled.
> It may take several minutes before the central address settings are reflected in the display.
> When other central controllers (system controller, etc.) are connected, it is recommended to set the central addresses on those units.

Main 5 Sub 2

② Touch an unit name column. A keyboard window like the one shown below appears. Use the keyboard to enter an unit name. Unit names can be up to 12 characters long.



* See “7 Entering Text and Numbers” for details about entering text in keyboard windows.

③ Touch a tenant number.A keyboard window like the one shown below appears. Use the keyboard to enter the tenant number.

*** The tenant number range is from 1 to 256.**

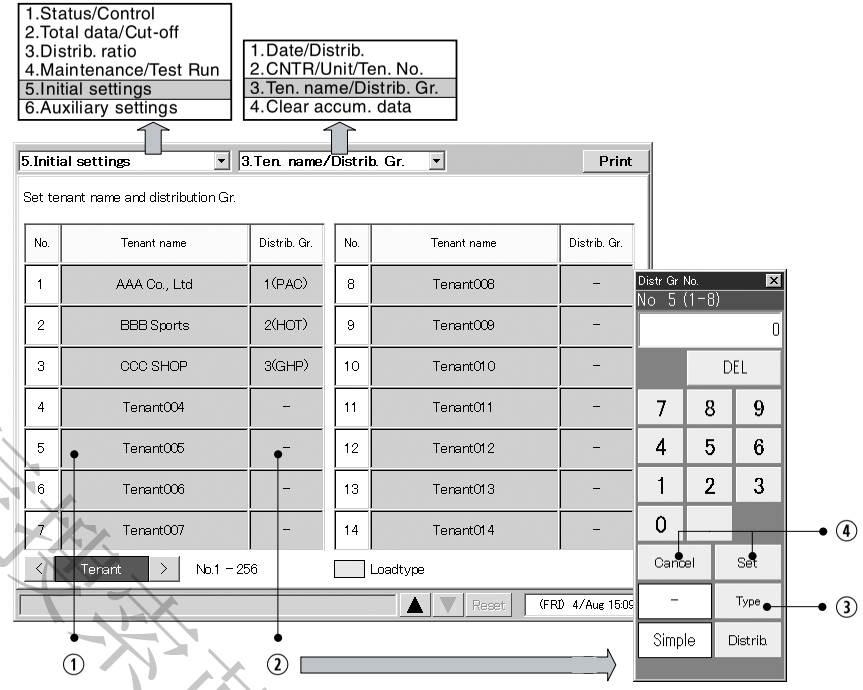
Main 5 Sub 3

6.3.4 Setting tenant names and distribution groups

Use this screen to set tenant names and distribution groups.
You can also use this screen to set the product type (PAC, GHP, HOT, etc.) of indoor units.

Procedure

Select 5.Initial settings in the main menu and 3.Ten. name/Distrib. Gr. in the sub menu, then proceed as follows.



① Touch a tenant name. A keyboard window appears. Use the keyboard to enter the tenant name. Tenant names can be up to 20 characters long.

* See “7 Entering Text and Numbers” for details about entering text on software keyboards.

* The tenant number range is from 1 to 256.

6 Using the System

Main5 Sub3

② Touch a distribution group. A keyboard window like the one shown above appears. Use the keyboard to enter a distribution group number and to select the product type from among PAC, GHP and HOT. Select "Simple" or "Load" in the distribution methods.

* Refer to "10. Calculating air conditioner distribution" for details.
The tenant set at "Load" distribution will have its "No" box display in light blue.

* The distribution group number range is from 1 to 8.

* This button is invalid when "No Distrib." has been set. (Refer to Main5 Sub1)

* The distribution group column set at loaded distribution has no product type such as "PAC" and "GHP" displayed.

* Make manual cut-off in advance to change the distribution method.

③ Press the [Type] button to select "PAC" or "GHP" for the following unit that is unable to automatically recognize product type.
- ON/OFF local adapter
This is only for "Simple distribution" setting.

④ Touch [Set] to confirm the setting, or [Cancel] to cancel it.

- PAC, GHP, and HOT cannot be mixed in the same group. Set up a separate distribution group for each type.
- HOT multi units cannot be recognized automatically (they are recognized as PAC). Manually set the product type to HOT.
- HOT Tenants cannot be set at the "Load" distribution.
- "Load" distribution tenants cannot be set at "HOT".
- Air conditioners unadaptable to loaded distribution cannot be set at "Load" Distribution.
- Local adapters are also unadaptable to loaded distribution.

6 Using the System

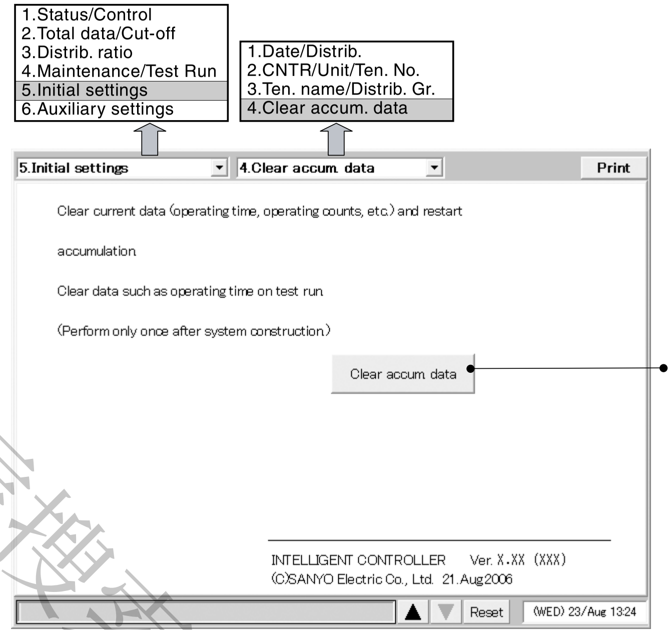
Main5 Sub4

6.3.5 Clear accumulation data

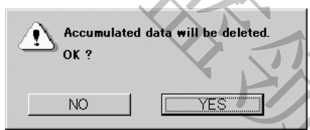
Use this screen to erase total data after test runs, and to restart total calculations for operating time, operating counts, and so on.

Procedure

Select [5.Initial settings] in the main menu and [4.Clear accum. data] in the sub menu, then proceed as follows.



① Touch [Clear accum. data].
A window like the following appears.



Touch [Yes]. Total data up to now is erased, and calculation of total operating time restarts.

6.4 Status Monitoring and Operation Screens

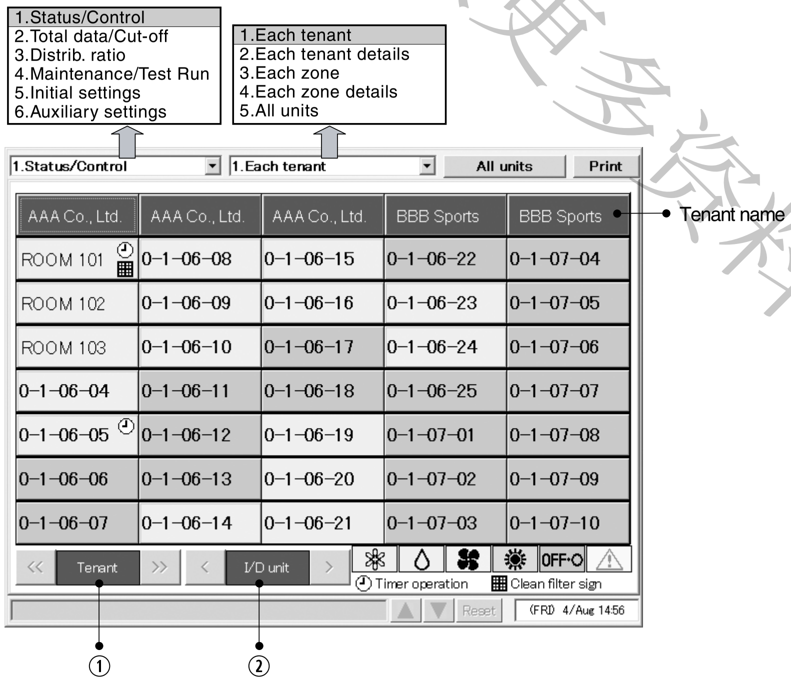
6.4.1 Displaying general information by tenant

Use this screen to display information about all connected indoor units by tenant.

Procedure

Select 1.Status/Control in the main menu and 1.Each tenant in the sub menu.

The indoor units for each tenant are displayed.



① Scrolls the display one tenant at a time.
② Scrolls the display one row at a time.

Meaning of symbols

- : COOL
- : DRY
- : FAN
- : HEAT
- : ALARM
- : AUTO Mode/Speed
- : SWING
- : VENTILATION
- : Accept remote controller
- : Prohibit remote controller setting No.1
- : High fan speed
- : Medium fan speed
- : Low fan speed
- : TIMER
- : Clean filter sign

"---" is displayed in the tenant name row for indoor units not registered to a tenant.

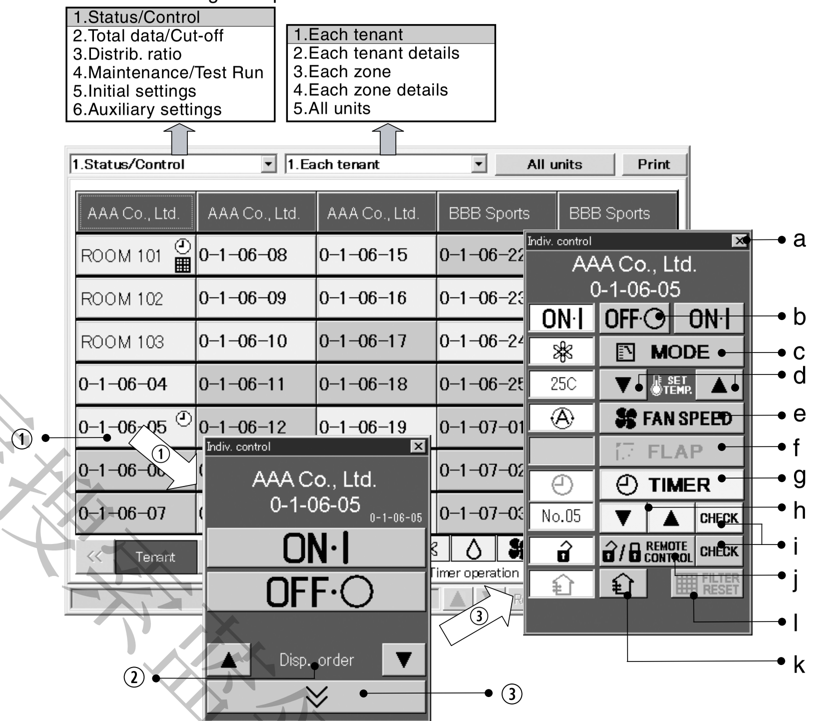
6.4.1.1 Operating units individually

Use this screen to operate individual indoor units.

Procedure

Select 1.Status/Control in the main menu and 1.Each tenant in the sub menu.

① When you touch the unit that you want to set, a remote control window for individual on/off operations appears.
② Move the display position on the screen up and down one line.
③ When you touch [button], a remote control window appears. This window allows you to make detailed settings for operations on individual units.



a. Closes the remote control window.
b. Sets to either Start or Stop.
c. Sets the operating mode.
d. Set the temperature.
e. Sets the fan speed.
f. Sets the fan direction.
g. Sets and cancels timer operation.
h. Sets timer number from No. 1 to No. 50.
i. Displays a window that allows you to check timer setting status and remote control prohibition status.
j. Displays one of "Prhbt1/ Prhbt2/ Prhbt3/ Prhbt4/Accept".
k. Turns the ventilation function ON and OFF. (You cannot press the button when air conditioners have no ventilation functions).
l. Resets filter cleaning signs.

- For multiple units, the operation mode for one unit may not be varied while another indoor unit is under operation. In such a case, once stop the unit, hold it for several minutes, and then vary the operation mode.

6 Using the System

Main 1 Sub 1

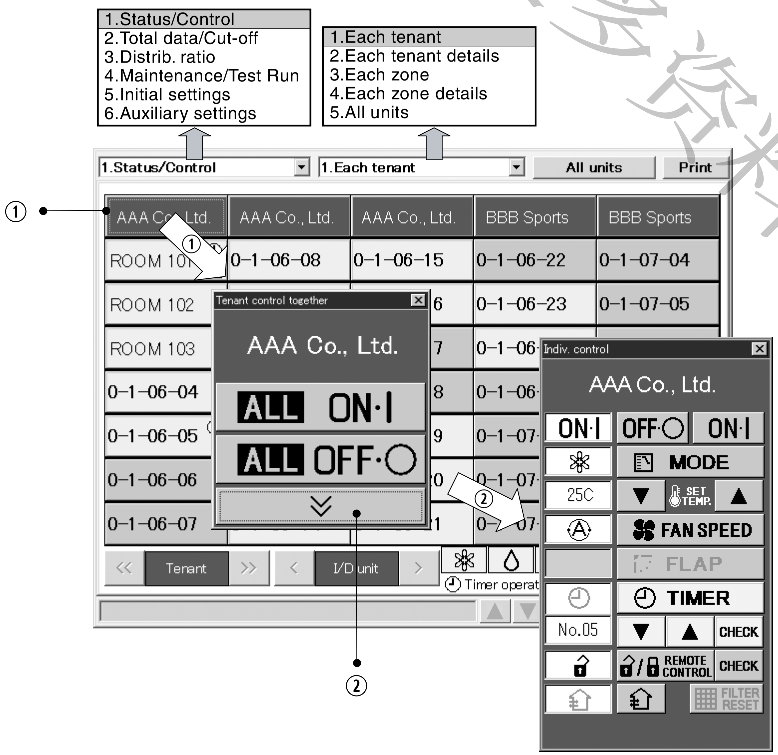
6.4.1.2 Operating all units by tenant

Use this screen to operate all connected indoor units of each tenant.

Procedure

Select 1.Status/Control in the main menu and 1.Each tenant in the sub menu.

① When you touch a tenant name, a remote control window appears. This window allows you to perform on/off operations for all units of the tenant.
② When you touch [≫], a remote control window appears. This window allows you to make detailed settings for operations on all units of the tenant.



6 Using the System

Main 1 Sub 1

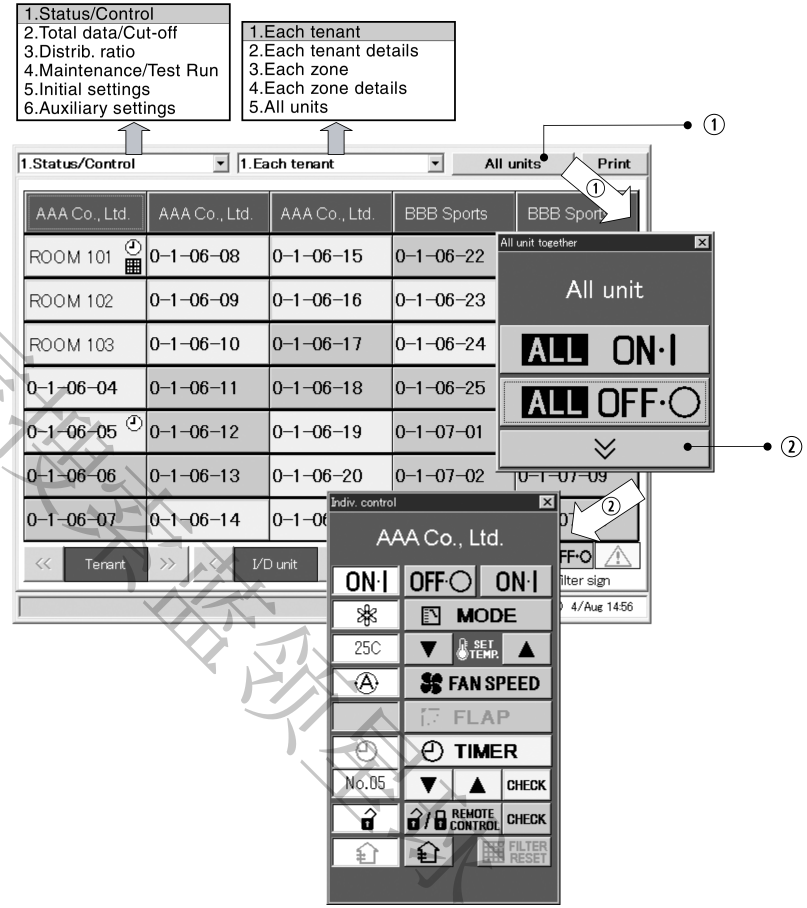
6.4.1.3 Operating all connected units

Use this screen to operate all connected indoor units.

Procedure

Select 1.Status/Control in the main menu and 1.Each tenant in the sub menu.

① When you touch All units, a remote control window appears. This window allows you to perform on/off operations for all connected units.
② When you touch [≫], a remote control window appears. This window allows you to make detailed settings for all connected units.



Main 1 Sub 2

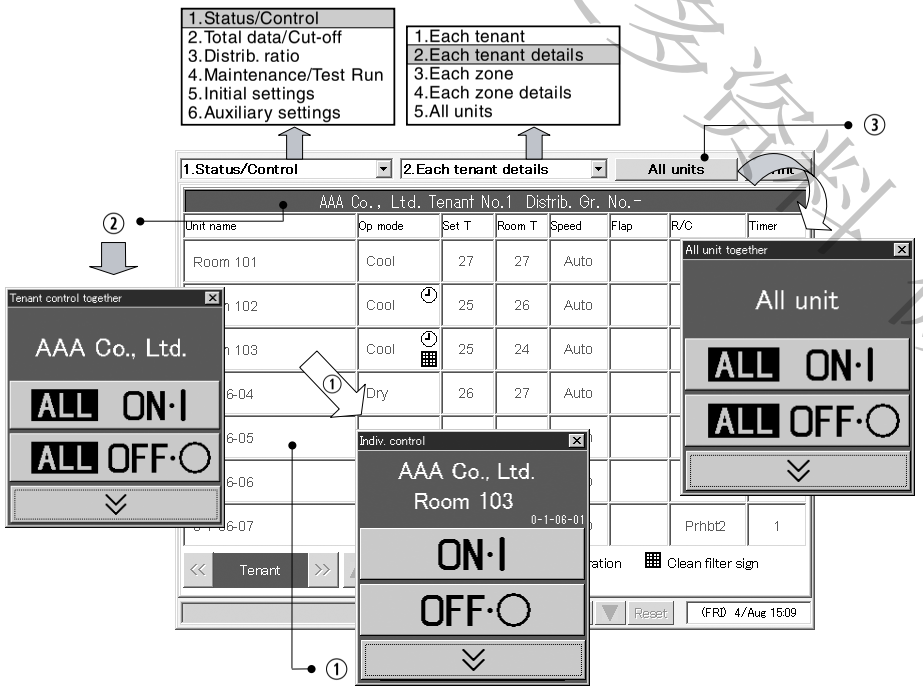
6.4.2 Displaying detailed information by tenant

Use this screen to display detailed settings and operating for each tenant.

Procedure

Select 1.Status/Control in the main menu and 2.Each tenant details in the sub menu.

① When you touch a unit name, a remote control window for individual operations appears.
② When you touch a tenant name, a remote control window for operating all tenant units appears.
③ When you touch All units, a remote control window for operating all connected units appears.



Main 1 Sub 3

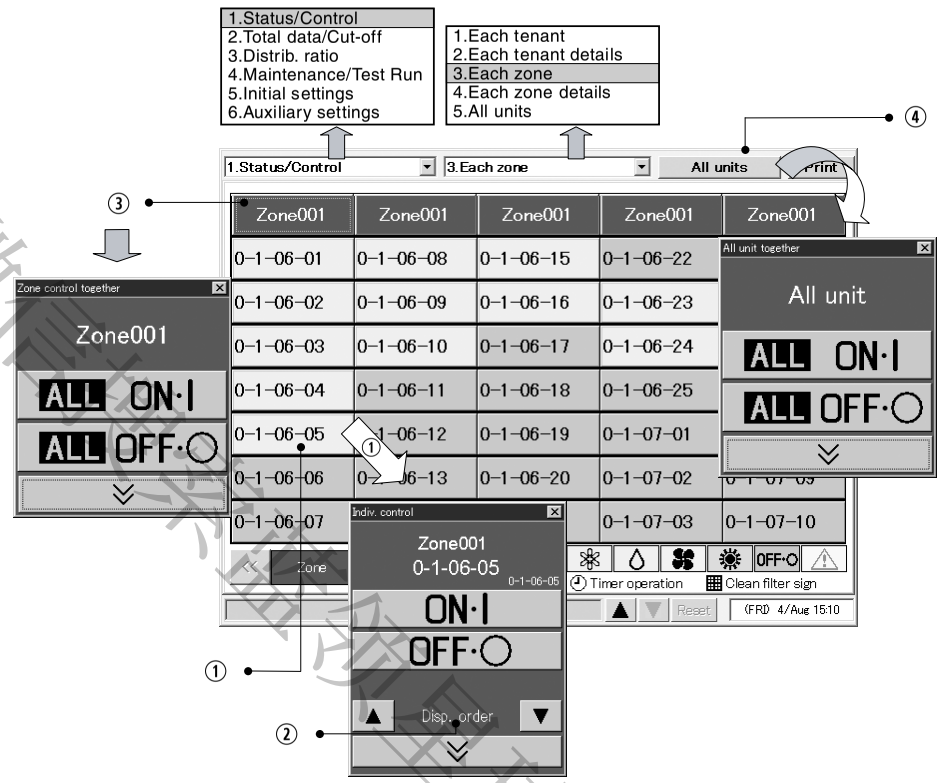
6.4.3 Displaying general information by zone

Use this screen to display the state of all units in a zone and to operate those units.

Procedure

Select 1.Status/Control in the main menu and 3.Each zone in the sub menu.

① When you touch a unit name, a remote control window for individual operations appears.
② Move the display position on the screen up and down one line.
③ When you touch a zone name, a remote control window for operating all units in the zone appears.
④ When you touch All units, a remote control window for operating all connected units appears.



6 Using the System

Main 1 Sub 4

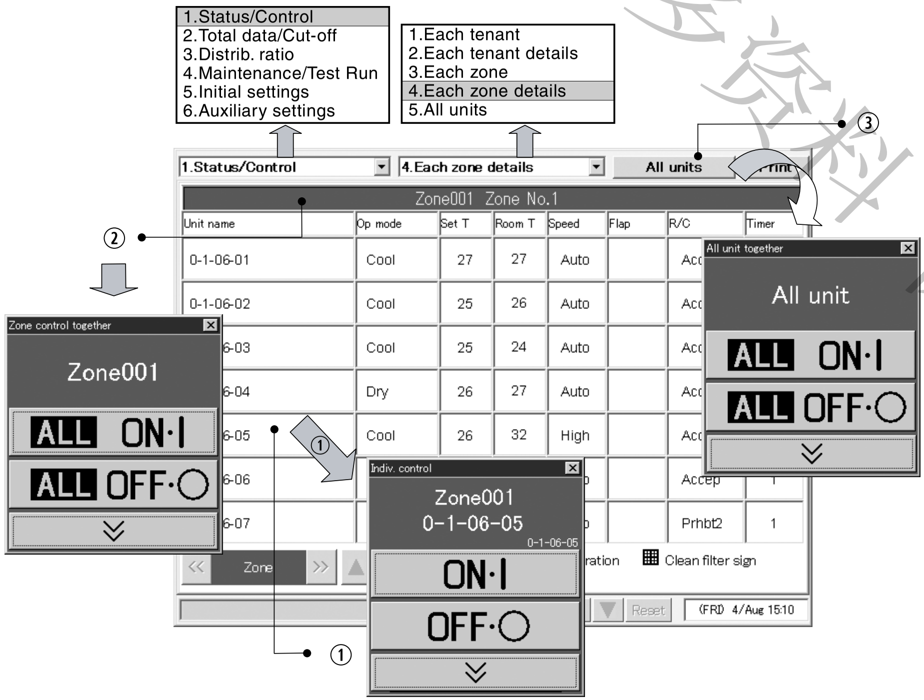
6.4.4 Displaying detailed information by zone

Use this screen to display detailed settings and operating for each zone.

Procedure

Select 1.Status/Control in the main menu and 4.Each zone details in the sub menu.

① When you touch a unit name, a remote control window for individual operations appears.
② When you touch a zone name, a remote control window for operating all units in the zone appears.
③ When you touch All units, a remote control window for operating all connected units appears.



6 Using the System

Main 1 Sub 5

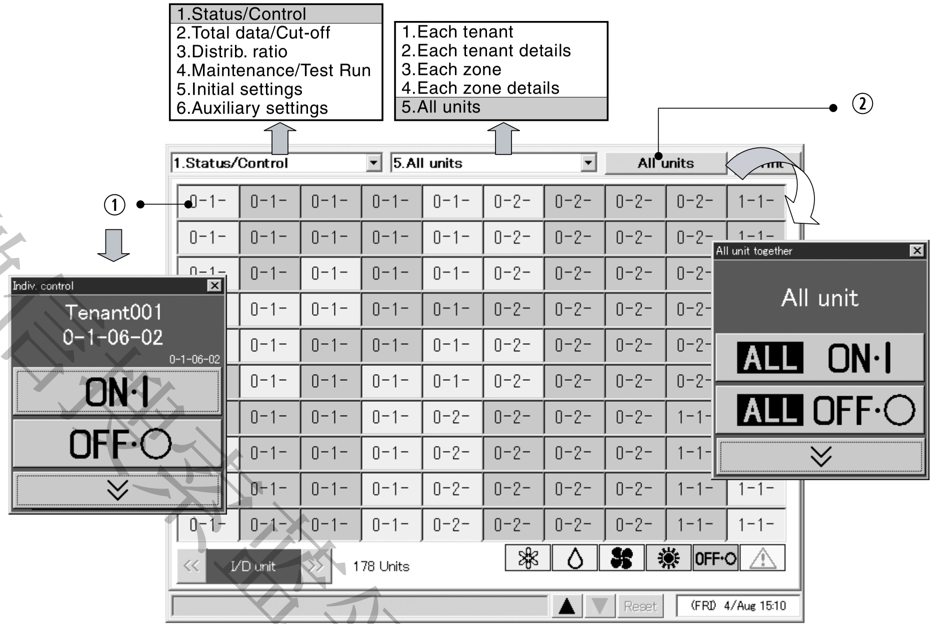
6.4.5 Displaying and operating all indoor units

Use this screen to display information about the state of all indoor units and to operate all indoor units at once.

Procedure

Select 1.Status/Control in the main menu and 5.All units in the sub menu.

One screen displays up to 100 indoor units in order of their tenant. The units can be operated individually or all at once.
① When you touch a unit name, a remote control window for individual operations appears.
② When you touch All units, a remote control window for operating all connected units appears.



7

6 Using the System

Main 2 Sub 1

6.5 Total Data and Manual Cut-Off Processing

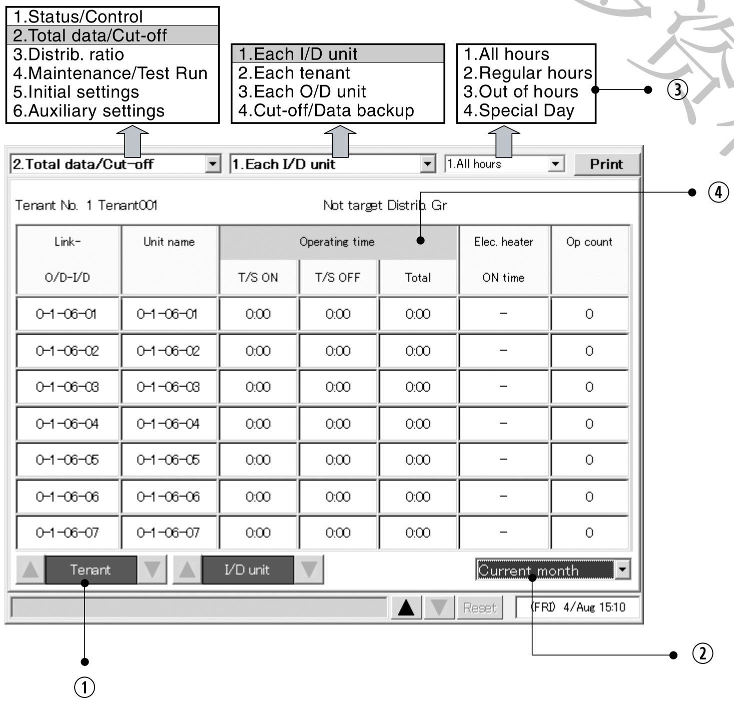
6.5.1 Displaying total data by indoor unit

Use this screen to check total data such as the operating time and the number of operations for each indoor unit.

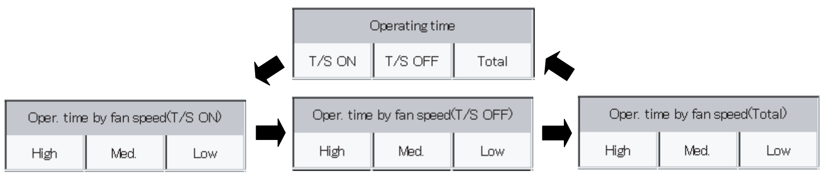
Procedure

Select 2.Total data/Cut-off in the main menu and 1.Each I/D unit in the sub menu.

① Selects the tenant to display.
② Selects either the current or the past (maximum 24 months) cut-off data.
③ Selects the time zone to display.
* This button will be invalid when setting the mode at "No Distrib.". (see Main 5 Sub 1)



④ If you want to display operating time by fan speed, touch Operating time. The display changes as shown below.



6 Using the System

Main 2 Sub 2

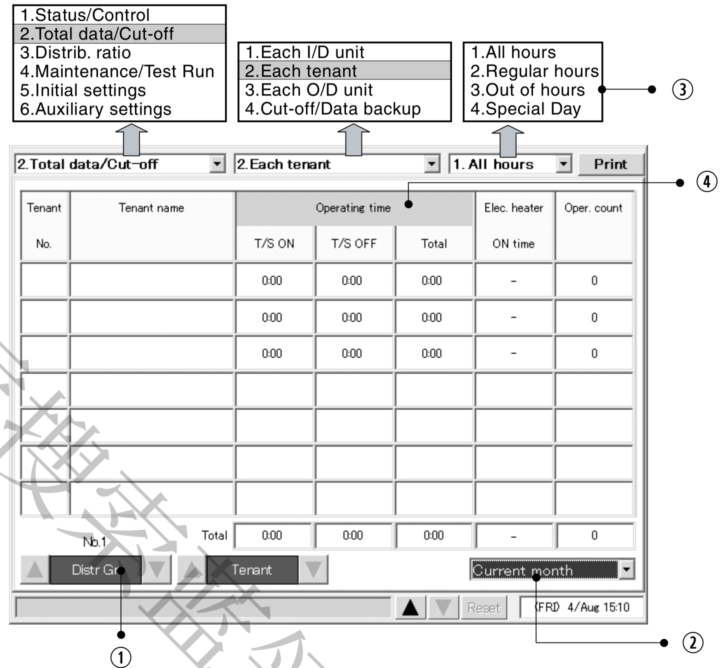
6.5.2 Displaying total data by tenant

Use this screen to check total data such as the operating time and the number of operations for each tenant.

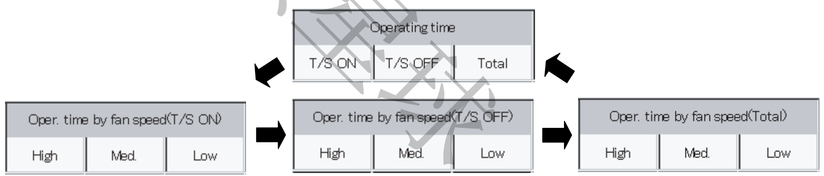
Procedure

Select 2.Total data/Cut-off in the main menu and 2.Each tenant in the sub menu.

① Selects the distribution group to display.
② Selects either the current or the past (maximum 12 months) cut-off data.
③ Selects the time zone to display.
* This button will be invalid when setting the mode at "No Distrib.". (see Main 5 Sub 1)



④ If you want to display operating time by fan speed, touch Operating time. The display changes as shown below.



6 Using the System

Main 2 Sub 3

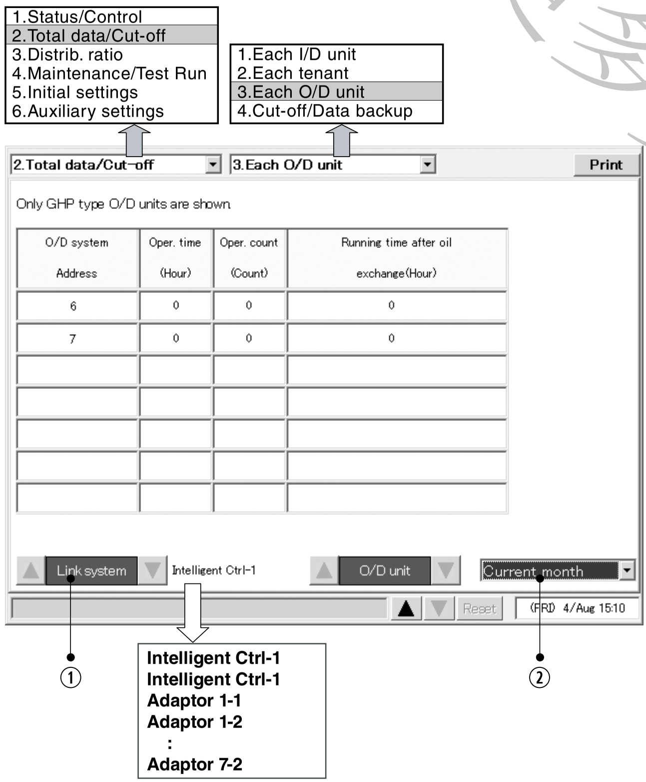
6.5.3 Displaying total data by outdoor unit

Use this screen to check total data such as the operating time and the number of operations for each outdoor unit.

Procedure

Select 2.Total data/Cut-off in the main menu and 3.Each O/D unit in the sub menu.

① Selects the connection destination link system to display.
② Selects either the current or the past (maximum 12 months) cut-off data.



- You should make frequent checks of the running time after oil exchanges. When the time approaches for an oil exchange, contact your dealer or service provider to request an early oil exchange. The engines of GHP type outdoor unit can be damaged by operation without exchanging the oil.
- For double multiple models comprising two or more outdoor units with the same address, data with a typical unit are displayed.

6 Using the System

Main 2 Sub 4

6.5.4 Performing manual cut-off processing and saving data

Use this screen to perform manual cut-off processing, and to back up setting and total data to optional PC Cards.

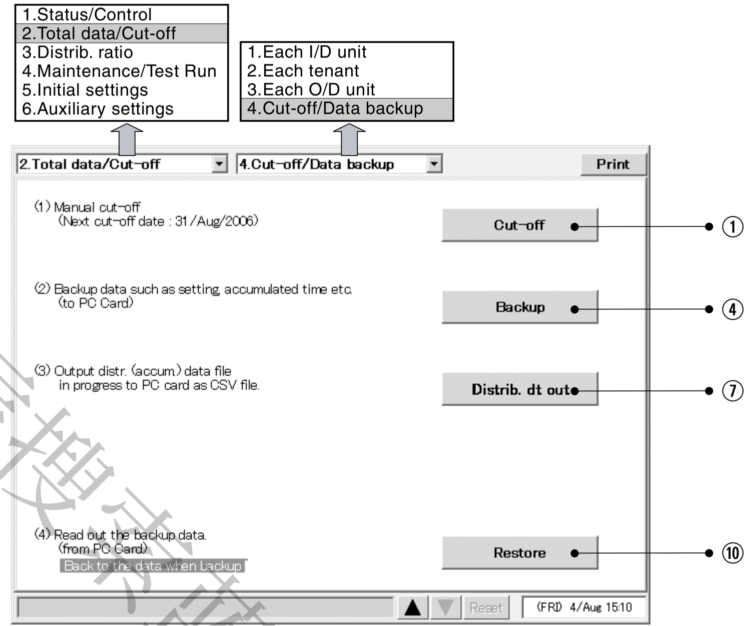
6.5.4.1 Manual cut-off processing

Proceed as follows to manually perform cut-off processing.

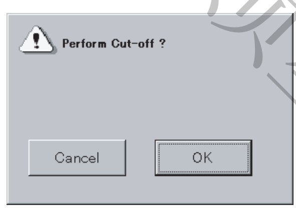
Procedure

Select 2.Total data/Cut-off in the main menu and 4.Cut-off/Data backup in the sub menu.

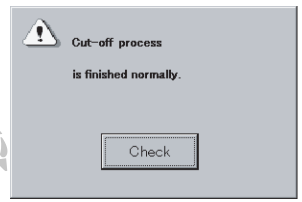
① Touch Cut-off.



② When a window like the one shown below appears, touch the OK button.



③ When a window like the one shown below appears, touch the Check button.



7

6 Using the System

Main 2 Sub 4

6.5.4.2 Saving data

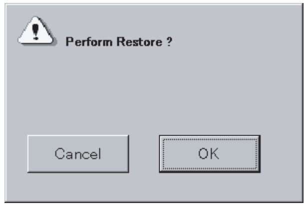
Proceed as follows to back up setting data and totals data to optional PC Cards.

Procedure

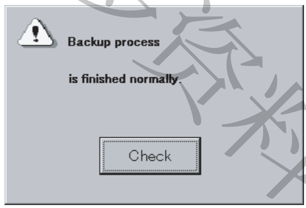
Complete the cut-off processing described in “6.5.4.1 Manual cut-off processing” and then execute the following backup procedure.

④ Insert a PC card and touch the [Backup] button.

⑤ When a window like the one shown below appears, touch the [OK] button.



⑥ When a window like the one shown below appears, touch the [Check] button.



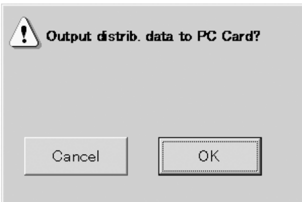
* When keeping the PC card inserted in a unit, data therein are automatically backed up once a day (at every 0 o’clock at midnight).

6.5.4.3 Outputting distribution data in progress

Save distribution data (total data) in progress before cut-off processing in PC cards (optionally available) following the procedure stated below.

Procedure

⑦ Insert a PC card and touch the [Distrib. dt out] button.
⑧ When a screen like the one shown below appears, touch the [OK] button.

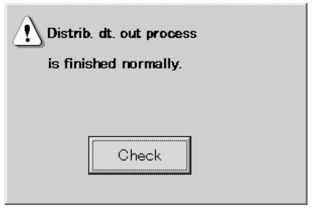


As data output by pressing the [Distrib. dt out] button are strictly in progress, it is impossible to apply these data for cut-off processing for the tenant who leaves halfway. (Manual cut-off processing is necessary).

6 Using the System

Main 2 Sub 4

⑨ When a screen like the one shown below appears, touch the [Check] button.



[File form]
A file name is fixed as follows according to the year, month, and date when the distribution data output was carried out.
20060316A.csv (Example of a file output on March 16, 2006)
When outputting repeatedly on the same day, the last “A” varies as B, C, D, and so forth.
(Outputting is possible up to 26 times a day).
Data composition in the file is the same as that in a cut-off processing file.

[Caution]
Copy output distribution data files to your PC and then delete them from the PC card.
When distribution data files are too many, normal backups of cut-off data may become impossible.

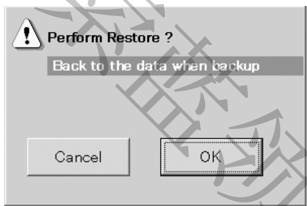
6.5.4.4 Restoring data

Proceed as follows to restore setting data and total data from optional PC Cards.

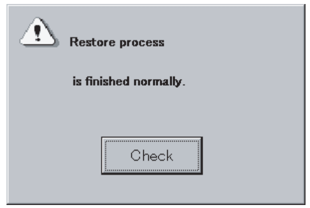
Procedure

⑩ Insert a PC card and touch the [Restore] button.

⑪ When a window like the one shown below appears, touch the [OK] button.



⑫ When a window like the one shown below appears, touch the [Check] button.



* When trying to restore data backed up using an old-version Intelligent Controller, a message “Unsupported file version. Perform Restore?” will be displayed; confirm the message and touch “Yes”.
After completing restoring, “Rebooting.” will be displayed and then touch “OK”. The data restored will be effective after rebooting. (After “Converting data” is displayed for a while, the system will automatically reboot again.)
* Everyday, at 23:30 to 00:00, cut-off processing take place, when you cannot press the [Restore] button.

Use the special optional PC Cards to back up and restore Intelligent Controller data. For details about using PC Cards, refer to the instructions of the PC Cards.
Depending on the amount of data, backup and restore operations may require up to 15 minutes.

6 Using the System

Main 3 Sub 1

6.6 Air Conditioning Distribution Ratios

6.6.1 Displaying distribution ratios by indoor unit

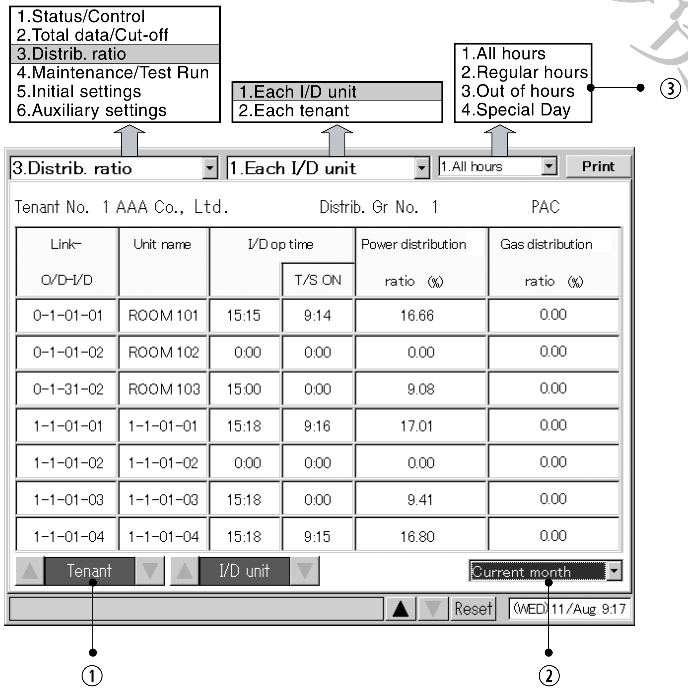
Use this screen to check the distribution ratios of indoor units.

Procedure

Select 3.Distrib. ratio in the main menu and 1.Each I/D unit in the sub menu.

*When "No Distrib." is selected, this screen is not accessible. (see Main 5 Sub 1)

① Selects the tenant to display.
② Selects either the current or the past (maximum 24 months) cut-off data.
③ Selects the time zone to display.



> Gas distribution ratios are not displayed for PAC units.

6 Using the System

Main 3 Sub 2

6.6.2 Displaying distribution ratios by tenant

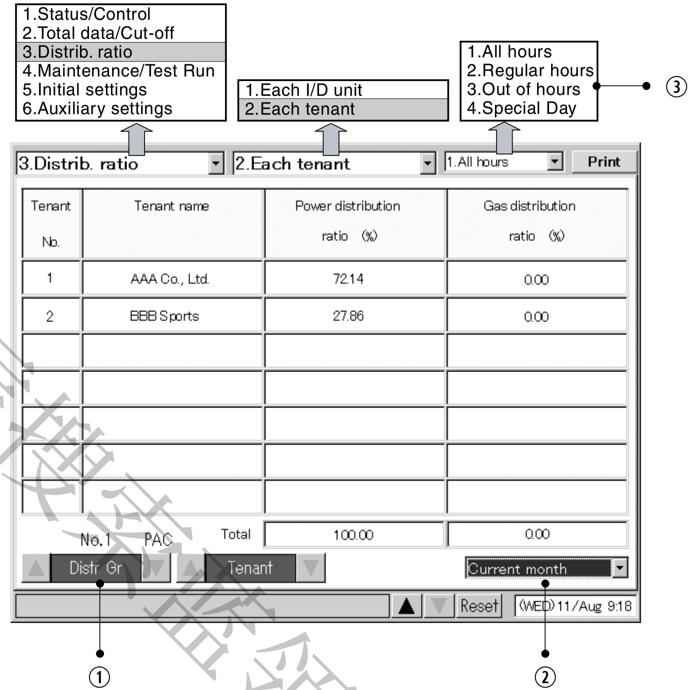
Use this screen to check distribution ratios by tenant.

Procedure

Select 3.Distrib. ratio in the main menu and 2.Each tenant. in the sub menu.

*When "No Distrib." is selected, this screen is not accessible. (see Main 5 Sub 1)

① Selects the distribution group to display.
② Selects either the current or the past (maximum 24 months) cut-off data.
③ Selects the time zone to display.



> Gas distribution ratios are not displayed for PAC units.

6 Using the System

6.6.3 Time zone totals and distribution

The Intelligent Controller provides functions for recording total operating time and calculating distribution ratios for four time zones: All hours, Regular hours, Out of hours, and Special days. When using these functions, be aware of the following points.

■ **Margin of error in time zone operating totals**

The intelligent controller acquires operating time data accumulated by individual indoor units via communication adaptors. The Intelligent Controller itself has an internal communication adaptor function.

When the Intelligent Controller requests data from a communication adaptor, the adaptor queries indoor units for their operating time data, and forward it to the Intelligent Controller after all totals have been calculated.

For this reason, there is a margin of error of up to several minutes that may arise in count totals around the transitions from one time zone to another. For example, cases such as the following are possible.

Case 1) Indoor units are stopped at the exact end of the Regular hours time zone (or immediately before the end of the zone). For this reason, several minutes are counted in the Out of hours total.

Case 2) Indoor units are operated for the same length of time before and after the transition from Regular hours to Out of hours, but the totals for the two zones are not the same.

■ **Note about daily timer settings**

For communications reasons, there is a slight delay before units can be stopped by a timer. Therefore you should avoid setting timers that stop units exactly at the transition between two time zones.

For example, if you simultaneously stop a large number of indoor units at the transition from Regular hours to Out of hours, a certain period of time is required for the indoor units to actually stop. This time is counted as Out of hours time.

If you need to set a timer to stop units before a time zone transition, you should avoid setting it within 10 minutes of the transition. (This is only an approximately guideline, since results vary depending on communications conditions.)

■ **Communications errors and data totals**

Data totals may not be accurate if communications errors occur in the Intelligent Controller, indoor units, or communication adaptors.

For example, if a communications error occurs in the Regular hours time zone, and normal communications are restored in the Out of hours time zone, all data received by the Intelligent Controller will be counted in the Out of hours time zone.

Totals data received by the Intelligent Controller is counted in the time zone in which it is received.

6 Using the System

6.7 Maintenance and Test Runs

6.7.1 Checking inspection signs

Use this screen to check for indoor units for which filter cleaning signs have been issued, and outdoor units (GHP) for which engine oil inspection signs have been issued.

Procedure

Select 4.Maintenance/Test Run in the main menu and 1.Inspection sign in the sub menu.

If filter cleaning signs or engine oil inspection signs have been issued, contact your dealer or service provider to request cleaning or oil exchange.

Filter cleaning signs are only an approximate guide. We recommend that you clean indoor unit filters regularly, even if no signs have been issued.

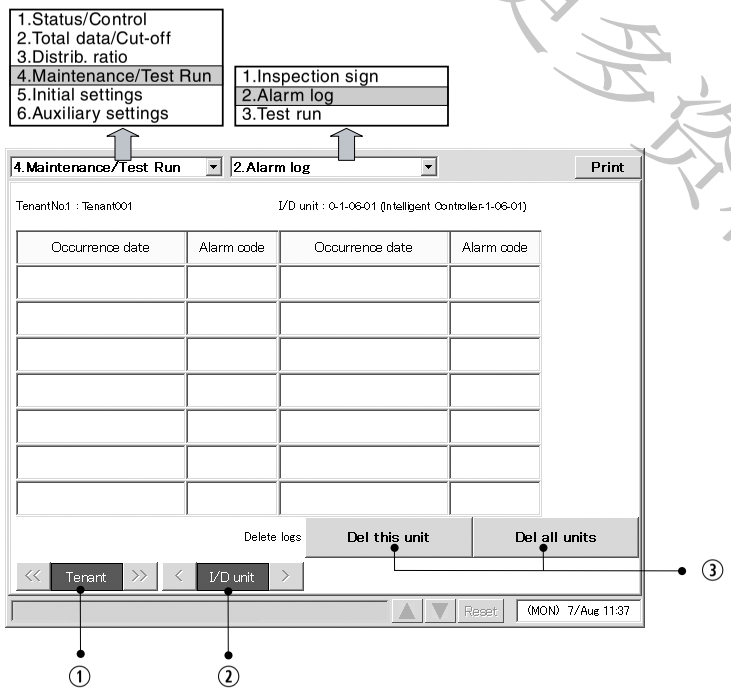
6.7.2 Checking the alarm logs of indoor units

Use this screen to check logs of up to the past 14 alarms and errors for individual indoor units.

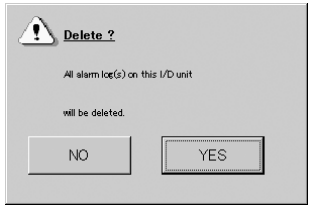
Procedure

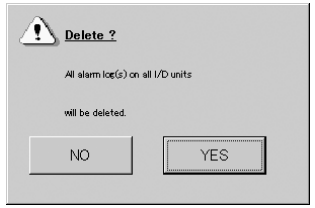
Select 4.Maintenance/Test Run in the main menu and 2.Alarm log in the sub menu.

① Select the tenant to display.
② Select the indoor unit to display.



③ Touch the Del this unit button to delete the alarm logs of the selected unit only, or touch the Del all units button to delete the alarm logs of all units.
④ When a window like the following appears, touch the Yes button.





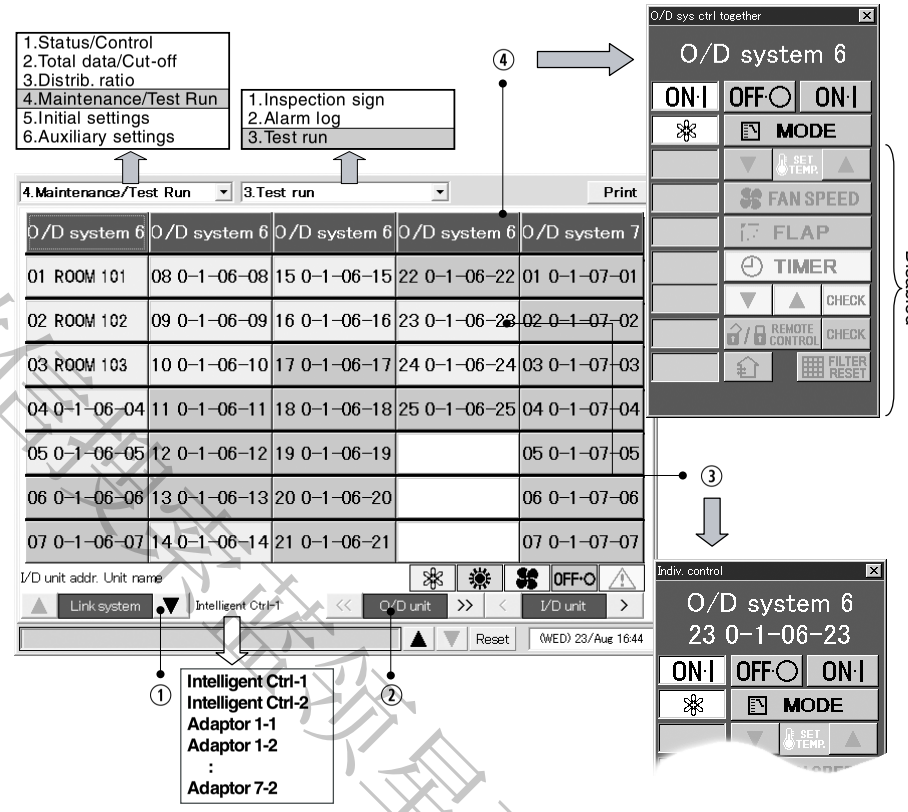
6.7.3 Executing test runs

Use this screen to display list of each indoor unit for outdoor unit system addresses.
You can execute test runs , either for each outdoor unit system address or individually.

Procedure

Select 4.Maintenance/Test Run in the main menu and 3.Test run in the sub menu.

① Select a connection destination link system.
② Select the outdoor unit to operate.



③ To operate an individual unit, touch a unit name and operate with the individual control remote control window.
④ To operate all units in an outdoor unit system, touch the outdoor unit system address column. A remote control window for operating an outdoor unit system appears. Use this window to execute a test run. Select Cool, Heat, or Fan as the operating mode.

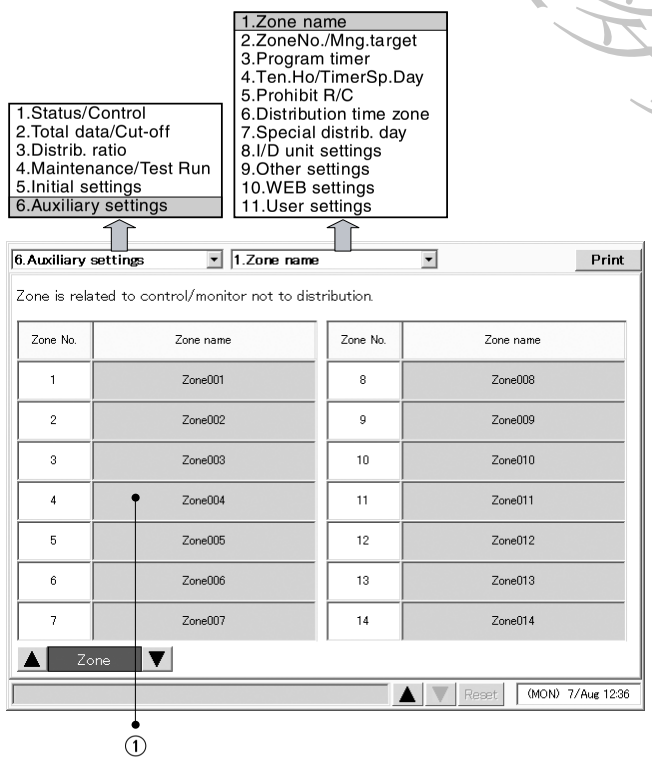
6.8 Auxiliary Settings

6.8.1 Registering zone names

You can assign names to zones.
Zones are unrelated to distribution, so you can mix GHP, PAC, and HOT units, and make settings that extend across link systems.
Start/stop, monitoring, timer operation and so on can be done all at once for all units in a zone.

Procedure

Select 6.Auxiliary settings in the main menu and 1.Zone name in the sub menu.



① Select a name to register or modify. A software keyboard appears.
② Enter the name with the keyboard.
Names can be up to 20 characters long.

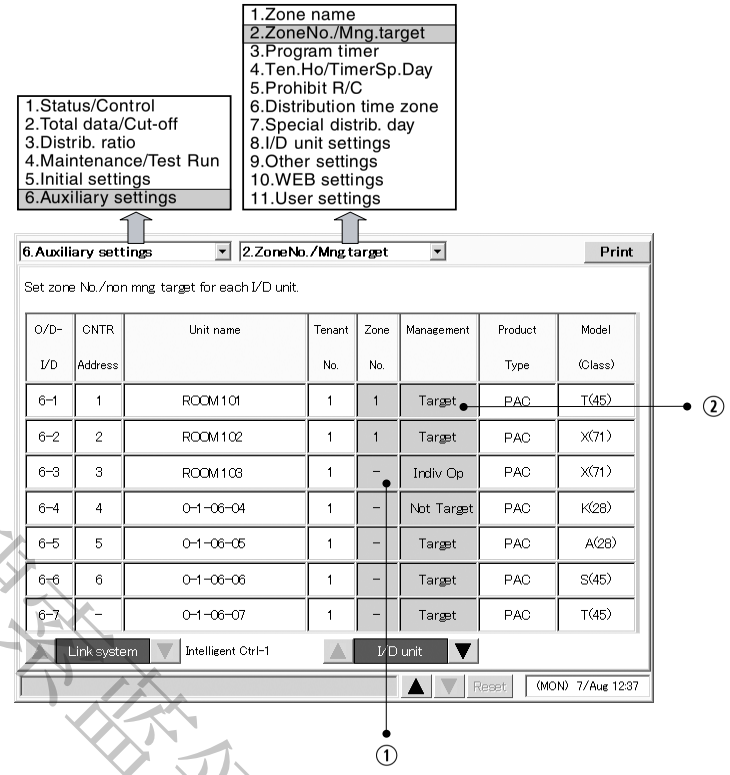
* See “7 Entering Text and Numbers” for details about entering text in keyboard windows.
* Zones name can be registered in the range 1 to 128.

6.8.2 Setting zone numbers and management targets

Use this screen to set the zone number and management category for individual indoor units. Be sure to assign a central address to each unit.

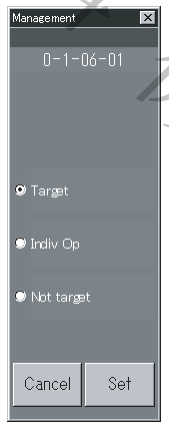
Procedure

Select 6.Auxiliary settings in the main menu and 2.ZoneNo./Mng.target in the sub menu.



① A window like the one shown at right appears when you touch the zone number column.
Enter digits from 1 to 9 to specify the zone number.
* Zone No. can be registered in the range 1 to 128.

② A window like the one shown at right appears when you touch the management column.
Select one from among Target, Individual operation, or Not Target.



- Individual operation:
  Display, total, distribution, and individual operation are possible with Individual units, but all-unit operations (all tenant units, all zone units, all connected units, external all stop input, external all start input, etc.) are not possible.
  However, external all-unit alarm output and external all-unit operation output are possible.

- Not Target:
  No operations are possible for Not Target units, including information display (except for Main 5 Sub 2 and Main 6 Sub 2), totals calculation, and distribution.

6.8.3 Programming timers

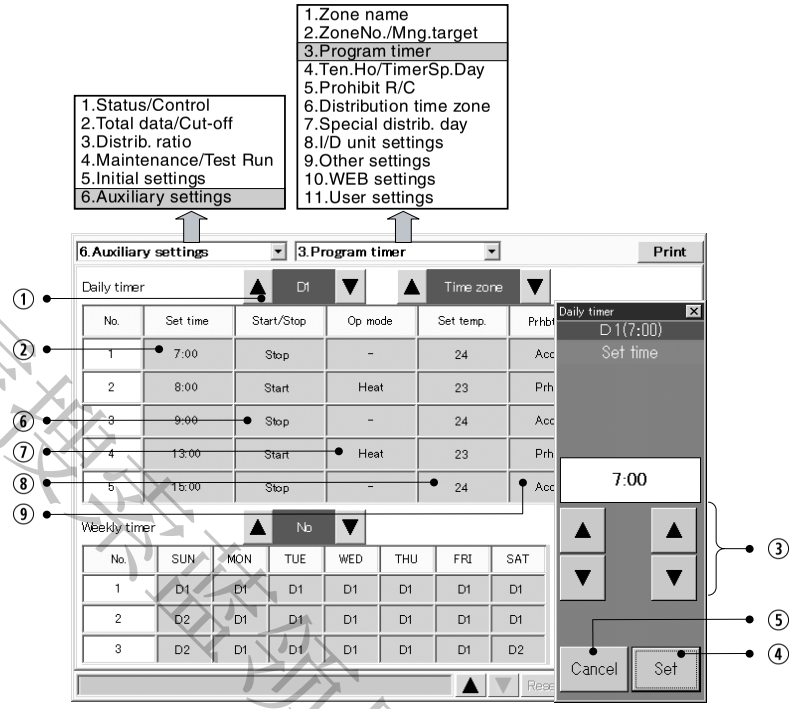
Up to 50 types of daily timers and 50 types of weekly timers can be programmed. It is also possible to set holidays or timer special days for tenants.

6.8.3.1 Programming daily timers

Up to 50 types of daily timers can be programmed, with up to 50 times per day. Start/stop, operation mode, temperature settings, and remote control prohibition can be programmed.

Procedure

Select 6.Auxiliary settings in the main menu and 3.Program timer in the sub menu.

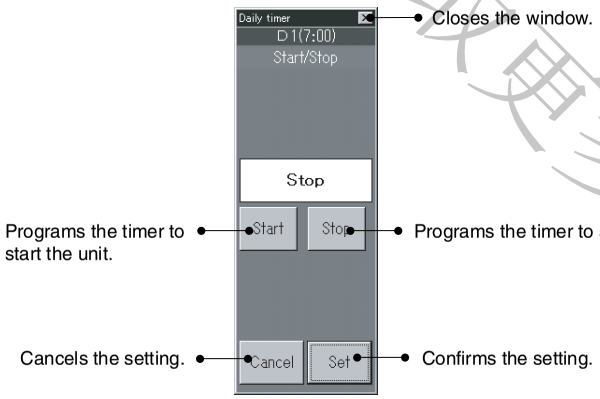


① With Daily timer, select a timer number (D1 to D50, Holiday, Sp1 to Sp5).
The Holiday number is reserved for tenant holiday settings.
The timer numbers Sp1 to Sp5 are reserved for setting timer special days.
② Touch the Set time column.
③ Select the time to set.

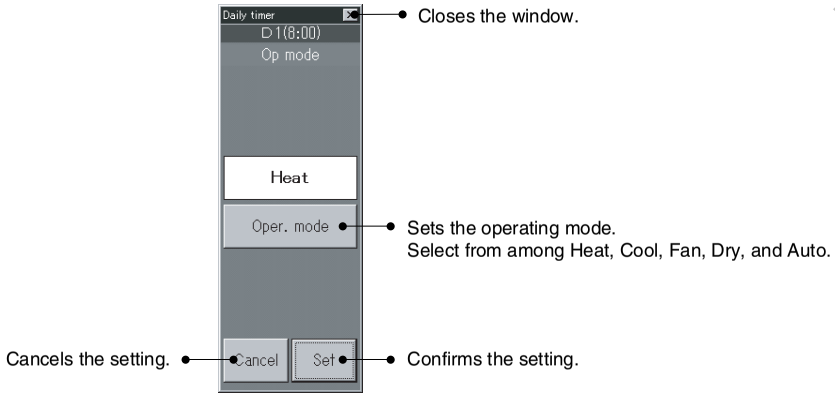
6 Using the System

Main 6 Sub 3

④ Touch Set to confirm the time.
⑤ Touch Cancel to cancel the setting.
The display changes to "—".
⑥ Touch the Start/Stop column and set in the following window.



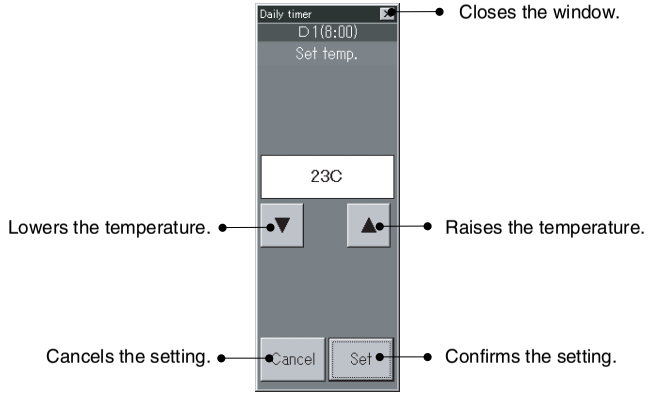
⑦ Touch the Op mode column and set in the following window.



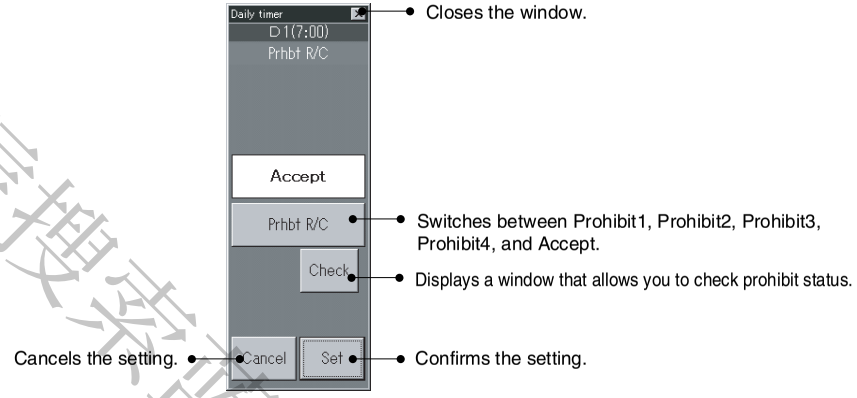
6 Using the System

Main 6 Sub 3

⑧ Touch the Set temp. column and set in the following window.



⑨ Touch the Prhbt R/C column and set in the following window.



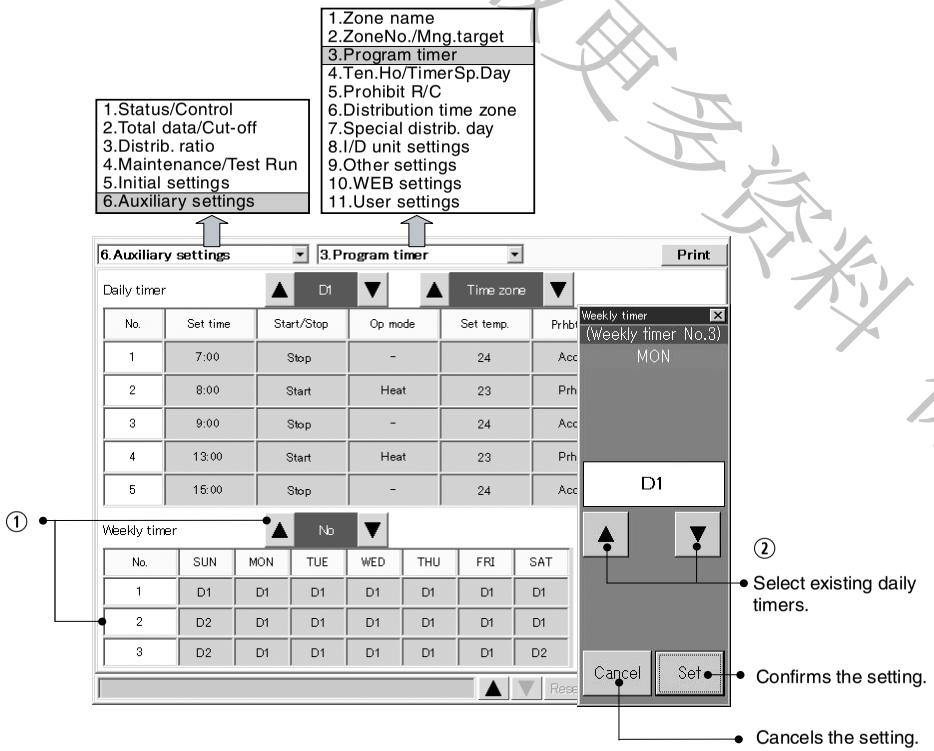
Since different air conditioner models have different upper and lower temperature limits, the temperature is set automatically within the supported range when an air conditioner is actually controlled.
Items for which no time is set are ignored.

6.8.3.2 Programming weekly timers

You can program weekly timers by assigning any daily timer to each day of the week. Up to 50 types of weekly timers can be programmed.

Procedure

Select 6.Auxiliary settings in the main menu and 3.Program timer in the sub menu.



① With Weekly timer, select a weekly timer number (1 to 50).
Up to 50 types of weekly timers can be set. Three items each are displayed.
Each press of ▼ changes the display in order like 1,2,3, 2,3,4, 3,4,5.
Each press of ▲ changes the display in order like 50,1,2, 49,50,1, 48,49,50.

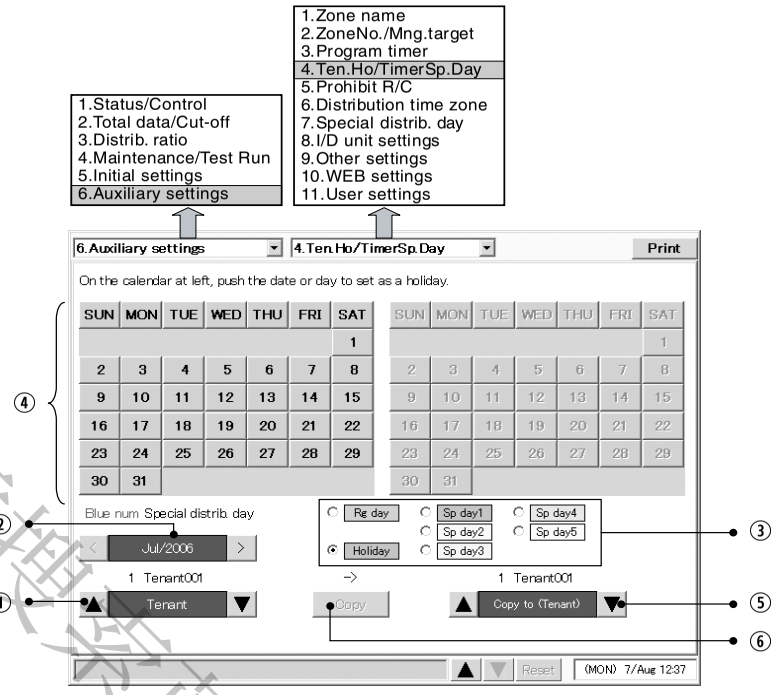
② Select the daily timer number (D1 to D50, Holiday, Sp1 to Sp5) to set and confirm or cancel each button.

6.8.4 Setting Tenant holiday/Timer special day

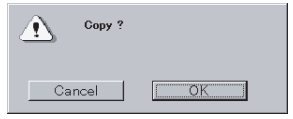
You can make settings by tenant of days of setting timer for holidays and timer special days. Holidays and timer special days can be registered for up to the next two years.

Procedure

Select 6.Auxiliary settings in the main menu and 4.Ten.Ho/Timer Sp. Day in the sub menu.



① Select the tenant.
② Select the calendar for the month of the year to set.
③ Select items (regular days, holidays, and special days 1 to 5) you would like to set.
④ Point the item (regular days, holidays, and special days 1 to 5) you would like to set on the left calendar and touch the date or day of the week.
⑤ If holidays and timer special days have already been registered for a tenant, you can copy them from the calendar to the calendar on the right. Select the tenant for the copy destination calendar.
⑥ A window like the one on the right appears when you touch Copy.
⑦ Touch the OK button to copy two years of holidays from the tenant on the left to the tenant on the right.
* Set the system mode at “Regular day” to cancel settings of holidays and timer special days.

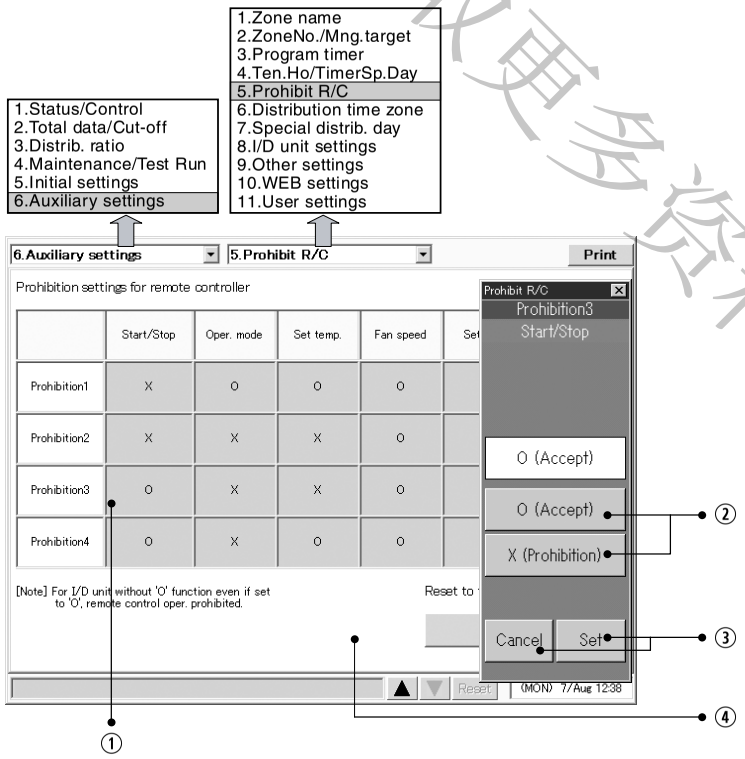


6.8.5 Prohibiting remote control use

You can prohibit the use of the remote controls connected to indoor units.

Procedure

Select 6.Auxiliary settings in the main menu and 5.Prohibit R/C in the sub menu.



① Touch the item you want to change to display a settings window for that item.

② To allow remote control use, touch the O (Accept) button. To prohibit remote control use, touch the X (Prohibition) button.

③ Touch the Set button to confirm the setting, or the Cancel button to cancel it.

④ Touch the Initial setting button to restore the initial setting (described above).

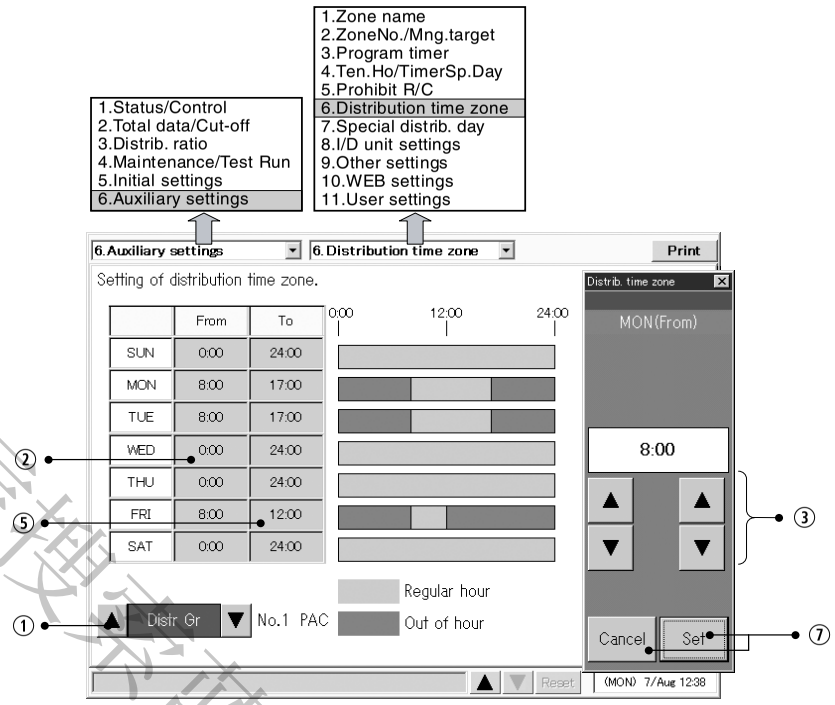
6.8.6 Setting distribution time zones

You can set distribution time zones for the same day of each week.

Procedure

Select 6.Auxiliary settings in the main menu and 6.Distribution time zone in the sub menu.

*When "No Distrib." is selected, this screen is not accessible. (see Main 5 Sub 1)



① Select the distribution group.

② Touch the "From" column.

③ Set the start time of regular hours to a time between 00:00 and 24:00 (30-minute intervals).

④ Touch the Set button to confirm the setting, or the Cancel button to cancel it.

- If you set the start time to 00:00 and the end time to 24:00, the entire day is regular hours.
- If the start time is the same as the end time, the entire day is out of hours.
- If the start time and the end time are reversed, the outer side is regular hours.

⑤ Touch the "To" column.

⑥ Set the end time of regular hours to a time between 00:00 and 24:00 (30-minute intervals).

⑦ Touch the Set or Cancel button.

* Refer also to "6.6.3 Time zone totals and distribution".

 Main 6 Sub 7

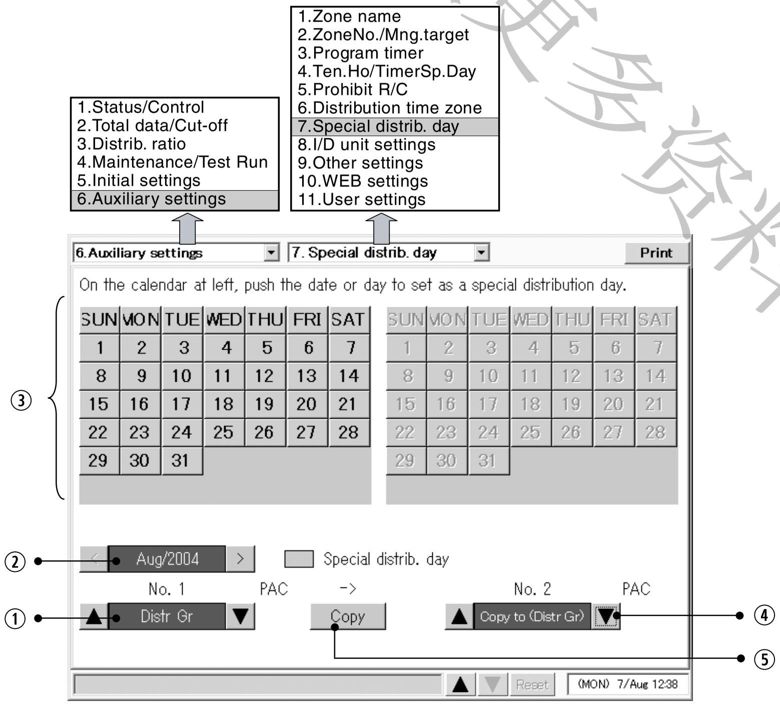
6.8.7 Setting special distribution days

You can set special distribution days to which normal time zone settings do not apply.
Use this function for holidays and so on. Special distribution days can be registered for up to the next two years.

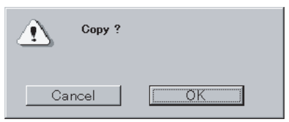
Procedure

Select [6.Auxiliary settings] in the main menu and [7.Special distrib. day] in the sub menu.

*When "No Distrib." is selected, this screen is not accessible. (see Main 5 Sub 1)



① Select the distribution group to set.
② Select the calendar for the month of the year to set.
③ On the left-side calendar, touch the date or day to set as a special distribution day.
④ If special distribution days have already been registered for a distribution group, you can copy them from the calendar to the calendar on the right. Select the distribution group for the copy destination calendar.
⑤ A window like the one on the right appears when you touch [Copy].
⑥ Touch the [OK] button to copy two years of special distribution days from the distribution group on the left to the distribution group on the right.



 Main 6 Sub 8

6.8.8 Indoor unit settings

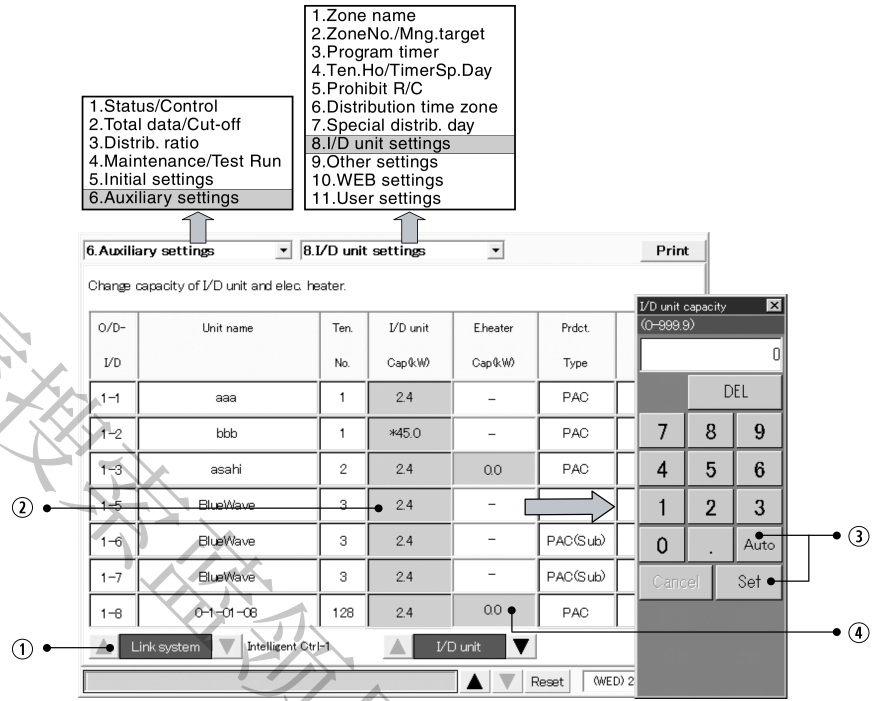
You can use this screen to check the air conditioning capacity of indoor units, and to set the capacity.
Normally you do not need to change settings with this screen.
Exercise care when changing settings, because improper settings can prevent accurate distribution.

Procedure

Select [6.Auxiliary settings] in the main menu and [8.I/D unit settings] in the sub menu.

*When "No Distrib." is selected, this screen is not accessible. (see Main 5 Sub 1)

① Select the link system to display.



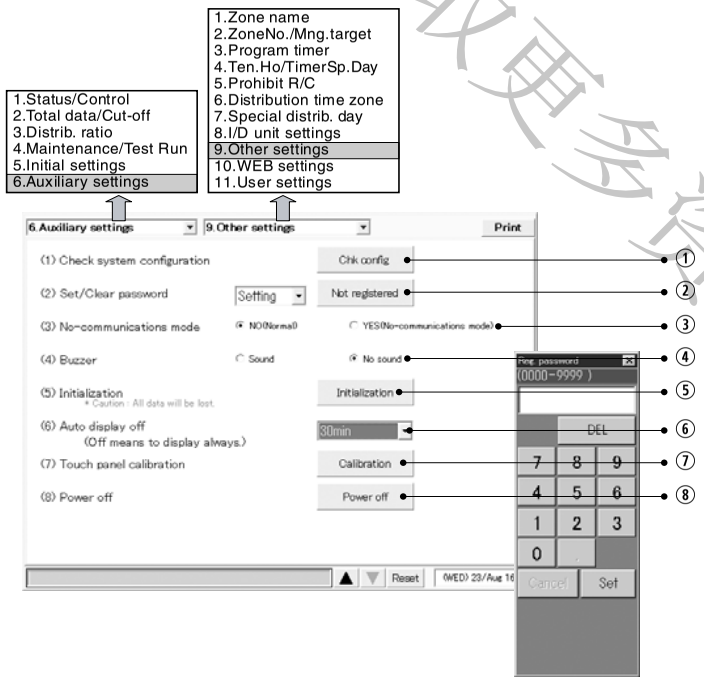
② To change a capacity setting, touch an item in the capacity column, and enter a kW capacity from 0 to 999.9 in the numeric keypad window which appears.
③ Touch [Set] to confirm the setting.
Or [Auto] to cancel it. (The capacity value will restore the received level)
If you have changed the capacity, an asterisk (*) appears to the left of the value.
④ Touching the heater capacity column for the indoor unit having an electric heater will have a soft ten-key for the heater capacity setting displayed. Input numbers 0.0 to 100.00 by kW. However, these are effective only for loaded distribution settings.

6.8.9 Other settings

You can use this screen to register passwords, initialize data, and make power saving settings for the LCD display.

Procedure

Select 6.Auxiliary settings in the main menu and 9.Other settings in the sub menu.



6.8.9.1 Checking the connection configuration

① Touch the Chk config. button to check the connection configuration of the system.
You should do this after adding or deleting units, changing addresses, and so on.
If the system configuration has changed, cut-off processing and confirmation of the system processing messages appear. For details, see “6.9 System Configuration Changes”.

6.8.9.2 Registering passwords

② Click the Not registered button to display a keyboard window for registering passwords.
You can register 3 kinds of passwords: “Setting”, “Distrib.”, and “Operation”.
Refer to “Menu list” under “5. Quick reference” for details.
Enter a 4-digit number from 0000 to 9999, and touch the Set button. The caption on the Not registered button changes to Registered.
To delete a password, first enter the four-digit password, then touch the Set button.

Up to 10 minutes may be required to check the system configuration.

6 Using the System Main 6 Sub 9

6.8.9.3 Selecting no-communications mode

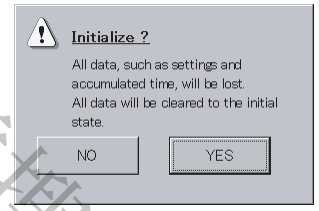
③ Use the options buttons to select whether or not to use no-communications mode.
If you select YES (no-communications mode) then communications errors will be suppressed, but it will not be possible to communicate with air conditioning units. Data displayed by the system will be meaningless.
This setting is provided for occasions when you want to register names or check the display layout even though air conditioners are not installed, not turned on, or otherwise not capable of communications.
Normally you should leave the NO (Normal) button selected, selecting YES (no-communications mode) only when it is necessary.

6.8.9.4 Buzzer sounds

④ When pressing an effective button during setting at Sound, the buzzer will sound (buzz).
When setting at No sound, even the alarm buzzer does not sound.

6.8.9.5 Initialization

⑤ Initialization erases all system data, including setting data and totals data.
A window like the following appears when you touch the Initialization button.



!! Do not make imprudent initialization.

Touch the Yes button to erase all data and return the system to the factory default state.
* Everyday, at 23:30 to 00:00, cut-off processing takes place and you cannot press the Initialization button then.

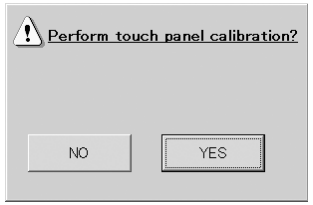
6.8.9.6 LCD auto off settings

⑥ The auto display off settings allow you to select a time after which the LCD display should be automatically turned off if there is no activity. The LCD display is turned on again when you touch it.
Settings: 5 minutes, 10 minutes, 15 minutes, 30 minutes, OFF (default: 30 minutes)
Turning the LCD display off when it is not in use saves power and can prolong the life of the display and backlight.

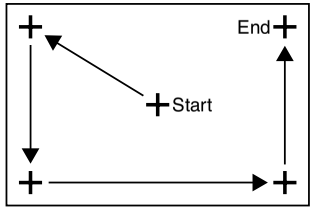
6.8.9.7 Calibrating touch panels

Humidity and temperature around the Intelligent Controller and its secular change may affect the point on the touch panel screen to deviate after use over a long period of time. In such a case, Calibrate the position.

⑦ Press [Calibration] and the next screen will be displayed.



Now press [Yes] and a cross mark will appear in the center of the screen.
Keep pressing the center with a touch pen for a second or longer and stop pressing. Follow the same procedure of Upper left → Lower left → Lower right → Upper right.



Finally the cross mark disappear and "New calibration settings have been measured." will be displayed. Then press somewhere on the screen and the result of calibration will become effective to restore the original screen.
When 30 seconds passes without operating the screen, the calibration result is cancelled to restore the previous screen.

6.8.9.8 Power off button

⑧ **Always touch this button before powering the Intelligent Controller off.**
A message appears asking if you want to exit the program. Touch [OK] in the message.
The system saves current data, and then displays a message "It is now safe to turn off the Intelligent Controller." Wait until this message appears before powering the system off. (If there is a large amount of data, several minutes may be required for this message to appear.)

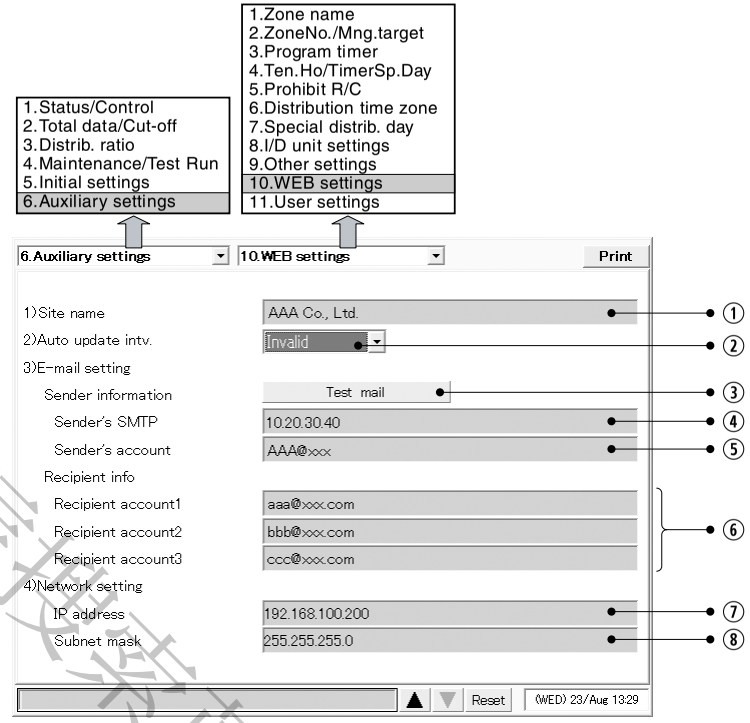
!! Powering off before this message appears may cause malfunction or prevent booting.

6.8.10 WEB settings

Settings related to WEB such as the site name, mail settings, and network settings are possible.

Procedure

Select [6. Auxiliary settings] in the main menu and [10. WEB settings] in the sub menu.



For items ① and ③ to ⑦, touch each input box and a soft keyboard will appear.

① Input the name of an optional site (within 40 characters).
② Set the automatic updating interval on the screen displayed on Web browser. When selecting "Invalid", data will not be updated until pressing the [New] button on the WEB browser screen.
③ Send the test mail.
④ Input the IP address (or domain name) of the mail (SMTP) server separately contracted.
⑤ Input an optional transmitter account name (mail address) (within 40 characters).
⑥ Input the receiver account name (mail address) (within 40 characters).
⑦ Input the Intelligent Controller IP address (or domain name).
Refer to settings for other equipment (PC, rooter, etc.).
⑧ Input the Intelligent Controller subnet mask.
Refer to settings for other equipment (PC, rooter, etc.).

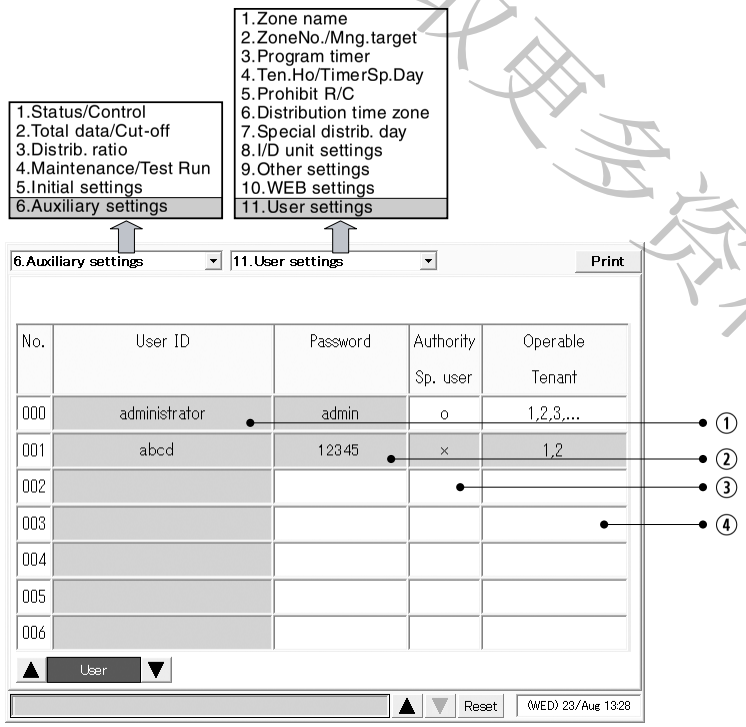
Refer to the network administrator for confirmation of detailed mail and network settings.

6.8.11 User settings

The user ID, password, authority, and operatable tenant can be set.

Procedure

Select 6.Auxialiary settings in the main menu and 11.User settings in the sub menu.



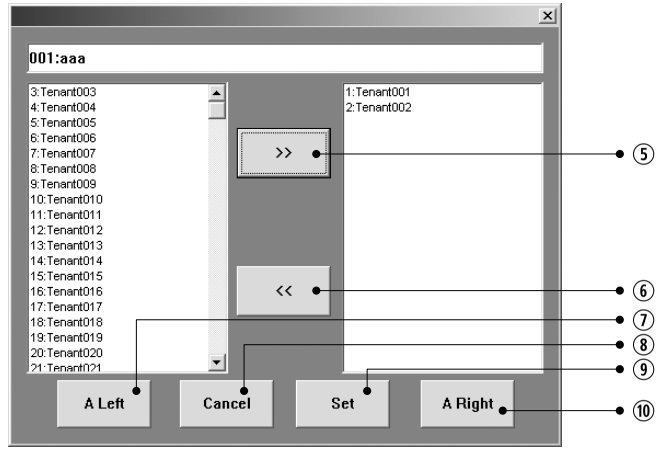
For items ① and ②, touch each input box and a soft keyboard will appear.

① Input an optional user ID (within 20 characters).

② Input an optional password (within 10 characters).

③ Users include three categories: “Administrator”, “Special user”, and “General user”.
No. 000 denotes “Administrator” (A special user solely admitted; its initial user ID: administrator).
No.001 or higher denotes “Special user” if authority is set to ❍, and “General user” if authority is set to ×.
The “General user” cannot make remote controller prohibiting processing.

④ When touching the input box, the following small screen is displayed, where you set operatable tenants by User ID.



⑤ Register the tenant selected on the left side into the right side as the operatable tenant.

⑥ Delete the tenant selected on the right side from among the operatable tenants.

⑦ Select all the tenants on the left side.

⑧ Cancel this tenant setting change.

⑨ Make register setting for this user as the operatable tenant.

⑩ Select all the tenants on the right side.

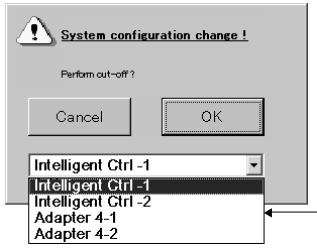
6.9 System Configuration Changes

An alarm message like the following appears when a system configuration change (or the possibility of a configuration change) is detected.
If the system continues to operate after its configuration has changed, distribution ratios and other data will be totally inaccurate. For this reason, cut-off processing must be done with the system in the state before the change. The following message is displayed to ask you to confirm the processing.

Operation procedure for each case is as follows.

6.9.1 When a system configuration change detected

This alarm message is displayed in cases such as the following.

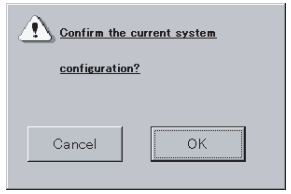


① "Check system Configuration" was made after removing the outdoor and indoor units.
② "Check system Configuration" was made after starting the unit and found that it was different from the previous one in configuration.
* "Configuration" includes not only the number of units and address but also indoor unit capacity, main/sub unit setting, and presence/absence of an electric heater.

Here you can see the link system where the configuration has been changed.

While this message is visible, no other operations can be performed except OK and Cancel.

Touch OK to perform cut-off processing with the system in the state before the change.
Touch Cancel if you do not need to perform cut-off processing.

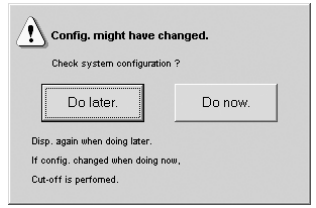


Touch OK to check the new configuration.

If you select OK here, the current system configuration is re-checked and the results are confirmed.
If you do not need to do this, select Cancel.

If the system has changed because of a mistake, return the system to its former state and then touch Cancel. You should also touch Cancel here if you mistakenly selected Cancel in the previous message, even though the system cut-off processing should have been done. This returns you to the first alarm message, where you can perform cut-off processing.
While this message is visible, no other operations can be performed except OK and Cancel.

6.9.2 When system configuration may change



This alarm message is displayed in cases such as the following.

① The following "Detailed settings" were made from a local remote controller.
(for address, extension settings, indoor unit capacity, or presence/abesnce of an electric heater)
② Only confirmation of "Detailed setting" was made from a local remote controller.
③ Automatic address setting was carried out for an indoor or outdoor unit.
④ An additional indoor or outdoor unit was installed.
* "Configuration" includes not only the number of units and address but also indoor unit capacity, main/sub unit setting, and presence/absence of an electric heater.

While this message is visible, no other operations can be performed except Do later. or Do now.
When touching Do later., this window closes and other screen operations are made possible. However, after a while the message will be displayed again.

Touch Do now. to confirm whether the configuration has been actually changed.
When a configuration change was detected as a result of configuration confirmation, cut-off processing is automatically performed and the post-variation configuration is established. When there is no change in configuration, the screen exits configuration confirmation processing.

For example, imprudently pressing Do now. while a communication error message is displayed will result in an automatic cut-off processing to establish the current configuration. Therefore, take full care to avoid such a mistake.

When establishing a configuration without making cut-off processing, press Do later. to once close the screen and perform "Check system Configuration" using the 6-9 screen.
After this, proceed "Perform cut-off processing?" → "Cancel" → "Confirm the current system configuration?" → "OK" in accordance with "6.9.1. When a system configuration change detected".

When no operation has been made on this screen for twelve hours or more, cut-off and post-variation configuration fixing processing are automatically carried out.

Caution

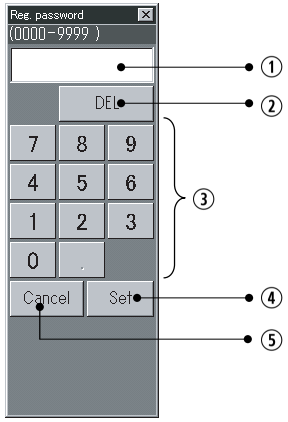
Imprudent cut-off processing and configuration fixing or neglecting them when necessary may cause a significant inconvenience in control.
When this alarm message is displayed, do not operate the system and contact the store where you purchased it or its service agency.
This message may be displayed also in inspecting the air conditioner. In such a case inform the person in charge of service of the fact.

7 Entering Text and Numbers

This system displays keyboard and numeric keypad windows when you need to enter names and numbers. The numeric keypad window appears when you need to enter numbers, and the keyboard window appears when you need to enter text.

7.1 Entering Numbers

A numeric keypad window like the one shown below appears when you need to enter a number, for example to register a password.



① Input field
Displays the number being entered.

② DEL button
Deletes digits in the number, from the right.

③ Numeric keys
Add the digit shown on the key face to the number in the input field.

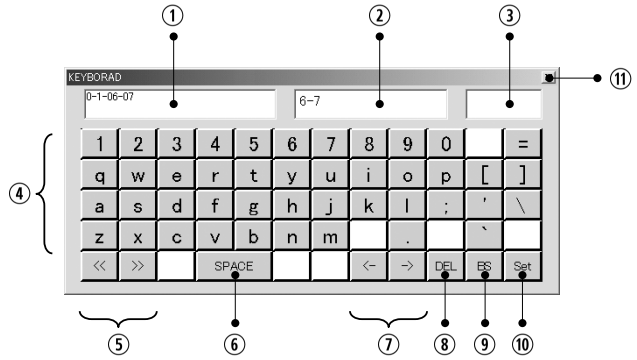
④ Set button
Confirms the number in the input field.

⑤ Cancel button
Clears the numbers entered.

7.2 Entering Text

A keyboard window like the one shown below appears when you need to enter text, for example a tenant name.
To edit an existing text string, touch the character that you want to edit in the input field.

Alphanumeric, lowercase



① Input field
Displays the text being entered.

② Information field
Displays information about the target of the operation (for example, the tenant number when a tenant name is being entered).

③ Input mode
Displays the current input mode (type of characters).

④ Character input buttons
Input characters.

⑤ Input mode selection buttons
Select the type of characters to input.

⑥ Space button
Inputs a space.

⑦ <- and -> buttons
Move the input cursor to the left and right in the input field.

7 Entering Text and Numbers

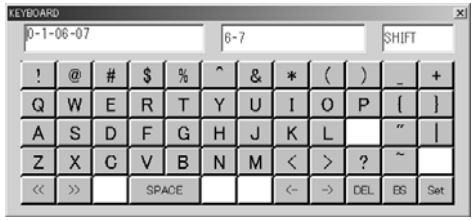
⑧ DEL button
Deletes the character to the right of the input cursor.

⑨ BS button
Deletes the character to the left of the input cursor.

⑩ Set button
Confirms the input and closes the keyboard window.

⑪ Close button
Closes the keyboard window.

Alphanumeric, upper case



8 Connection of External Signals

When connecting external signals, refer to the Installation Instructions (end of this manual) for detailed information about the electrical specifications.

8.1 All Stop Input

You can stop all connected units automatically by connecting external signals (for example, from fire-alarm detectors.)
All stop input is available only for managed (“target”) units. It does not affect units which have been designated as not managed (“Not target”) or individually operated (“Indiv Op”).

1) Input location
The communications connector panel on the side of the Intelligent Controller or on an optional communication adaptor connected to the Intelligent Controller:
DI1 (No. 17), DI-COMM (No.16)

2) Operation
While the input is asserted ON, a stop signal is sent periodically (once per minute) to all indoor units.

3) Display

This message disappears when normal status is restored.

8.2 All Start Input

You can start all connected units automatically by connecting external signals.
All start input is available only for managed (“target”) units. It does not affect units which have been designated as not managed (“Not target”) or individually operated (“Indiv Op”).

1) Input location
The communications connector panel on the side of the Intelligent Controller or on an optional communication adaptor connected to the Intelligent Controller:
DI2 (No.18), DI-COMM (No.16)

2) Operation
When inputting ON from OFF, the operation signal will be transmitted to all the indoor units.

8 Connection of External Signals

8.3 All-Unit Alarm Output

An external signal is output when an alarm or error occurs in any connected unit.
This signal can be used by alarm monitors and other equipment.

1) Output location
   The communications connector panel on the side of the Intelligent Controller or on an optional communication adaptor connected to the Intelligent Controller:
   DO1 (No.14), DO-COMM (No.13)
2) Operation
   The signal goes ON when an alarm or error occurs, and goes OFF when normal status is restored.

8.4 All-Unit Operation Output

An external signal is output when any connected unit is operating.

1) Output location
   The communications connector panel on the side of the Intelligent Controller or on an optional communication adaptor connected to the Intelligent Controller:
   DO2 (No.15), DO-COMM (No.13)

2) Operation
   The signal goes ON when any connected unit (including local adaptors) is operating, and goes OFF when all units are stopped.
   Operation during alarms and errors is included.

9 Printing

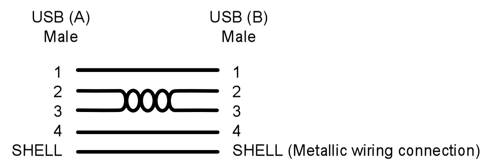
Printing using the Intelligent Controller is as stated below.

9.1 Preparation

Printing is ready only by connecting a USB cable to the unit' s USB port. Purchase the cable shown below (an example) separately.

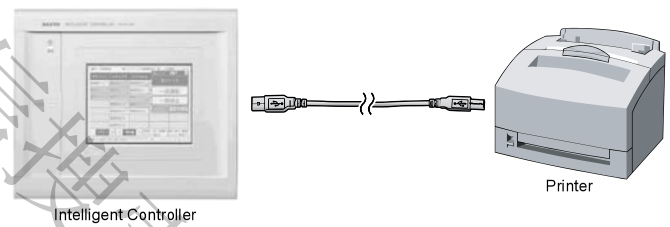
Example) ELECOM USB2-20 (2 m) or equivalent.

Internal wiring connection (reference)

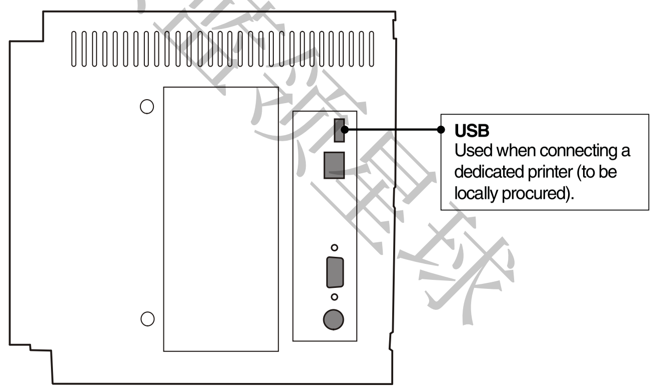


9.2 Connection

Connect the printer with the Intelligent Controller using a USB cable.



Connect the cable to the "USB" connector located on the controller's back.



9 Printing

9.3 Restrictions

(1) The Intelligent Controller is adaptable to printers of the "PCL" standards, among which we have made sure that the following two are fully adaptable:

Laser printer	1710 from Dell Inc.
Ink jet printer	Officejet Pro K550 from Hewlett-Packard Co.

(2) Some printers need to have the Intelligent Controller powered on prior to connecting the printer cable or re-power the printer.

(3) Printers can be connected only to the USB port.

(4) Only A4-size paper in vertical position can be printed.

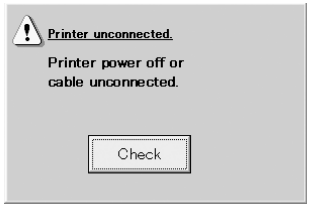
(5) Printing is available only in monochrome. Color printing is unavailable.

(6) Printing provides hardcopies (just as displayed in the screen).

(7) Refer to the operation manual for the printer for the printer-side settings, displays, and measures to counter failures.

(8) The following alarm dialogue will be shown when pressing [Print] in the events of:

- The printer is not connected to the system.
- The printer is not powered on.
- The printer is off-line.



10 Calculating air conditioner distribution

The Intelligent Controller calculates energy (electricity and gas) distribution ratios utilizing the accumulated working time (T/S ON/OFF) or the capacity value of the indoor unit.
* T/S: Thermostat

10.1 Calculating simple distribution

Parameters as listed below are used to calculate simple distribution:

① **RHHi**: accumulated operation time for indoor unit i (High fan speed)
② **RHi**: accumulated operation time for indoor unit i (Medium fan speed)
③ **RLi**: accumulated operation time for indoor unit i (Low fan speed)
④ **SHHi**: T/S ON accumulated time for indoor unit i (High fan speed)
⑤ **SHi**: T/S ON accumulated time for indoor unit i (Medium fan speed)
⑥ **SLi**: T/S ON accumulated time for indoor unit i (Low fan speed)
⑦ **Pi**: Capacity of indoor unit i (in kW)
⑧ **k**: Weighing factor for power consumptions as T/S ON and OFF
⑨ **aHH**: Weighing factor for High fan speed
⑩ **aH**: Weighing factor for Medium fan speed
⑪ **aL**: Weighing factor for Low fan speed
* Accumulated operation time = T/S ON accumulated time + T/S OFF accumulated time

Index of indoor unit i power/gas consumptions is calculated.
Here, "TEi" and TGi" denotes the power and gas consumption indexes of the indoor unit i, respectively.

When "Object of power distribution calculation" is "T/S ON + OFF time":
The power consumption index is calculated using "Accumulated operation time" and "T/S ON accumulated time"; the gas consumption index using "T/S ON accumulated time"

- For GHP:
  TEi = (RHHi x aHH + RHi x aH + RLi x aL) x Pi   Formula 1
  TGi = (SHHi x aHH + SHi x aH + SLi x aL) x Pi   Formula 2
- For PAC:
  TEi = { (RHHi x aHH + RHi x aH + RLi x aL) /K + (SHHi x aHH + SHi x aH + SLi x aL)} x Pi   Formula 3
  TGi = 0

When "Object of power distribution calculation" is "T/S ON time":
Both the power and gas consumption indexes are calculated using "T/S ON accumulated time".

- For GHP:
  TEi = (SHHi x aHH + SHi x aH + SLi x aL) x Pi
  TGi = (SHHi x aHH + SHi x aH + SLi x aL) x Pi
- For PAC:
  TEi = (SHHi x aHH + SHi x aH + SLi x aL) x Pi
  TGi = 0

- Weighing by wind speed is not carried out for models with their speed set only as High or only as High and low.
- Distribution ratios are not calculated when you have chosen not to perform distribution ratio calculations. (See "6.3.2 Setting the date, cut-off date, and distribution ratio calculation method")

10 Calculating air conditioner distribution

Calculate **electricity/gas usage index of entire distribution group**

Let "TOTALe" be the electricity usage index of entire distribution group, and let "TOTALg" be the gas usage index of entire distribution group. Let "m" be the number of indoor units in the distribution group.

TOTALe = TE1 + TE2 + ··· + TEm
TOTALg = TG1 + TG2 + ··· + TGm

Calculate **electricity/gas usage distribution ratio of indoor units**

Let "REi" be the electricity usage distribution ratio, and let "RGi" be the gas usage distribution ratio.

REi (%) = TEi / TOTALe × 100
RGi (%) = TGi / TOTALg × 100

Calculate **electricity/gas usage distribution ratio of tenant j**

Let "NEj" be the electricity usage distribution ratio of tenant j, and let "NGj" be the gas usage distribution ratio of tenant j. Let "n" be the number of indoor units of tenant j.

NEj (%) = RE1 + RE2 + ··· + REn
NGj (%) = RG1 + RG2 + ··· + RGn

Distribution ratios are rounded at the third decimal place and shown to the second decimal place.

* The following table shows which of the formulas ① to ③ on the previous page are used by the two distribution modes.

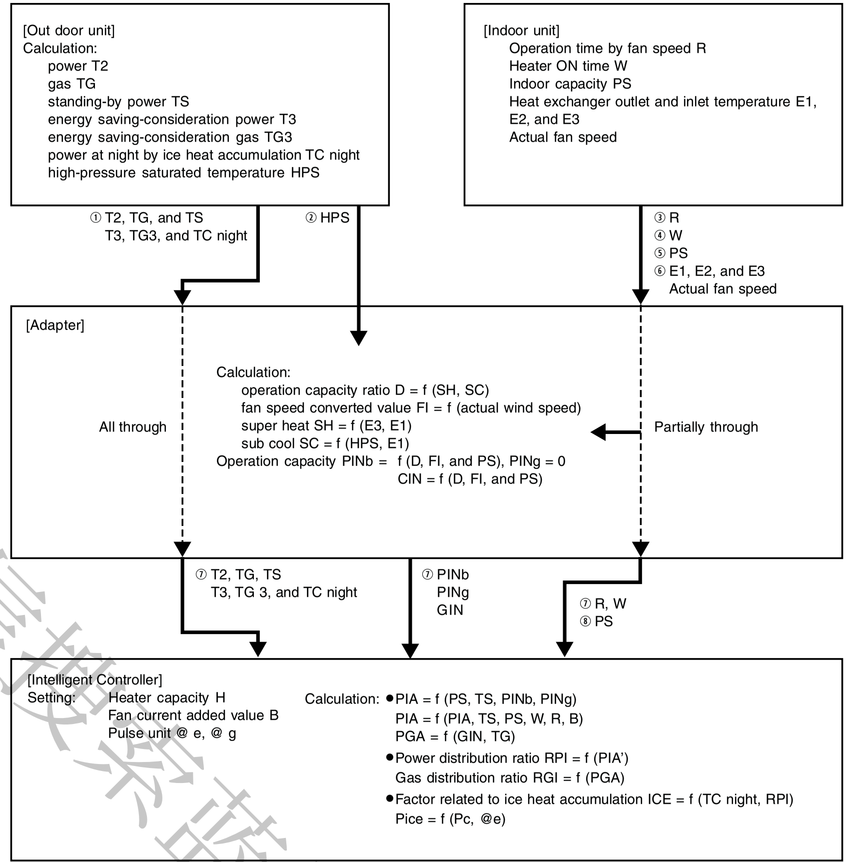
		T/S ON+OFF time distribution mode	T/S ON time distribution mode
GHP	Electricity	①	②
	Gas	②	②
PAC	Electricity	③	②
	Gas	–	–
HOT	Electricity	③	②
	Gas	②	②

See "About distribution ratios in 12 Supplementary Information".

10 Calculating air conditioner distribution

10.2 Calculating loaded distribution

Data flow



* "f" means function. For example:
Operation capacity ratio D = f (SH, SC)
means that the operation capacity ratio is calculated using super heat SH and sub cool SC.

Calculation parameter	Simple distribution	Loaded distribution
Indoor unit capacity (kW)	❍	❍
Indoor unit operation time	❍	❍
Indoor fan speed ratio (high, medium, low)	❍	❍
Outdoor unit operation ratio (Power: detected using CT, Gas: neuro-calculation)	×	❍
Standing-by power and various heater powers	×	❍
Indoor unit loaded ratio (Calculated using the values detected by multiple internal thermo sensor of indoor unit)	×	❍ (Overheat degree)

❍:parameters considered in distribution calculation
×:parameters not considered in distribution calculation

11 TERMS

This section explains some of the terms used in this manual.

- **Adaptor address (No. 0 set on Intelligent Controller, No. 1 to 7 set on communication adaptors)**
  An adaptor address is the address assigned to an optional communication adaptor.
- **Link system address (No. 1 to 2, fixed)**
  A link system is a collection of indoor units and outdoor units connected to a single indoor/outdoor control wire. Up to two link systems each can be connected to the Intelligent Controller and to an optional communication adaptor.
- **Outdoor unit system address (No. 1 to 30 for each link system, set on outdoor unit side)**
  An outdoor unit system is collection consisting of one outdoor unit and the indoor units connected to that outdoor unit. A single link system can contain up to 30 outdoor systems.
- **Indoor unit address**
  Up to 64 indoor units can be connected in one link system.
  The Intelligent Controller system supports up to two link systems connected to the Intelligent Controller only (128 indoor units), or four link systems (256 indoor units) when an optional communication adaptor is connected.
  Indoor unit addresses, central control addresses, and unit names are applied to indoor units.
  - **Indoor unit address** (No.1~/for each outdoor unit system, set on indoor unit side)
    An indoor unit address is a unique number within an outdoor unit system.
    These numbers are assigned to each indoor unit, including units subject to group control.
    These numbers are the smallest unit of totals calculation and distribution calculation.
  - **Central control address** (No.1 to 64 for each link system, set on Intelligent Controller and other central control equipment)
    A central control address is a unique number within a link system. It is shared with other central control equipment (system controllers, multi controllers, etc.)
    This is the same address used in group control.
  - **Unit name** (set on Intelligent Controller)
    This is the same name used in group control.
    It is the smallest unit of operation, monitoring, and timer operations.
- **Distribution group number (No. 1 to 8, set on Intelligent Controller)**
  A distribution group is made up of one or more tenants. The total of the distribution ratios in the group is 100%. The Intelligent Controller system supports up to 8 distribution groups. GHP, PAC, and HOT units cannot be mixed in a single distribution group.
- **Tenant number (No. 1 to 256 set on Intelligent Controller)**
  A tenant is a collection that is the object of distribution calculations (or operation and monitoring). It is made up of one or more indoor units. The system as a whole supports up to 256 tenants.
- **Zone number (No. 1 to 128, set on Intelligent Controller)**
  A zone is unrelated to distribution. It is a range for performing all-unit operation, monitoring, and timer operation. GHP, PAC, and HOT units can be mixed in a zone. The system as a whole supports up to 128 zones.

12 Supplementary Information

- Powering the system off
  Always use the following procedure to power the Intelligent Controller off.

  Touch the [Power off] button in the “Other settings” screen (Main 6 Sub 9).
  ⇩
  Touch the [OK] button in the message box which appears to ask if you want to exit the program.
  ⇩
  Wait until a message appears to inform you that “It is now safe to turn off the Intelligent Controller.” (*) and then power the system off.
  (*Several minutes may pass before this message appears.)
- Air conditioner limitations
  Some types of air conditioners are limited in the settings which they support.
  For example, cooling-only air conditions cannot be set to heating.
  Floor-type models typically support only high fan speeds.
  Ceiling mounted models do not have flaps, and therefore cannot change the fan direction.
  You should be aware of the limitations of the air conditioner models in your system.
  For more information, contact your dealer or service provider.
- Standby power (for simple distribution)
  The Intelligent Controller performs distribution calculations on the basis of indoor unit operating time.
  Therefore it does not count power consumed while under are stopped (on standby).
  For example, if no units are operated over the course of a month, no standby power consumption is distributed to any tenant. However if a unit is operated for even one minute, then all of the standby power consumption is distributed to the corresponding tenant.
  For loaded distribution, distribution is made with standing-by power added.
- W Multi GHP outdoor unit data is displayed as “Reference unit”.
  Because the reference unit changes depending on operating conditions, the data displayed by the Intelligent Controller also changes.
  Outdoor unit data is data such as “number of operations” and “operating time”.
- Only an alarm code is displayed in the notification bar and alarm log display.
  The content of an alarm can very for different models, even if the alarm code is the same. Consult the documentation of the various models to determine the content of the alarm.
- Because of data transmission delay, the totals and distribution data displayed by the Intelligent Controller for different time zone (regular hours, out of hours, special days) may not be counted in a completely accurate fashion.
  For details, see “6.6.3 Time zone totals and distribution”.
- The Intelligent Controller does not support printing.
  If you need to print totals and distribution data, please install the optional PC Card on a PC at your location.
- Filter cleaning signs and oil exchange signs are updated every 1 minutes.
  Operating time totals and distribution data are updated every 18 minutes. Electric heater ON time is updated once an hour.
- Cut off processing for the previous day is performed every day for a few minutes after 00:00 a.m. The system will not respond to user input during this processing.

12 Supplementary Information

■ After the settings of an indoor unit are changed from the Intelligent Controller, the display may revert temporarily to the former settings. This is more likely to occur with all-unit operations. The cause is communications delay, not any malfunction in the system. If you wait a few minutes, the display will show the correct information.

■ Errors occurred while operating during a thunder storm or because of electromagnetic interference.
Power the Intelligent Controller off and then on again. (Refer to "Powering the system off" stated on the previous page)
As a rule, the Intelligent Controller should be powered off only in cases such as the above.
Correct management of air conditioning is not possible when the Intelligent Controller is powered off.

■ About distribution ratios
The formulas used by the Intelligent Controller to calculate air conditioning distribution ratios are only approximations. They normally do not yield the same amounts that appear on bills from electric and gas utilities.
Depending on operating conditions, there may be a margin of error between distribution ratios and actual air conditioning amounts.
There may also be a small margin of error between the following, due to the rounding algorithms used in distribution ratio calculations.
- "Distribution ratios of tenants in a group" and "100.00%"
- "Total of distribution ratios" and "Overall tenant distribution ratio"
- "Total of distribution during regular hour, out of hours, and special days time zones" and "Total of all hours time zones"

The Intelligent Controller does not measure energy use directly. It calculates energy distribution ratio based on the inferred load ratio of each indoor unit. The results of the calculations should be regarded as approximations.

■ About operating time totals
Air conditioning distributions and air conditioner operating times are calculated only for periods in which the Intelligent Controller is powered on and in which there are no communications errors between the Intelligent Controller and the air conditioners.
Therefore, no totals are accumulated for times when the Intelligent Controller is powered off or in which communications errors occur.
You should be aware that errors in distribution ratios will become larger if conditions like the above continue for a longer period of time.

■ Setting the current date and time
The current date and time should be set on a regular basis, since the system clock can gain or lose up to about two minutes per month.

■ Touch panel operations are not possible at the following times.
- While the system is booting
- During connection checks
- Under cut-off processing
- During PC Card access (backup, restore)

■ About passwords
Passwords should be recorded and saved in a safe place. They should never be disclosed to third parties.
If you forget your password, contact your dealer or service provider.

■ Flickering on the screen
This may occur occasionally. It is due to data refreshing and is not a malfunction.

12 Supplementary Information

■ About On/off Local adaptors (SHA-KL4UGB)
You can use on/off local adaptors to connect equipment that can be turned on and off (fans, room air conditioners and so on) to the Intelligent Controller.
However, note that the following limitations apply.
For details, refer to the documentation of the equipment or contact your dealer or service provider.

▶ Central control is supported for the following operations only.
- Start/stop
- Remote control prohibition (start/stop only)

Timer settings are supported, but settings other than "start/stop" and "remote control prohibition" are ignored. Remote control prohibition is possible only when prohibition signal output from the local adaptor has been connected to the equipment. Even in this case, the only operations that can be prohibited are start and stop.

▶ Alarm display
Alarm details are not shown.
The "C12" code is displayed (meaning local adaptor all-unit alarm).
However, this is possible only when a local adaptor alarm input signal has been connected.

▶ About air conditioning distribution
① Indoor unit fan speed data
Total operating times by fan speed are fixed at high speed. (Units are treated as if they always operated at high speed, even if the thermostat ON signal is connected to the unit.)
② Electric heater ON time
Total electric heater ON time is not displayed.
③ Indoor unit capacity values
These cannot be read automatically. Set them as kW values in the "I/D unit settings" screen
(Distribution is not performed if they are not set.)
④ Product types
When connected via local adapters, the system cannot distinguish PAC and GHP units.
You need to set the type as well when you set the indoor unit capacity.
(Refer to "Tenant name/Distribution group" screen [Main 5 Sub 3])
⑤ This applicable only to simple distribution. No loaded distribution can be made.

▶ As long as it conforms to the contact specifications of the on/off local adaptors, any type of equipment can be connected to the Intelligent Controller. However, you should avoid connecting equipment whose operation can have grave consequences for life or property.

■ When only one centralized control unit is installed in a system without remote controller, if the centralized control unit is damaged, the air conditioner(s) may become inoperable, or other troubles may occur. To avoid this problem, we recommend that you install multiple centralized control units.

12 Supplementary Information

★ IMPORTANT ★

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  Other products names are trademarks or registered trademarks of their respective holders, or copyrights of their respective holders.
- Duplication of all or part of the software and documentation of this product without the express consent of the holder of the rights to the above, and transfer of the software to another party, are prohibited by law.
- Sanyo will not be liable for any loss, lost profits, or any incidental damages due to use of this product or the supplied software. Sanyo will not be liable to any claim based on a third-party claim.
  Even in the case of errors in calculations of distribution ratios, and so on, Sanyo will not be responsible for any remedies.
- The software supplied with this product may not be used on any other equipment.
- This product and the supplied software are subject to change without notice.
  The contents of this manual are subject to change without notice.
- Sanyo will not be liable for any violation of the rights of any third party stemming from use of information in this manual, or for violation of other rights.

13 Troubleshooting

Before requesting service, check the following items.
Do not attempt to service the Intelligent Controller yourself. Doing so can be dangerous.

Symptom	Cause
Nothing appears on the screen when the computer is turned on.	• Is the power cord connected? • Is the power switch set to on?
Timer operation does not work.	• Is timer operation set to the target unit? Operation of a selected timer does not start if the setting is not set the target unit. • Does the setting match the current date and time?If the date and time do not match, operation can start at an unexpected time. (See "6.3.2 Setting the date, cut-off date, and distribution ratio calculation method")
The distribution ratio is always 100%.	• Check the group settings and tenant settings. Distribution rate calculations always result in 100% if there is only one tenant registered in a distribution group, or if there is only one indoor unit in a tenant.
The power goes off at odd times.	• The screen may be blank because of the power-saving auto off function. The Intelligent Controller is still powered on. Touch the screen to restore the display. • Regardless of the selected auto off time, the screen may be turned off when the Intelligent Controller boots.
There is an alarm message in the notification bar at the bottom of the screen that will not go away.	• The message displays the unit where the alarm occurred, and the alarm number. Inform your dealer or service provider about the content of the message.
Backing up to a PC Card does not work.	• Data can be backed up only to the special PC Cards (option) for the Intelligent Controller. Backup to other PC Card types is not possible.
It takes a long time after an operation for the screen to be updated.	• A certain amount of time may be required depending on the state of communications with the connected air conditioners. Please wait until all of the information is received.
LCD display	• In rare cases there may be a dot on the screen which is always on or always off. This is not a malfunction. Due to the nature of LCD displays, there may be some color bleeding in certain areas because of variations in temperature and so on. This is normal and not a malfunction.
Nothing happens when an operation button is pressed.	• Over extended use, the touch positions and display positions on the touch panel may get out of alignment. (→ "6.8.9.7. Calibrating touch panels")
When local remote control operation is prohibited on the Intelligent Controller, the Intelligent Controller is not able to start/stop operation of a malfunctioning air conditioner.	• Emergency operations until our service person arrives: Power off the Intelligent Controller and externally installed communication adapter; re-power on the indoor unit. Operation with the local remote control will be possible. However, this cannot be done in a remote control free system.
A power outage occurred. When it ended, the equipment did not come on automatically according to program timer settings.	• The Intelligent Controller does not power on equipment automatically by program timer after a power outage. The setting for the next programmed time will be executed when the time arrives.
The Intelligent Controller cannot find a single indoor unit. Or it cannot find all of them.	• Try using the "Check configuration" button in the "Other settings" screen (Main 6 Sub 9).
A message of "Application error!!" is displayed and the unit does not start.	• Contact the store where you purchased the system or our service agency.

7

14 Maintenance

■ **Unplug the power cord before cleaning the Intelligent Controller.**

The system has high-voltage connectors and other dangerous components. Always power the system off and unplug the power cord before cleaning it.

■ **Use a neutral solvent**

To clean the control panel and touch panel, use a soft cloth slightly moistened with a neutral solvent.
Do not use volatile liquids such as benzene or thinner, and do not use polishing power or pesticides.
Doing so can damage painted surfaces and the surface of the touch panel.

■ **Avoid direct contact with water**

Do not allow water to contact the product directly.
Insulation will be impaired, which may result in damage or electrical shorts.

■ **Do not disassemble**

Do not disassemble the Intelligent Controller.
Doing so is extremely dangerous. It may damage the unit or cause electrical shock.

■ **Check the mounting of components**

Several times a year, check to make certain that the mounting of components such as the control panel has not been weakened by rust or corrosion.

15 Specifications

Product number		SHA-KT256BG
External dimensions		(H) 240 (W) 280 (D) 150 mm
Method of installation		Front door of control panel
Maximum number of connectable units		Maximum 128 air conditioners (indoor units) Maximum 256 air conditioners (indoor units) with communication adaptor connected
Timer precision		± Approx. 2 minutes/month (normal temperature)
Timers	Setting unit	1 minute
	Operation	50 times/day 50 types of daily timer / 50 types of weekly timer
	Program cycle	1 week
Temperature / humidity ranges for use		5°C to 40°C / 20% to 80%
Display		6.5-inch TFT color LCD display (640 x 480 pixels), with backlight
Power requirements		Single-phase 100~240 V 50/60 Hz
Power consumption		Max. 30 W
Weight		3.6 kg

DECLARATION OF CONFORMITY

This product is marked "CE" as it satisfies EEC Directive No. 89/336/EEC, 73/23/EEC and 93/68/EEC.
This declaration will become void in case of misusage and/or from non observance though partial of Manufacturer's installation and/or operating instructions.

16 Installation (Electric) and Service Instructions

Safety Precautions

- Before conducting installation or electrical work, be sure to carefully read these “Safety Precautions” and follow them carefully.
- The precautions given in this manual consist of specific “Warnings” and “Cautions”. Be sure to follow these precautions, as they provide important safety related information. The labels and their meanings are as described below.

⚠ **Warning**	This refers to a hazard or unsafe procedure or practice which can result in severe personal injury or death.
⚠ **Caution**	This refers to a hazard or unsafe procedure or practice which can result in personal injury or product or property damage.

⚠ Warning

- Be sure to arrange installation at the dealer where the system was purchased or use a professional installer. Electric shock or fire may result if an inexperienced person performs any installation or wiring procedures incorrectly.
- Carefully follow these Installation (Electric) and Service Instructions when installing the unit. Electric shock or fire may result if the unit is not installed correctly.
- Electrical installation should be performed by qualified electrician, in accordance with the provisions of the Technical Standards for Electrical Installations, local regulations for indoor wiring, and these Installation (Electric) and Service Instructions. Be sure to use a dedicated electrical circuit. Insufficient electrical circuit capacity may result in electric shock or fire.
- Use the specified cables for the electrical connections, and connect the cables securely. Fasten the cables securely so that the cables will not exert force on the connection terminals. Insecure connections or fastening may result in overheating or fire.
- The installation location may require the use of a circuit breaker. Failure to use a circuit breaker may result in electric shock or fire.

⚠ Caution

- When performing electrical installation, discharge any accumulated static electricity to ground before touching the unit.

Supplied parts

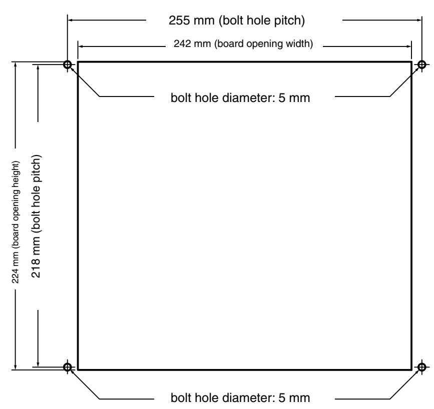
Part number	Part name	Quantity	Part number	Part name	Quantity
①	Small pan head bolt (M4 x 10)	4	②	Nut (M4)	4
③	Flat washer	4	④	Cable tie	6
⑤	Operation Manual	1			

Specifications

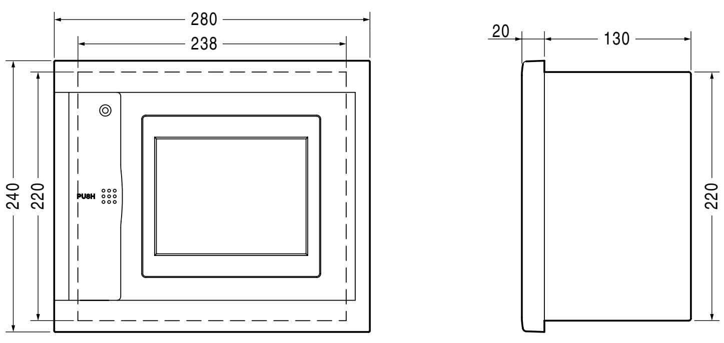
Rated voltage ·················· 100 - 240 V, single phase
Rated frequency ············· 50/60 Hz
Power consumption ········ 30 W max.
Operating temperature ··· 5° to 40° C
Operating humidity ·········· 20 to 80% (non-condensing)

1 Cautions regarding the design of the control box

Control box machining diagram



External dimensions



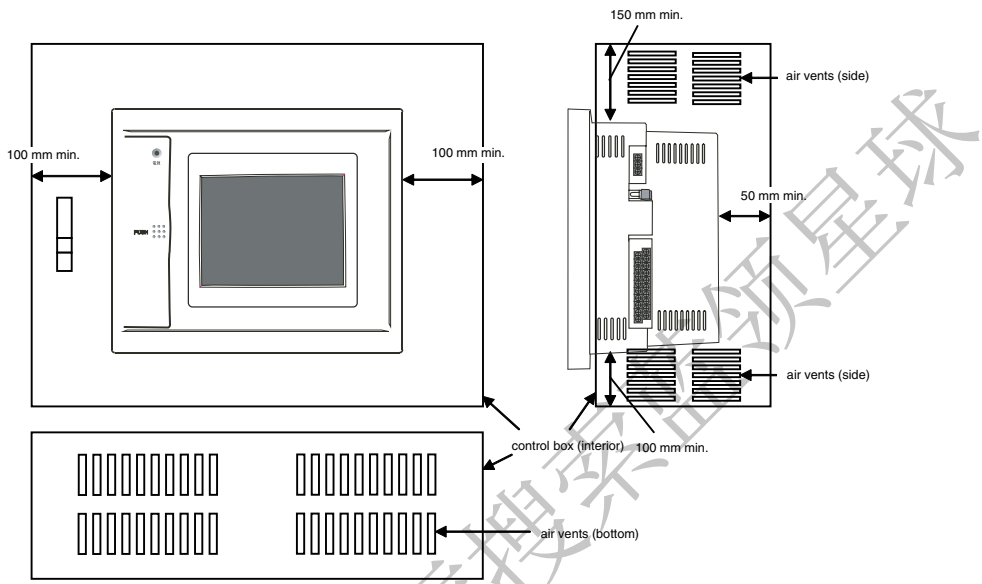
16 Installation (Electric) and Service Instructions

Take the following into consideration when designing the control box:

1. To ensure sufficient airflow for cooling, provide air vents (holes, slots, etc.) on the upper, lower, left and right sides of the box, as shown in the figure below. (Be sure not to clog the ventilation hole when setting.)

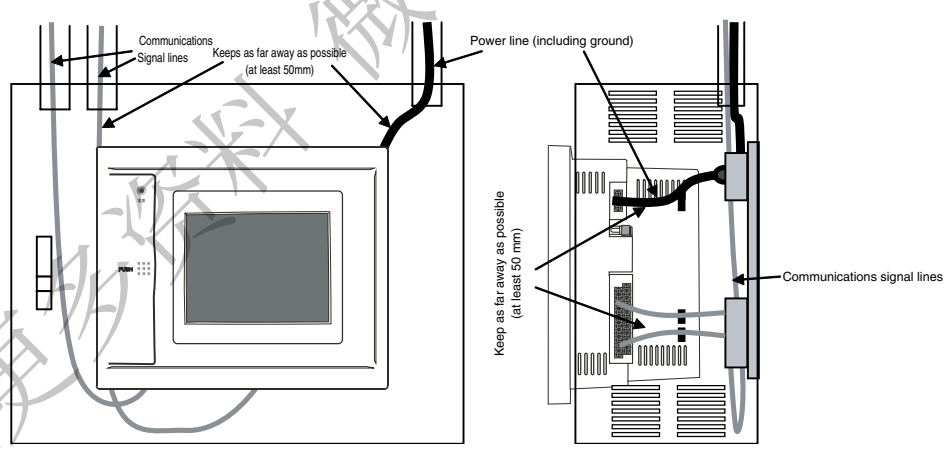
   Ensure that the temperature inside the control box does not exceed 40 °C.

Control box example



2. Keep the power and communications signal lines as far apart as possible (at least 50 mm) to reduce the effects of electrical noise.

Wiring example



2 Mounting

Caution

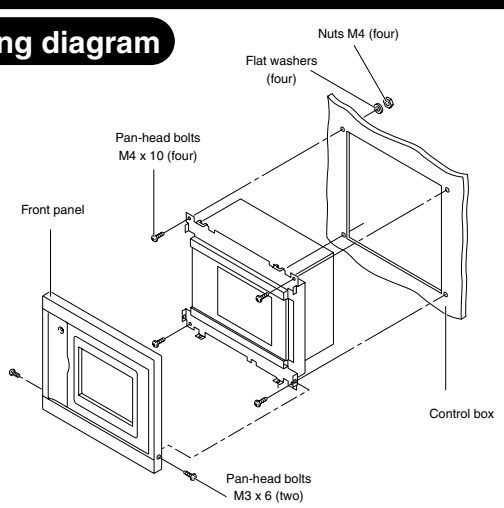
- Do not route communications signal lines or input / output signal lines close to power supply lines, or routing them through the same conduit. Doing so may result in malfunction.
- Mount the unit far away from potential noise sources.
- Do not mount the unit where it could get wet, or in areas of high humidity.
- Do not mount the unit where it could be subject to excessive vibration or shocks.
- Mount the unit inside a control box.

(1) Remove the two pan-head bolts from the lower sides and bottom of the front panel.

(2) Mount the controller unit to the control box using the four supplied bolts, washers, and nuts.

(3) Replace the front panel.

Mounting diagram

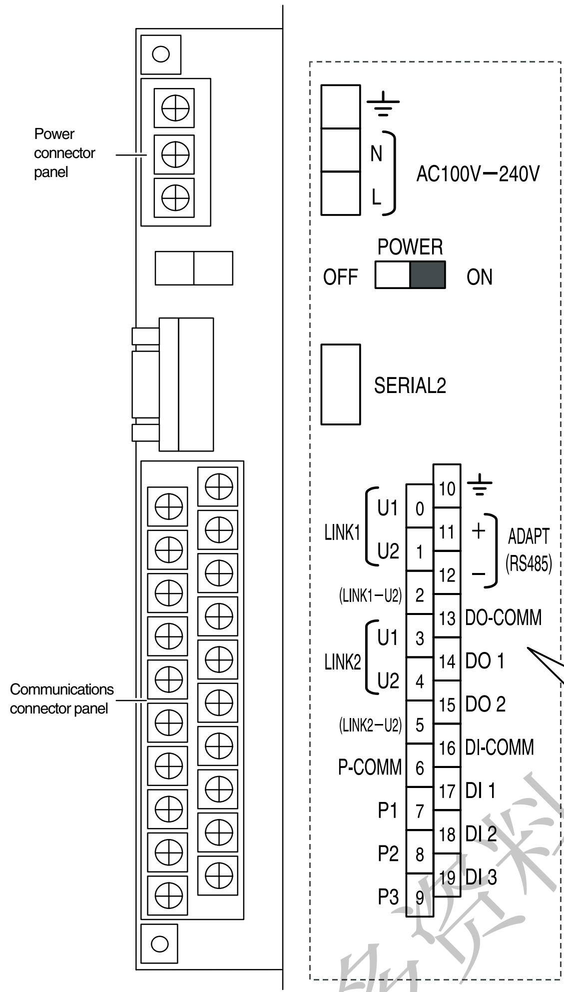


16 Installation (Electric) and Service Instructions

3 Wiring

Always shut off the power supply (breaker) before installing or uninstalling.

Connection terminals



(1) Power supply connection

Connect the power supply to the commercial power mains (100 to 240 V AC), using a dedicated circuit.
Connect the power supply lines to the L and N power supply terminals (the power supply neutral to the N terminal).
Connect an earth ground line to the FG power supply terminal.

(2) Signal connection

- Connect indoor and outdoor signals using 0.5 - 2.0 mm² two-conductor cable.
- Overall length of each signal line should be 1 km or less.
- Do not run signal lines through the same conduit as power supply lines, use the same cable as the power supply, or run close to the power supply lines (maintain at least 30 cm separation).
- Do not run the LINK1 and LINK2 signal lines through the same conduit, use the same cable for wiring, or run the signal lines close together.

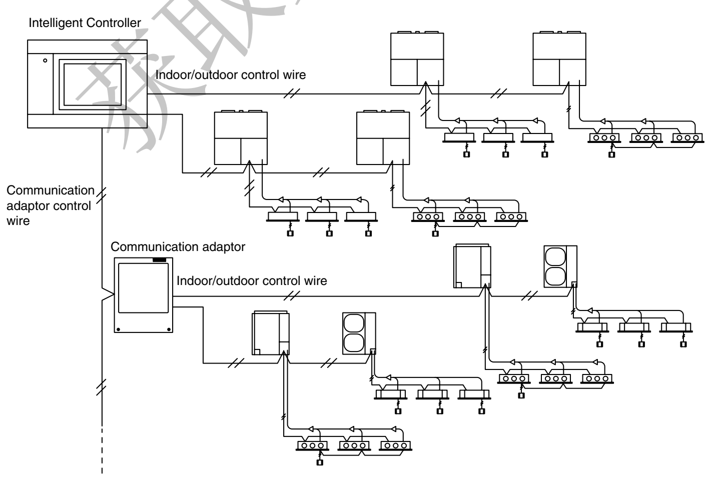
Terminal names and uses

AD

ADAPT +/-	:	Communication adaptor control wire (RS-485)
LINK 1/2	:	Indoor/outdoor control wire (HBS)
P1 - P3	:	reserved
DI 1	:	All stop input
DI 2	:	All start input
DI 3	:	reserved
DO 1	:	All alarm output
DO 2	:	All operation output
SERIAL 2	:	reserved

Basic wiring diagram

Wire up the communication adaptor control wire and Indoor/outdoor control wire as shown in the figure below.



* When connecting link systems (indoor and outdoor unit control wires), always connect beginning with LINK1 and LINK2 on the Intelligent Controller. Up to 4 link systems can be connected.

Wiring procedure

- Indoor/outdoor control wire (no polarity)
  Connect signal terminals 0 and 1 (LINK1) to the Indoor/outdoor control wire terminals of an indoor or outdoor unit. If using two link systems for connection, connect signal terminals 3 and 4 (LINK2) in the same manner.
- Communication adaptor control lines (note + and - polarity)
  Up to seven external communication adaptors can be connected to the control unit (see figure at left). However, a maximum of four links is supported. Be sure to follow the communications adaptor Installation Instructions when connecting the adaptors. Make sure that AC200V lines are not connected to the communication adaptor terminals or Indoor/outdoor control wire terminals.

* If the AC200V voltage is accidentally applied to the Indoor/outdoor control wire terminals, a fuse will blow to protect the controller board. If this happens, disconnect the AC200V line, and connect the Indoor/outdoor control wire to the spare U2 terminal. (The other signal line can stay connected to the U1 terminal.) The spare U2 terminals are right next to the main U2 terminals.

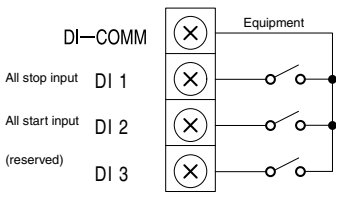
Use terminal 2 (LINK1-U2) instead of terminal 1
Use terminal 5 (LINK2-U2) instead of terminal 4

7

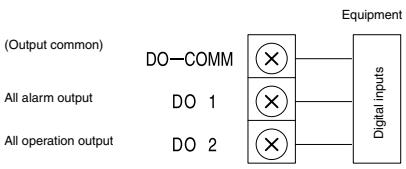
16 Installation (Electric) and Service Instructions

4 Connecting to external equipment

(1) External system inputs
(no-voltage contact point static)



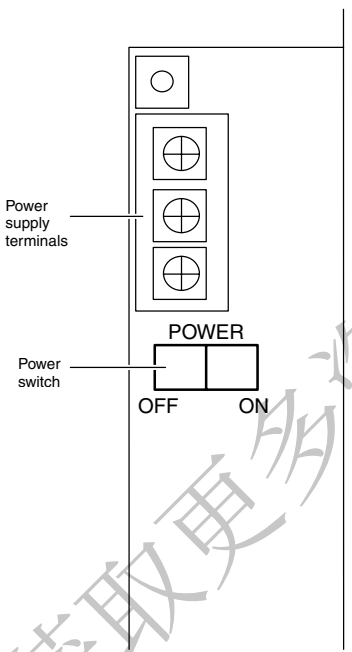
(2) External system outputs
(no-voltage contact point static)



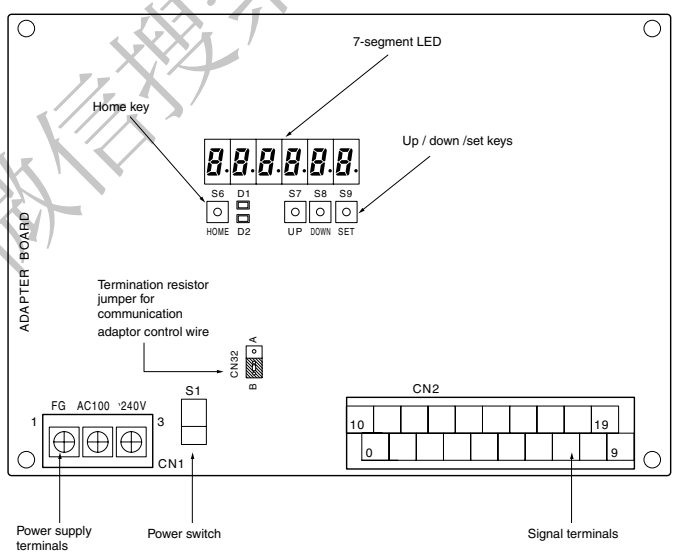
- Keep the input and output signal line lengths to under 20 meters. For distances greater than this, install a standalone communication adaptor, or use a relay.
- For use in areas that may be susceptible to electrical noise, use two-conductor shielded cable (with one line grounded), with a cross-section of 0.5 mm² or greater.
- Do not apply external voltages to the input terminals.
- The input terminals use a sensing current of about 10 mA at 5 V DC.
- The output terminal allowable contact voltage and current are 30 V DC, 0.5 A.

5 Power switch

The Intelligent Controller has a power switch.If the LCD is blank after connecting power, check the position of the power switch.



6 Circuit board diagram



* Ordinarily, there is no need to change any settings on the Intelligent Controller board.

7 Verify the system configuration, make necessary settings

① Turn on power to all air conditioner units.
② Turn on power to the Intelligent Controller.
③ Set the date and time on the Intelligent Controller and verify the system configuration.
④ Following the display on the Intelligent Controller, verify the number of units connected.
⑤ Perform the necessary settings. **Be sure to set the central control address.**
* See the Operation Manual for details.

8 Educating the customer

- Give the Operation Manual to the customer.
- Explain the operation to the customer, following the explanations given in the Operation Manual.

Customer Memo

Fill in the following information now. It will be convenient if service is needed.

Serial number	
Date of installation	
Name of store where purchased	Telephone No.

SANYO

Sanyo Centralized Control System

SHA-KT256BG

INTELLIGENT CONTROLLER

Operation Manual

Access and Operation by Web Browser

Thank you for choosing the SHA-KT256BG Intelligent Controller.
Before using the system, be sure to read this manual carefully.

Contents

Access and Operation by Web Browser

Accessing the Intelligent Controller from your computer allows you to monitor/operate air-conditioning equipment using a Web browser.

1. Computer Environment Requirements

In order to use the web browser of your computer to connect to the Intelligent Controller and monitor/operate air-conditioning equipment, the following environment requirements must be met.

Supported browser : Internet Explorer 6.0 or later
Java applet : Sun Microsystems Java Plugin Ver 1.4.2 or later
Screen resolution : 1024 x 768 recommended

2. Log-in

To log in to the Intelligent Controller, enter the following into the address bar of the web browser:

http://[Intelligent Controller address]/SACWWW/index_[language code].asp

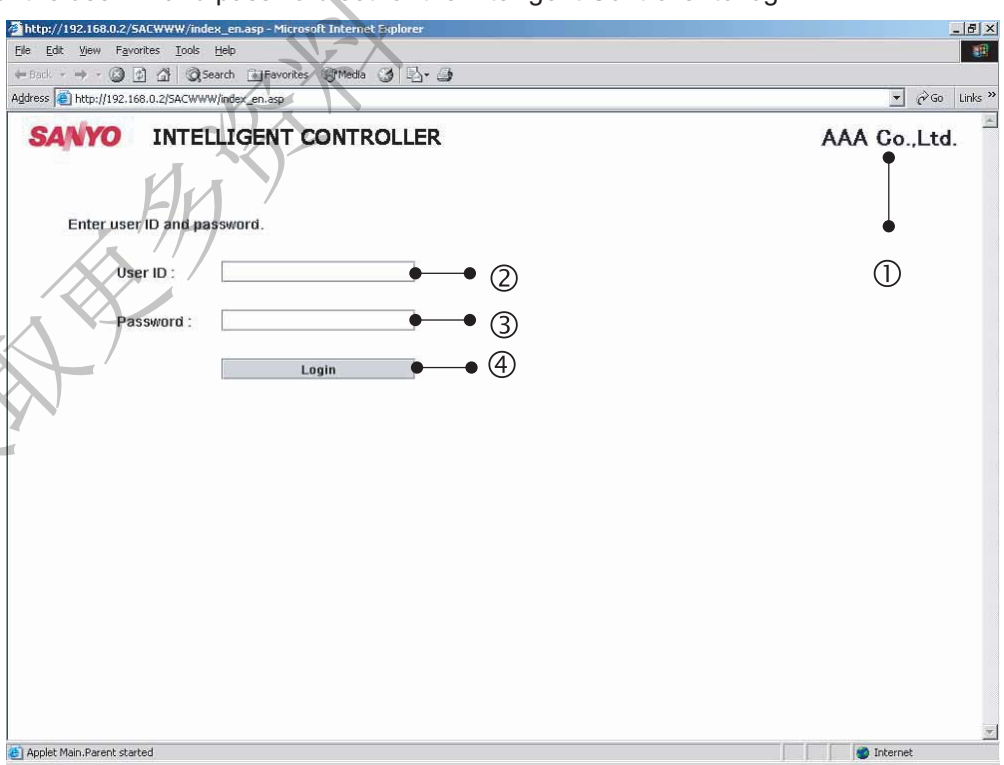
For example, if the Intelligent Controller address is 192.168.0.2 and you want to connect to the English page, enter:

http://192.168.0.2/SACWWW/index_en.asp

The language codes are as follows.

English : en	French : fr	German : de	Italian : it
Portuguese : pt	Spanish : es		
Chinese : zh	Japanese : ja	Korean : ko	

This will cause the web browser to connect to the Intelligent Controller, and a screen such as shown below appears.
Enter the user ID and password set for the Intelligent Controller to log in.

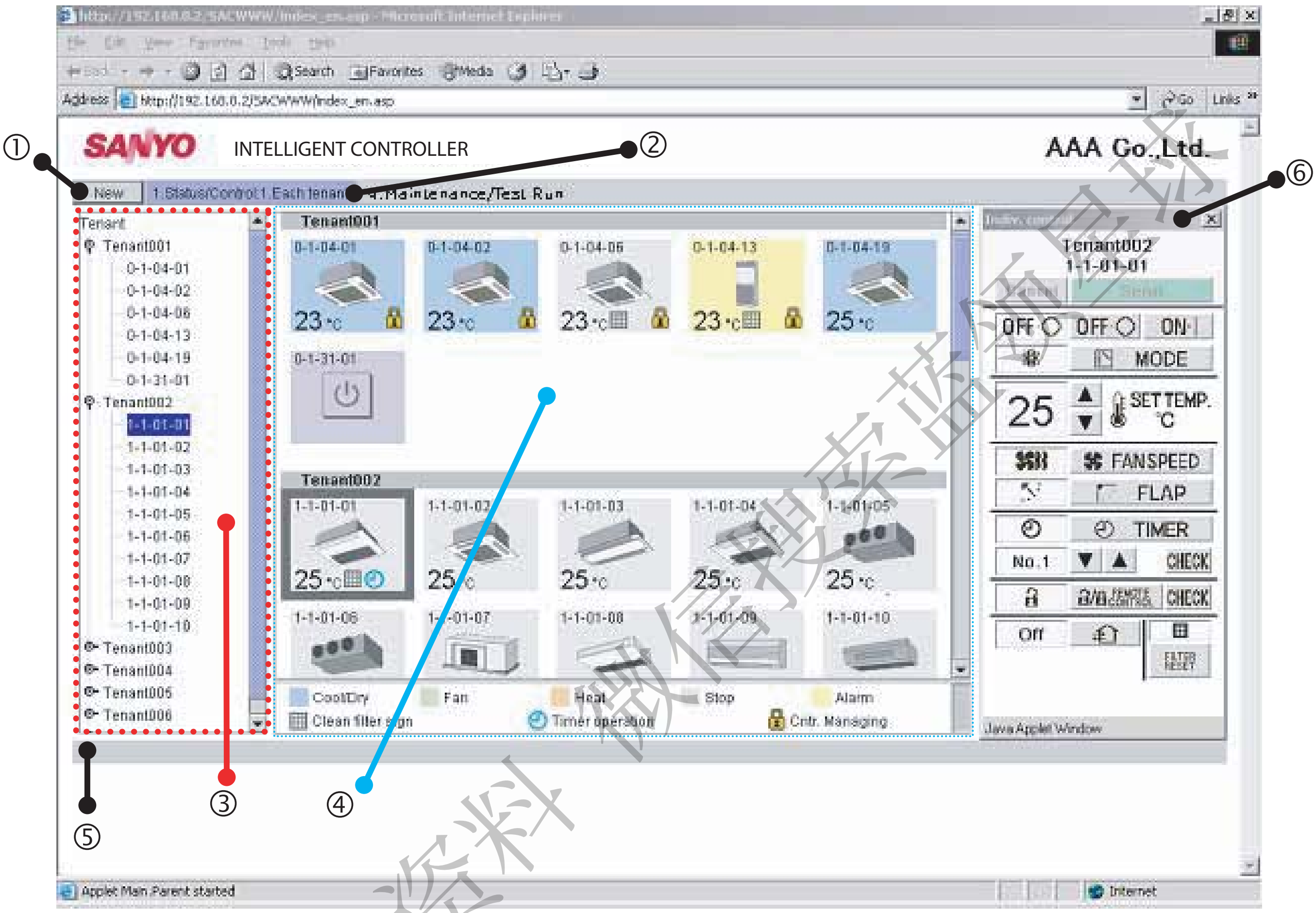


① Shows the site name that was set for Intelligent Controller.
② Enter the user ID that was set for Intelligent Controller.
③ Enter the password that was set for Intelligent Controller.
④ Click the Login button.

3. Screen Display and Operation

3-1. [Each Tenant] Screen

After you log in to the Intelligent Controller, or when you use the menu to select [1. Status/Control : 1. Each tenant], a screen such as shown below appears.



① New button
Updates the screen to the latest information.

② Menu
Lets you select one of the following screens.

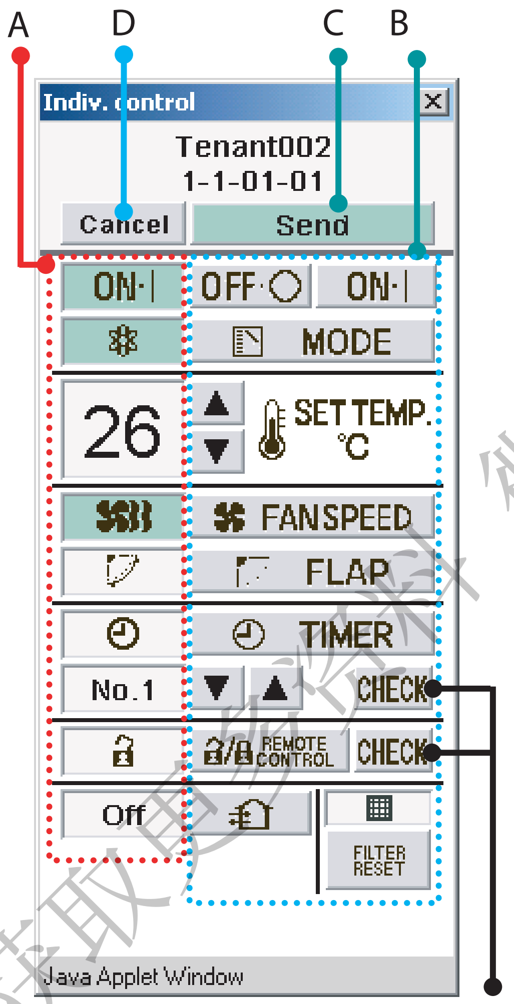
1.Status/Control:1.Each tenant
1.Each tenant
2.Each tenant details
5.All units

③ Tree configuration
Shows the indoor unit and tenant structure currently accessed by the Intelligent Controller in a tree configuration. Clicking on a section changes the display to the selected indoor unit.
In the example shown, clicking on the reverse section (indoor unit 1-1-01-01) will select the individual indoor unit, and clicking on the tenant name (Tenant001, Tenant002 etc. in the example) will select all indoor units for that tenant. Clicking on the top of the tree (Tenant in the example) will select all indoor units of the site.
The following page shows examples for selecting all indoor units for a tenant and all indoor units of a site.

④ Icon display area
Shows icons for indoor units connected to the Intelligent Controller.
Clicking on an icon whose frame is shown in reverse (indoor unit 1-1-01-01 in the example) will select that unit. Clicking on a tenant name (Tenant001, Tenant002 etc. in the example) will select that tenant.

⑤ Notification column
Shows information about the connection status of web browser and Intelligent Controller, etc.

⑥ Remote control window
Shows the Remote control window. When this window has been closed, clicking on the indoor unit or making another selection will bring it up again.



Remote control window

A Status/Control screen section
Shows the status of the indoor unit and the operation condition.
When a control operation is performed, the background color of the respective field changes and the [Send] button becomes available. Clicking the [Send] button will send all operation steps performed up to this point to the Intelligent Controller. If you instead click the [Cancel] button or perform a step such as selecting another indoor unit, operation steps performed up to this point will be canceled.

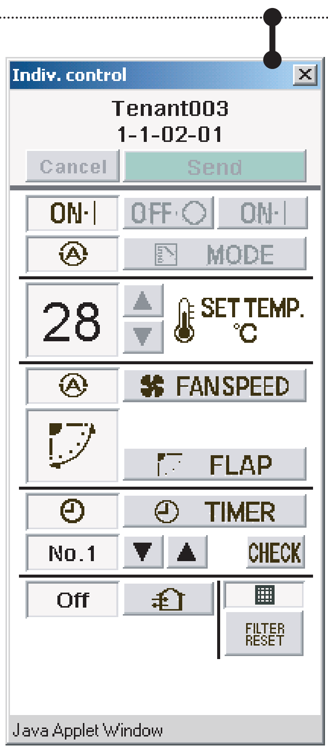
B Control section
Shows controls for possible operation steps such as start/stop switching, operation mode selection, temperature selection, fan speed setting, fan direction setting etc.

If the logged in user has only general user privileges, buttons for restricted operation steps will be grayed out (inactive).
The [REMOTE CONTROL] and [CHECK] buttons will not be displayed.

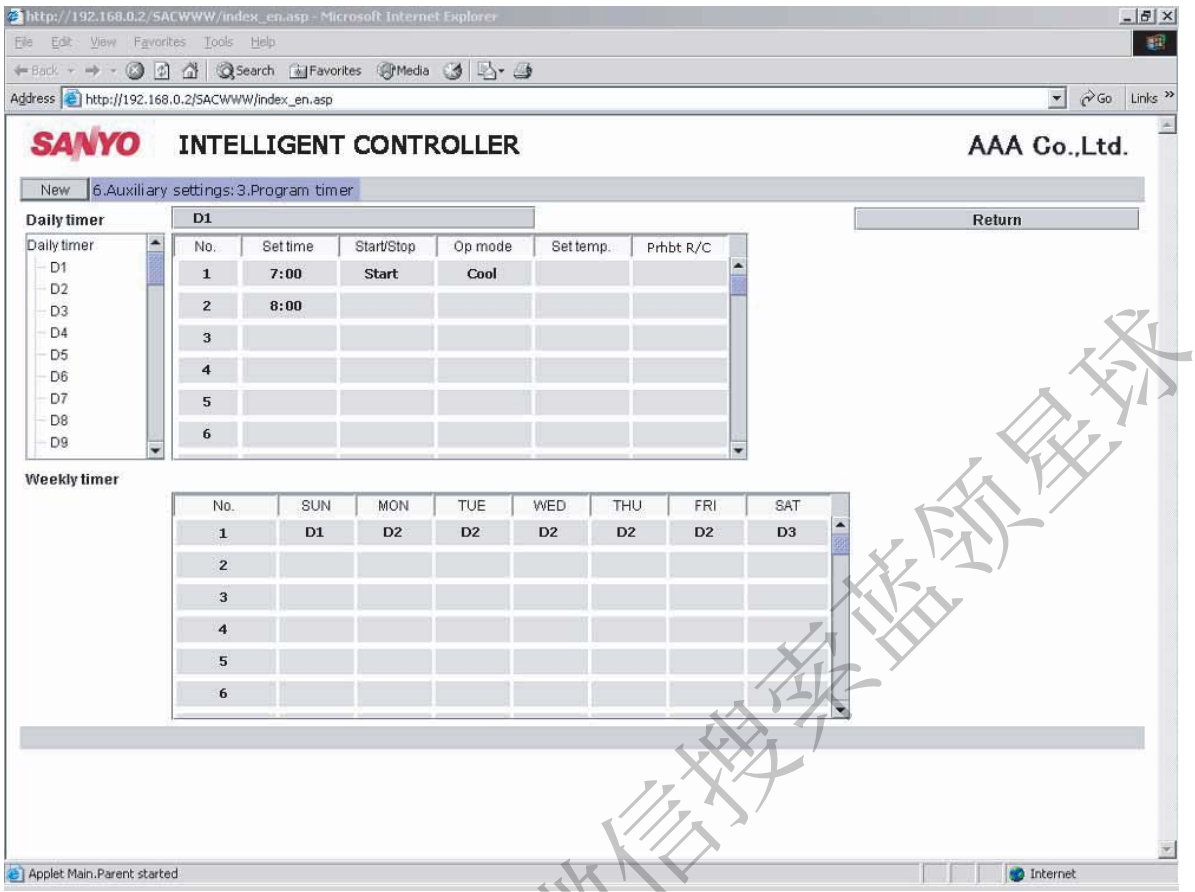
C [Send] button
Sends the changes made to the Intelligent Controller.

D [Cancel] button
Cancels the changes made.

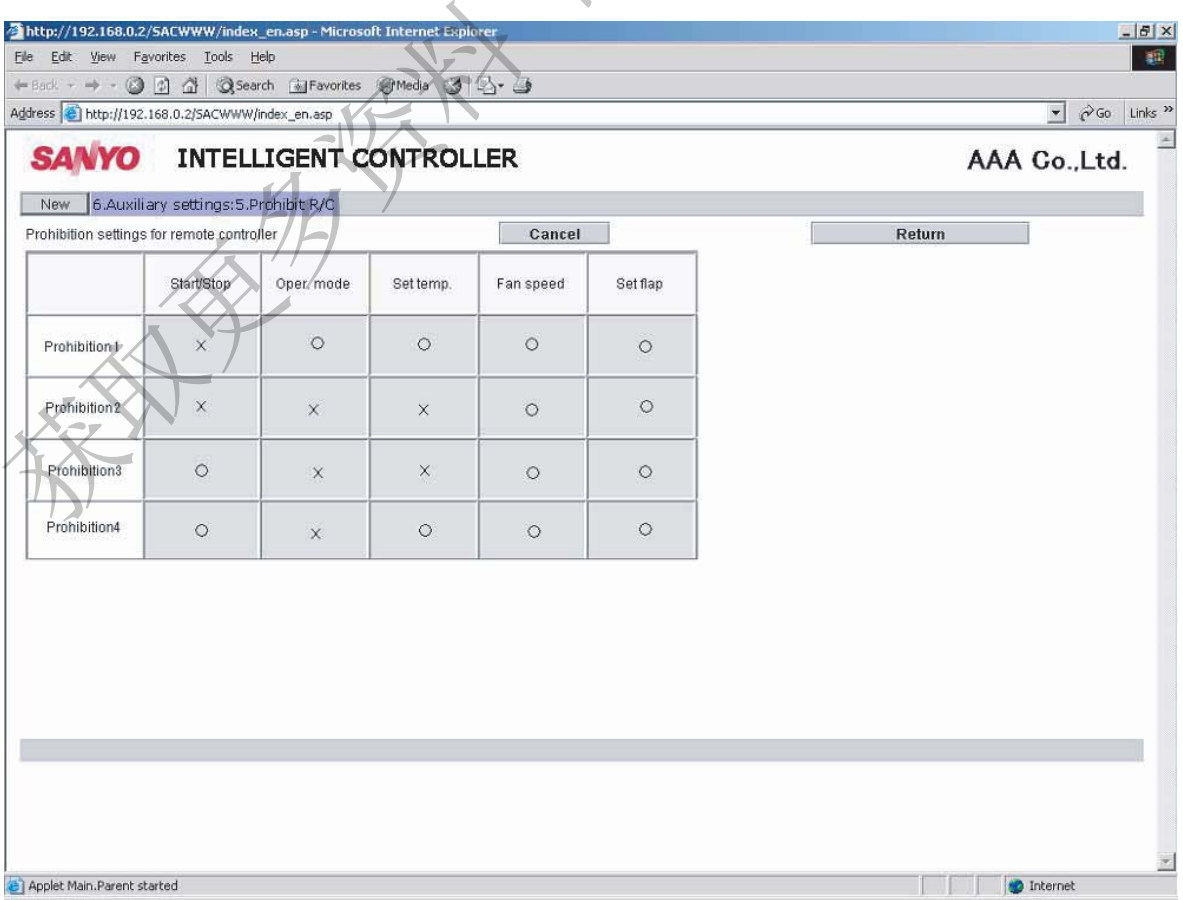
E [CHECK] buttons
Used to check the timer setting and remote control prohibition setting status.
These buttons bring up the screens shown on the next page.
Clicking the [Return] button will return the display to the previous screen.



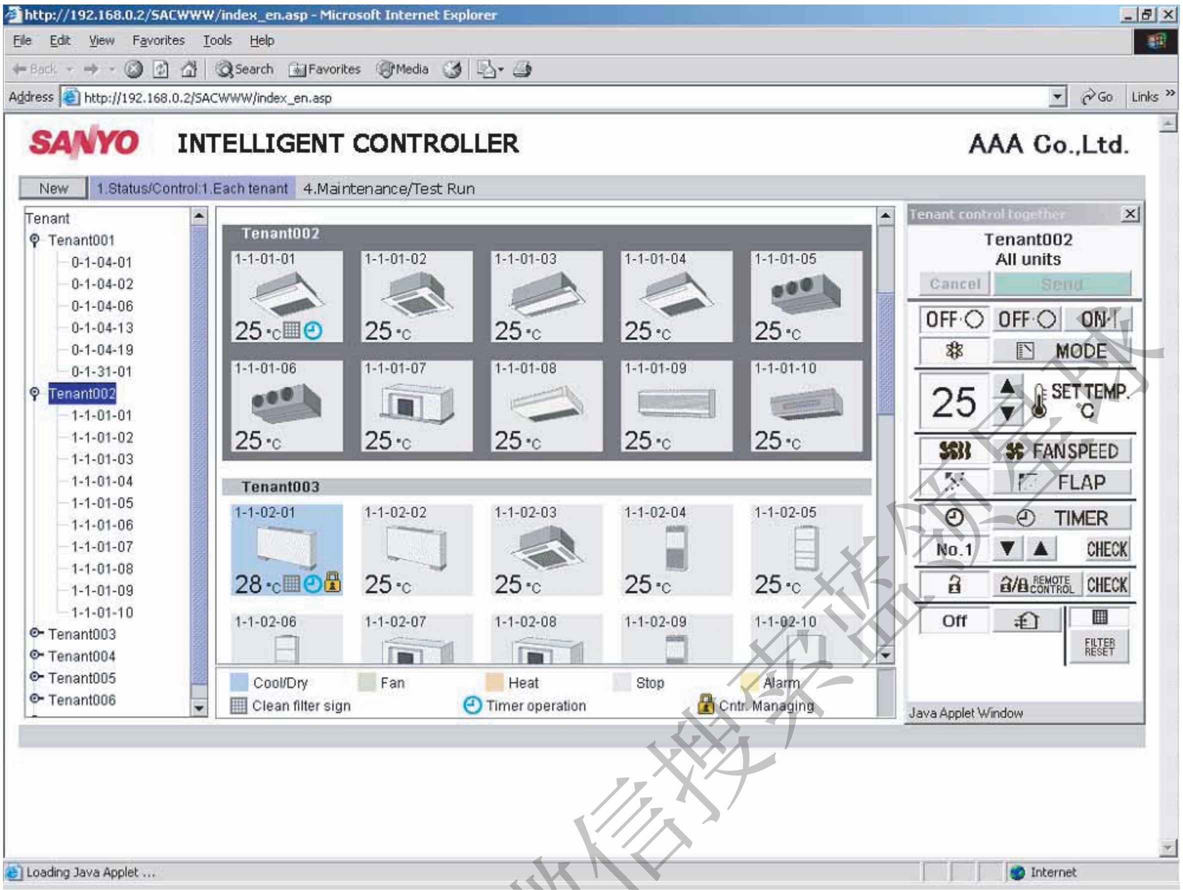
Remote control window for general user



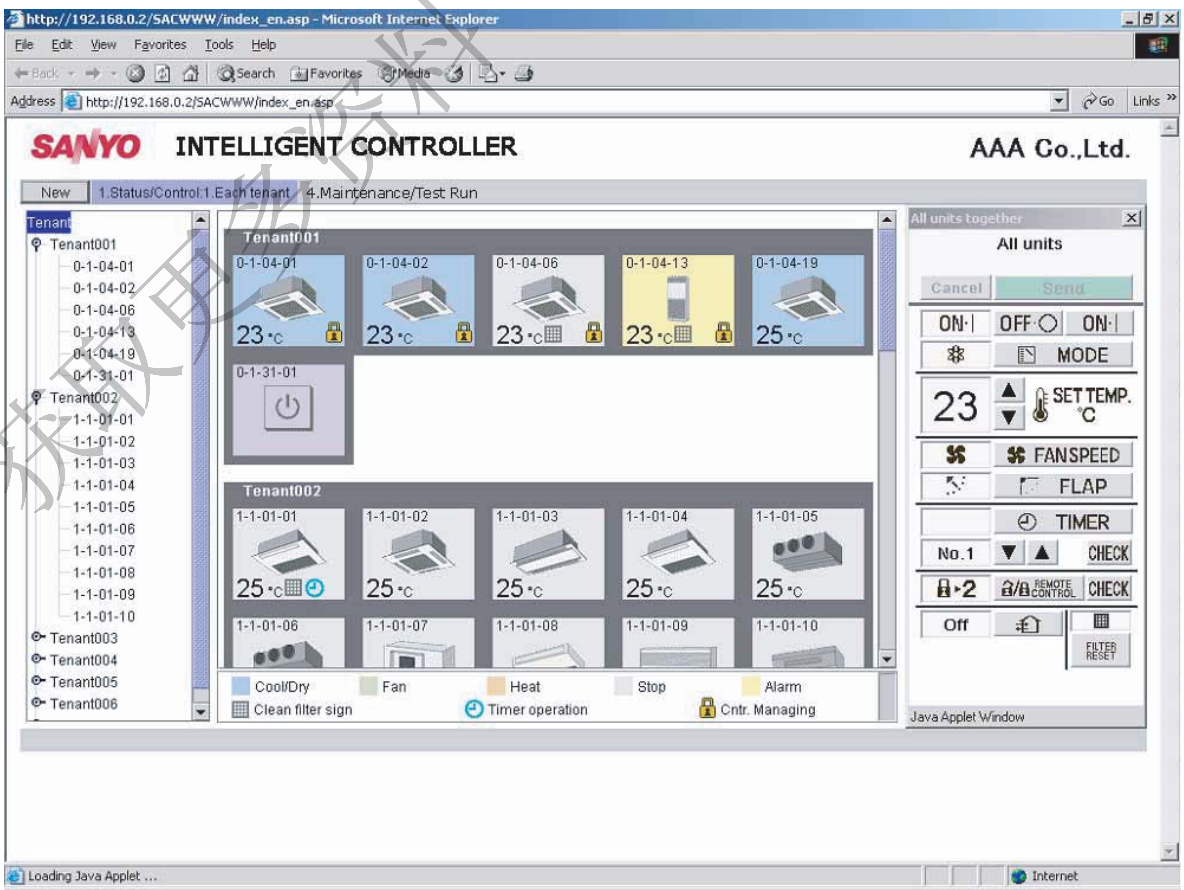
Timer setting status screen



Remote control prohibition setting status screen



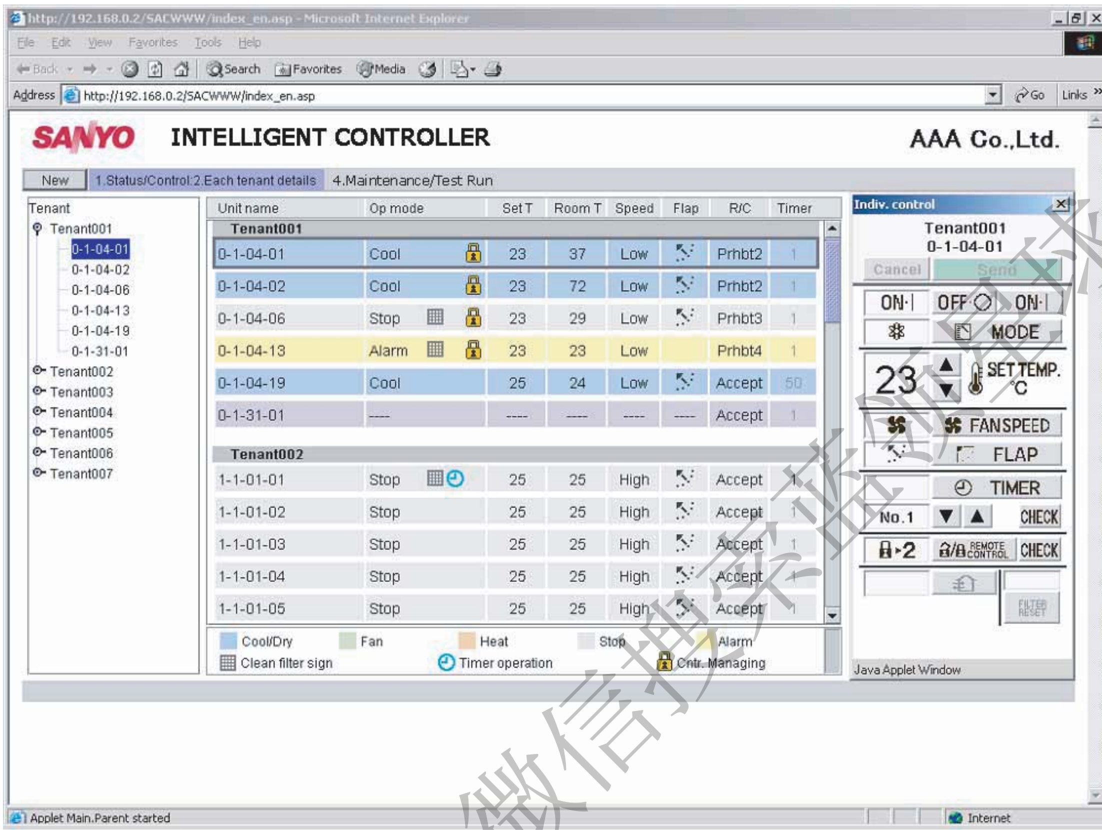
Screen example for selecting all indoor units of a tenant



Screen example for selecting all indoor units

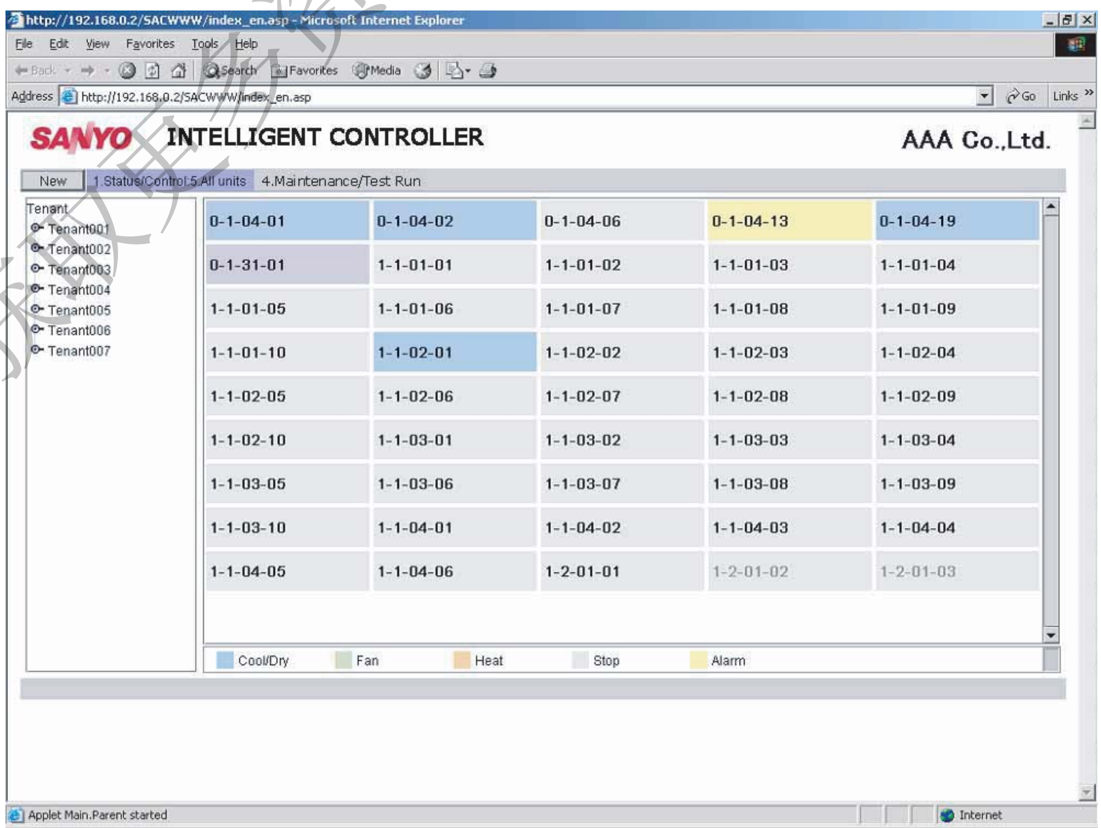
3-2. [Each Tenant Details] Screen

When you use the menu to select [1. Status/Control : 2. Each tenant details], a screen such as shown below appears. Operation principles for this screen are similar to those of the [Each tenant] screen.



3-3. [All Units] Screen

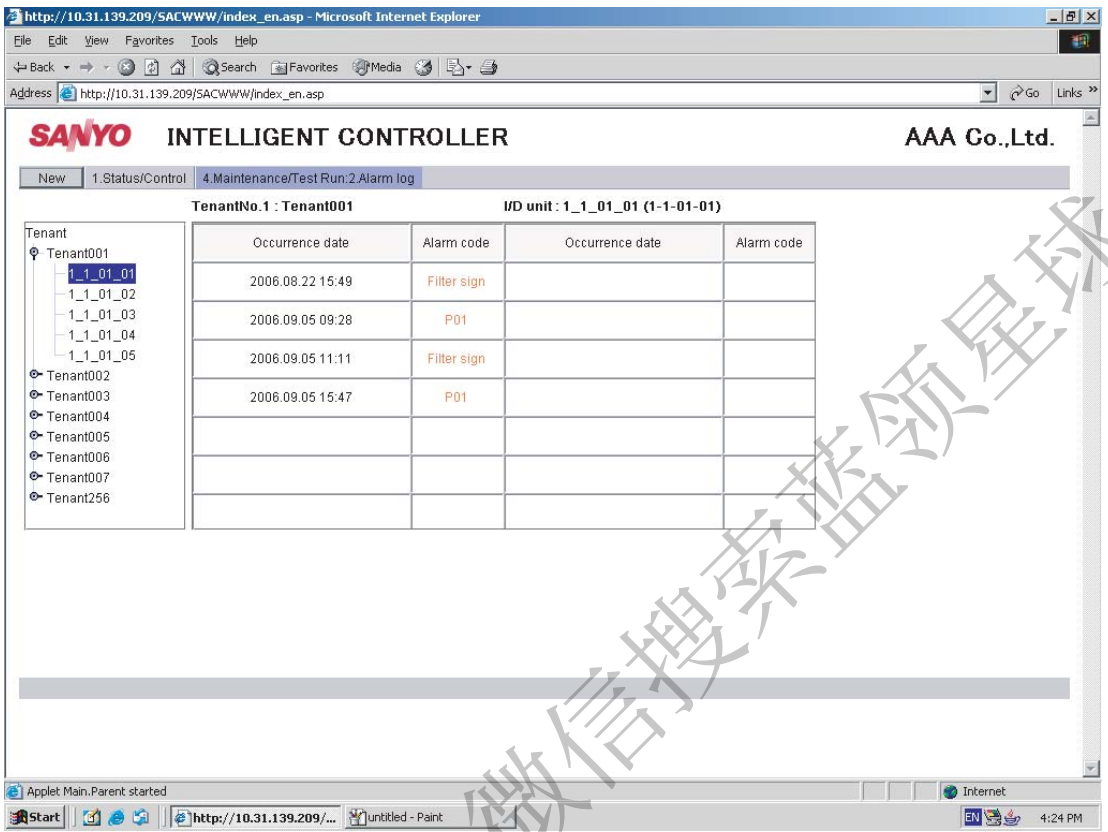
When you use the menu to select [1. Status/Control : 5. All units], a screen such as shown below appears. Operation principles for this screen are similar to those of the [Each tenant] screen.



7

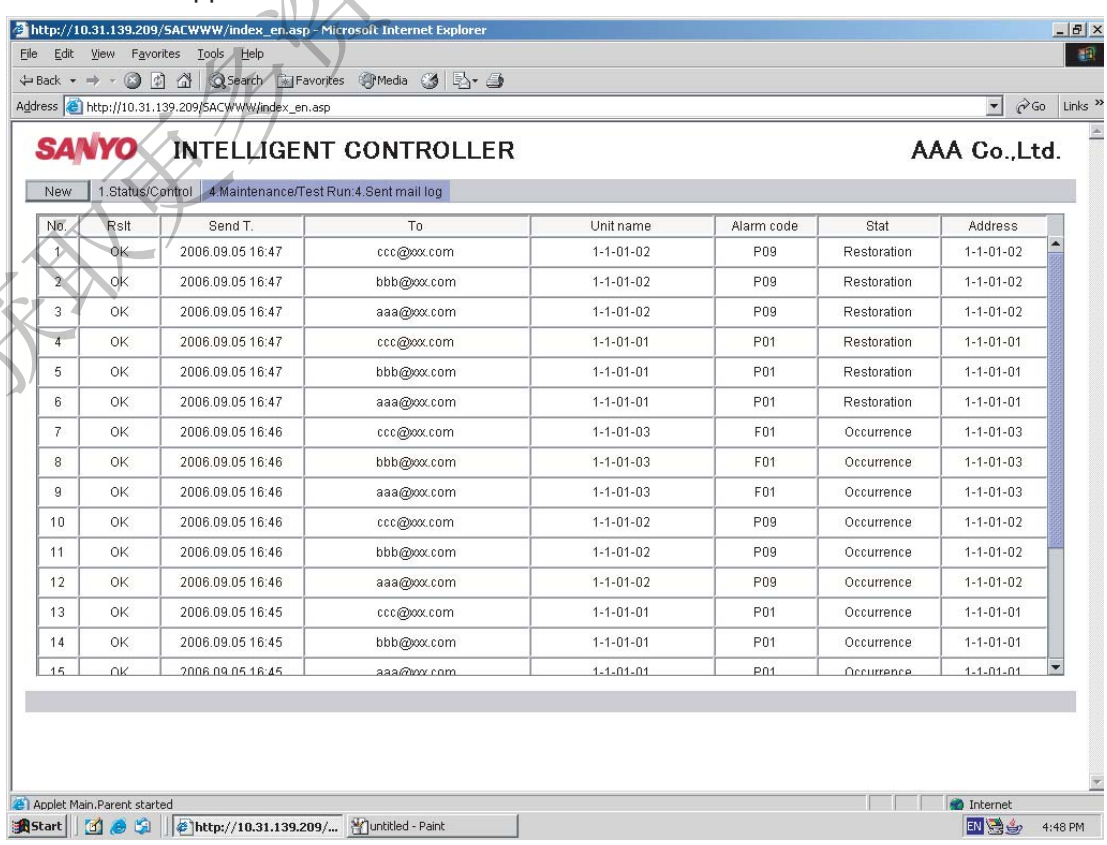
3-4. Alarm Log Screen

When you use the menu to select [4. Maintenance/Test Run : 2. Alarm log], a screen such as shown below appears.



3-5. Mail Send Log Screen

When you use the menu to select [4. Maintenance/Test Run : 4. Mail send], a screen such as shown below appears.



4. Supplementary Information

■ When connecting the Intelligent Controller via Internet, consider implementing network security measures, such as a firewall.

85464359577002

Instructions for the Electrical Installer

For your safety

- Read the following instructions carefully, and carry out secure installation and electrical work.
- The precautions given in this manual consist of specific “Warnings” and “Cautions”. They provide important safety-related information. Be sure to strictly observe all safety procedures. The labels and their meanings are as described below.

⚠ **Warning**	This symbol refers to a hazard or unsafe procedure or practice that can result in severe personal injury or death.
⚠ **Caution**	This symbol refers to a hazard or unsafe procedure or practice that can result in personal injury or product or property damage.

* After installation is completed, perform a test run to check for operating trouble. Explain operating procedures to the customer following the central control device Operation Manual and then request the customer to store this Instructions for the Electrical Installer together with the central control device Operation Manual.

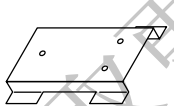
⚠ Warning

- Be sure to arrange installation by the dealer where the system was purchased or by a professional installer. Electric shock or fire may result if an inexperienced person performs any installation or wiring procedures incorrectly.
- Be sure that this unit is securely installed in accordance with this Instructions for the Electrical Installer. Electric shock or fire may result if any installation or wiring procedures are incorrectly performed.
- Only a qualified electrician should attempt to connect this system, in accordance with the instructions in this manual. Use a dedicated electrical circuit. Insufficient electrical circuit capacity or incorrect installation may cause electric shock and fire.
- Use the specified cables for the electrical connections, and connect the cables securely. Run and fasten the cables securely so that external forces or pressure placed on the cables will not be transmitted to the connection terminals. Overheating or fire may result if connections or attachments are not secure.
- Depending on the installation conditions and location, an earth leakage breaker may be required. If an earth-leakage breaker is not installed, there is a danger of electric shock or fire.

⚠ Caution

- Ground yourself to discharge static electricity before performing any wiring.

Accessories

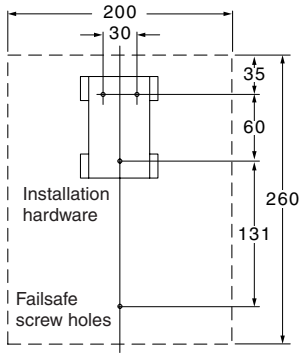
No.	Accessory	Quantity	No.	Accessory	Quantity	No.	Accessory	Quantity
①	Installation hardware 	1	②	Installation screw (4×12) 	4	③	Nylon clamper 	4
④	Nylon clamper installation screw (3×8) 	4	⑤	Binding strap 	6			

1 Installing

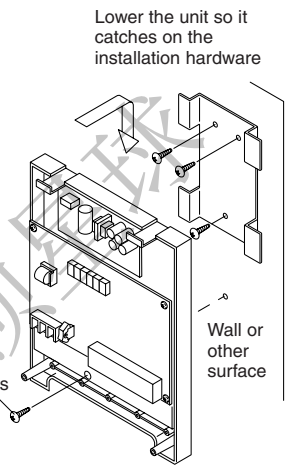
Note

- Do not run the indoor/outdoor communication lines, input/output lines, and power cables through the same conduit, or twist those cables together, or place the cables near one another. It can cause malfunction.
- Install the main unit away from any sources of electrical noise.
- Avoid installing in any locations where the unit may come into contact with water, or in any extremely humid locations.
- Avoid installing in any location that is subject to excessive vibration or physical impacts.

(1) After determining the attachment position, secure the installation hardware as shown in the dimensions diagram. If the included screws will not work for the installation, prepare appropriate screws (such as metric ones) for use at the site.
(2) Attach the main unit and fasten the installation hardware as illustrated.
(3) If the installation hardware is loose or appears like it will fall out, remove the upper case on the unit and secure with screws in the failsafe screw holes.



Installation dimensions



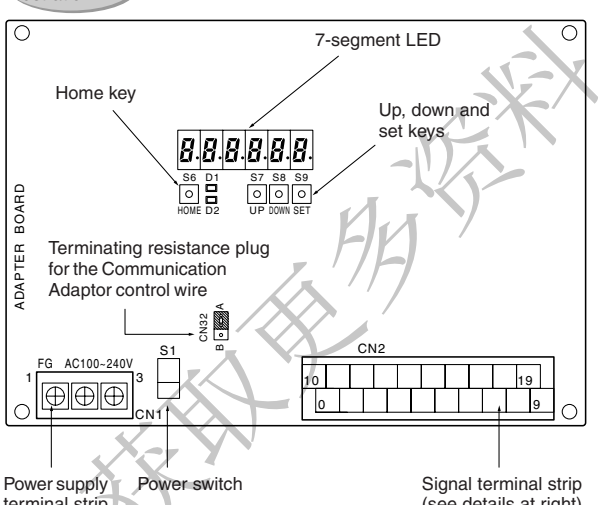
Detailed illustration

2 Wiring

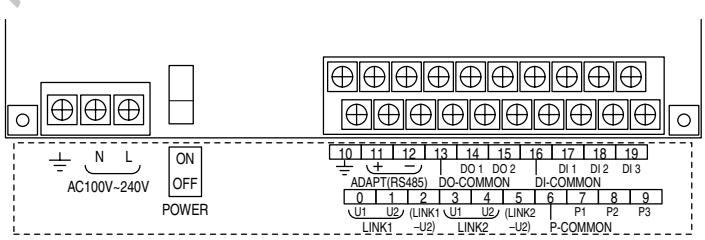
Always shut off the power supply (breaker) before installing or uninstalling the Communication Adaptor.
Remove the two screws at the front of the unit and remove the upper case.

Arrangement of the terminal board and switches

Detailed board illustration



Detailed terminal assembly illustration



ADAPT +/- :	Communication Adaptor control wire (RS-485)
LINK 1/2:	Indoor/outdoor control wire (HBS)
P1:	Pulse meter inputs (gas flow meter and fuel flow meter) (*)
P2 and P3:	Pulse meter input (power flow meter) (*)
DI1:	All stop input (*)
DI2:	All operation input (*)
DI3:	Reserved
DO1:	All alarm output (*)
DO2:	All operation output (*)

(*) Input/output function when connecting to the Intelligent Controller

(1) Connecting the power supply

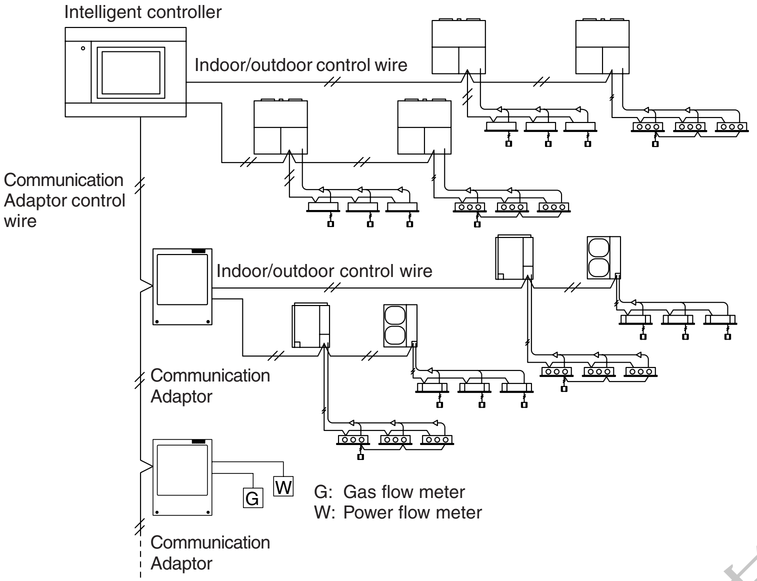
The unit can use AC power sources between 100 and 240 V.
Connect the power supply to terminals 2 (N) and 3 (L) on the power terminal strip CN1. (Connect the AC neutral end to N.)
Connect the ground line securely.

(2) Connecting the communication line

- For the Communication Adaptor control wires, use only two-conductor **shielded wire** with a cross-section between 0.5 and 2.0 mm^2 (MVVS or CPEVS).
- Be sure to ground only one end of the shielding.
- The overall length of each line should be 1 km or less.
- Do not run the communication line through the same conduit as the power supply, use the same cable as the power supply, or run close to the power supply line (maintain at least 30 cm separation).
- Do not run the LINK1 and LINK2 signal lines through the same conduit, use the same cable for wiring, or run them close together.
- Use different communication and power cables so they can be differentiated visually.

Basic wiring diagram (Example using an Intelligent Controller)

Wire up the Communication Adaptor control wire and Indoor/outdoor control wire as shown in the figure below.



Wiring procedure

- **Indoor/outdoor control wire**

  Connect terminals 0 and 1 (LINK1) on the Communication Adaptor signal terminal strip CN2 to the indoor/outdoor control wire terminals of the indoor or outdoor unit. There is no polarity.

  If connecting two indoor/outdoor control wire systems, connect terminals 3 and 4 (LINK2) on CN2 in the same manner.

- **Communication Adaptor control wire**

  Connect terminals 11 and 12 (ADAPT + and -) on the Communication Adaptor signal line terminal strip CN2 with the same terminals on the other Communication Adaptor. **The terminals have polarity.** Connect so the positive and negative elements are correct.

  When connecting, **be sure to use crossover wiring, not a branching configuration**.

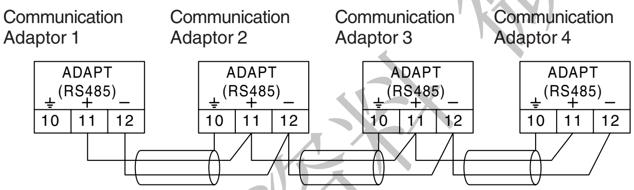
3 Precautions for the Communication Adaptor control wire

(Some items are duplicated in other sections.)

(1) The overall length should be 1 km or less.

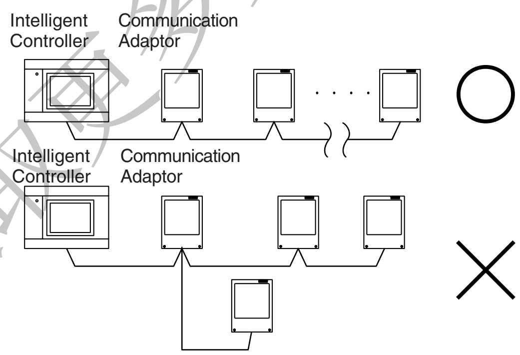
(2) The communication wire has polarity. Connect so the positive and negative elements are correct.

(3) Use only shielded wire. Be sure to ground only one end of the shielding.

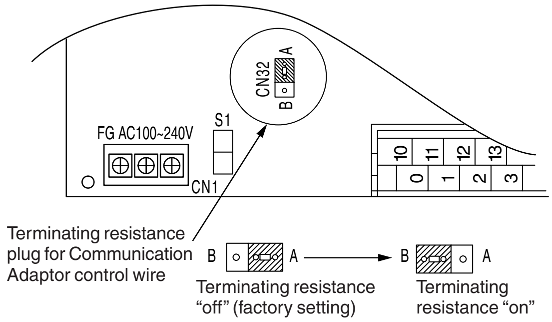


(4) Be sure to use crossover wiring, not a branching configuration.

* Connect the Intelligent Controller to the end of the crossover configuration.



(5) Change the terminating resistance plug CN32 to the "B" side (with terminal resistance) on the board for the Communication Adaptors (2 of them) at both ends of the configuration.



(6) Do not hook more than 16 units up to the Communication Adaptor. The system you are using (such as an Intelligent Controller) may have further restrictions. Consult the installation manual for your system.

* The Intelligent Controller has a maximum restriction of seven units.

(7) Make sure that high voltage (ex. 200 V) AC lines are not connected to the Communication Adaptor control wire or the indoor/outdoor control wire terminals.

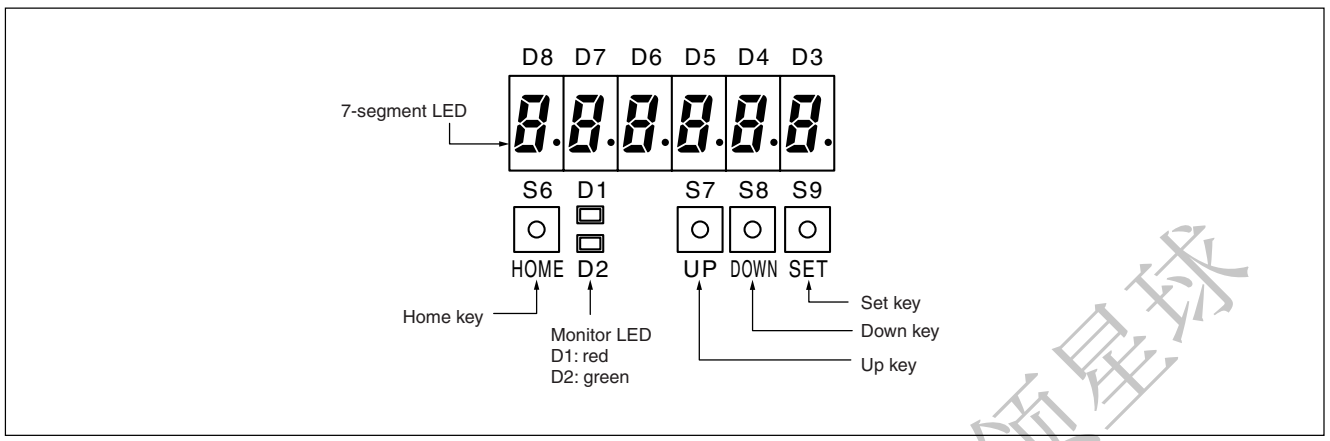
* If high voltage (ex. 200 V) AC is accidentally applied to the indoor/outdoor control wire terminals, a fuse will blow to protect the controller board. If this happens, disconnect the 200 V AC line, and connect the U2 terminal wire of the indoor/outdoor control wire to the spare terminal. (Do not change the U1 terminal wire.) Spare terminals are located right next to U2.

Change terminal number 1 LINK1-U2
→ to terminal number 2 (LINK1-U2)
Change terminal number 4 LINK2-U2
→ to terminal number 5 (LINK2-U2)

7

4 Setting the Communication Adaptor board

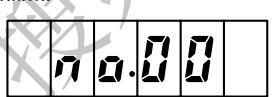
The switches on the board control the adaptor numbers, turn the indoor/outdoor control wire connection on and off, and control other settings.



(1) Switch operation overview

① Item selection
Use the UP and DOWN keys to find the desired item, then press the SET key to select.

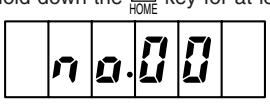
② Changing the settings
Use the UP and DOWN keys to change the setting, then press the SET key to confirm.

Hold down the HOME key for at least two seconds to reset to the default setting 

(Any settings in progress will be lost.)

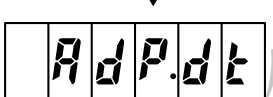
(2) Adaptor number setting procedure

① Hold down the HOME key for at least two seconds so the initial display shows as follows:



(no.00)

After 2 seconds



(AdP.dt)

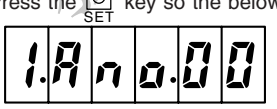
② Press the UP key five times so the following display appears:

(no.05)

This automatically switches to the below display after 2 more seconds. (Operation is not necessary.)

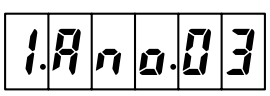
(FirSt)

③ Press the SET key so the below display appears. (Only the green monitor LED is on.)



(1.Ano.00) (Factory setting)

④ Hold down the SET key for at least 1 second so the "00" part blinks, indicating that the setting can be changed. (The green and red monitor LEDs are both on.)
Use the UP and DOWN keys to set the adaptor number.
For example, to set number 3, press the UP key three times. The following will display:



(1.Ano.03)

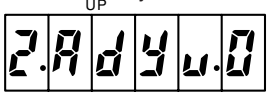
⑤ Press the SET key for at least 1 second to confirm. (Only the green monitor LED is on.)

(3) Setting the indoor/outdoor control wire connection on/off

① Repeat steps ① to ③ in section (2) "Adaptor number setting procedure" above. The following will display:

(1.Ano.03) (When the adaptor number is 3)

② Press the UP key once so the following display appears:



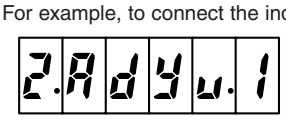
(2.Adyu.0) (Factory setting)

③ Hold down the SET key for at least 1 second so the "0" part blinks, indicating that the setting can be changed. (The green and red monitor LEDs are both on.)

Use the UP and DOWN keys to turn the indoor/outdoor control wire connection on or off as shown in the table below.

Setting value	Indoor/outdoor control wire connection
0	LINK1: On, LINK2: On (factory setting)
1	LINK1: On, LINK2: Off
2	LINK1: Off, LINK2: On
3	LINK1: Off, LINK2: Off

For example, to connect the indoor/outdoor control wire only to LINK1, press the UP key once. The following display will result:



(2.AdYu.1)

④ Press the SET key for at least 1 second to confirm. (Only the green monitor LED is on.)

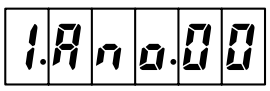
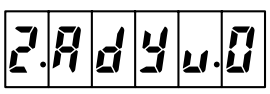
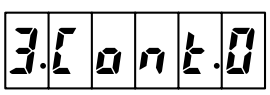
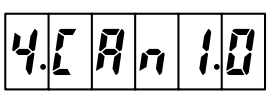
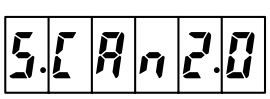
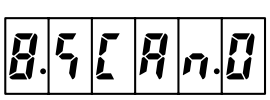
(4) Other settings

With the display status showing as in number ③ in section (2) "Adaptor number setting procedure", press the UP and DOWN keys to select the setting items shown in the table below. Set as needed.
The setting procedure is the same as above.
(Press the SET key for at least 1 second, press the UP and DOWN keys to change, then press the SET key at least one second to confirm.)

Note

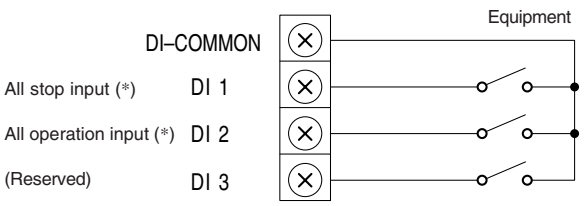
① When configuring, do not set the same adaptor number more than once.
* Use numbers between 1 and 7 for connecting to an Intelligent Controller.
② Turn the indoor/outdoor control wire connection on/off as appropriate.
(Set to "Off" for LINKs with no connection.)
③ For connecting the indoor/outdoor control wire to only one link, use the "LINK1" side.

Table 1 Communication Adaptor setting items

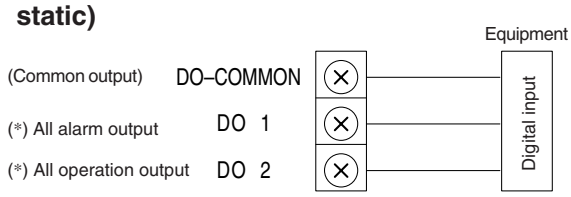
	Display	Setting item (grayed in areas indicate factory setting)
	 (1.Ano.xx)	**[1] Adaptor number setting** xx = 00 to 15: adaptor number Sets the Communication Adaptor number. Set 1 to 7 for the Intelligent Controller, making sure the same number is not used twice. When actually communicating from a master system, the link system address LINK1 is 2n and LINK2 is 2n + 1, where n is the Communication Adaptor number. Thus, when the adaptor number is 2, the LINK1 address is 4 and the LINK2 address is 5.
	 (2.AdYu.x)	**[2] Indoor/outdoor control wire connection settings** x = 0: LINK1 on, LINK2 on x = 1: LINK1 on, LINK2 off x = 2: LINK1 off, LINK2 on x = 3: LINK1 off, LINK2 off Set so any LINK (indoor/outdoor control wire) connected to the air conditioner is "on", and any LINK not connected is "off". * For solo installation (pulse meter dedicated), use x = 3: LINK1 and 2 both set to off.
	 (3.Cont.x)	**[3] Base unit settings** Always use 0 (the initial value).
	 (4.CAn1.x)	**[4] Settings for the number of Communication Adaptor units in one link, part 1** x = 0 to 7 x = 0: First Communication Adaptor in the LINK1 link x = 1: Second Communication Adaptor in the LINK1 link x = 7: Eighth Communication Adaptor in the LINK1 link
DOWN UP	 (5.CAn2.x)	**[5] Settings for the number of Communication Adaptor units in one link, part 2** x = 0 to 7 x = 0: First Communication Adaptor in the LINK2 link x = 1: Second Communication Adaptor in the LINK2 link x = 7: Eighth Communication Adaptor in the LINK2 link Set the Communication Adaptor unit number for each LINK system when connecting multiple Communication Adaptors to one indoor/outdoor control wire.
	 (6.PUL.xx)	**[6] Minimum pulse input detection time setting** x = 03: 30 msec x = 10: 100 msec If connecting a pulse meter with a pulse width between 30 and 100 msec, set to 30 msec.
	 (7.LoCA.x)	**[7] Local Adaptor connection settings** x = 0: LINK 1 on, LINK2 on x = 1: LINK 1 off, LINK2 on x = 2: LINK 1 on, LINK2 off x = 3: LINK 1 off, LINK2 off Set whether there is a Local Adaptor (for turning off and on) for each LINK system. If the setting is "off", startup will be faster as no Local Adaptor detection is run.
	 (8.SCAn.x)	**[8] Initial communication setting** Always use 0 (the initial value).

5 Connecting to external equipment

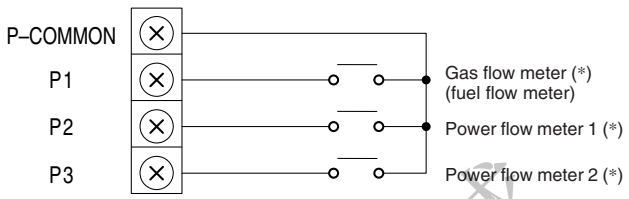
(1) External all input (No-voltage a-contact static)



(2) External all output (No-voltage a-contact static)



(3) Pulse meter input (No-voltage a-contact pulse)

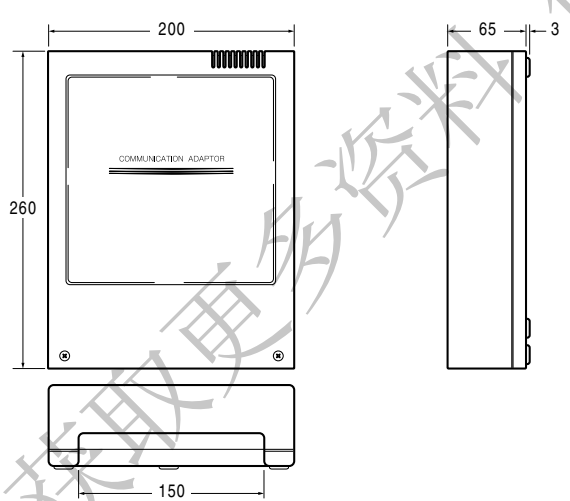


- Minimum pulse width: 100 msec
- Minimum pulse interval: 1 sec

(*) Input/output function when connecting to the Intelligent Controller

- Keep the signal input line lengths to 20 meters or less. For distances greater than this, install a standalone Communication Adaptor or use a relay.
- For use in areas that may be susceptible to electrical noise, use a two-conductor shielded cable (with one line grounded), with a cross-section at least 0.5 mm².
- Do not apply external voltages to the input terminals.
- About 10 mA of 5 V DC voltage is applied to the contact point for input terminal detection.
- The output terminal allowable contact voltage and current are 30 V DC and 0.5 A.

6 Outer dimensions



7 Specifications

Rated voltage	Single phase 100 to 240V
Rated frequency	50/60 Hz
Power consumption	5.6 W max
Operating temperature	–10 to +50°C
Operating humidity	20 to 80% (no condensation)

● DECLARATION OF CONFORMITY

This product is marked "CE" as it satisfies EEC Directive No. 89/336/EEC, 73/23/EEC and 93/68/EEC.
This declaration will become void in case of misusage and/or from non observance though partial of Manufacturer's installation and/or operating instructions.

Appendix A. Connecting to an Intelligent Controller

Before making the initial settings for the Communication Adaptor, check to ensure the below operations are complete.

(1) Is the air conditioner test operation complete?
(2) Is the wiring for the air conditioner and the Communication Adaptor complete?

To set, follow steps 1 to 5 below in sequence.

(1) Adaptor number setting

- **This is a required setting.**
- Set the address for the Communication Adaptor control wire.
  For the Intelligent Controller internal board, the address is 0. Set a value between 1 and 7 for the external adaptor, ensuring no value is used twice.
  Refer to the number (2) "Adaptor number setting procedure" in section 4 "Setting the Communication Adaptor board".
  * Refer to Table 1 [1].

(2) Indoor/outdoor control wire connection setting

- **This setting is required for two or more Communication Adaptors.**
- Two links can be connected to a Communication Adaptor.
  For links without an air conditioner or other such connection, set the LINK to "off".
- The Intelligent Controller can be connected to only four links that are set to be active.
  Refer to the number (3) "Setting the indoor/outdoor control wire connection on/off" in section 4 "Setting the Communication Adaptor board".
  * Refer to Table 1 [2].

(3) Number of Communication Adaptor units in one link setting

- **This setting is required only for using an Intelligent Controller in conjunction with a AMY Software.**
- When adding another Communication Adaptor to the indoor/outdoor control wire, the adaptor address for the added unit needs to be changed.
  * Refer to Table 1 [4] and [5].

(4) Minimum pulse input detection time setting

- **This setting is not required if pulse input (P1, P2, P3) is not used.**
- Use a pulse meter whose minimum pulse width is normally at least 100 msec.
  If and only if a pulse meter 30 msec or higher must be used, use this setting.
  * Refer to Table 1 [6].

(5) Local Adaptor connection setting

- By not using a Local Adaptor, the configuration confirmation time can be shortened.
- **Not using this setting will not affect operation of the device.**
  * Refer to Table 1 [7].

Complete!

8. Local Adaptor for ON/OFF Controller (SHA-KL4UG(B))

Safety Precautions

- Read these Safety Precautions before beginning installation or electrical work, and perform the work only in the correct manner.
- Precautions in this manual are given in the form of "Warnings" or "Cautions." Both types of precautions contain important information related to your safety, the safety of users, and the correct operation, installation or maintenance of the air conditioning system. Be sure to carefully observe all relevant precautions.

WARNING	This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.
CAUTION	This symbol refers to a hazard or unsafe practice which can result in personal injury or product or property damage.

When installation work is completed, perform a test run and check that no trouble occurs. Also be sure to explain the methods for using the product to the customer, based on the contents of the Operation Manual. In addition, request that the customer keep and conveniently store the "Information for the Person in Charge of Installation (Electrical) Work and Servicing " together with the Operation Manual.

WARNING

- Request installation and electrical work only from the dealer or a quali-fied air conditioning specialist.
  Attempting to carry out installation work on your own, and doing so in-correctly, may result in electrical shock, fire, or other hazards.
- Installation procedures must be performed correctly, carefully following the instructions in this document.
  Failure to do so may result in electrical shock, fire, or other hazards.
- Electrical work must be performed by a qualified electrician. It must be performed in accordance with technical standards related to electrical equipment, interior wiring regulations, local codes, and the contents of these instructions. Be sure to use a dedicated power supply circuit. Insufficient power circuit capacity or improper electrical work may result in electrical shock or fire.
- Use only the designated cables for wiring, and connect them securely. Fasten cables so that no external force is applied to the terminal connec-tions.
  Insufficient connections or cable fastening may result in heat generation, fire, or other hazards.

CAUTION

- Depending on the installation location, it may be necessary to install an earth leakage breaker. Failure to do so may result in electrical shock or fire.
- Do not install in kitchens, workshops, or other locations where there is oil mist in the air.
- Do not install next to windows or in other locations exposed to direct sunlight or in direct contact with outside air.
- Do not install near an elevator, automatic door, industrial sewing ma-chine, or other devices that can be expected to produce electrical noise.

Accessories for Local Adapter

No.	Supplied parts	Qty.	No.	Supplied parts	Qty.
①	Fastening screws, Tapping screws 4 x 8 	4	③	Terminals (M3) 	11
②	Binding strap 	2			

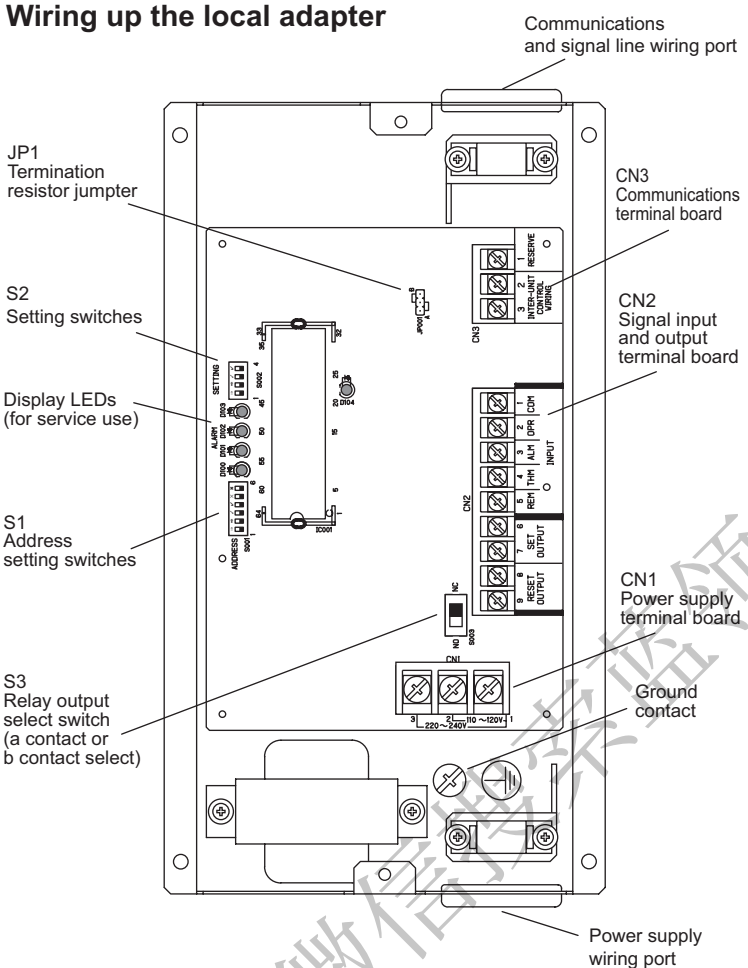
Installing the Local Adapter

<Note 1> Avoid twisting the inter-unit control wiring or the input/out-put wiring together with power or other wiring, and avoid running them in the same metal conduit. Doing so can cause malfunction.

<Note 2> Install the local adapter at a location away from any sour-ces of electrical noise.

<Note 3> Install a noise filter or take other appropriate action if elec-trical noise affects the power supply circuit of the unit.

Wiring up the local adapter



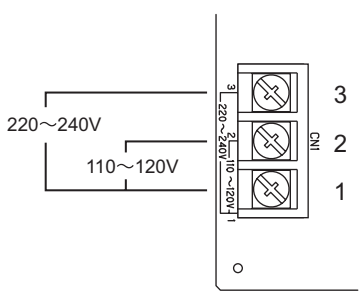
(1) Connecting the power supply

This local adapter can use either 110-120 V AC or 220-240 V AC power supply.

Use terminals 1 and 2 for 110-120 V AC, or terminals 1 and 3 for 220-240 V AC.

※ Be sure of the power supply voltage before connecting the power supply terminals. Connecting the wrong power supply voltage could result in fire or other damage.

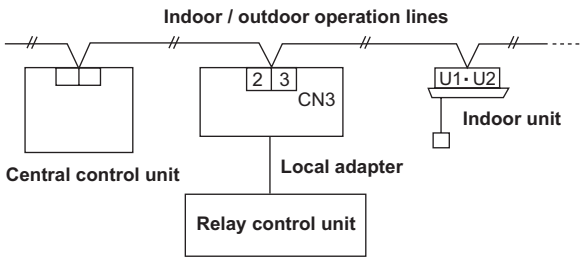
※ Connect the power supply wires securely to the power supply terminals, using M4.5 round connectors with insulator holddown.



(2) Connecting to the central control unit

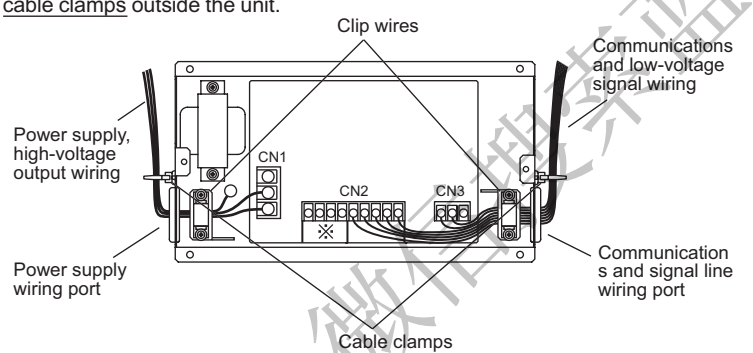
Connect the local adapter indoor / outdoor operation lines (CN3, (2) and (3)) to the central control unit indoor / outdoor operation lines, as shown in the diagram below.

- These signal lines do not have polarity; either signal line may be connected to terminals (2) and (3).
- These terminals may also be connected to the indoor / outdoor operation lines of other indoor or outdoor units.



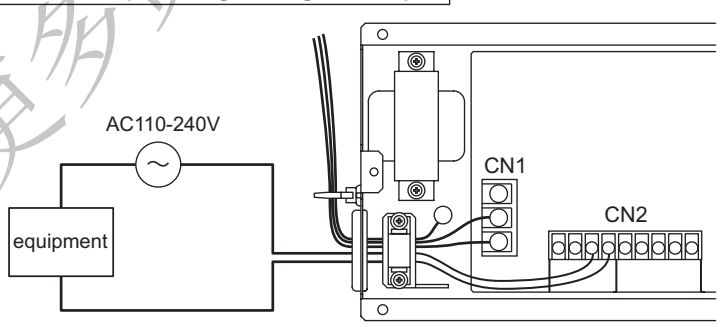
Securing the wiring

Make sure to secure all wiring using the clip wires inside the unit, and the cable clamps outside the unit.



※ If the SET / RESET output uses high voltage signaling (110 - 240 V AC), pull that signal line out through the power supply wiring port. Bundling the high voltage signal line with the communications lines or low-voltage signal lines, or allowing it to touch them, may result in malfunction.

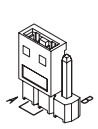
Circuit example for high-voltage set output

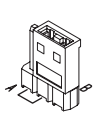


Termination Plug (JP1)

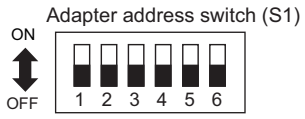
If the system is comprised of a single local adapter, and there are no air conditioner units connected directly to the indoor / outdoor operation lines, then a jumper must be installed on the B side of the termination plug (JP1) of the single local adapter.

Jumper on the A side of JP1: termination resistor not connected (factory default setting)
Jumper on the B side of JP1: termination resistor connected


no termination resistor


termination resistor connected

How to Set the Adapter Address



The adapter address corresponds to the indoor unit number.
If multiple local adaptors are used, make sure each adapter has a unique address.

(1) Setting the central control address from the central control unit
(Setting switch S2-3 OFF)

This mode is useful for systems with both local adaptors and indoor units which are connected directly to indoor / outdoor operation lines, and when the central control unit sets or changes central control addresses.

Set the local adapter addresses, beginning with address 1.
※Local adaptors are registered as system address 31.

Example: When the local adapter address is set to 1, then the local adapter unit number becomes 31-1.
In this case, the central control unit is free to set the local adapter's central control address.

(2) Setting the central control address using the local adapter address switches (Setting switch S2-3 ON)

The local adapter address becomes the central control address.
Set the local adapter address as desired.
※ Local adaptors are registered as system address 31, and the adapter address and central control address will be the same.

Example: If the local adapter address is set to 5, then the local adapter unit number becomes 31-5, and its central control address becomes 5.

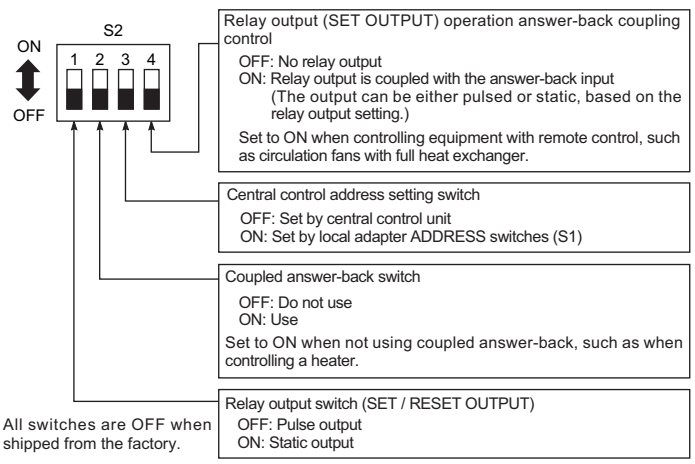
※ The central control address is fixed by the adapter address switches. **(The central control address may not be changed by the central control unit.)**

Set the address so that it does not match that of any indoor unit central control address.

Channel	Adapter address switch number 1 2 3 4 5 6	Channel	Adapter address switch number 1 2 3 4 5 6	Channel	Adapter address switch number 1 2 3 4 5 6	Channel	Adapter address switch number 1 2 3 4 5 6
1	○○○○○○	17	○○○○●○	33	○○○○○●	49	○○○○●●
2	●○○○○○	18	●○○○●○	34	●○○○○●	50	●○○○●●
3	○●○○○○	19	○●○○●○	35	○●○○○●	51	○●○○●●
4	●●○○○○	20	●●○○●○	36	●●○○○●	52	●●○○●●
5	○○●○○○	21	○○●○●○	37	○○●○○●	53	○○●○●●
6	●○●○○○	22	●○●○●○	38	●○●○○●	54	●○●○●●
7	○●●○○○	23	○●●○●○	39	○●●○○●	55	○●●○●●
8	●●●○○○	24	●●●○●○	40	●●●○○●	56	●●●○●●
9	○○○●○○	25	○○○●●○	41	○○○●○●	57	○○○●●●
10	●○○●○○	26	●○○●●○	42	●○○●○●	58	●○○●●●
11	○●○●○○	27	○●○●●○	43	○●○●○●	59	○●○●●●
12	●●○●○○	28	●●○●●○	44	●●○●○●	60	●●○●●●
13	○○●●○○	29	○○●●●○	45	○○●●○●	61	○○●●●●
14	●○●●○○	30	●○●●●○	46	●○●●○●	62	●○●●●●
15	○●●●○○	31	○●●●●○	47	○●●●○●	63	○●●●●●
16	●●●●○○	32	●●●●●○	48	●●●●○●	64	●●●●●●

● : ON　○ : OFF

Setting Switches

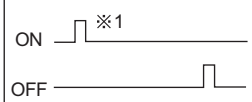
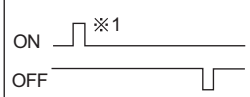
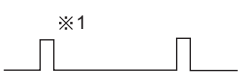


Connection as a Relay Control Unit

The local adapter output terminal and input terminal specifications are given below.
Use the signals most appropriate for the type of equipment being controlled.

(1) Output terminals

The local adapter provides four styles of ON (set relay) and OFF (reset relay) output signals for use by the equipment being controlled. Select the style appropriate for your application. For more information, see the "Relay Circuit Examples" section.

Output style	Contact outputs (relay contact)	Setting method
Pulse contact output ON (set) output: a contact OFF (reset) output: a contact		・S2-1: OFF ・S2-4: OFF ・S003: NO
Pulse contact output ON (set) output: a contact OFF (reset) output: b contact		・S2-1: OFF ・S2-4: OFF ・S003: NC
Pulse contact output ON (set) output: a contact Both start and stop signals are sourced in turn from the ON (set) relay		・S2-1: OFF ・S2-2: OFF ・S2-4: ON ・Only the ON contact output is used. ・The OFF contact output becomes a local prohibit signal (see ※2)
Static contact output (continuous contact)		・S2-1: ON ・Only the ON contact output is used. ・The OFF contact output becomes a local prohibit signal (see ※2)

※1 The pulse width is approximately 0.5 seconds.
※2 The output changes according to a signal from the Central control unit. Use this signal as needed.
Individual permission: OFF (continuous contact)
Local prohibit: ON (continuous contact)

< Contact capacity >

Output	Contact capacity (resistive load)
ON (set) relay output (CN1, terminals 6 and 7)	250 V AC, 10 A (inductive load: 5 A) Minimum usable load: 5 V, 100 mA
OFF (reset) relay output (CN1, terminals 8 and 9)	250 V AC, 3 A Minimum usable load: 5 V, 100 mA

Caution:
Note that the ON (set) relay output and OFF (reset) relay output have different contact capacities.

(2) Input terminals

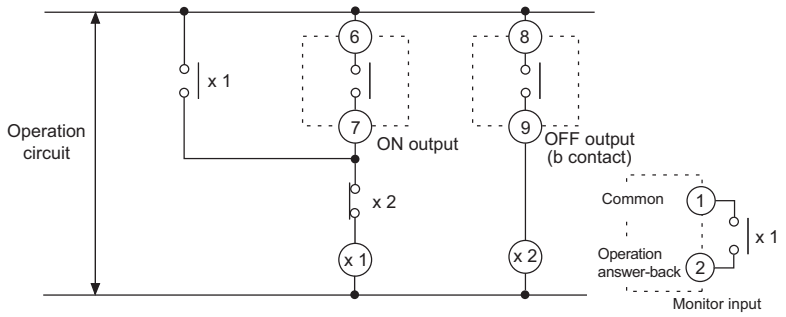
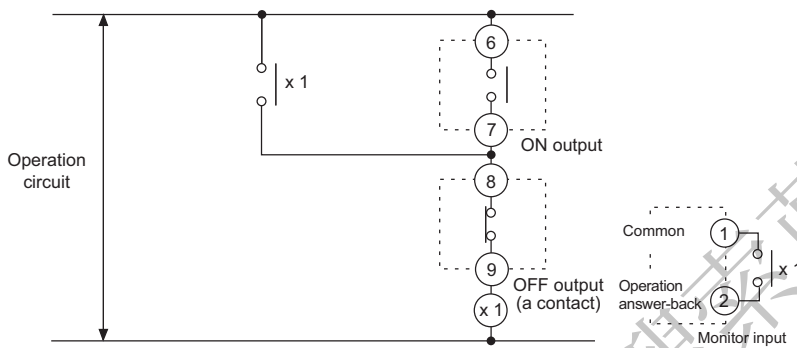
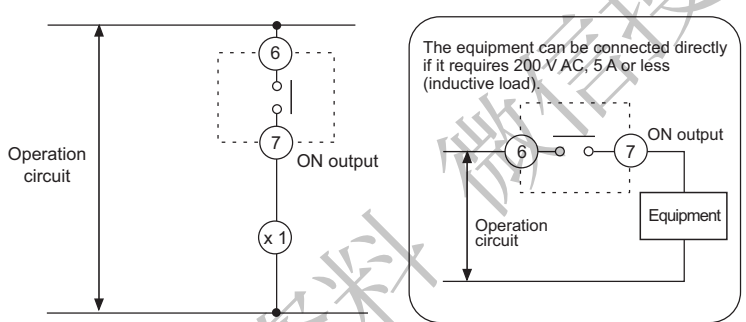
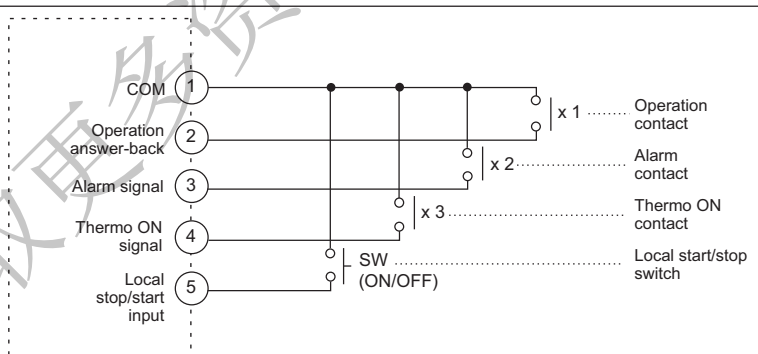
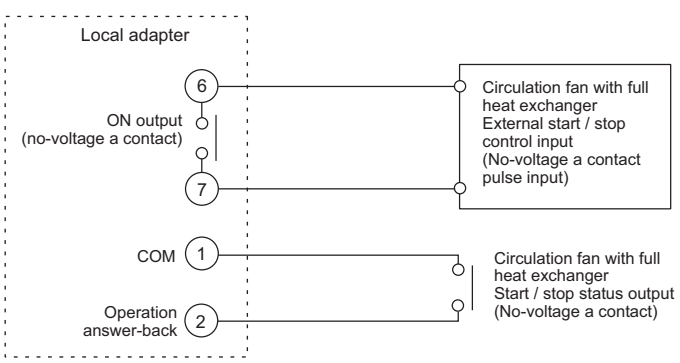
- Status monitor signals from the equipment being controlled are received by the relay contacts.
- The local start/stop input uses a pulse style, so connect it to a momentary input device, such as a push switch.

Input	Terminal numbers	Input style	Usage
Operation answer-back input	1, 2	No-voltage a contact (static)	Monitor the operation (start/stop condition)
Alarm signal input	1, 3	No-voltage a contact (static)	Monitor general alarms
Thermo ON signal input	1, 4	No-voltage a contact (static)	Monitor the load when the thermo is ON, and report to the central control unit
Local start/stop input	1, 5	No-voltage a contact (pulse)	Equipment ON/OFF from local adapter

Circuit contact voltage and current: 12 V DC, 10 mA

Caution:
When local prohibit (central) is set by the central control unit, the local start/stop input will be ignored.
When stopped, the alarm input will be ignored.

Relay Circuit Examples

Style	Installed equipment (areas within the dashed lines are the local adapter)	Notes
Pulse contact output (no-voltage contact) (ON output a contact + OFF output a contact)		1) X1, X2 are auxiliary devices 2) The local adapter OFF output uses the a contact (S003 set to NO) 3) Switch S2-1 is OFF, switch S2-4 is OFF
Pulse contact output (no-voltage contact) (ON output a contact + OFF output b contact)		1) X1 is an auxiliary device 2) The local adapter OFF output uses the b contact (S003 set to NC) 3) Switch S2-1 is OFF, switch S2-4 is OFF
Continuous contact output (no-voltage contact) (ON output a contact)		1) X1 is an auxiliary devices 2) Switch S2-1 is ON 3) The equipment can be controlled directly (power supply directly shut off) by the ON output if it requires 250 V AC, 5 A or less (inductive load) 4) The output will be OFF during a commercial power outage 5) The OFF output may be used for individual / central selection (will be ON when the central control unit is set to "central", off when the central control unit is set to "individual").
Input (no-voltage a contact)		1) X1, X2, X3 are auxiliary devices; SW is a push switch. 2) If operation answer-back from the equipment is not used, switch S2-2 is ON. In this case, the internal answer-back will be OFF during a commercial power outage. 3) If the answer-back input is unused, it should not be connected. (Only connect inputs that are used.)
Connecting to a circulation fan with a full heat exchanger		1) Switch S2-1 is OFF, switch S2-2 is OFF, switch S2-4 is ON 2) The circulation fan with full heat exchanger's external start/stop control input uses no-voltage a contact pulse, and its start/stop condition output uses no-voltage a contact. **Caution:** If the Central control unit or circulation fan with full heat exchanger remote control repeatedly and continuously initiates start/stop operations, the circulation fan with full heat exchanger may not be able to recognized the settings.

Alarm Display

Alarm			Service display lamps			
Item	Meaning	Action	D100	D101	D102	D103
Alarm from connected equipment	An alarm signal was received by the local adapter from a connected piece of equipment during operation.	Investigate the reason for the alarm from the connected equipment, and remove the cause of the alarm.	※	●	●	●
System stop	The system is stopped.	Not an alarm	※	※	※	※

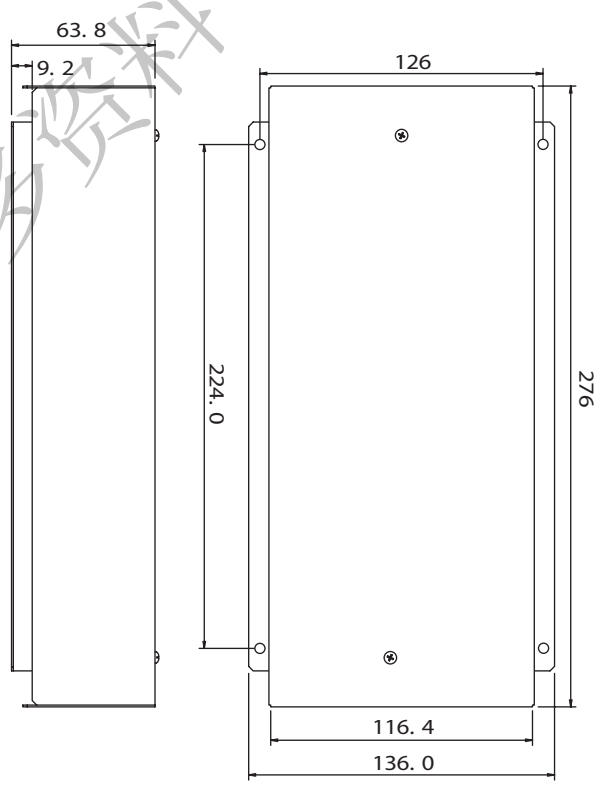
※: blink ●: Off

Of the items listed above, only the alarm from connected equipment is passed to an upstream central control unit, which will display "C12". If the central control unit does not have an LCD display, then its warning LED will blink.

Specifications

Power source	AC 110 -120V / 220-240 V 50-60Hz , single-phase
Input	10VA
Operating environment	0-40℃, 20-80% humidity, indoor only
External dimensions	50 mm (h) x 235 mm (w) x 96.5 mm (d)
Weight	Approx. 1.3 kg

External dimensions



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LonWorks Interface Product Manual

--- Contents ---

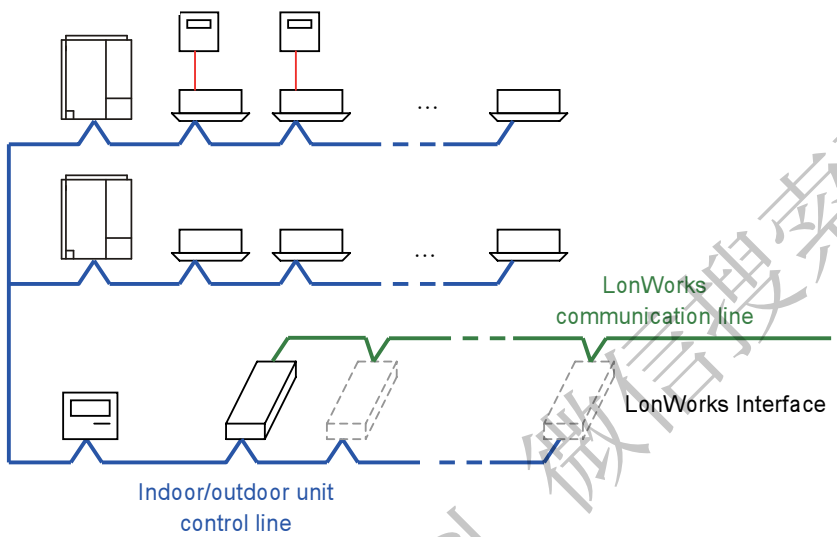
1. LonWorks Interface Overview

Product Overview

This interface is a communications interface for connecting LonWorks to an air conditioner unit (PAC, GHP) control network.

From the host connected to LonWorks, basic settings and status monitoring is possible for up to 16 groups of A/C units.

System Diagram



- Up to 16 groups of indoor units (maximum 64 units) can be controlled with 1 LonWorks Interface unit. For 17 or more groups of indoor units, connect additional interface units.
- Install a remote controller (or system controller, etc.), which can control the A/C units, to an indoor/outdoor unit line other than the LonWorks Interface unit.
- Before making the connection to the LonWorks Interface unit, set the central control addresses in the indoor units.

Functions

A/C unit settings from the LonWorks	Settings for each group of indoor units	Start/stop
		Temp. setting(*1)
		Operation mode
		Option 1 settings(*2)
		Option 2 settings(*2)
	Settings for all units	Emergency stop
A/C unit status notifications made to the LonWorks		Start/stop
		Temp. setting
		Operation mode
		Option 1 settings(*2)
		Option 2 settings(*2)
		Alarm status(*3)
		Indoor units with active alarms(*4)
		Room temp(*5)
		A/C unit status(*6)
Configuration properties		Transmission interval settings(*7)
		Minimum time secured for transmission(*8)

(*1) When a temperature above the upper limit of the temperature which can be set by the indoor units has been specified, it will be set to the upper limit; conversely, when a temperature below the lower limit has been specified, it will be set to the lower limit.
(*2) Two options can be selected using the setting switch from among remote-controller prohibit, fan speed setting, air direction setting and filter sign.
(*3) When indoor units are under group control, an alarm is determined to have occurred when the alarm occurs at one or more of the units.
(*4) The number of the indoor unit at which the alarm has occurred is notified. This makes it possible to identify at which indoor unit of the indoor unit group the alarm has occurred.
(*5) When indoor units are under group control, the room temperature of the main unit in the group is notified.
(*6) When an alarm occurs at one or more indoor units, the alarm code is notified as the indoor unit status.
(*7) All the data which can be output is output at the set interval.
(*8) The same data is not output continuously at the set interval.

DECLARATION OF CONFORMITY

This product is marked " CE " as it satisfies EEC Directive No. 89/336/EEC, 73/23/EEC and 93/68/EEC.

This declaration will become void in case of misusage and/or from non observance though partial of Manufacturer's installation and/or operating instructions.

2. Procedures for Installation (Electrical Work) of LonWorks Interface

Safety Precautions

The following is intended for the installer responsible for installation and test operations of the LonWorks Interface, and should be carefully read before beginning.

The precautions given in this manual consist of specific "Warnings" and "Cautions." They provide important safety-related information and are important for your safety, the safety of others, and trouble-free operation of the system. Be sure to strictly observe all safety procedures. The labels and their meanings are as described below.

⚠Warning	This symbol refers to a hazard or unsafe procedure or practice which can result in severe personal injury or death.
⚠Caution	This symbol refers to a hazard or unsafe procedure or practice which can result in personal injury or product or property damage.

※After installation is completed, perform a test run to check for operating trouble. As you do, use the central control device *Operation Manual* and explain operating procedures to the customer. Then request that the customer store this manual together with the central control device *Operation Manual.*

⚠Warning

- Be sure to arrange installation from the dealer where the system was purchased or using a professional installer.
  Electric shock or fire may result if an inexperienced person performs any installation or wiring procedures incorrectly.
- Please install and ensure construction according to *Procedures for Installation (Electrical Work) of LonWorks Interface.*
- Only a qualified electrician should attempt to connect this system, in accordance with the instructions in this manual. And be sure to use a dedicated electrical circuit.
  If the electrical circuit capacity is insufficient a danger of electric shock and fire may be present.
- Use the specified cables (type and wiring diameter) for the electrical connections, and connect the cables securely. Run and fasten the cables securely so that external forces or pressure placed on the cables will not be transmitted to the connection terminals. Overheating or fire may result if connections or attachments are not secure.

⚠Caution

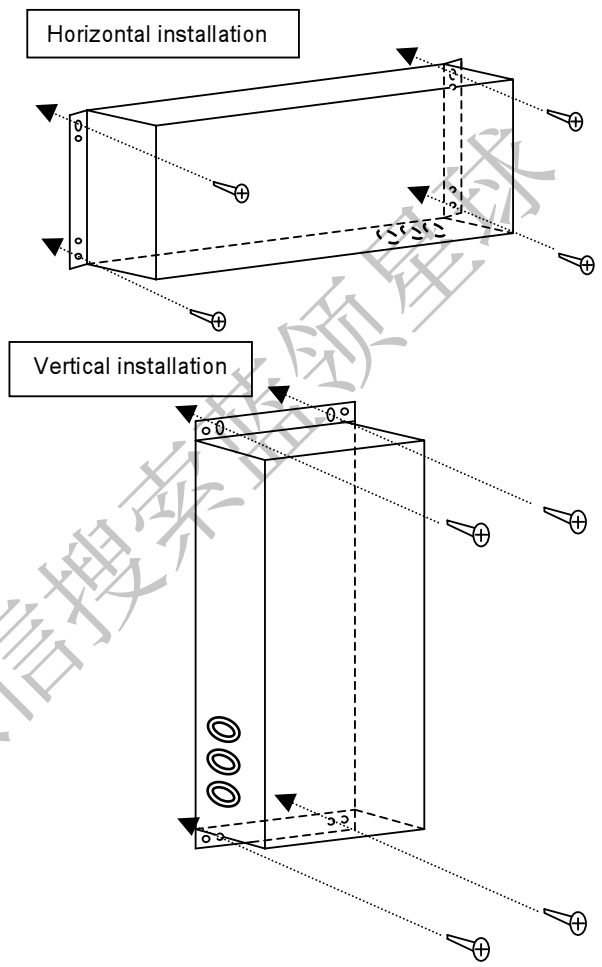
Depending on the installation conditions and location, an earth leakage breaker may be required. If an earth-leakage breaker is not installed, there is a danger of electric shock or fire.

Included Parts

Included parts		
No.	Part	Qty
(1)	Product manual	1

Installation Method

- Install using either of the 2 methods given below.
  The screws used to install the main unit must be provided by the installer.



- Install the LonWorks Interface away from any sources of electrical noise.

Wiring Specifications

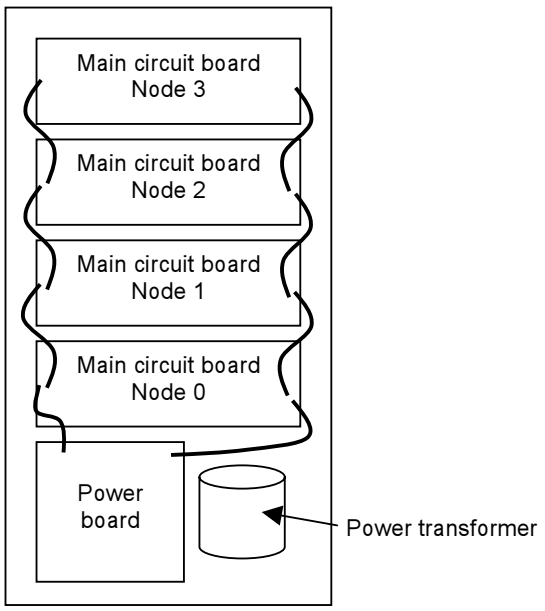
- For the indoor/outdoor control lines use twin-core 0.5 – 2 mm^2 shielded cables and ground the shield on both side.
- For the LonWorks communication line cables, use twisted-pair cables with a wire diameter of 0.51 mm or larger as recommended by Echelon Corp.

Examples of cables recommended by Echelon Corp			
Cable type	Wire diameter /AWG	Total cable length	
		Bus type	Free
24 AMG twisted-pair (TIA568A category 5)	0.51mm /24	900m	450m

- Do not use the same cable for the indoor/outdoor control lines, the LonWorks communication lines, and the power cable. Do not run them through the same conduit or place the cables near one another.
- Connect the cables so that there is no miswiring.
  (Miswiring can cause malfunction.)

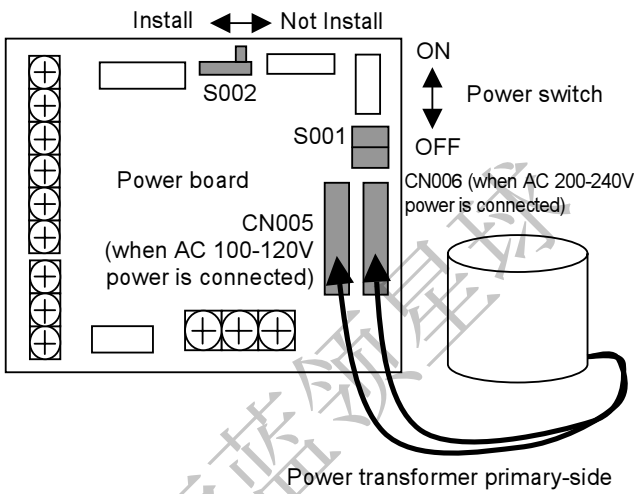
LonWorks Interface Structure

- This interface contains 4 LonWorks communication boards (nodes).
- Up to 4 indoor unit groups (maximum 32 units) can be assigned to 1 node.



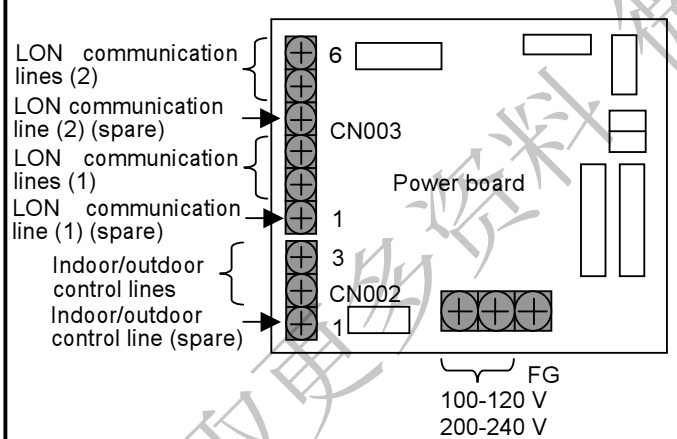
Power Board Initial Settings

Not Install: Ordinarily, keep this set to "Not Install" (initial setting).
Install: Free topology terminal resistor (51Ω) for the LonWorks communication lines.



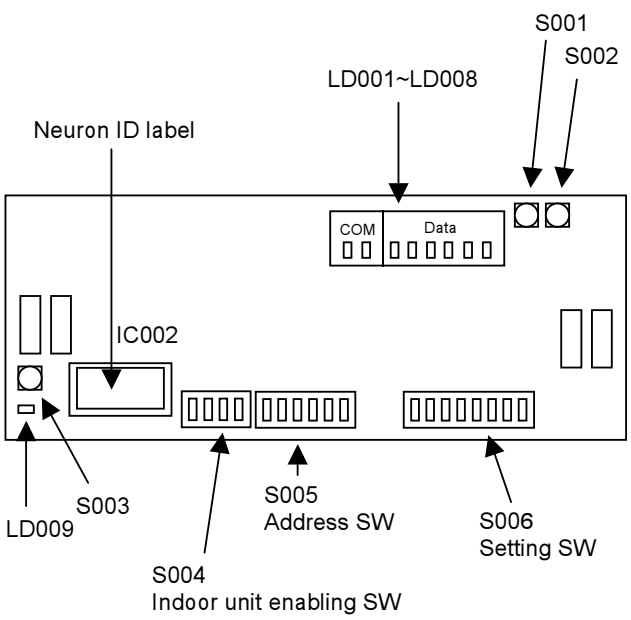
When AC 200-240V power is connected, connect the power transformer primary-side to CN006. When AC 100-120V power is connected, connect the power transformer primary-side to CN005. (It is connected to CN006 when the unit is shipped from the plant.)

Power Board Wiring

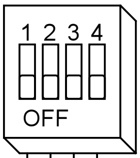


- The LonWorks communication lines can be connected to either (1) or (2) in the above figure. The results are the same.
- Do not run the indoor/outdoor control lines, the LonWorks communication lines, and the power cables through the same conduit, or place the cables near one another. Doing so can cause the system to malfunction.
- Before turning the power on, follow the instruction in *Power Board Initial Settings*.
- When using the spare indoor/outdoor cotrol line, connect [1] and [3] at CN002.
- When using the spare LON communication line, connect [1] and [3] or [4] and [6] at CN003.

Main Circuit Board



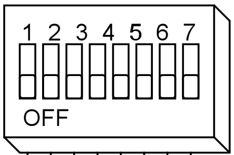
Indoor Unit Enabling Switches



- OFF Indoor unit group 3 is disabled.
  ON Indoor unit group 3 is enabled.
- OFF Indoor unit group 2 is disabled.
  ON Indoor unit group 2 is enabled.
- OFF Indoor unit group 1 is disabled.
  ON Indoor unit group 1 is enabled.
- OFF Indoor unit group 0 is disabled.
  ON Indoor unit group 0 is enabled.

- One main circuit board can control 4 groups (indoor unit groups 0 – 3).
- Set to "disable" if the indoor unit group does not exist. Set to "enable" if the indoor unit group exists.

Setting Switches

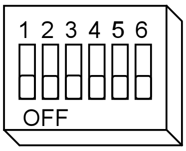


O: ON –: OFF R/C: Remote Controller

6	7	8	Option 1	Option 2
-	-	-	R/C prohibit	Fan speed
-	-	O	R/C prohibit	Air direction
-	O	-	R/C prohibit	Filter sign
-	O		Fan speed	Air direction
O	-	-	Fan speed	Filter sign
O	-	O	Air direction	Filter sign
O	O	-	---*	---*
O	O	O	---	---

- Not used (Be sure to set to OFF.)
- OFF Central/individual setting is according to the central control device (normal setting).
  ON Central/individual setting is always set to "individual."
- OFF Control temperature is used for the room temperature (normal setting).
  ON Inlet temperature is used for the room temperature.
- Not used (Be sure to set to OFF.)
- OFF Communicate as a "main" central control device.
  ON Communicate as a "sub" central control device.
  - If there are no central control devices other than this interface, set to "main" (ON).
  - To set this interface as the main, set only node 0 to "main" (ON).
  - If using in combination with an communication adapter, AMY adapter, intelligent controller, or system controller, set to "sub" (OFF).
  - If using in combination with an ON/OFF central controller, set the ON/OFF central controller as the main if the ON/OFF central controller's remote-controller prohibit function is to be used. If this interface's remote-controller prohibit function is to be used, set this interface as the main.

Address Switches

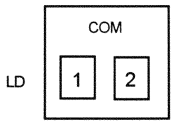


O : ON - : OFF

Address switch 1	2	3	4	5	6	Central control address
-	-	-	-	-	-	1
O	-	-	-	-	-	2
-	O	-	-	-	-	3
O	O	-	-	-	-	4
-	-	O	-	-	-	5
O	-	O	-	-	-	6
-	O	O	-	-	-	7
O	O	O	-	-	-	8
-	-	-	O	-	-	9
O	-	-	O	-	-	10
-	O	-	O	-	-	11
O	O	-	O	-	-	12
-	-	O	O	-	-	13
O	-	O	O	-	-	14
-	O	O	O	-	-	15
O	O	O	O	-	-	16
-	-	-	-	O	-	17
O	-	-	-	O	-	18
-	O	-	-	O	-	19
O	O	-	-	O	-	20
-	-	O	-	O	-	21
O	-	O	-	O	-	22
-	O	O	-	O	-	23
O	O	O	-	O	-	24
-	-	-	O	O	-	25
O	-	-	O	O	-	26
-	O	-	O	O	-	27
O	O	-	O	O	-	28
-	-	O	O	O	-	29
O	-	O	O	O	-	30
-	O	O	O	O	-	31
O	O	O	O	O	-	32
-	-	-	-	-	O	33
O	-	-	-	-	O	34
-	O	-	-	-	O	35
O	O	-	-	-	O	36
-	-	O	-	-	O	37
O	-	O	-	-	O	38
-	O	O	-	-	O	39
O	O	O	-	-	O	40
-	-	-	O	-	O	41
O	-	-	O	-	O	42
-	O	-	O	-	O	43
O	O	-	O	-	O	44
-	-	O	O	-	O	45
O	-	O	O	-	O	46
-	O	O	O	-	O	47
O	O	O	O	-	O	48
-	-	-	-	O	O	49
O	-	-	-	O	O	50
-	O	-	-	O	O	51
O	O	-	-	O	O	52
-	-	O	-	O	O	53
O	-	O	-	O	O	54
-	O	O	-	O	O	55
O	O	O	-	O	O	56
-	-	-	O	O	O	57
O	-	-	O	O	O	58
-	O	-	O	O	O	59
O	O	-	O	O	O	60
-	-	O	O	O	O	61
O	-	O	O	O	O	62
-	O	O	O	O	O	63
O	O	O	O	O	O	64

7

Communications LED (Green)

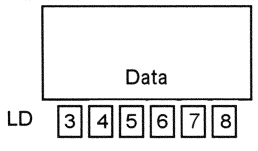


COM: Communications

LD001	LD002	Display meaning
X	X	①Power OFF
X	Low	②--
X	High	③Flash writer writing in progress
X	O	④Waiting for A/C unit initial communication
Low	X	⑤A/C unit initial communication in progress
Low	Low	⑥--
Low	High	⑦LonWorks communication microcomputer error
Low	O	⑧EEPROM error
High	X	⑨--
High	Low	⑩--
High	High	⑪--
High	O	⑫--
O	X	⑬Test run mode
O	Low	⑭--
O	High	⑮Version display in progress
O	O	⑯Normal communications in progress

X: Not lit、Low: Low-speed flashing (once/second)
High: High-speed flashing, O: Constantly lit

Data LED (Red)



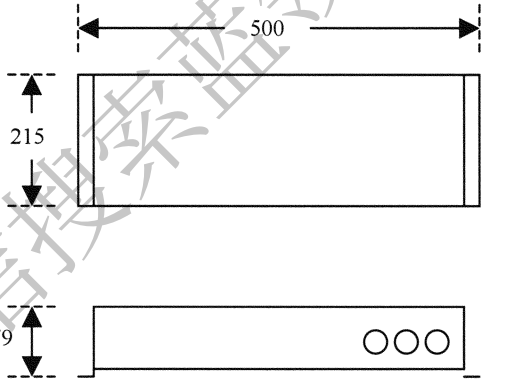
Communications LED	Data LED display meaning
①	No LED lit
②	All LEDs lit
③	--
④	Displays the wait time (seconds) for A/C unit initial communication.
⑤	Displays the A/C unit communications status
⑥	--
⑦	No LED lit
⑧	No LED lit
⑨	--
⑩	--
⑪	--
⑫	--
⑬	According to the test run mode specifications
⑭	--
⑮	According to the version display specifications
⑯	Displays the A/C unit communications status

• Display of A/C unit communications status

LD	Display meaning	
	Indoor unit group	**OFF:** Waiting for initial communication **Low-speed flashing:** Waiting for minimum transmission interval **High-speed flashing:** Initial communication in progress **ON:** Normal communications in progress
003	0	
004	1	
005	2	
006	3	
007	Illuminates for 200 ms when data is output to the LonWorks communicator.	
008	Illuminates for 200 ms when data is output to the indoor/outdoor communicator.	

Diagram of External Dimensions

(mm)



Product Specifications

Connects to	LonWorks network FTT-10 A transceiver device
Power	Single-phase, AC 100-120V or 200-240V
Power consumption	11 W max.
Service environment conditions	Temp. 0 to 40°C, humidity 20 to 80% Indoor use only
External dimensions	Height 79 mm × Width 500 mm × Depth 215 mm
Weight	Approx. 3.3 kg

3. Assigning Central Control Addresses

- Before assigning central control addresses for the LonWorks Interface, use the remote controller to make central control address settings for A/C units.
- Follow only the steps for "Assigning Central Control Addresses" when a system controller or other central controller is already provided.

[Setting Central Control Addresses]

(1) Press and hold both the and buttons for 4 seconds or longer.
Check that the "SETTING" display on the remote controller is flashing.

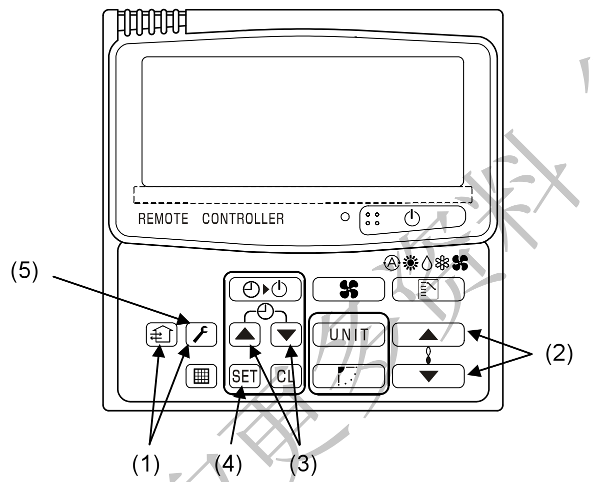
(2) Set the "03" item code by pressing the and temperature setting buttons.

(3) Set the desired central control address by pressing the and timer buttons.

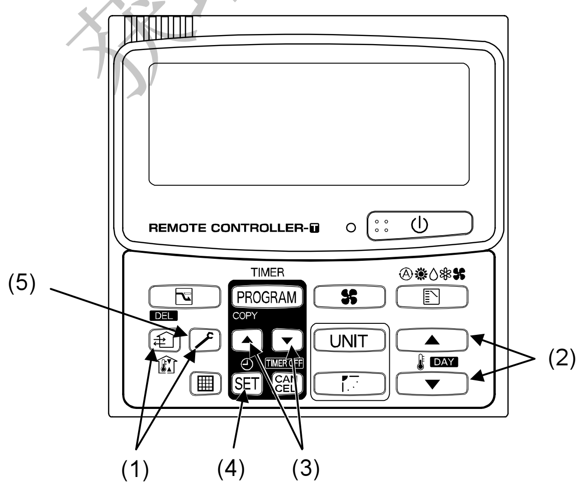
(4) Press the SET button, and check that the "SETTING" display stops flashing and illuminates instead.
(The setting data cannot be changed unless the SET button is pressed.)

(5) Press the button, and check that the display on the remote controller has been cleared.

RCS-SH80UG



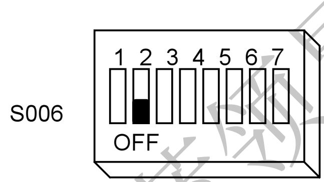
RCS-TM80BG



[Assigning Central Control Addresses]

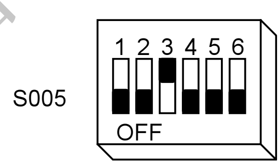
(1) Turn the power switch (S001) on the LonWorks Interface power board to OFF.

(2) Turn the setting switch (S006-2) to OFF (so that central control addresses are set with the DIP switches).



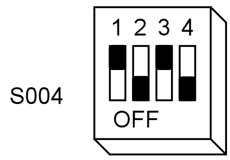
(3) Set the first central control address with the address switch (S005). When assigning serial numbers, a consecutive series of numbers is assigned for the central control addresses.

<Example> If the first central control address is "5," then this circuit board assigns central control addresses "5," "6," "7," and "8."



(4) Make the enable/disable settings with the indoor unit enabling switches (S004).

<Example> If central control addresses "6" and "8" do not exist, enable only "5" and "7."



"5" is set as the central control address for indoor unit group 0, and "7" is set as the central control address for indoor unit group 2.

(5) Turn the power switch (S001) on the LonWorks Interface power board to ON.

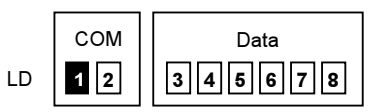
7

4. LonWorks Interface Test Run

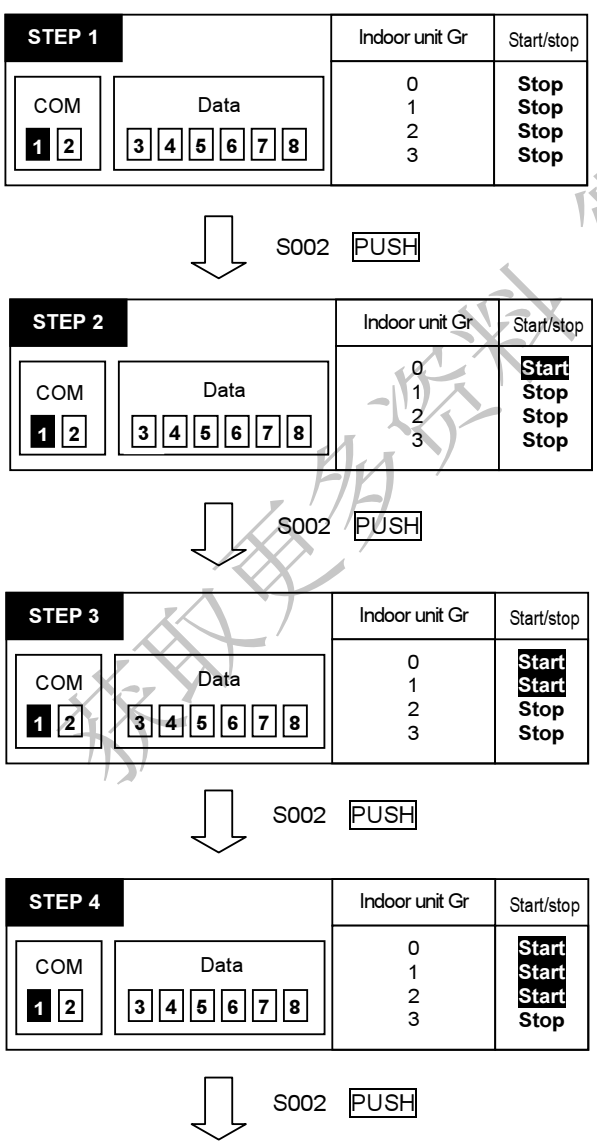
Before performing a test run of the LonWorks Interface, perform test runs of the A/C units and assign central control addresses for A/C units.

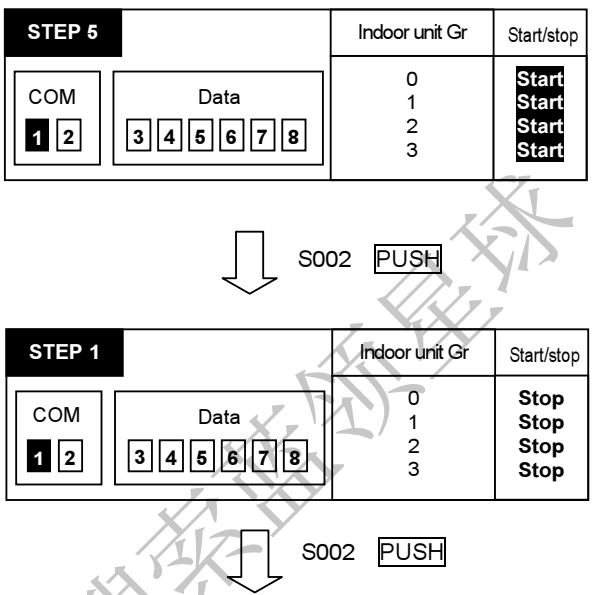
[LonWorks Interface Test Run Procedure]

(1) Press and hold touch-switch S001 on the main circuit board for 5 seconds or longer.
Test run mode is enabled for the main circuit board that is currently being controlled. LD001 illuminates, and LD002 – LD008 turn off.



(2) Press touch-switch S002. The data LEDs appear as shown in the tables below.
In addition, the assigned indoor unit groups start and stop as shown in the tables below.

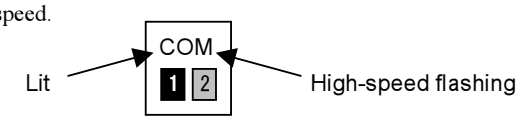




(3) Be sure to reset the power after the LonWorks Interface test run is completed.

5. Checking the LonWorks Interface Version

(1) Press touch-switch S002.
Version display mode is enabled on that circuit board for a period of 18 seconds. LD001 illuminates, and LD002 flashes at high speed.



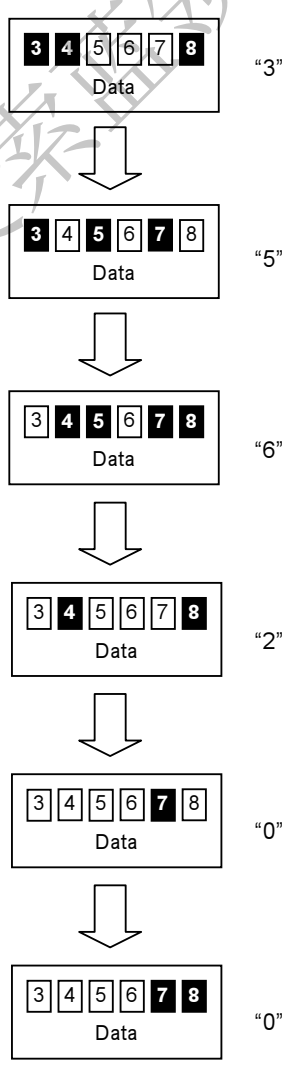
(2) While the version is displayed (18 seconds), the display contents are the following.

First 3 seconds	Displays the first digit of the main microcomputer version Off Lit 3 4 5 6 7 **8** Data
Next 3 seconds	Displays the second digit of the main microcomputer version Lit Off 3 4 5 6 **7** 8 Data
Next 3 seconds	Displays the third digit of the main microcomputer version Lit Lit 3 4 5 6 **7** **8** Data
Next 3 seconds	Displays the first digit of the LonWorks I/F microcomputer version Off Lit 3 4 5 6 7 **8** Data
Next 3 seconds	Displays the second digit of the LonWorks I/F microcomputer version Lit Off 3 4 5 6 **7** 8 Data
Last 3 seconds	Displays the third digit of the LonWorks I/F microcomputer version Lit Lit 3 4 5 6 **7** **8** Data

• Version display

0	3 4 5 6	5	**3** 4 **5** 6
1	**3** 4 5 6	6	3 **4** **5** 6
2	3 **4** 5 6	7	**3** **4** **5** 6
3	**3** **4** 5 6	8	3 4 5 **6**
4	3 4 **5** 6	9	**3** 4 5 **6**

<Example> Main microcomputer Version 3.56
LonWorks I/F microcomputer Version 2.00



7

6. List of LonWorks Network Variables

A/C unit	Input/output	Item	Variable name	Variable type
Indoor group 0	Input	Start/stop	nviOnOff_00	SNVT_switch
		Temp. setting	nviSetPoint_00	SNVT_temp_p
		Operating mode	nviHeatCool_00	SNVT_hvac_mode
		Option 1 setting	nviOption1_00	SNVT_switch
		Option 2 setting	nviOption2_00	SNVT_switch
	Output	Start/stop status	nvoOnOff_00	SNVT_switch
		Temp. setting	nvoSetPoint_00	SNVT_temp_p
		Operating mode	nvoHeatCool_00	SNVT_hvac_mode
		Option 1 status	nvoOption1_00	SNVT_switch
		Option 2 status	nvoOption2_00	SNVT_switch
		Alarm status	nvoAlarm_00	SNVT_switch
		Indoor units with active alarms	nvoAlarmIn_00	SNVT_switch
		Room temp.	nvoSpaceTemp_00	SNVT_temp_p
		Indoor unit status	nvoInState_00	SNVT_count
Indoor group 1	Input	Start/stop	nviOnOff_01	SNVT_switch
		Temp. setting	nviHeatCool_01	SNVT_temp_p
		Operating mode	nviSetPoint_01	SNVT_hvac_mode
		Option 1 setting	nviOption1_01	SNVT_switch
		Option 2 setting	nviOption2_01	SNVT_switch
	Output	Start/stop status	nvoOnOff_01	SNVT_switch
		Temp. setting	nvoSetPoint_01	SNVT_temp_p
		Operating mode	nvoHeatCool_01	SNVT_hvac_mode
		Option 1 status	nvoOption1_01	SNVT_switch
		Option 2 status	nvoOption2_01	SNVT_switch
		Alarm status	nvoAlarm_01	SNVT_switch
		Indoor units with active alarms	nvoAlarmIn_01	SNVT_switch
		Room temp.	nvoSpaceTemp_01	SNVT_temp_p
		Indoor unit status	nvoInState_01	SNVT_count
Indoor group 2	Input	Start/stop	nviOnOff_02	SNVT_switch
		Temp. setting	nviHeatCool_02	SNVT_temp_p
		Operating mode	nviSetPoint_02	SNVT_hvac_mode
		Option 1 setting	nviOption1_02	SNVT_switch
		Option 2 setting	nviOption2_02	SNVT_switch
	Output	Start/stop status	nvoOnOff_02	SNVT_switch
		Temp. setting	nvoSetPoint_02	SNVT_temp_p
		Operating mode	nvoHeatCool_02	SNVT_hvac_mode
		Option 1 status	nvoOption1_02	SNVT_switch
		Option 2 status	nvoOption2_02	SNVT_switch
		Alarm status	nvoAlarm_02	SNVT_switch
		Indoor units with active alarms	nvoAlarmIn_02	SNVT_switch
		Room temp.	nvoSpaceTemp_02	SNVT_temp_p
		Indoor unit status	nvoInState_02	SNVT_count
Indoor group 3	Input	Start/stop	nviOnOff_03	SNVT_switch
		Temp. setting	nviHeatCool_03	SNVT_temp_p
		Operating mode	nviSetPoint_03	SNVT_hvac_mode
		Option 1 setting	nviOption1_03	SNVT_switch
		Option 2 setting	nviOption2_03	SNVT_switch
	Output	Start/stop status	nvoOnOff_03	SNVT_switch
		Temp. setting	nvoSetPoint_03	SNVT_temp_p
		Operating mode	nvoHeatCool_03	SNVT_hvac_mode
		Option 1 status	nvoOption1_03	SNVT_switch
		Option 2 status	nvoOption2_03	SNVT_switch
		Alarm status	nvoAlarm_03	SNVT_switch
		Indoor units with active alarms	nvoAlarmIn_03	SNVT_switch
		Room temp.	nvoSpaceTemp_03	SNVT_temp_p
		Indoor unit status	nvoInState_03	SNVT_count
Indoor groups 0 – 3	Input	Emergency stop	nviAllInOff	SNVT_switch

Transmission intervals settings	nciSndHrtBt	SNVT_time_sec
Minimum time secured for transmission	nciMinOutTm	SNVT_time_sec

7. Details of LonWorks Network Variables

[nv1] Unit start/stop command

network input SNVT_switch nviOnOff_00;
network input SNVT_switch nviOnOff_01;
network input SNVT_switch nviOnOff_02;
network input SNVT_switch nviOnOff_03;

These input network variables are used to change the start/stop status of the indoor unit.
If start/stop is only done from an A/C unit side (as with the remote controller), then it is not necessary to use these network variables.

Contents state 0: Stop value (Not used)
1: start

[nv2] Unit start/stop status notification

network output SNVT_switch nvoOnOff_00;
network output SNVT_switch nvoOnOff_01;
network output SNVT_switch nvoOnOff_02;
network output SNVT_switch nvoOnOff_03;

These output network variables are used to provide notification of the unit's current start/stop status and the thermostat ON/OFF status.
They are also output when the status has been changed from an A/C unit side (as with the remote controller).
They are output when the LonWorks Interface or the A/C unit power is reset.
When the indoor units are subject to group control, "thermostat ON" is output when 1 or more indoor unit is thermostats ON, and "thermostat OFF" is output when all indoor unit are thermostats OFF.

Contents state 0: Stop value 0: Thermostat OFF
1: Start 200: Thermostat ON

[nv3] Temperature setting command

network input SNVT_temp_p nviSetpoint_00;
network input SNVT_temp_p nviSetpoint_01;
network input SNVT_temp_p nviSetpoint_02;
network input SNVT_temp_p nviSetpoint_03;

These input network variables are used to change the indoor unit temperature setting.
If the temperature setting is only changed from an A/C unit side (as with the remote controller), then it is not necessary to use these network variables.
When a temperature above the upper limit of the temperature which can be set by the indoor units has been specified, it will be set to the upper limit; conversely, when a temperature below the lower limit has been specified, it will be set to the lower limit.

Contents
Valid range

Auto heat/cool mode:	17 - 27°C
Heat mode:	16 - 26°C
Cool mode:	18 - 30°C
Dry mode:	18 - 30°C
Fan mode:	Temp. setting not used.

Temperature settings are made in units of 1.0°C. (Values after the decimal point are discarded.)

* Be aware that the temperature setting ranges may vary according to the models of the outdoor and indoor units.

[nv4] Temperature setting status notification

network output SNVT_temp_p nvoSetpoint_01;
network output SNVT_temp_p nvoSetpoint_01;
network output SNVT_temp_p nvoSetpoint_02;
network output SNVT_temp_p nvoSetpoint_03;

These output network variables are output when the temperature setting status is changed.
They are also output when the status has been changed from an A/C unit side (with the remote controller).
They are output when the LonWorks Interface or the A/C unit power is reset.

Contents
Valid range Output range: 16 - 30°C
Temp. unit: 1.0 °C

* Be aware that the temperature setting ranges may vary according to the models of the outdoor and indoor units.

[nv5] Operating mode setting command

network input SNVT_hvac_mode nviHeatCool_00;
network input SNVT_hvac_mode nviHeatCool_01;
network input SNVT_hvac_mode nviHeatCool_02;
network input SNVT_hvac_mode nviHeatCool_03;

These input network variables are used to change the indoor unit operating mode.
If the operating mode setting is only changed from an A/C unit side (as with the remote controller), then it is not necessary to use these network variables.

Contents 0: Auto heat/cool 5: Dry
1: Heat 9: Fan
3: Cool

* The operating modes that can be set may vary according to the models of the outdoor and indoor units.
* Settings other than the above are ignored.

[nv6] Operating mode status notification

network output SNVT_hvac_mode nvoHeatCool_00;
network output SNVT_hvac_mode nvoHeatCool_01;
network output SNVT_hvac_mode nvoHeatCool_02;
network output SNVT_hvac_mode nvoHeatCool_03;

These output network variables are output when the operating mode has been changed.
They are also output when the status has been changed from an A/C unit side (with the remote controller).
They are output when the LonWorks Interface or the A/C unit power is reset.

Contents 0: Auto heat/cool 5: Dry
1: Heat 9: Fan
3: Cool

[nv7] Option 1 setting command
[nv9] Option 2 setting command

network input SNVT_switch nviOption1_00;
network input SNVT_switch nviOption1_01;
network input SNVT_switch nviOption1_02;
network input SNVT_switch nviOption1_03;
network input SNVT_switch nviOption2_00;
network input SNVT_switch nviOption2_01;
network input SNVT_switch nviOption2_02;
network input SNVT_switch nviOption2_03;

These input network variables are used to make the indoor unit option settings.

Two of the following 4 option settings can be selected: remote-controller prohibit, fan speed setting, air direction setting, and filter sign reset.

Make changes using the DIP switches on the main circuit board.

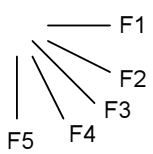
When option settings are not made from the LonWorks, it is not necessary to use these network variables.

	state	value	Start/stop operation	Temp. setting	Operating mode
Remote-controller prohibit	0	(Not used)	O	O	O
	1	100	×		
		120	O	×	
		140	×		
		150	O	O	×
		160	×		
		180	O	×	
		200	×		
		Other			

O :Permitted
×:Prohibited

Fan speed setting	(Not used)	120	Auto
		200	High
		150	Medium
		100	Low
		Other	

Air direction setting	(Not used)	200	Swing
		170	F1
		140	F2
		110	F3
		80	F4
		50	F5
		Other	Swing



* Positions F4 and F5 can not be set for cool- and dry-mode operation.

Filter sign	Filter sign is reset when data is updated.

[nv8] Option 1 setting status notification
[nv10] Option 2 setting status notification

network output SNVT_switch nvoOption1_00;
network output SNVT_switch nvoOption1_01;
network output SNVT_switch nvoOption1_02;
network output SNVT_switch nvoOption1_03;
network output SNVT_switch nvoOption2_00;
network output SNVT_switch nvoOption2_01;
network output SNVT_switch nvoOption2_02;
network output SNVT_switch nvoOption2_03;

These output network variables provide notification of changes in the status of the indoor unit option settings.

Two of the following 4 option settings can be selected: remote-controller prohibit, fan speed setting, air direction setting, and filter sign reset.

Make changes using the DIP switches on the main circuit board.

They are output when the LonWorks Interface or A/C unit power is reset.

	state	value	Start/stop operation	Temp. setting	Operating mode
Remote-controller prohibit	0	0	O	O	O
	1	100	×		
		120	O	×	
		140	×		
		150	O	O	×
		160	×		
		180	O	×	
		200	×		

O :Permitted
×:Prohibited

Fan speed setting	1	120	Auto
		200	High
		150	Medium
		100	Low
		50	Very
		0	Stop

Air direction setting	1	200	Swing
		170	F1
		140	F2
		110	F3
		80	F4
		50	F5
		0	Stop

Filter sign	0	0	OFF
	1		ON

[nv11] Alarm notification

network output SNVT_switch nvoAlarm_00;
network output SNVT_switch nvoAlarm_01;
network output SNVT_switch nvoAlarm_02;
network output SNVT_switch nvoAlarm_03;

These output network variables are output when an alarm occurs at an indoor unit, and when the alarm is reset at an indoor unit.
They are output when the LonWorks Interface or A/C unit power is reset.

Contents state 0: Normal 1: Alarm value 0 at all times

[nv12] Indoor unit number with active alarm notification

network output SNVT_switch nvoAlarmIn_00;
network output SNVT_switch nvoAlarmIn_01;
network output SNVT_switch nvoAlarmIn_02;
network output SNVT_switch nvoAlarmIn_03;

These output network variables are output when an alarm occurs at an indoor unit.
They are output when the LonWorks Interface or A/C unit power is reset.

Contents state 0 at all times value Indoor unit number with active alarm × 2
* Value = 0 when no alarms are active.

[nv13] Room temperature notification

network output SNVT_temp_p nvoSpaceTemp_00;
network output SNVT_temp_p nvoSpaceTemp_01;
network output SNVT_temp_p nvoSpaceTemp_02;
network output SNVT_temp_p nvoSpaceTemp_03;

These output network variables are output when the indoor unit room temperature changes.
They are output when the LonWorks Interface or A/C unit power is reset.
When indoor units are under group control, the room temperature of the main unit in the group is output.

Contents
Valid range
Output range: -35.0 - 92.5°C
Temp. units: 0.5°C

* Be aware that the output temperature range may vary according to the models of the outdoor and indoor units.
*When indoor units are under group control, the status is output from the main unit.

*

*---

[nv14] A/C unit status notification

network output SNVT_count nvoInState_00;
network output SNVT_count nvoInState_01;
network output SNVT_count nvoInState_02;
network output SNVT_count nvoInState_03;

These output network variables are output when the A/C unit status changes.
They are output when the LonWorks Interface or A/C unit power is reset.

0	Normal communications in progress (no alarms)
1~255	According to alarm code table
300	Indoor unit not connected (initial communication in progress)

[nv15] Emergency stop

network output SNVT_switch nviAllInOff;

This input network variable is used to stop the indoor units in an emergency.
Remote-controller prohibit (start/stop prohibit) is enabled for the stopped indoor units.
The remote-controller prohibit (temperature setting, operating mode) status remains the same as before the units were stopped.
When emergency stop is canceled, remote-controller prohibit (start/stop prohibit) status returns to the status prior to emergency stop; however, the unit itself remains stopped.
If this function is not used, then it is not necessary to use this network variable.

Contents state 0: Cancel 1: Emergency stop value (Not used)

[nc49] Transmission interval setting

network input config SNVT_time_sec nciSndHrtBt;

This network configuration sets the interval for automatic data output. When the set time has elapsed, data is output automatically.
The network variables that are affected by this configuration are the following:
nvoOnOff_0? nvoSetpoint_0? nvoHeatCool_0?
nvoOption1_0? nvoOption2_0? nvoAlarm_0?
nvoAlarmIn_0? nvoSpaceTemp_0? nvoInState_0?

Contents
The valid range is 0.0 seconds to 6553.5 seconds. If 0.0 seconds is set, automatic data update is disabled.
The transmission interval setting is the same for all network variables.
When the set time has elapsed, above all network variables are output.

[nc52] Setting of minimum time secured for transmission

network input config SNVT_time_sec nciMinOutTm;

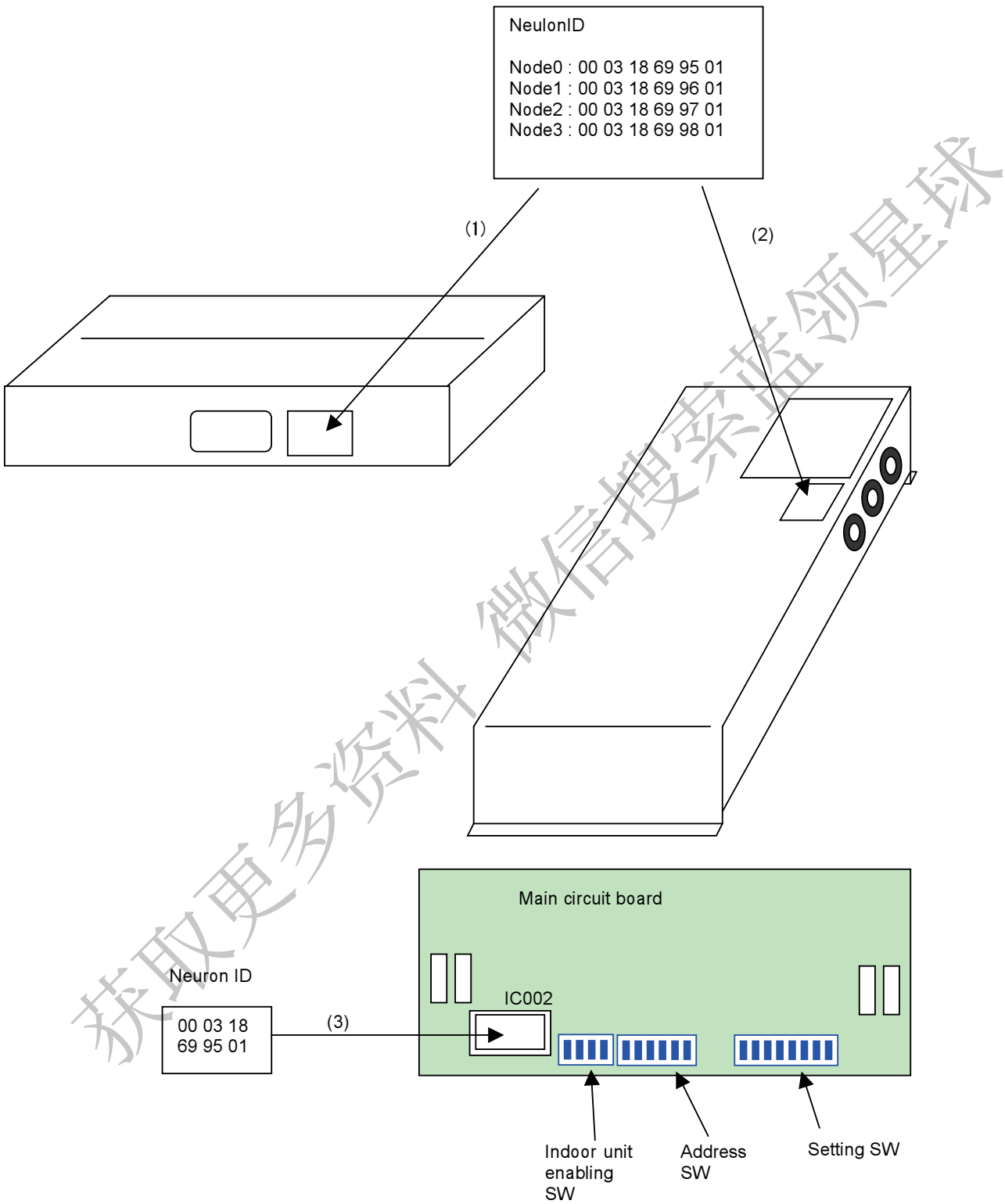
This network configuration determines the minimum interval that is secured for output network variables.
The network variables that are affected by this configuration are the following:
nvoOnOff_0? nvoSetpoint_0? nvoHeatCool_0?
nvoOption1_0? nvoOption2_0? nvoAlarm_0?
nvoAlarmIn_0? nvoSpaceTemp_0? nvoInState_0?

Contents
The valid range is 0.0 seconds to 6553.5 seconds.
The minimum time secured for transmission is independent for each network variable. It is not valid between different network variables.

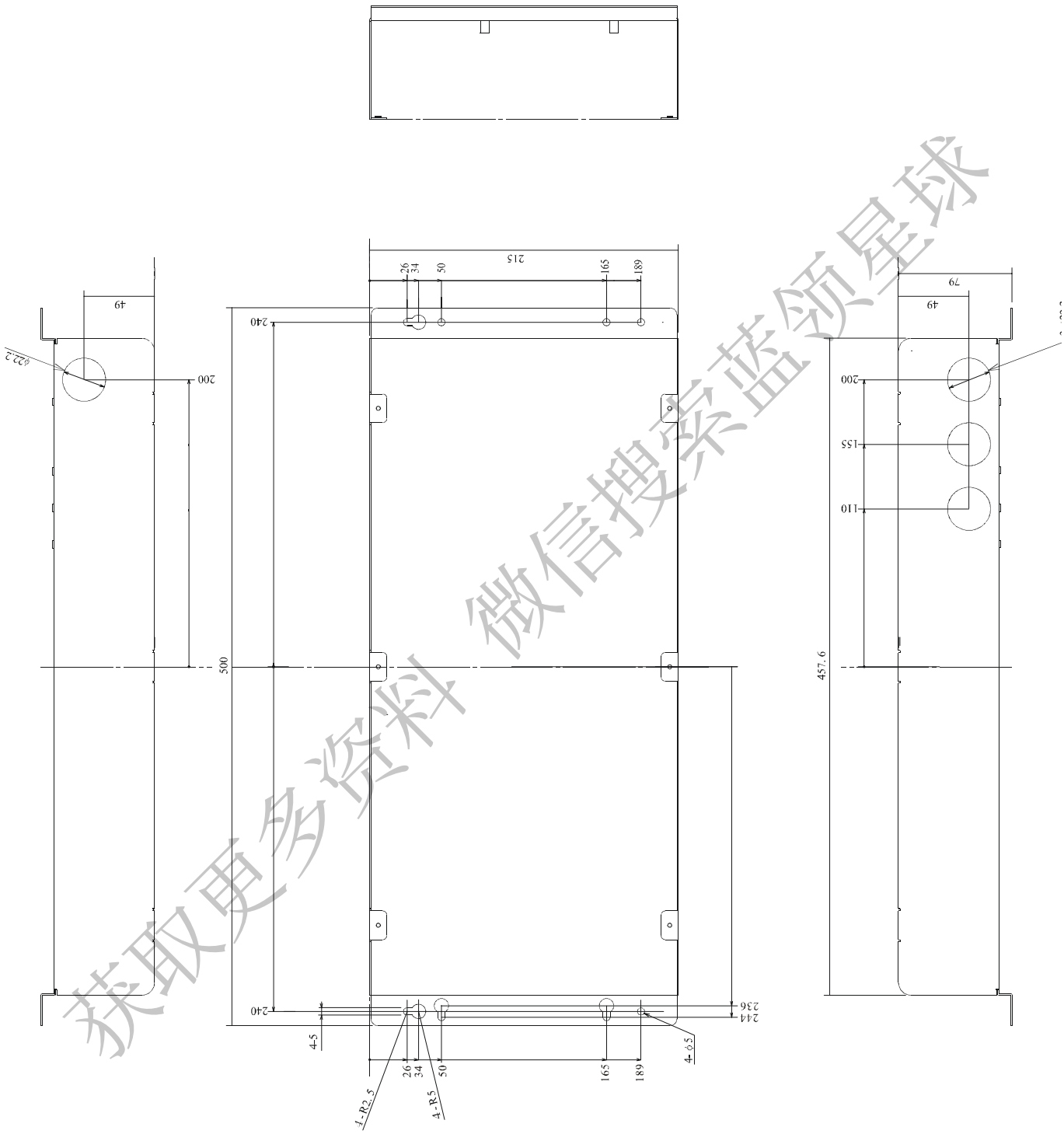
8. Locations Where Neuron ID is Applied

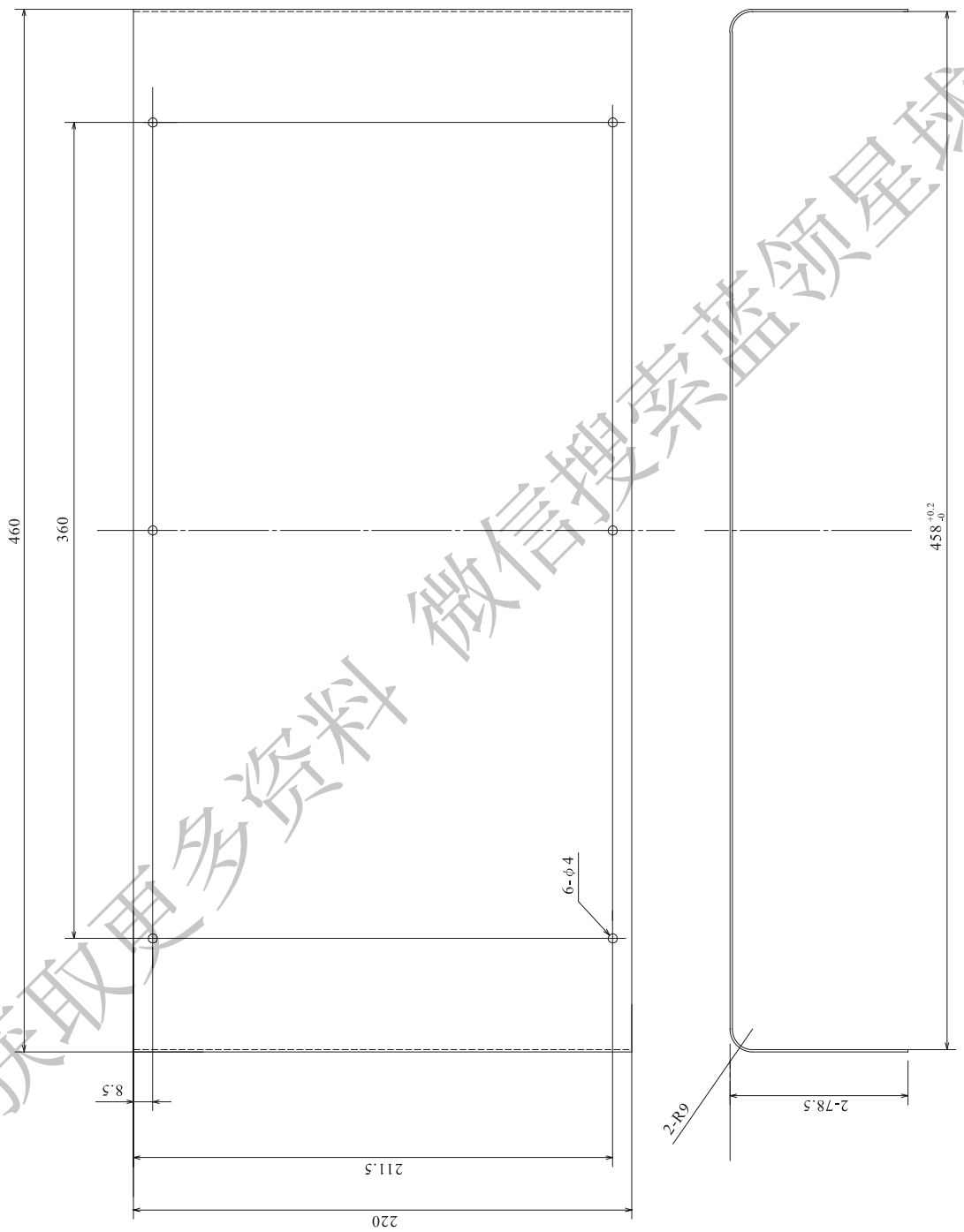
The Neuron ID is applied in the following 3 locations.

(1) Packaging box
(2) Top panel lid
(3) On the main circuit board Neuron chip

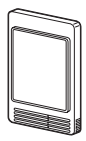
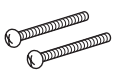
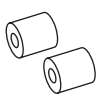


9. Panel Diagram





■ Parts supplied with remote sensor

No.	Supplied parts	Qty
1	Remote sensor (comes with 200 mm wire) 	1
2	Machine screws M4 25 	2
3	Wood screws 	2
4	Spacers 	2
5	Wire joints 	2
6	Clamp 	1
7	Installation manual 	1

■ Remote sensor installation guidelines

Place of installation

- Mount the remote sensor at a height of 1 to 1.5 meters above the floor where it can sense the average temperature of the room.
- Do not mount the remote sensor in a place exposed to direct sunlight or a place exposed to outside air such as near a window.
- Do not mount the remote sensor behind an object so that it is separated from the air circulation of the room.
- Mount the remote sensor within the room being air conditioned.
- The remote sensor must be mounted on the wall or other surface vertically.

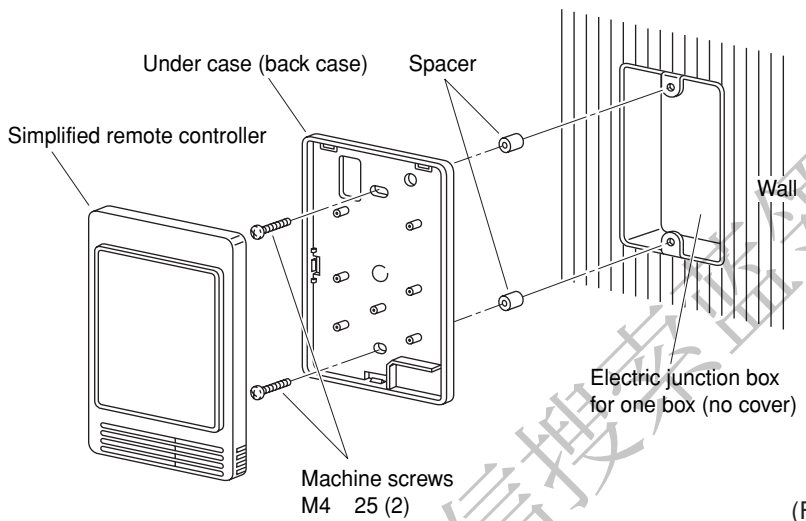
■ How to install the remote sensor

< NOTE 1 > Do not twist the remote sensor wiring with the power wiring or run it in the same metal conduit, because this may cause malfunction.

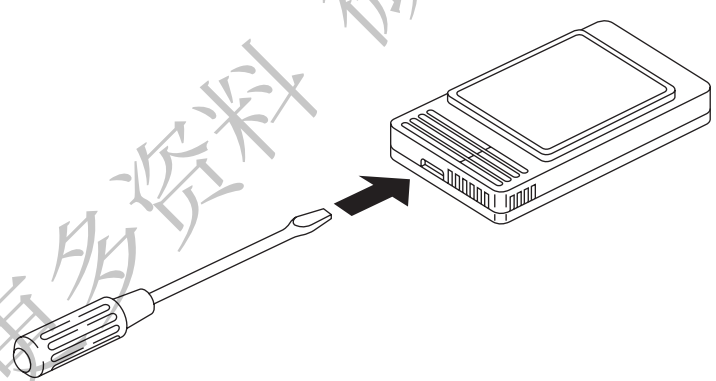
< NOTE 2 > Install the remote sensor away from sources of electrical noise.

< NOTE 3 > Install a noise filter or take other appropriate action if electrical noise affects the power supply circuit of the unit.

• Use an electric junction box (supplied locally) (See Fig. 1) for flush mounting of the remote sensor.



(Fig. 1)



(Fig. 2)

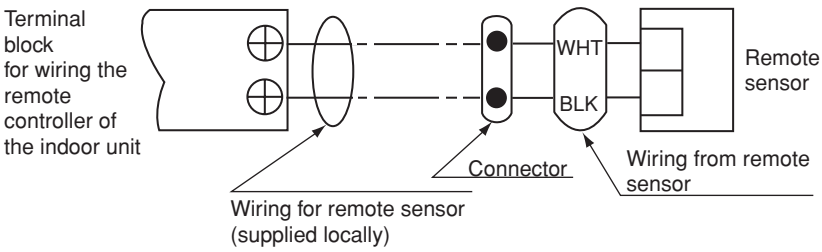
1. Insert a screwdriver or the like in the groove on the lower side of the remote sensor body to pry off the back case. (See Fig. 2)
2. Use the 2 supplied M4 machine screws to secure the remote sensor back case. Prior to mounting, clear the cutouts in the back case corresponding to the holes in the wall box using a screwdriver or the like. Use the spacers and take care not to tighten the screws excessively. If the back case will not seat well, cut the spacers to a suitable thickness.
3. Connect locally supplied 2 core lead wires to the lead wires from the remote sensor. (See "How to wire the remote sensor.")

   When connecting the locally supplied 2 core lead wires to the terminal block, check the terminal numbers in the indoor unit to make sure that the wires are correctly connected. (See Fig. 3)

   (The remote sensor is damaged if 220 / 240V AC is applied.)
4. Fit the remote sensor to the tabs of the back case and mount it.

■ How to wire the remote sensor

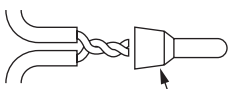
● **Connection diagram**



* 1: 0.5 mm^2 to 1.6 mm^2 of the wires are used for lead wires.

(Fig. 3)

● **How to connect lead wires**

2 supplied white wire joints	Lead wire from indoor unit  Lead wire from remote sensor Wire joint	1. Peel off 14 mm of the cable sheathing. 2. Twist the 2 wires together and crimp them together with the wire joint. 3. When a crimping tool is not used, solder the wires together and cover the joint with insulating tape.

(Fig. 4)

■ Important Information When Using Together with Remote Controller Switch

● **Installation method**

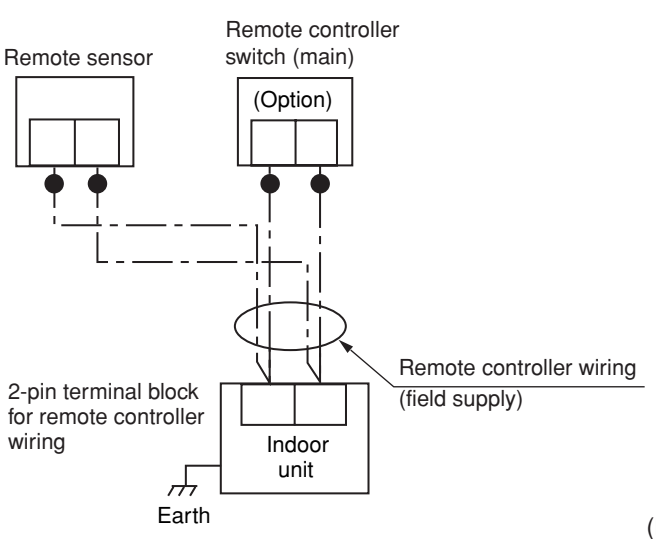
1. Set the remote controller switch as the main remote controller.

< NOTE > Do not set the room temperature sensor on the remote controller switch as the remote controller sensor.

● **Basic wiring diagram**

< NOTE > When connecting the wires, be careful not to wire incorrectly. (Incorrect wiring will damage the unit.)

- Wiring when controlling a single indoor unit with the remote sensor and remote controller switch:



(Fig. 5)

Contents

Product Information

If you have problems or questions concerning your Air Conditioner, you will need the following information. Model and serial numbers are on the nameplate on the bottom of the cabinet.

Model No. _____ Serial No. _____

Date of purchase _____

Dealer's address _____

Phone number _____

DECLARATION OF CONFORMITY
This product is marked " CE " as it satisfies EEC Directive No. 72/23/EEC, 89/336/EEC, 92/31/EEC and 93/68/EEC, and conforms with following standards.

EN60335-1	EN55014-1
EN60335-2-40	EN55014-2

This declaration will become void in case of misusage and/or from non observance though partial of Manufacturer's installation and/or operating instructions.

Alert Symbols

The following symbols used in this manual, alert you to potentially dangerous conditions to users, service personnel or the appliance:

This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death

This symbol refers to a hazard or unsafe practice which can result in personal injury or product or property damage.

Installation Location

- We recommend that this schedule timer be installed properly by qualified installation technicians in accordance with the Installation Instructions provided with the schedule timer.

WARNING

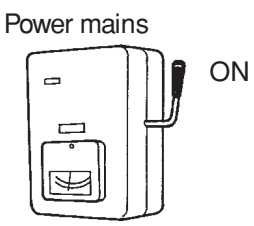
- Do not install the schedule timer where there are fumes or flammable gases, or in an extremely humid space such as a greenhouse.
- Do not install the schedule timer where excessively high heat-generating objects are placed.

Electrical Requirements

1. All wiring must conform to the local electrical codes. Consult your dealer or a qualified electrician for details.
2. Wiring must be done by a qualified electrician.

CAUTION

To warm up the system, the power mains must be turned on at least five (5) hours before operation. Leave the power mains ON unless you will not be using this appliance for an extended period.



Safety Instructions

- Read this Instruction Manual carefully before using this schedule timer. If you still have any difficulties or problems, consult your dealer for help.
- The air conditioner is designed to give you comfortable room conditions. Use this only for its intended purpose as described in this Instruction Manual.

WARNING

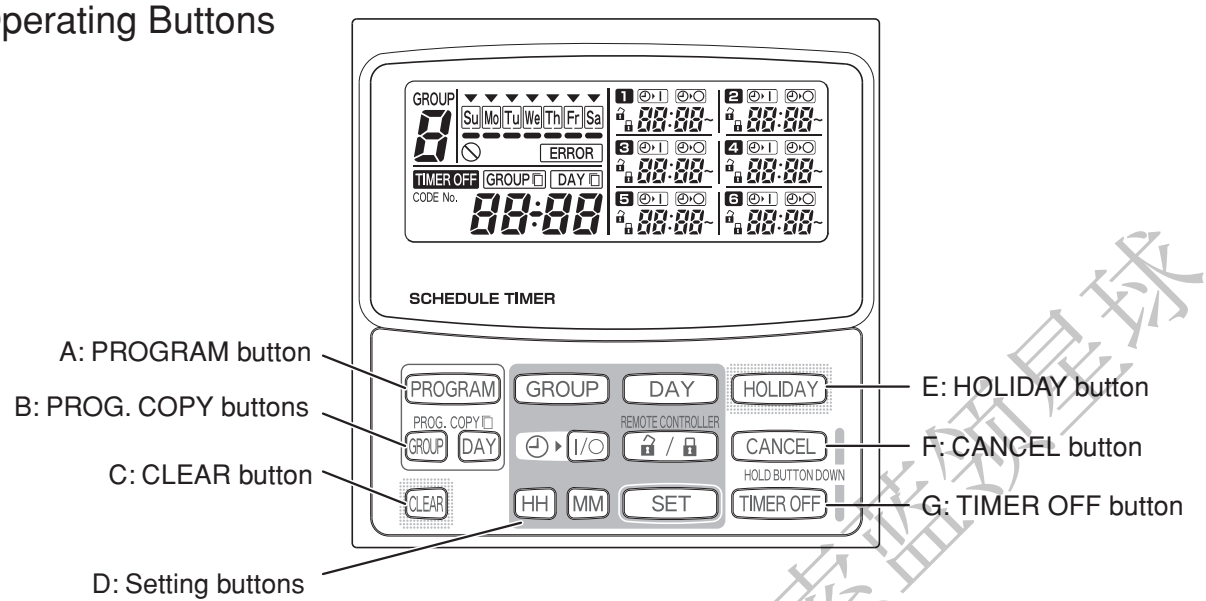
- Never touch the unit with wet hands.
- Never use or store gasoline or other flammable vapor or liquid near the air conditioner – it is very dangerous.
- The air conditioner has no ventilator for intaking fresh air from outdoors. You must open doors or windows frequently when you use gas or oil heating appliances in the same room, which consume a lot of oxygen from the air.
  Otherwise there is a risk of suffocation in an extreme case.

CAUTION

- Do not turn the air conditioner on and off from the power mains switch. Use the ON/OFF operation button.
- Do not stick anything into the air outlet of the outdoor unit.
  This is dangerous because the fan is rotating at high speed.
- Do not let children play with the air conditioner.
- Do not cool or heat the room too much if babies or invalids are present.

Names and Functions of Parts

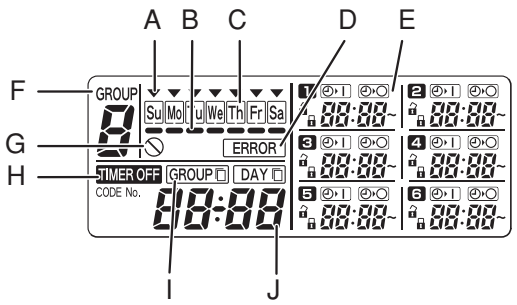
Operating Buttons



A: PROGRAM button	Use to start setting programs and to enter program settings.
B: PROG. COPY buttons	Use to copy programs to groups or specific days in a schedule. (Refer to page **7**-164)
C: CLEAR button	Press to clear the settings of the currently displayed program. The current program is not cleared unless the PROGRAM button is pressed after pressing the CLEAR button.
D: Setting buttons	Use to make program settings and to set the present time.
GROUP	Press to set groups for programmed operation.
DAY	Press to set todayís day and days of programmed operation.
HH MM	Press to set the present time and times used in programmed operation.
I/O	Use to start/stop indoor units via the timer.
REMOTE CONTROLLER	Use to enable/disable remote controller operation via the timer.
SET	Use to set programmed operation trigger time. Program settings are not entered unless the PROGRAM button is pressed at the end of setting operations.
E: HOLIDAY button	Press to set and cancel holidays during a scheduled week of operation.
F: CANCEL button	Press to cancel the current program setting operation, copying operation or holiday setting operation. When the CANCEL button is held down for 2 seconds, the current setting operation or copying operation is canceled and the normal display returns.
G: TIMER OFF button	Press to turn the timer OFF when timer operation will not be used for a long period of time. When this button is held down for 2 seconds, TIMER OFF appears on the display. Programs cannot be run until the button is again held down for 2 seconds.

Some of the above features are disabled when the unit is installed. If the button of a disabled feature is pressed, ⃠ appears on the display.
For more information, contact your dealer.

Display



A: Today's day of the week (▼)	Indicates today's day of the week.
B: Program schedule indication (▬)	Appears under days that are scheduled for program operation.
C: Holiday schedule indication (⎕)	Appears around scheduled holidays. (Refer to page **7**-168)
D: ERROR indication	Displayed when a mistake is made during timer setting.
E: Timer program	Displays set timer programs. Also, indicates the copy source/destination during group program copying.
F: Group No.	Up to 8 groups can be selected and displayed.
G: ⃠ (Disabled Feature) indication	Displayed if the selected feature was disabled during installation.
H: TIMER OFF indication	Displayed when the timer has been turned OFF.
I: Copy mode indication	Displayed when copying a program into a group or day of the schedule.
J: Present time	Displays the present time on a 24-hour clock. Also, displays settings in the various setting modes.

Using the Schedule Timer

To use the schedule timer, follow the steps below.

STEP 1 Turn ON power to the air conditioner.

- Turn ON power to the air conditioner connected to the schedule timer. The schedule timer performs initial communications with the indoor units, during which SC An blinks on the display.

NOTE

Do not turn off the power mains in heating and cooling seasons. (This keeps the crankcase heater electricity turned on, which protects the compressor at startup.) If the air conditioner has been OFF for a long period of time, turn on power 5 hours before starting operation.

STEP 2 Make the initial settings of the schedule timer.

- Set the present time and today's day of the week. (Refer to page **7**-158)

STEP 3 Set up programs of the schedule timer.

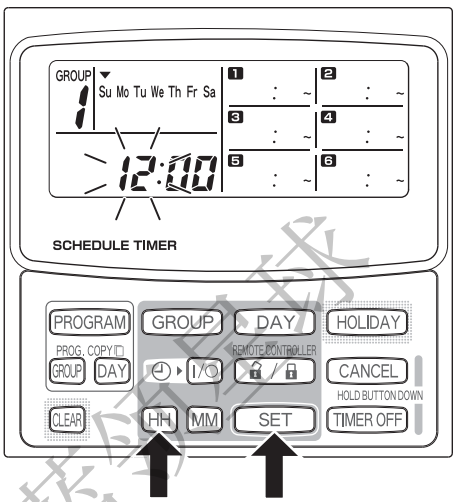
- Make settings for programmed operation. (Refer to page **7**-160)

Setting the Present Time

Set the present time. (Example: When the present time is 12:45)

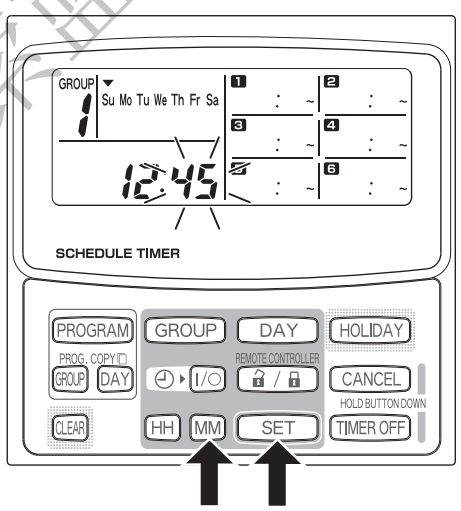
STEP 1 Hold down the SET button and press the HH button to set the hour.

- The hour increases one hour at a time with each single press of the HH button while the SET button is held down.
- The hour scrolls rapidly when both the SET button and HH button are held down. (Example: To set 12:00, release the HH button when “12” is displayed.)
- When the SET button is released, the hour is set and the indication changes from blinking to lighting.



STEP 2 Hold down the SET button and press the MM button to set the minutes.

- The minutes increase one minute at a time with each single press of the MM button while the SET button is held down.
- The minutes scroll rapidly when both the SET button and MM button are held down. (Example: To set 00:45, release the MM button when “45” is displayed.)
- When the SET button is released, the minutes are set and the indication changes from blinking to lighting.



NOTE

- Pressing just the HH or MM button does not change the time.

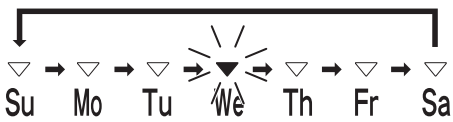
7

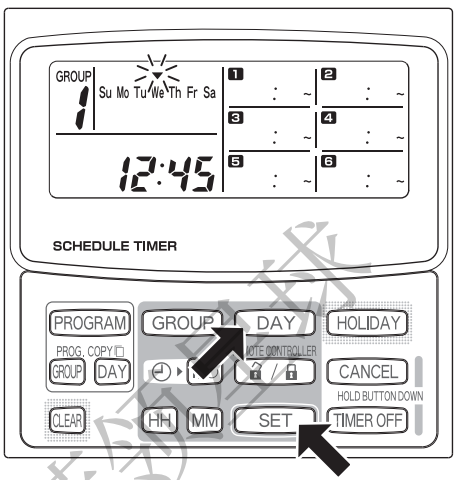
Setting Today's Day of the Week

Set today's day of the week. (Example: When today is Wednesday)

STEP 1 Hold down the SET button and press the DAY button to set today's day of the week.

- ▼ blinks and moves one day at a time across the days of the week with each single press of the DAY button while the SET button is held down.
- When the SET button is released, the day of the week is set and the ▼ changes from blinking to lighting.





NOTE

- Pressing just the DAY button does not change the day of the week.

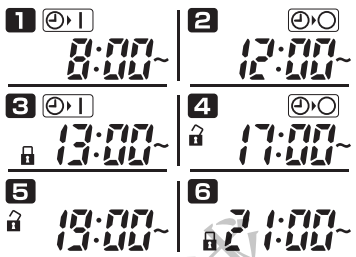
Setting Up Programmed Operations

Correctly set the present time and today's day of the week.
Unless both are correctly set, the programs will not run as expected.

- Up to 6 programmed operations can be set per day for each group and day of the week.
- A combination of the below operations can be set for each timer program.
  – Air conditioner starting/stopping
  – Remote controller operation enable/disable *1
- To change the settings of an existing program, use the same below procedure used to set up a new program.

*1 The remote controller operation enable/disable setting is disabled depending on installation conditions. If so, ⃠ appears on the display when the [🔓/🔒] button is pressed.
For more information, contact your dealer.

Example settings

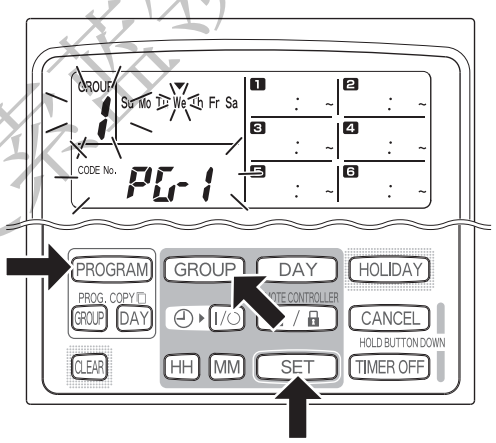


STEP 1 Press the PROGRAM button to select a group.

- When the PROGRAM button is pressed, the group No. and today's day of the week start blinking and the
- present time indication changes to a blinking "PG-1". Press the GROUP button to select a group for programmed operation and then press the SET button.

NOTE

- Group selection is disabled depending on installation conditions. If so, proceed to the next step.
- The number of selectable groups is set during installation.

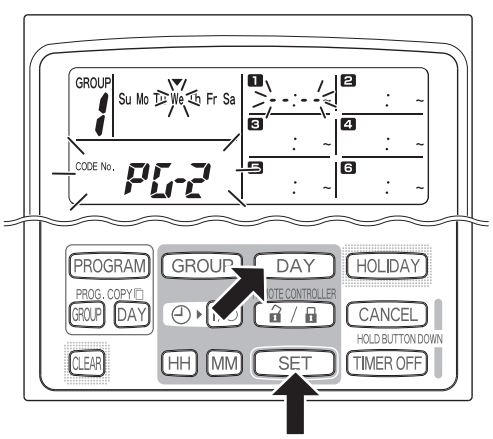


STEP 2 Press the DAY button and select a day of the week for programmed operation.

- When the SET button is pressed, the program schedule marker (▬) changes from blinking to lighting and, at the same time, the time set in program 1 starts blinking. Also, the present time indication changes to a blinking "PG-2".

NOTE

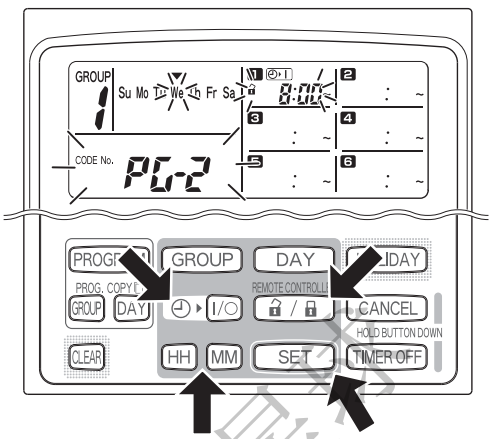
- The currently selected day of the week blinks slowly at this time.



7

STEP 3 Set up the program and press the SET button.

- Select timer operation with the ⏲▸I/○ (timer ON/OFF) button and 🔓/🔒 (remote controller operation enable/disable) button. Then, set the trigger time with the HH and MM buttons, and press the SET button.
- When the SET button is pressed, the time set in program **1** changes from blinking to lighting and, at the same time, the time set in program **2** starts blinking.

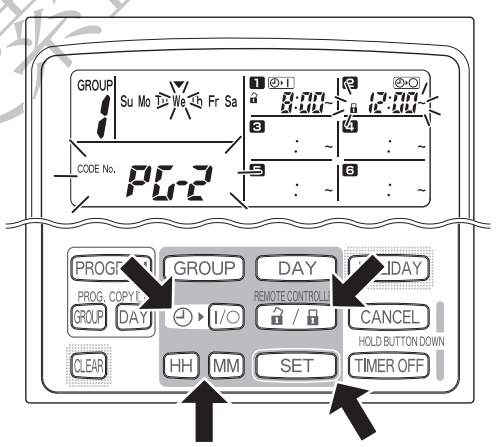


NOTE

- Every time the ⏲▸I/○ button is pressed, the timer indication changes in the order of ⏲▸I (ON) – ⏲▸○ (OFF) – no indication.
- Every time the 🔓/🔒 button is pressed, the remote controller indication changes in the order of 🔓 (enabled) – 🔒 (disabled) – no indication.
- The remote control operation enable/disable setting is disabled depending on installation conditions. In this case, only timer ON/OFF can be set.

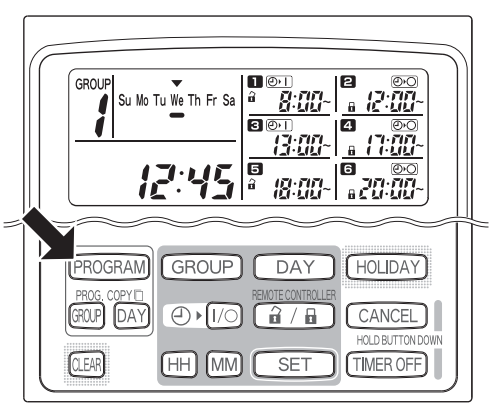
STEP 4 Set up programs **2** – **6** in the same way.

- When the SET button is pressed, settings are automatically arranged in the order of earliest time first.
- If the SET button is pressed without any new settings being made in the program, program **1** starts blinking again and settings can be changed.
- Similarly, if the SET button is pressed after setting up program **6**, program **1** starts blinking again.



STEP 5 Press the PROGRAM button.

- Program settings are entered and the normal display returns.



STEP 6 Set up programmed operation for other groups and days of the week in the same way. Programs that have already been set up can be copied into other groups and days of the week. (Refer to page **7**-164)

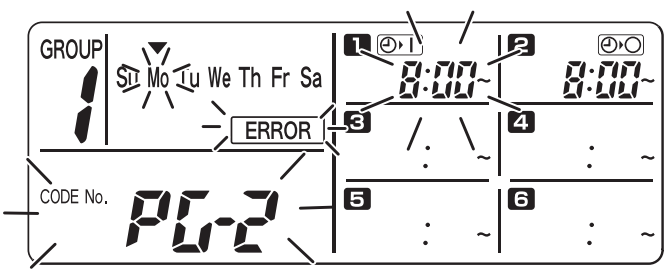
NOTE

- A “0:00” time setting is interpreted to mean 12:00 midnight.
- To cancel program settings during program setup (while “PG-1” or “PG-2” is blinking on the display), hold down the CANCEL button for more than 2 seconds. The normal display returns.
- If settings are canceled without pressing the PROGRAM button, settings are not entered.

Setting Errors

If time is set as shown below while setting up a program, “ERROR” is displayed (the ERROR indication blinks). Therefore, correct the time setting.

If Program Times Are the Same



STEP 1 Every time the SET button is pressed, the setting mode switches between programmed operations of the same time setting (1 and 2 in the above example), therefore select the time setting to correct.

STEP 2 Change the time setting with the HH and MM buttons so that the times are no longer the same.

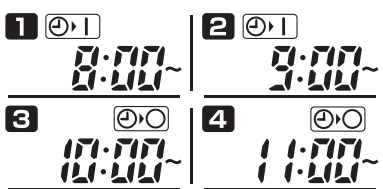
STEP 3 Press the SET button and check “ERROR” is not displayed.

STEP 4 Press the PROGRAM button to end the setting mode.

Example Time Settings That Do Not Cause Errors

The below time settings do not generate an error.

1) When ON and OFF times are staggered



2) When OFF time is earlier than ON time

7

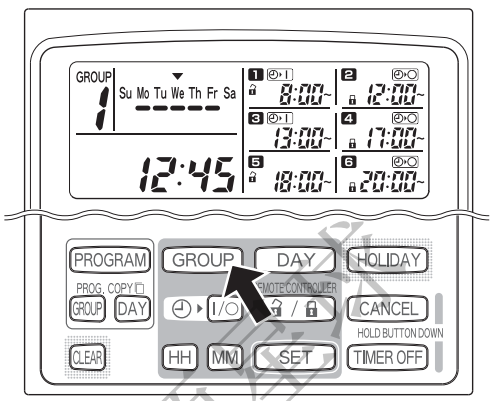
How to Check Program Times

You can check the programmed times for each group and day of the week.

STEP 1 Press the GROUP button and select a group whose time you want to check.

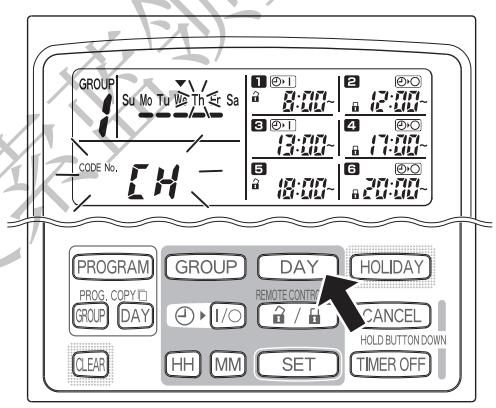
NOTE

- Group selection is disabled depending on installation conditions. If so, proceed to the next step.



STEP 2 Press the DAY button.

- When the DAY button is pressed the first time, tomorrow's day of the week starts blinking and the program settings for tomorrow are displayed.
- Every time the DAY button is pressed, the program settings change in order of the days of the week.
- Pressing the GROUP button displays the program settings of another group on that same day.

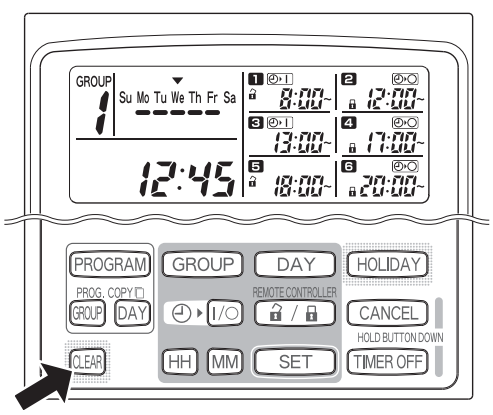


STEP 3 End checking.

- Press the CLEAR button. The normal display returns.

NOTE

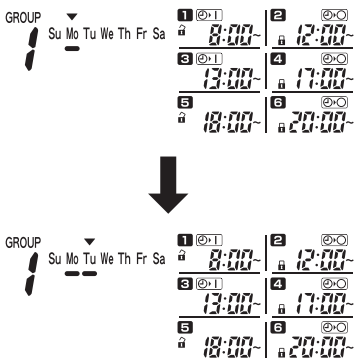
- Holding down the CANCEL button for more than 2 seconds also returns the normal display.



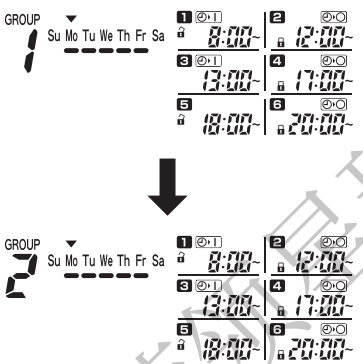
How to Copy Program Times

You can copy the already set program of one day into another day (Day Program Copying), as well as copy the entire week programmed for one group into another group (Group Program Copying).

Example of Day Program Copying
(Copying Monday's program into Tuesday)



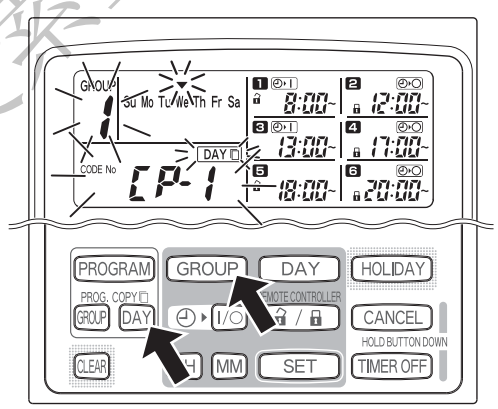
Example of Group Program Copying
(Copying group No. 1's program into group No. 2)



How to Copy Day Programs

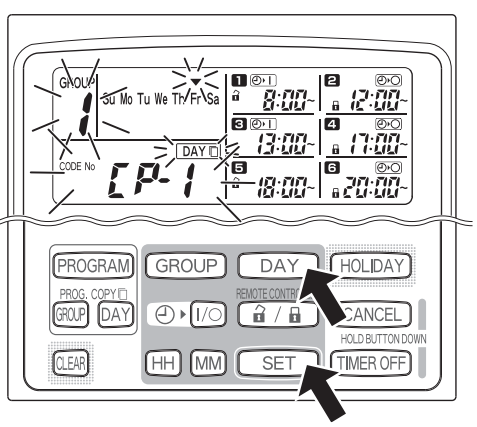
STEP 1 Press the PROG. COPY DAY button.

- The group No. and the ▼ over today's day start blinking and "CP-1" starts blinking in the present time display area. In this state, select a group in which to copy day programs, using the GROUP button.



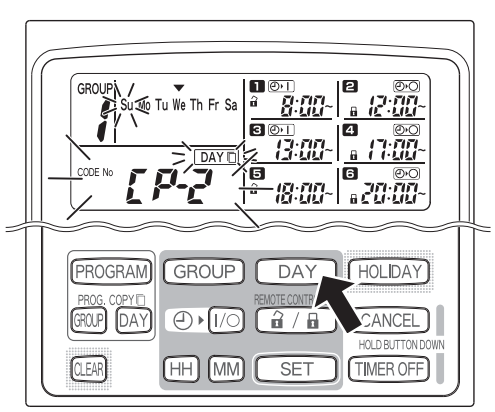
STEP 2 Select a source day program to copy.

- Every time the DAY button is pressed, the ▼ moves across the days of the week display, therefore select a day of the week that will serve as the copy source.
- Once having selected the copy source day, press the SET button to set it. The display changes to key you to select a copy destination day.



STEP 3 Select a copy destination day.

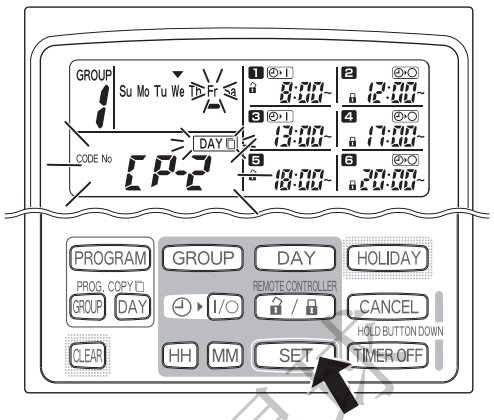
- When the schedule timer is ready for you to select a copy destination day, "CP-2" starts blinking in the present time display area, while the selected copy source day blinks in the days of the week. Therefore, select a day of the week as the copy destination, using the DAY button.



7

STEP 4 Press the SET button to copy.

- Press the SET button and the program schedule marker (▬) will be displayed.

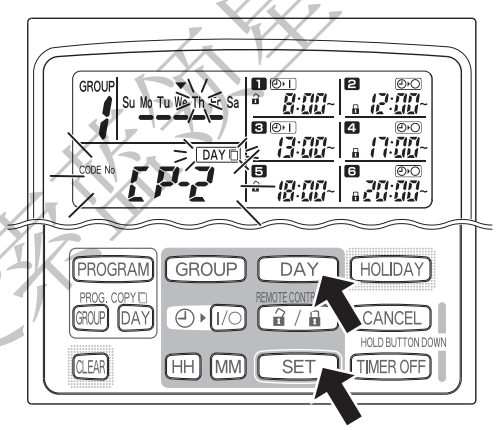


STEP 5 Select other copy destination days if desired.

- You can copy the selected source day program into other days by repeatedly pressing the DAY button to select a day of the week followed by the SET button to set it.

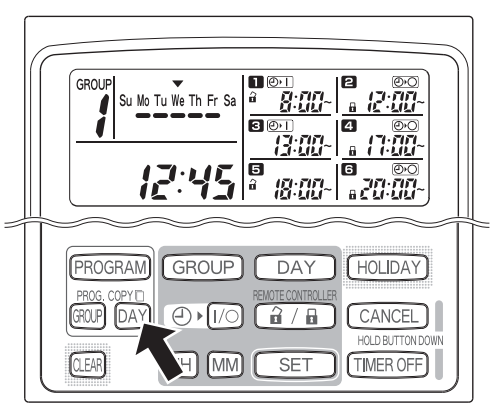
NOTE

- Pressing the CLEAR button extinguishes the program schedule marker (▬) and cancels the copy operation.



STEP 6 Press the PROG. COPY DAY button to enter the copied program in the selected days.

- The normal display returns.



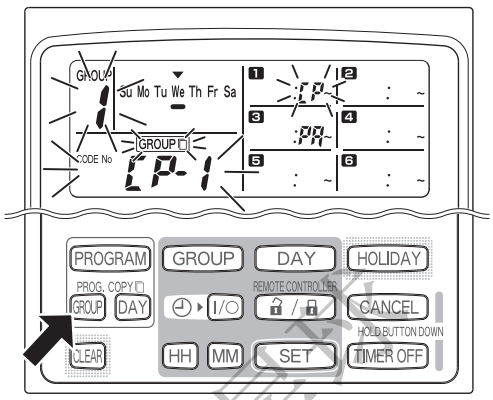
NOTE

- If a program already exists in the copy destination day, the newly copied program overwrites the existing program.
- If you accidentally copy over a program in the day program copy mode, holding down the CANCEL button for more than 2 seconds returns the program to the point prior to pressing the PROG. COPY DAY button in STEP 1. (All changes and copy operations made up until that point are cleared.)

How to Copy Group Programs

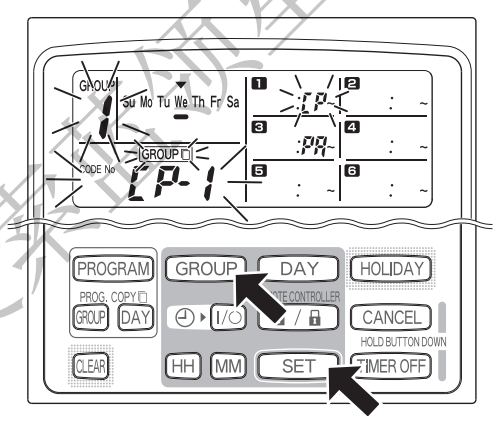
STEP 1 Press the PROG. COPY GROUP button.

- "CP-1" starts blinking in the present time display area and "CP" (copy) starts blinking in the program 1 area to indicate the copy source.



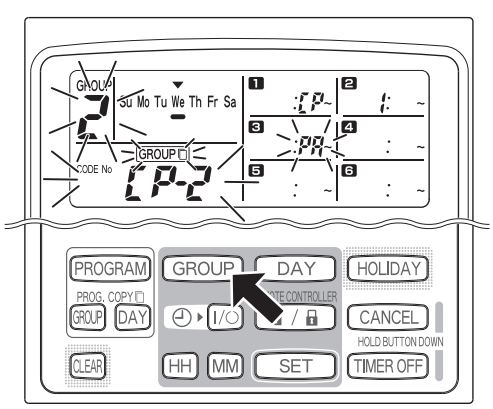
STEP 2 Select a source group program to copy.

- Select a copy source group using the GROUP button.
- Once having selected the copy source group, press the SET button to set it. The display changes to key you to select a copy destination group.



STEP 3 Select a copy destination group.

- After pressing the SET button, "CP-2" starts blinking in the present time display area, the copy source group No. set appears in the program 2 area, and "PA" (paste) starts blinking in the program 3 area to indicate the copy destination.
- Select a copy destination group using the GROUP button.

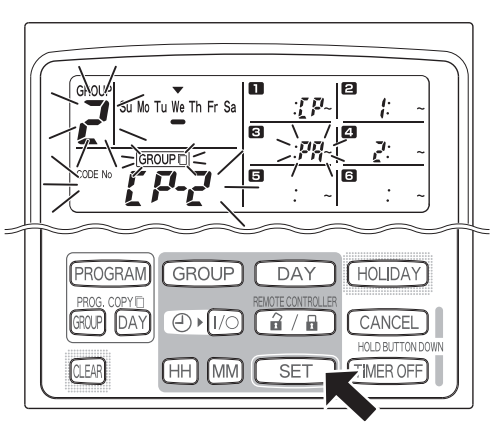


STEP 4 Enter the selected copy destination group.

- When the SET button is pressed, the number of the copy destination group appears in the program No. area.

NOTE

- If a group from numbers 1 to 4 was selected as the copy destination group, that number appears in the program 4 area. If a group from numbers 5 to 8 was selected, that number appears in the program 6 area.



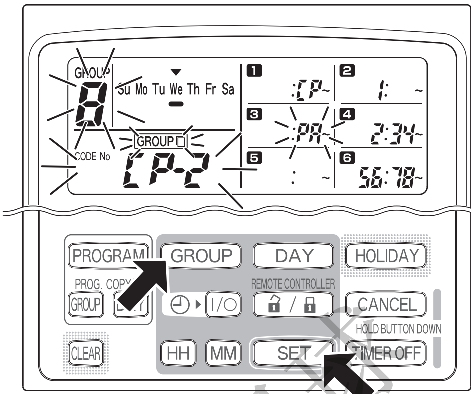
7

STEP 5 Select other copy destination groups if desired.

- You can copy the selected source group programs into other groups by repeatedly pressing the GROUP button to select a group followed by the SET button to set it.

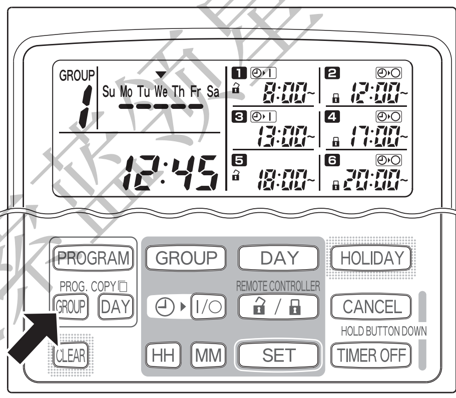
NOTE

- If a group from numbers 1 to 4 was selected as the copy destination group, that number appears in the program 4 area. If a group from numbers 5 to 8 was selected, that number appears in the program 6 area.



STEP 6 Press the PROG. COPY GROUP button to enter the copied programs in the selected groups.

- The normal display returns.



NOTE

- If a program already exists in the copy destination group, the newly copied program overwrites the existing program.
- If you accidentally copy over a program in the group program copy mode, holding down the CANCEL button for more than 2 seconds returns the program to the point prior to pressing the PROG. COPY GROUP button in STEP 1. (All changes and copy operations made up until that point are cleared.)

7

How to Set Holidays in a Scheduled Week of Operation

Operations programmed for a specific day during the week can be temporarily disabled by setting that day as a holiday.

- When the set holiday passes, the holiday setting is canceled and operation is resumed as programmed the following week.
- Holidays can be selected for the week starting from today's day. If today is selected as a holiday, the holiday setting is canceled from the next programmed operation. (Depending on the program, if the program is currently running, the program may not stop.)

Example Setting

Today is Thursday and Friday is set as a holiday.

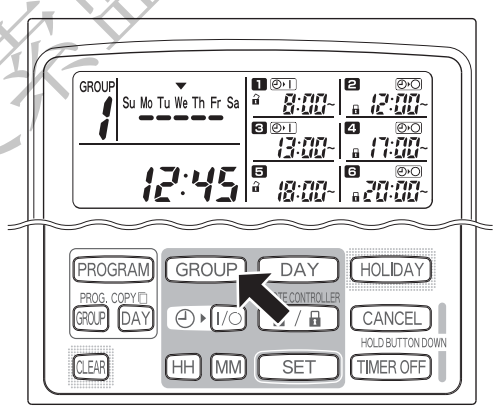
When Friday comes, the program set for that day does not run.

When Saturday comes, Friday's holiday setting is canceled.

STEP 1 Press the GROUP button to select a group to go on holiday.

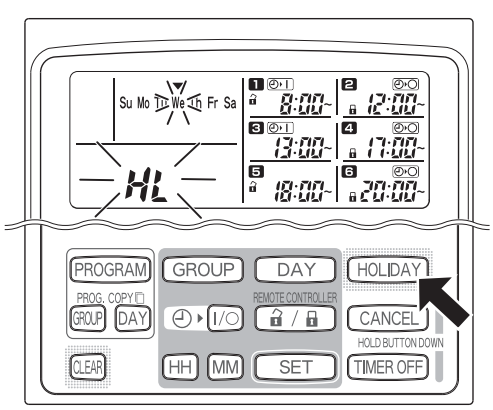
NOTE

- Depending on installation conditions, group selection is disabled or set so that all groups are automatically selected for the holiday feature. If so, proceed to the next step.



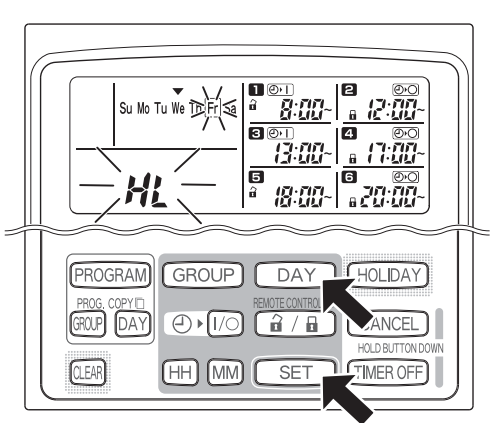
STEP 2 Press the HOLIDAY button.

- "HL" starts blinking in the present time display area and today's day of the week starts blinking.

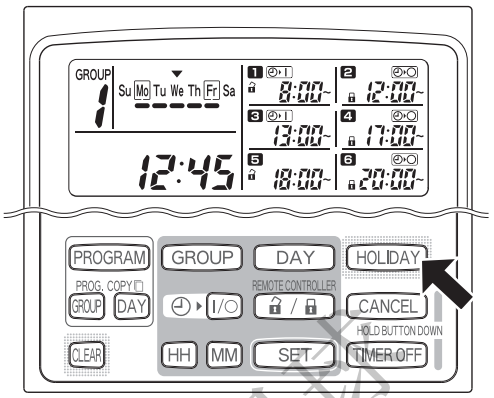


STEP 3 Select a day as the holiday using the DAY button, and press the SET button.

- A "_" appears over the selected holiday.
- To select other holidays, select a day using the DAY button and set it with the SET button.
- If you made a mistake or want to cancel a holiday, press the CLEAR button.



STEP 4 Press the HOLIDAY button to enter the holiday.
- The normal display returns.

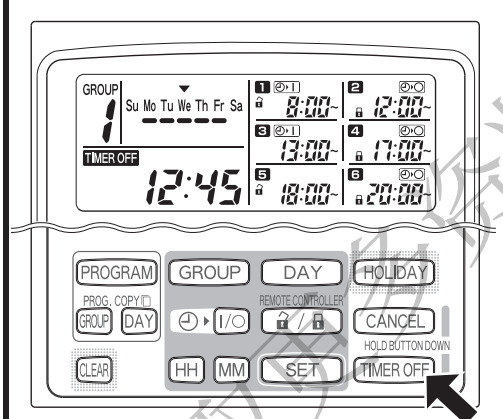


How to Disable the Timer Operation

To halt programmed operation for one week or more, you can disable all timer programs.
- Once the timer has been disabled, programmed operations are not run until the below procedure is performed.

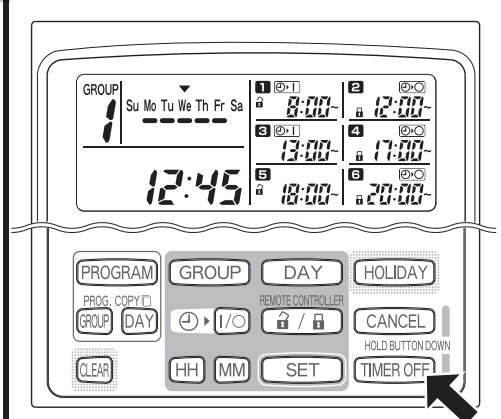
NOTE
- During installation, the remote controller may be set to disable the timer for individual groups. In this state, the timer is disabled only for the selected group, therefore press the GROUP button to confirm which group is selected.

Hold down the TIMER OFF button for more than 2 seconds



- **TIMER OFF** appears on the display. The timer is disabled from the next scheduled program.

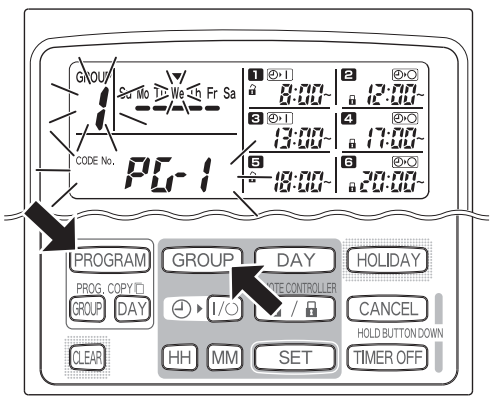
To turn the timer back ON, hold down the TIMER OFF button for more than 2 seconds



- **TIMER OFF** goes out and the timer is enabled from the next scheduled program.

How to Clear Programs

Press the PROGRAM button.

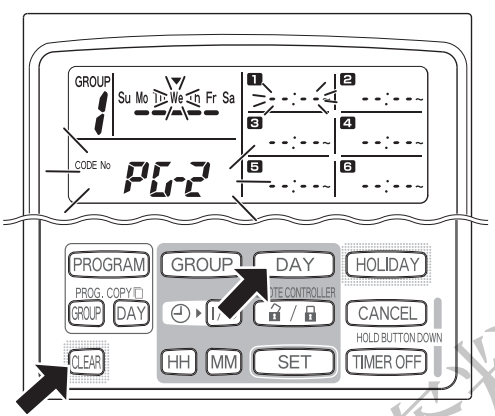


- When the PROGRAM button is pressed, the group No. and the present day of the week start blinking and the present time indication changes to a blinking “PG-1”.
- Press the GROUP button to select a group to clear.

NOTE

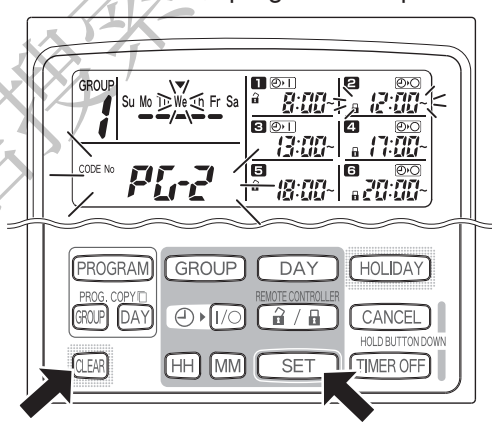
- Group selection may be disabled during installation. If so, proceed to the next step.
- Holding down the CANCEL button for more than 2 seconds returns the program to the point prior to pressing the PROGRAM button. (All operations made up until that point are cleared.)

To cancel specific days



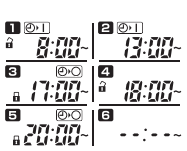
- Select a day to cancel using the DAY button and press the CLEAR button. All settings in programmed operations 1 through 6 are cleared. The display appears as shown above.
- Press the PROGRAM button to enter the clear operation. The normal display returns without the program schedule marker (▬) underneath the days of the week.

To cancel individual programs on specific days



- Select a day and press the SET button. Programmed operations 1 through 6 start blinking in rotation, therefore press the CLEAR button when the programmed operation to clear starts blinking. (The remaining programmed operations are automatically arranged in the order of earliest time first.)
- Press the PROGRAM button to enter the clear operation. The normal display returns.

Example:
Display after clearing programmed operation 2 above

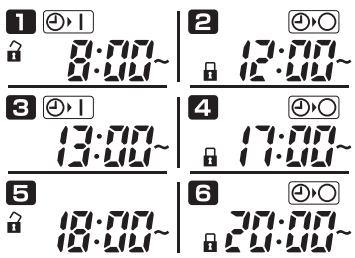


Important Information to Remember

1. Schedule Timer and Air Conditioner Operation

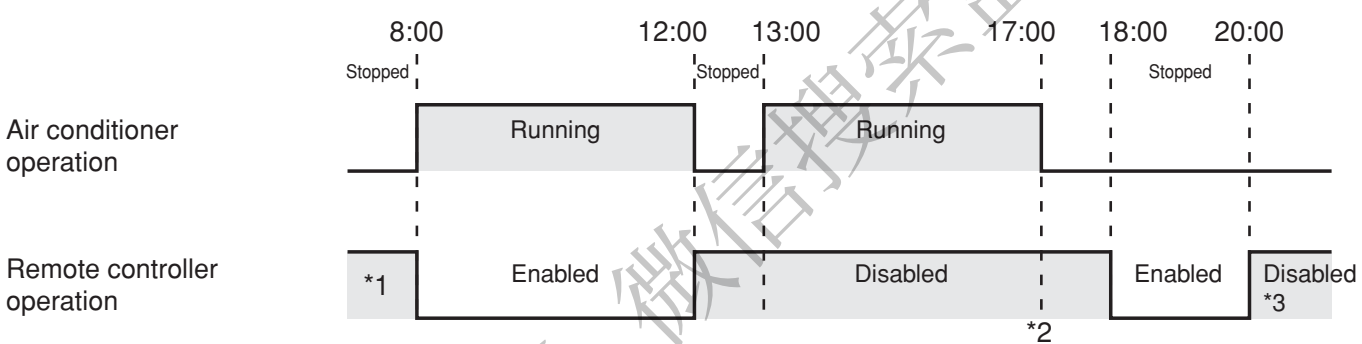
Air conditioners operate either according to operations programmed from the schedule timer (starting/stopping and remote control operation enable/disable) or according to a connected remote controller or system controller.

Schedule timer settings (Example)



Operation without system controller operation

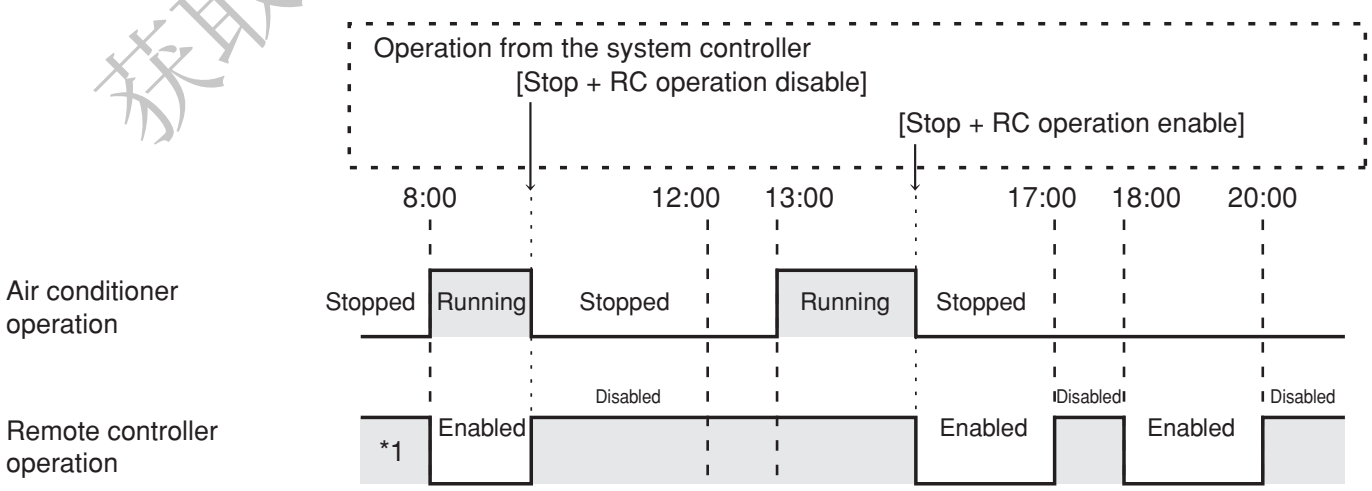
If remote controller operation is enabled, the air conditioner can be started/stopped from the remote controller. (The air conditioner responds to the most recently pressed button.)



*1 Whether remote controller operation is enabled or disabled depends on the setting of the previous day.
*2 Since remote controller operation is disabled, operation remains disabled.
*3 The remote controller remains disabled the next day and thereafter until it is enabled in the remote controller operation enable/disable setting.

Operation with system controller operation

If remote controller operation is enabled, the air conditioner can be started/stopped from the remote controller. (The air conditioner responds to the most recently pressed button.)
The remote controller operation enable/disable set from the system controller (Centralized control 1 to 4) is canceled according to programmed operations.



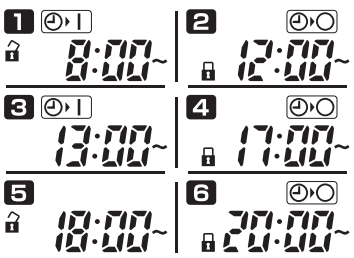
*1 Whether remote controller operation is enabled or disabled depends on the setting of the previous day.

2. Power Outages

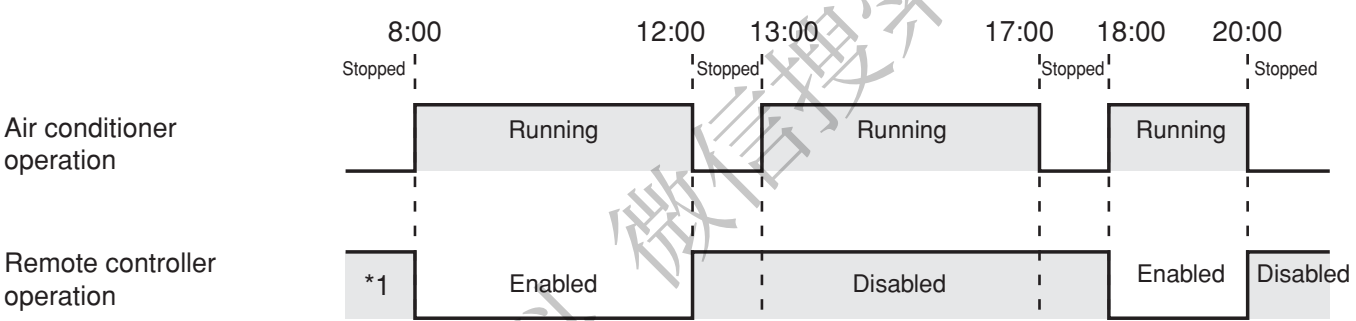
If the air conditioner is running when power is lost, the air conditioner remains OFF when power is restored. Also, if remote controller operation was disabled when power was lost, it is enabled for a few minutes when power is restored.

- Programmed operations scheduled for times that come after power is restored run as usual.
- Program settings are retained in the non-volatile memory of the schedule timer, therefore they are not cleared in the event of a power outage. Also, the present time and todayís day of the week are retained for a maximum of 100 hours by the internal battery.

Schedule timer settings (Example)

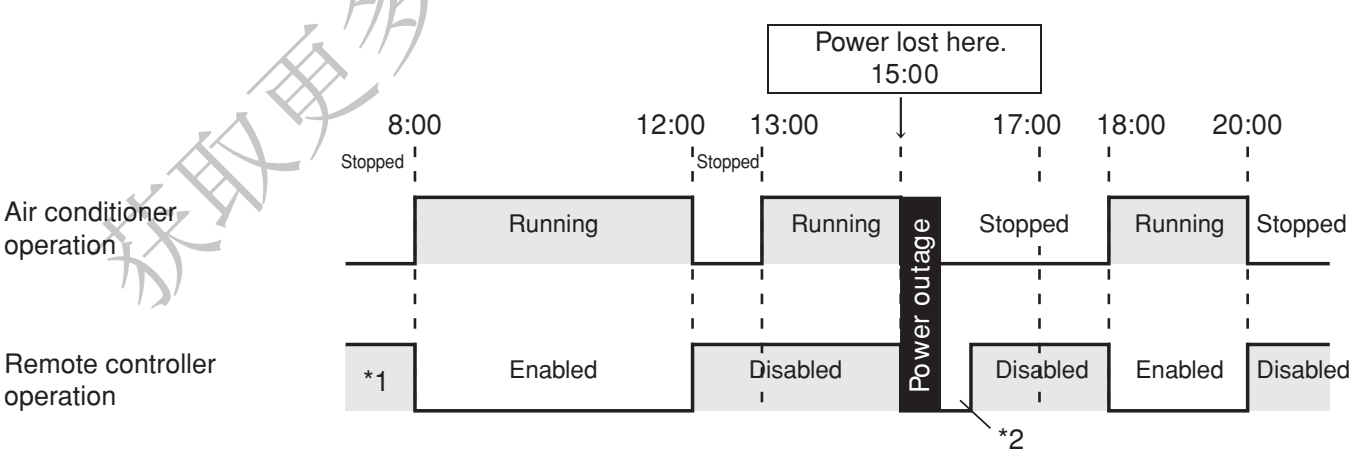


Operation when power is not lost



*1 Whether remote controller operation is enabled or disabled depends on the setting of the previous day.

Operation when power is lost at 15:00 and subsequently restored



*1 Whether remote controller operation is enabled or disabled depends on the setting of the previous day.

*2 Remote controller operation is enabled for a few minutes after power is restored.

Troubleshooting

Before requesting servicing, check the following.

	Trouble	Cause/Remedy
Check before requesting servicing	SC An blinks on the display.	The schedule timer is performing initial communications with connected indoor units. Wait for communications to finish.
	Air conditioners do not operate as scheduled when the set time comes.	The timer has been disabled. (Refer to page **7**-169) A holiday has been scheduled. (Refer to page **7**-168)
	Air conditioners can be started and stopped from the remote controller even though the program disables remote controller operation.	Power to the air conditioner was lost and subsequently restored. (Refer to page **7**-172)
	88:88 blinks in the present time display area.	Power to the air conditioner was lost for a long period of time. Set the present time and todayís day of the week again. (Refer to pages **7**-158 and **7**-159)

If trouble persists despite taking the above action, stop the schedule timer, turn off the unit and report the serial number and problem to your dealer. Never service the unit yourself as this is dangerous.

11. Schedule Timer (SHA-TM64AG(B))

Safety Precautions

- Read these Safety Precautions before beginning installation or electrical work, and perform the work only in the correct manner.
- Precautions in this manual are given in the form of "Warnings" or "Cautions." Both types of precautions contain important information related to your safety, the safety of users, and the correct operation, installation, or maintenance of the air conditioning system. Be sure to carefully observe all relevant precautions.

WARNING	This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.
CAUTION	This symbol refers to a hazard or unsafe practice which can result in personal injury or product or property damage.

When installation work is completed, perform a test run and check that no trouble occurs. Also be sure to explain the methods for using the product to the customer, based on the contents of the Operation Manual. In addition, request that the customer keep and conveniently store the "Information for the Person in Charge of Installation (Electrical) Work and Servicing" together with the Operation Manual.

WARNING

- Request installation and electrical work only from the dealer or a qualified air conditioning specialist.
  Attempting to carry out installation work on your own, and doing so incorrectly, may result in electrical shock, fire, or other hazards.
- Installation procedures must be performed correctly, carefully following the instructions in this document.
  Failure to do so may result in electrical shock, fire, or other hazards.
- Electrical work must be performed by a qualified electrician. It must be performed in accordance with technical standards related to electrical equipment, interior wiring regulations, local codes, and the contents of these instructions. Be sure to use a dedicated power supply circuit.
  Insufficient power circuit capacity or improper electrical work may result in electrical shock or fire.
- Use only the designated cables for wiring, and connect them securely.
  Fasten cables so that no external force is applied to the terminal connections.
  Insufficient connections or cable fastening may result in heat generation, fire, or other hazards.

CAUTION

- Depending on the installation location, it may be necessary to install an earth leakage breaker. Failure to do so may result in electrical shock or fire.
- Do not install in kitchens, workshops, or other locations where there is oil mist in the air.
- Do not install next to windows or in other locations exposed to direct sunlight or in direct contact with outside air.
- Do not install near an elevator, automatic door, industrial sewing machine, or other devices that can be expected to produce electrical noise.

Accessories for Schedule Timer

No.	Supplied parts	Q'ty
1	T10 power wire (with current fuse) *1	1
2	T10 relay wire *2	1
3	Power wire for connection to system controller	1
4	Screws M4×30	1

No.	Supplied parts	Q'ty
5	Spacers	2
6	Wire joints	6
7	Operation manual	1
8	Installation manual	1

Installing the Schedule Timer

<Note 1> Avoid twisting the inter-unit control wiring or the input/output wiring together with power or other wiring, and avoid running them in the same metal conduit. Doing so can cause malfunction.

<Note 2> Install the schedule timer at a location away from any sources of electrical noise.

<Note 3> Install a noise filter or take other appropriate action if electrical noise affects the power supply circuit of the unit.

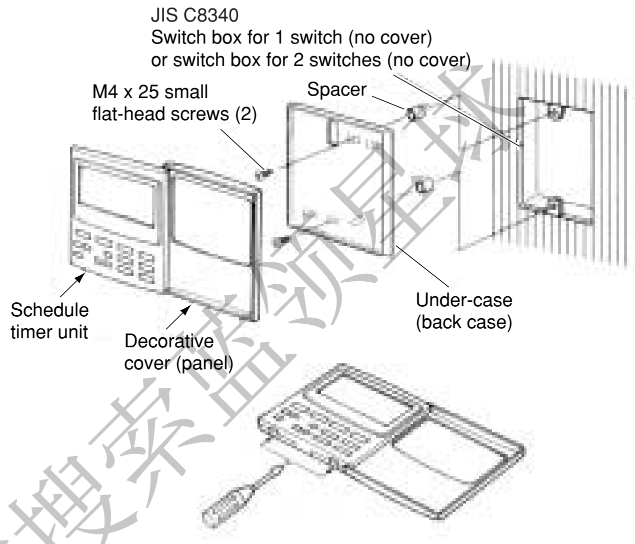


Fig. 2

(1) Open the panel on the schedule timer unit. Insert a standard (flat-head) screwdriver or similar tool into the notches on the bottom of the schedule timer unit to open and remove the back case.
(2) Use the 2 supplied M4 small screws and install the schedule timer back case onto the switch box. Before installing, use a screwdriver or similar tool to press on and open the screw holes that correspond to the JIS box that is used.
When fastening the case, use spacers and do not tighten the screws too much. If the schedule timer does not fit tightly against the wall, cut the spacers as required to make adjustments.
(3) Connect the supplied power wire (2-core) and inter-unit control wire (3-core) to the schedule timer unit.
(Refer to "Wiring the Schedule Timer.")
(4) Align the schedule timer unit with the tabs on the back case and press to install it.

*1 If the fuse blows as a result of a wiring short-circuit, miswiring, or overcurrent, replace it with a 125 V, 0.1 A fuse.
*2 Use with 3-series type (Fig. 1).

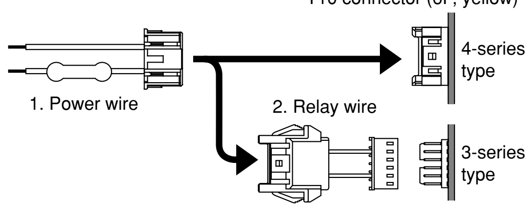


Fig. 1

Installation of connected schedule timers

When installing schedule timers (remote controller switches, system controllers, etc.) onto the wall, use the method shown in Figs. 3 and 4.

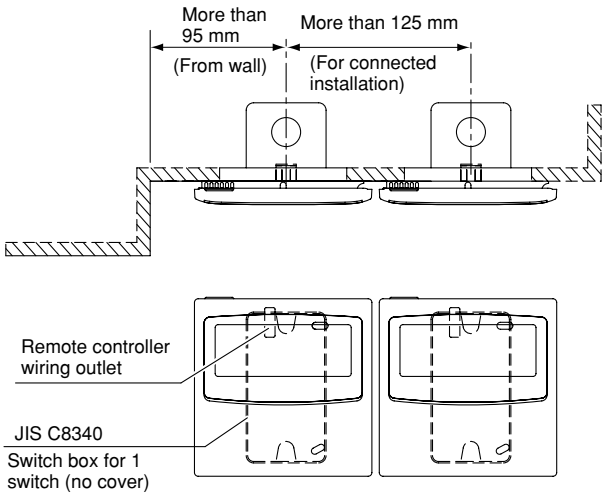
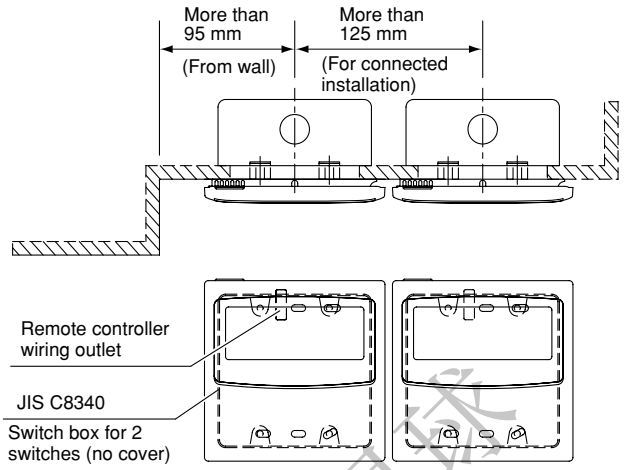


Fig. 3



* For maintenance reasons, leave a gap of 25 mm or more between the remote controller switch and schedule timer if they are arranged in parallel above/below each other.

Fig. 4

Wiring the Schedule Timer

- Before beginning wiring
  - Use 0.5 – 2 mm² wires for field supply wiring.
  - For inter-unit control wiring, use signal wires that allow the remote controller wiring to be differentiated from the power wiring, and take care to prevent miswiring. **(Miswiring will damage the schedule timer.)**
  - Check that the schedule timer communications wiring and power wiring are connected correctly. (Fig. 5)

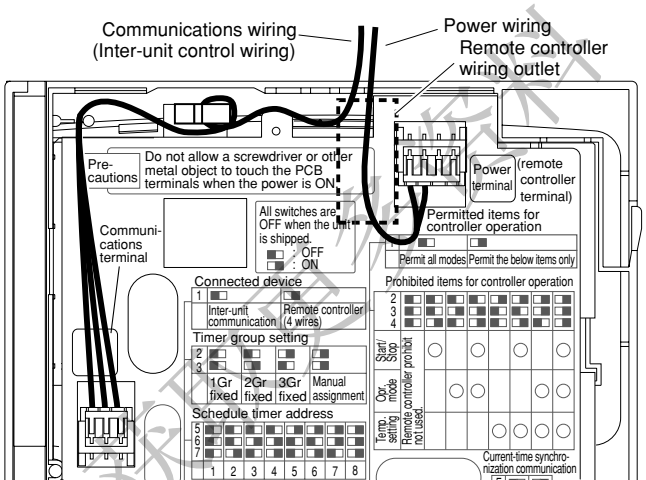


Fig. 5

<Basic Wiring Diagram>

- Route the A/C inter-unit control wiring for central control as shown in the figure below.
- The maximum number of indoor units that can be connected to a single system is 64. The maximum number of outdoor units is 30.
- The maximum number of schedule timer units that can be connected is 8. (A maximum of 10 schedule timer units and other central control devices can be connected.)

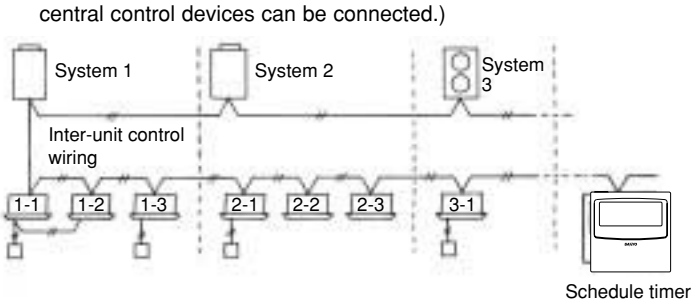


Fig. 6

<Note> Depending on the model of A/C, a local adapter may be required.

- Wiring

The schedule timer wiring can be connected by the following two methods. Select one of these connection methods according to the actual installation location.
When wiring, extend the lengths of the wires using wire joints (provided) and extension wires (field supply).

CAUTION **When installing multiple schedule timers, avoid the use of cross-over wiring.**

- Connection diagram (Be sure to use the provided wires as the power wiring.)

If a system controller is also installed:

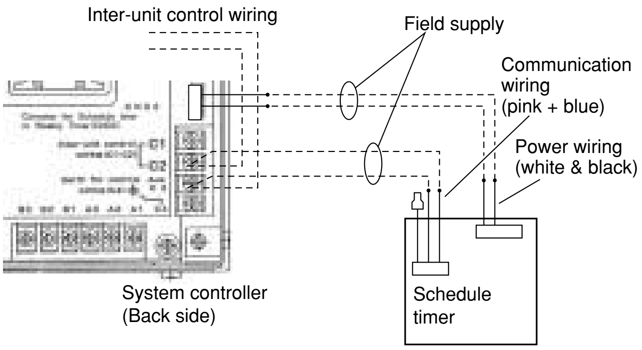


Fig. 7

Connect the wires for the schedule timer inter-unit control wiring (see Note below) to the C1 and C2 terminals on the system controller terminal board. Connect the system controller power wiring to CN02 and to the schedule timer power wires (white + black).

- The inter-unit control wiring has no polarity. The wiring may be connected in either direction to C1 and C2.
- The power wiring has no polarity. The wiring may be connected in reverse.
- **The length of the power wiring must be no more than 100 m.**

Note: The inter-unit control wires are pink + blue + blue (using wire joint crimping). Use pink + blue wires.

If a system controller is not installed (power is supplied from the indoor unit):

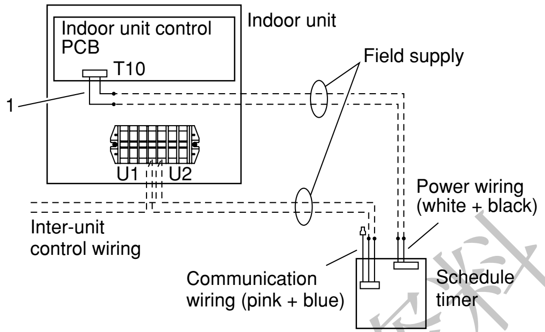


Fig. 8

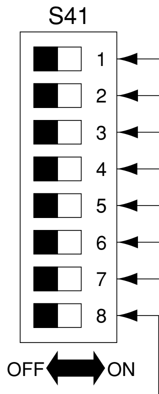
If power is supplied from the indoor unit control PCB of a nearby indoor unit, connect the provided T10 terminal connection wires to the T10 terminal on the indoor unit control PCB, and to the schedule timer power wires.

- The inter-unit control wiring has no polarity. The wiring may be connected in either direction to U1 and U2.
- If necessary, use a relay wire when connecting the wiring to the indoor unit control PCB.
- The power wiring has no polarity. The wiring may be connected in reverse.
- **The length of the power wiring must be no more than 200 m.**

<Note> The only functions of the schedule timer are indoor unit ON/OFF and remote controller enable/disable operations. It is therefore recommended that during installation, a system controller, remote controller, or similar device be installed next to the schedule timer so that the operation mode and other information can be checked.
(If the system controller or other central control device is not present, the schedule timer cannot be used in combination with a system that does not utilize remote controllers.)

About the Setting Switches

Complete the switch settings before turning ON the schedule timer power.



* These switches are all OFF at the time of delivery.

Connection (1)

This switch should be OFF for normal use. **Turn S41 switch ON only for systems that are compatible with the former weekly timer service.**

Timer Group Settings (2, 3)

Function	2	3
1 timer group – fixed	OFF	OFF
4 timer group – fixed	OFF	ON
8 timer group – fixed	ON	OFF
Manual group setting	ON	ON

What is a timer group?
This is a group of indoor units, created by dividing the central control addresses of the 64 indoor units that are connected to the inter-unit control wiring, and assigning a timer program to each group.

Central Control Main/Sub Switching (4)

Sub: OFF
Main: ON

(1) Set to "sub" (OFF) when using together with the AMY adapter, communications adapter, intelligent controller, multi-controller, LON I/F, and system controller.
(2) In cases other than (1) above, when using together with an ON/OFF central controller, set to "main" (ON) when only 1 schedule timer unit is used.
(3) In cases other than (1) above, and when using with multiple schedule timer units, set only 1 unit to "main" (ON) and set the remainder to "sub" (OFF).

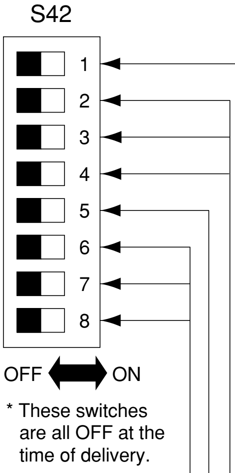
Schedule Timer Address Settings (5, 6, 7)

A maximum of 8 schedule timer units can be connected to the inter-unit control wiring. If multiple units are connected, use the setting switches and allocate the addresses, taking care to avoid duplication.

Function	5	6	7
Address 1	OFF	OFF	OFF
Address 2	OFF	OFF	ON
Address 3	OFF	ON	OFF
Address 4	OFF	ON	ON
Address 5	ON	OFF	OFF
Address 6	ON	OFF	ON
Address 7	ON	ON	OFF
Address 8	ON	ON	ON

Holiday and Operation Disable Settings for Each Group (8)

When this setting switch is OFF, units are all controlled together. When this switch is ON, the units are controlled by the settings for each timer group.



* These switches are all OFF at the time of delivery.

Remote Controller Enable Items (1)

If remote controller enable/disable is used, this switch sets the range for remote controller enable (cancel).

Enable all items* that can be controlled with the remote controller.
OFF
Enable only the items determined by setting switches 2, 3, and 4.
ON

This switch should be OFF for normal use, or when remote controller enable/disable is not used.

* This refers to the following items: start/stop, operation mode, temperature setting, flap, and fan speed.

Remote Controller Disable Item Switches (2, 3, 4)

When timer remote controller disable is used, set the remote controller disable item switches according to the items for which remote controller operation will be disabled.

Remote controller disabled items		2	3	4
Remote controller disable not used		OFF	OFF	OFF
Start/stop	Central 1	OFF	OFF	ON
Operation mode	Central 4	OFF	ON	OFF
Operation mode + Start/stop		OFF	ON	ON
Temperature setting		ON	OFF	OFF
Temperature setting + Start/stop		ON	OFF	ON
Temperature setting + Operation mode	Central 3	ON	ON	OFF
Temperature setting + Operation mode + Start/stop	Central 2	ON	ON	ON

Central 1 – 4 are the designations for the remote-controller disable modes for the system controller.

Simultaneous time communications (5) Disabled: OFF Enabled: ON

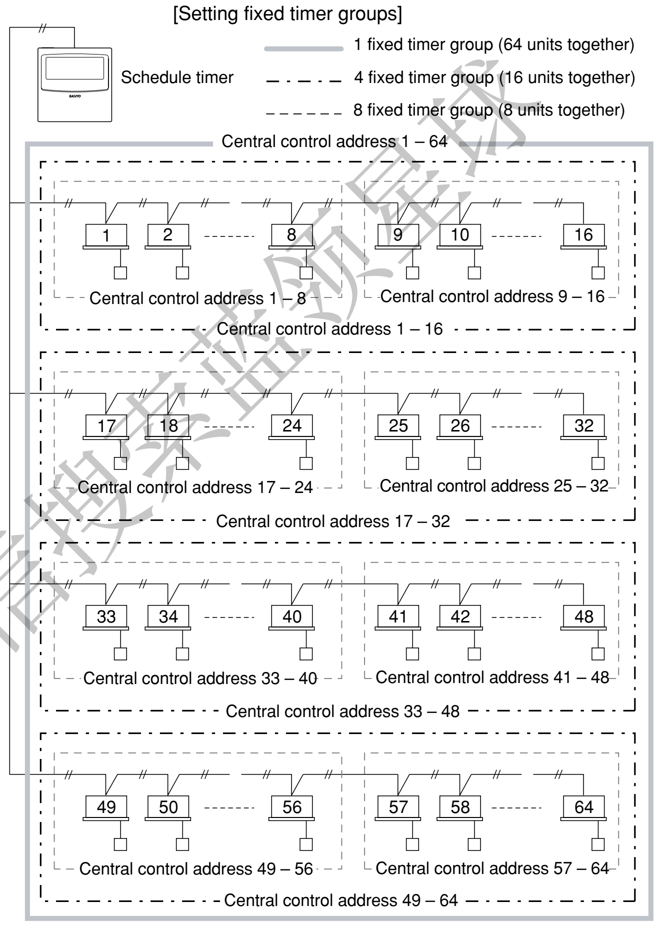
When multiple schedule timers are installed, set this switch to ON to perform time settings for multiple units simultaneously. One minute after the time is set, the time at the other schedule timers will change to match the set time. (Ordinarily this switch is OFF.)

Spare (6, 7, 8)

Be sure that these switches are OFF when the system is used.

Creating Timer Groups

The schedule timer can be set for 6 time status changes. These can be used to create up to 8 groups (timer groups). For systems in which schedule timers are used, set the timer groups to match the central control addresses of the indoor units that will be subject to group timer control. The timer-group settings for the schedule timer involve assignment of central control addresses. Therefore, use the system controller (or other central control device) or wired remote controllers to set the central control addresses of the indoor units, then make the schedule timer settings.



7

- **Procedure for making fixed timer group settings (fixed groups)**

(1) First, use a different central control device (system controller or other device) or the wired remote controllers to set the central control addresses, as assigned in the figure above, to the indoor units that will be subject to group timer control.
(2) Next, use S41 switches 2 and 3 to set the number of timer groups you wish to create.
(3) Finally, turn ON the schedule timer power. Initial communications are performed. (SCAn blinks in the display.) The normal display appears after several minutes, and the timer group settings are confirmed.

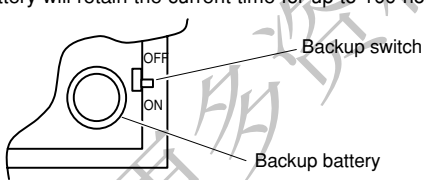
- **Procedure for making manual timer group settings (manual group assignments)**

Manual timer group settings allow central control addresses to be assigned freely within the timer groups.

(1) Turn ON S41 setting switches 2 and 3, then turn ON the power. Restart and initial communications are performed. (SCAn blinks in the display.) The normal display appears after several minutes.
(2) When the normal display appears, press and hold the schedule timer CLEAR button, the timer button, and the button for 4 seconds or longer. “Ad-01” appears, blinking, in the current time display. (Ad indicates “address” and 01 is the central address number.)
(3) Use the GROUP button in the area to select the timer group. Then use the DAY button in the area to select the central control address to assign and register for that timer group. Press the SET button to register the selected central control address.
(4) To continue registering addresses, repeat step (3). (Central control address numbers will be added to the right side of the LCD display.) To cancel a registered central control address, use the GROUP button in the area to select the timer group, then use the DAY button in the area to select the central control address and press the CLEAR button.
(5) Repeat steps (3) – (4) for each timer group. When registration is completed, press the timer button. The schedule timer restarts automatically and performs initial communications. (SCAn blinks in the display.) The normal display appears after several minutes, and the manually assigned timer group settings are confirmed.

Memory Backup Switch

After installation is completed, check that the backup switch on the reverse side of the schedule timer PCB is turned to ON.
(The backup battery will retain the current time for up to 100 hours.)



Checking the Central Control Addresses and Operating the Units that are Controlled by the Schedule Timer

The schedule timer communicates with the indoor units to check which central control addresses can be controlled with the current timer control. The schedule timer can then be used to start and stop these units.

(1) Press and hold the schedule timer button, TIMER OFF button, and CLEAR button for 4 seconds or longer. “Ad-(central control address)” appears in sequence, blinking.
(2) Use the GROUP button in the area to display the blinking central control addresses in sequential order. In this way, it is possible to check which central control addresses in the displayed timer group can be operated by the timer.
(3) With the selected timer group displayed, press the timer button. Each time the button is pressed the indoor units in the displayed timer group start or stop. Pressing the button in this mode permits all items (operation start/stop, operation mode, temperature setting items) at the indoor units in the displayed timer group where remote controller prohibit is in effect.
(4) After checking the addresses and operating the units, press and hold the CANCEL button for 2 seconds or longer. The schedule timer display returns to the normal display and all controllable indoor units stop.

Explanation to Customers

- After work is completed, present the Operation Manual and Information for the Person in Charge of Installation (Electrical) Work to the customer.
- Explain to the customer the methods for use of the system, as described in the Operation Manual.

Installation Work Plan

- Use the wired remote controller to check the unit No. of the indoor units.
  (Start the A/C unit with the wired remote controller, then press the remote controller UNIT SELECT button once to display the unit No. of the master unit.)

Schedule timer			Central control addresses	Indoor unit Unit No. System - Indoor	Room name
Fixed timer group					
1	4	8			
1 At the time of shipment	1	1	1	– , –	
			2	– , –	
			3	– , –	
			4	– , –	
			5	– , –	
			6	– , –	
			7	– , –	
			8	– , –	
		2	9	– , –	
			10	– , –	
			11	– , –	
			12	– , –	
			13	– , –	
			14	– , –	
			15	– , –	
			16	– , –	
	2	3	17	– , –	
			18	– , –	
			19	– , –	
			20	– , –	
			21	– , –	
			22	– , –	
			23	– , –	
			24	– , –	
		4	25	– , –	
			26	– , –	
			27	– , –	
			28	– , –	
			29	– , –	
			30	– , –	
			31	– , –	
			32	– , –	
	3	5	33	– , –	
			34	– , –	
			35	– , –	
			36	– , –	
			37	– , –	
			38	– , –	
			39	– , –	
			40	– , –	
		6	41	– , –	
			42	– , –	
			43	– , –	
			44	– , –	
			45	– , –	
			46	– , –	
			47	– , –	
			48	– , –	
	4	7	49	– , –	
			50	– , –	
			51	– , –	
			52	– , –	
			53	– , –	
			54	– , –	
			55	– , –	
			56	– , –	
		8	57	– , –	
			58	– , –	
			59	– , –	
			60	– , –	
			61	– , –	
			62	– , –	
			63	– , –	
			64	– , –	

12. Serial-Parallel I/O Unit for Each Indoor Unit (ACC-SP1AG(B))

For Your Safety

Read the following instructions carefully, and carry out secure installation and electrical work.

The precautions given in this manual consist of specific "⚠Warning" and "⚠ Caution". They provide important safety-related information. Be sure to strictly observe all safety procedures. The labels and their meanings are as described below.

⚠Warning	This symbol refers to a hazard or unsafe procedure or practice that can result in severe personal injury or death.
⚠Caution	This symbol refers to a hazard or unsafe procedure or practice that can result in personal injury or product or property damage.

After installation is completed, perform a test run to check for operating trouble. Explain operating procedures to the customer and request the customer to store the Procedures for Installation (Electrical Work) and Test Operation of Seri-Para I/O Unit for each indoor unit.

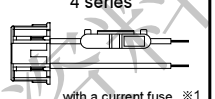
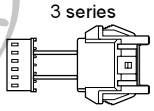
⚠ Warning

- Be sure to arrange installation by the dealer where the system was purchased or by a professional installer. Electric shock or fire may result if an inexperienced person performs any installation or wiring procedures incorrectly.
- Be sure that this unit is securely installed in accordance with the Procedures for Installation (Electrical Work) and Test Operation of Seri-Para I/O Unit for each indoor unit. Electric shock or fire may result if any installation or wiring procedures are incorrectly performed.
- Only a qualified electrician should attempt to connect this system, in accordance with the instructions in this manual. Use a dedicated electrical circuit. Insufficient electrical circuit capacity or incorrect installation may cause electric shock and fire.
- Use the specified cables for the electrical connections, and connect the cables securely. Run and fasten the cables securely so that external forces or pressure placed on the cables will not be transmitted to the connection terminals. Overheating or fire may result if connections or attachments are not secure.

⚠ Caution

- Depending on the installation conditions and location, an earth leakage breaker may be required. If an earth-leakage breaker is not installed, there is a danger of electric shock or fire.
- Ground yourself to discharge static electricity before performing any wiring.

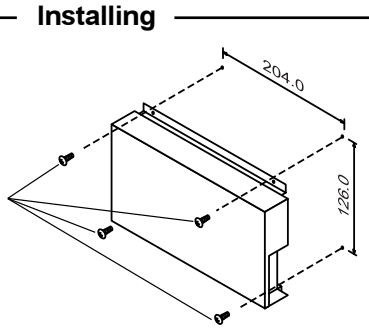
Accessories

No.	Accessory	Quantity	No.	Accessory	Quantity
①	T10 cable (150mm) for indoor model of 4 series  with a current fuse ※1	1	③	Installation Screws (tapping screws ϕ4x8mm) 	4
			④	Wire joints 	2
②	T10 cable (100mm) for indoor model of 3 series 	1	⑤	Installation Plan (this manual) 	1

※1 In the case of melting-down of fuse cables due to a short-circuit, wrong wiring or excessive current, change current to 125V/0.1A.

Installing

Installation Screws
(tapping screws x 4
Accessory components③)

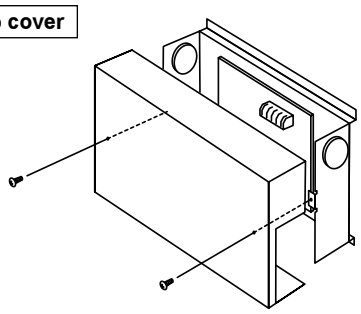


Note:

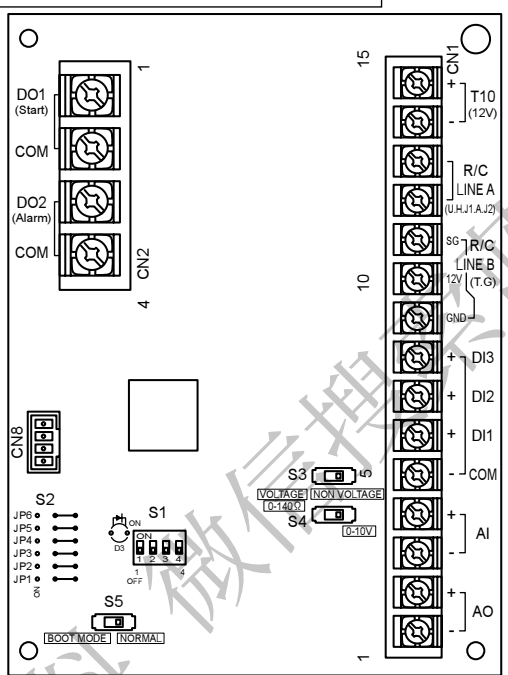
- Do not run the communication lines and power cables through the same conduit, or twist those cables together, or place the cables near one another. It can cause mal-function.
- Install it away from any sources of electrical noise.
- Avoid installing in any locations where the unit may come into contact with water, or in any extremely humid locations.
- Avoid installing in any location that is subject to excessive vibration or physical impacts.

Wiring

Removing the top cover



Arrangement of the terminal block and switches



CN1	15	+	T10(12V)	12 V power supply
	14	-		
	13		R/C LINE A	Remote control line A
	12			
	11	SG	R/C LINE B	Remote control line B
	10	12V		
	9	GND		
	8	+	DI 3	Digital input
	7	+	DI 2	
	6	+	DI 1	
	5	-	COM	
	4	+	AI	Analog input (Change temperature setting)
	3	-		
	2	+	AO	Analog output (Room temperature monitor)
	1	-		

CN2	1	DO1	Digital output 1 (Start output)
	2	COM	
	3	DO2	Digital output 2 (Alarm output)
	4	COM	

S1	Control type setting switch
S2	Detail setting switch
S3	Voltage present / absent switch
S4	Set temperature input select switch
S5	Not used

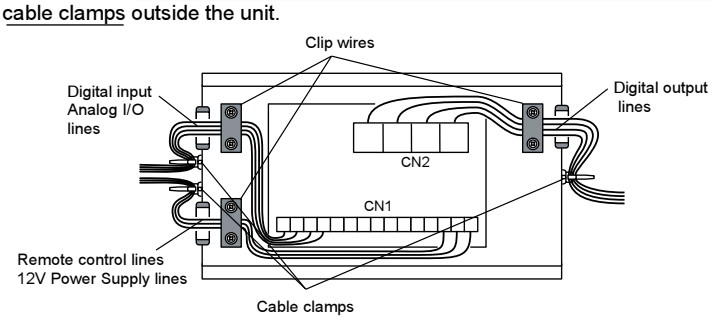
CN8	Not used

Caution:

- Always use round connectors with insulator holddown for wiring to the terminal block. (CN1 uses M3.0, CN2 uses M3.5)

Securing the wiring

Make sure to secure all wiring using the clip wires inside the unit, and the cable clamps outside the unit.



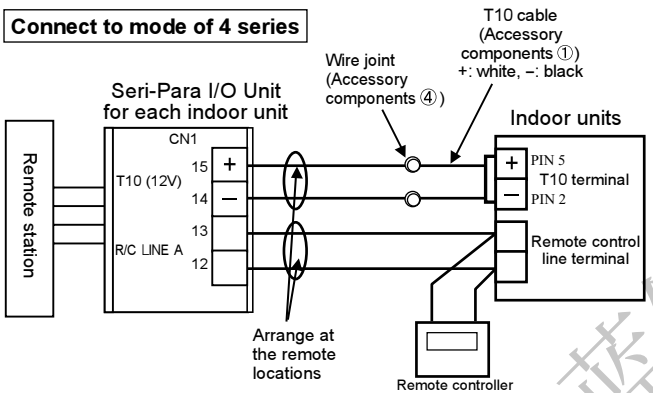
Caution:

- If using high-voltage wiring such as AC power supply (Digital output), make sure that wiring does not contact any component on the circuit board, or any low-voltage (CN1) wiring.

(1) Connecting to indoor units

- Do not run the control lines and power cables in the same conduit, do not connect those lines and cables with the same wire, and do not place those lines and cables close together. (Maintain a minimum 30 cm separation.)
- Wiring specifications
  Type: vinyl insulated cord with sheath
  Thickness: 0.5 to 2.0 mm^2
  Length: 200 m maximum

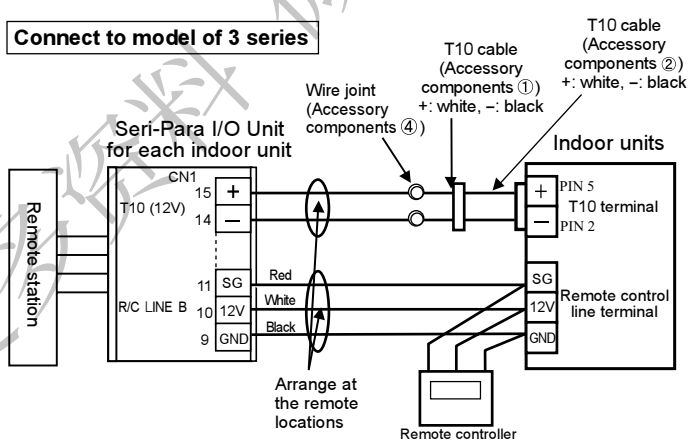
Connect to mode of 4 series



- Remote control line
  Connect terminals 12 and 13 (Remote Control Line A) on the Seri-Para I/O Unit terminal block CN1 to the Remote Control terminals of the indoor unit.
  There is no polarity for the signal wires.

- 12V power supply line
  Connect terminals 14 and 15 (12V Power Supply Line) on the Seri-Para I/O Unit terminal block CN1 to the T10 terminal of the indoor unit.
  The polarity of the connection is important; make sure to connect the + and - terminals correctly.
  Wiring the polarity incorrectly may result in damage to the units.

Connect to model of 3 series



- Remote control line
  Connect terminals 9, 10, and 11 (Remote Control Line B) on the Seri-Para I/O Unit terminal block CN1 to the Remote Control terminals of the indoor unit. The polarity of the connection is important; make sure to connect the GND, 12V and SG correctly.
  Wiring the polarity incorrectly may result in damage to the units.

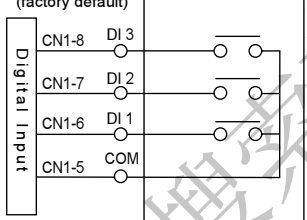
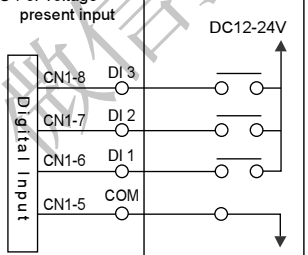
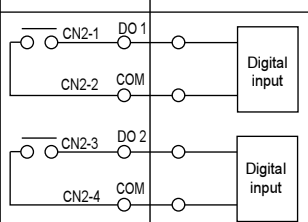
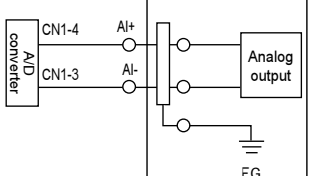
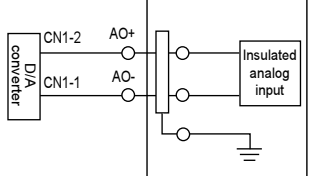
- 12V power supply line
  Connect terminals 14 and 15 (12V Power Supply Line) on the Seri-Para I/O Unit terminal block CN1 to the T10 terminal of the indoor unit.
  The polarity of the connection is important; make sure to connect the + and - terminals correctly.
  Wiring the polarity incorrectly may result in damage to the units.

Cautions

* In addition to the Seri-Para I/O Unit, be sure to install a remote control or centralized control device (system controller, etc.) in the indoor unit.
* Two or more Seri-Para I/O Units cannot be linked within a remote control line.
* The Seri-Para I/O Unit cannot be used with a control device which uses the T10 terminal of the indoor unit (example: indoor unit relay board, schedule timer, etc.)

(2) Connecting to the Remote Stations

● Do not run the control lines and power cables in the same conduit, do not connect those lines and cables with the same wire, and do not place those lines and cables close together. (Maintain a minimum 30 cm separation.)

Name	Input/ output item	Seri-Para I/O Unit side		Remote Station side	
		Input/output conditions	Terminal number	Example Circuit	Input/output conditions
Digital input/output terminal	Digital input ※1	DI1 Input DI2 Input DI3 Input Voltage a-contact static or Voltage a-contact pulses Allowable contact voltage and current: DC 24 V, 10 mA Voltage present / absent switch : S3 Voltage absent: set to [NON VOLTAGE] Voltage present: set to [VOLTAGE]	● For voltage absent input (factory default)  ● For voltage present input 		Voltage present 12 to 24V or Voltage absent When pulse input: 200 ms minimum
	Digital output ※2	Start output Alarm output No-voltage a-contact static Allowable contact voltage and current: AC 240 V, 3A DC 24 V, 3A (Minimum load 10mA)			
Analog input/output terminal	Analog input ※3	Indoor temperature setting input Input voltage:0 to 10V or 0 to 140 Ω Temperature setting range: Within the indoor units temperature setting range Temperature reading: In steps of 1℃ Set temperature input select switch : S4 Voltage level input: set to [0 to 10V] Resistance connection: set to [0 to 140 Ω]			For analog inputs, use within 0.1% of reference accuracy
	Analog output ※4	Indoor temperature monitor output Output current: 4 to 20 mA Temperature indication range: 5 to 36 °C, 0.5 °C step			Allowable load: 240 Ω maximum

※1 Digital input

● Select the control type using control type setting switch S1, according to the table below.

Control type	Input1 (DI 1)		Input2 (DI 2)		Input3 (DI 3)		Voltage a-contact static/pulses ※1
	(open) (close)	(close) (open)	(open) (close)	(close) (open)	 (open) (close)	 (close) (open)	
0	Start Fan low	Indoor units stop when all of Input 1, 2, 3 are open	Start Fan medium	Indoor units stop when all of Input 1, 2, 3 are open	Start Fan high	Indoor units stop when all of Input 1, 2, 3 are open	All input: static
1	Start Prohibit R/C Start/Stop	Stop Prohibit R/C Start/Stop	Start Accept R/C Start/Stop	Stop Prohibit R/C Start/Stop	Stop Prohibit R/C Start/Stop	-	Input 1, 2: static Input 3: pulse
2	Start Prohibit R/C Start	Stop Prohibit R/C Start/Stop	Accept R/C Start/Stop	Stop Prohibit R/C Start/Stop	Stop Prohibit R/C Start/Stop	-	Input 1, 2: static Input 3: pulse
3	Start <-> Stop Prohibit R/C Start/Stop	-	Start <-> Stop Accept R/C Start/Stop	-	Stop Prohibit R/C Start/Stop	-	All input: pulse
4	Start Prohibit R/C Start/Stop	-	Start Accept R/C Start/Stop	-	Stop Prohibit R/C Start/Stop	-	
5	Start Prohibit R/C Start	-	Accept R/C Start/Stop	-	Stop Prohibit R/C Start/Stop	-	
6	Start Accept R/C Start/Stop	-	Stop Accept R/C Start/Stop	-	-	-	
7	Start <-> Stop Prohibit R/C Start/Stop	-	Start <-> Stop Accept R/C Start/Stop	-	Set thermostat OFF	Release thermostat OFF	Input 1, 2: pulse Input 3: static
8	-	-	-	-	-	-	-
9	Heat	-	Cool	-	Fan	-	All input: pulse
10	Heat Start	Indoor units stop when all of Input 1, 2, 3 are open	Cool Start	Indoor units stop when all of Input 1, 2, 3 are open	Fan Start	Indoor units stop when all of Input 1, 2, 3 are open	All input: static
11	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-
15	Start	Stop	-	-	Set thermostat OFF	Release thermostat OFF	All input: static

※ R/C: Remote Controller

※1: When inputting pulses, set the pulse width to 200 ms.

●Wiring specifications

Type: vinyl insulated cord with sheath
Thickness: 0.5 to 2.0 mm^2
Length: 100 m maximum

※2 Digital output

●D01 for start output signal.
D02 for alarm output signal.
●Maximum allowable contact voltage and current are AC 240 V and 3 A maximum or DC24 V and 3 A maximum.
●Wiring specifications are for digital input.

※3 Analog input

●Select the temperature setting control method from the following 3 types.

- Input voltage ① (equally divided upper and lower setting temperature limits)
- Input voltage ② (fixed voltage)
- Input resistance

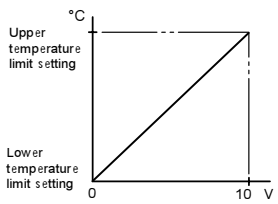
●In case of Input voltage ①, ②

- Set the Set temperature input switch S4 to "0 to 10 V" (factory default)
- Wiring specifications

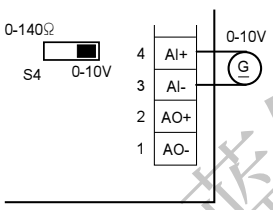
  Type: vinyl insulated cord with sheath (shield line recommended)
  Thickness: 1.25 to 2.00 mm^2
  Length: 70 m maximum

●Input voltage ① (equally divided upper and lower setting temperature limits)

- Performed in the input range of 0 to 10 V DC (lower setting temperature limit to upper setting temperature limit). (factory default)
- Relationship between setting temperature and voltage is as the diagram below.
- Upper and lower temperature setting limits may vary according to the indoor units and operation mode.
  Refer to the relationship between setting temperature and voltage, described in (example) 3-1 "Operation mode of a typical model [lower limit to upper limit]".



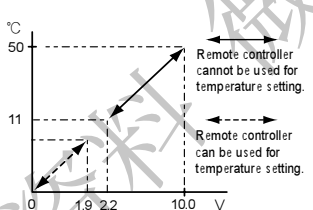
Relationship between input voltage and temperature

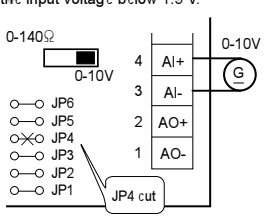


Line connection

●Input voltage ② (fixed voltage)

- Performed in the input range of 0 to 10 V DC.
- The effective range of the setting temperature is 2.2 V to 10 V (11 °C to 50 °C).
  Remote controller cannot be used for temperature in this range.
- When the input exceeds the upper or lower setting temperature limits, it is set to the upper or lower limits.
  For example, in case of air-conditioning (cool) [18 °C to 30 °C], if the voltage is below 3.5 V, the temperature is set to 18 °C, and if over 6.2 V, to 30 °C.
- To set the temperature using remote controller, set the input voltage below 1.9 V.





Mapping table of setting temperature and input voltage (input voltage ②)

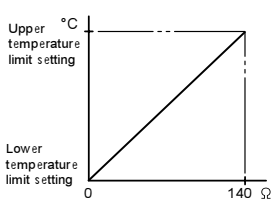
Temperature setting [°C]	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Input voltage [V]	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	5.0	5.2	5.4	5.6	5.8	6.0

Note:
Input voltage after an indoor unit has been connected.
The maximum input voltage is 10 V. Over 10 V input voltage may cause malfunction.

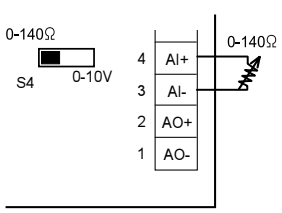
●Input resistance

- Temperature setting (1 °C step) is performed in the range of 0 to 140 Ω.
- Relationship between setting temperature and resistance is as the diagram below.
- Upper and lower temperature setting may vary according to the indoor units and operation mode.
  Refer to the relationship between setting temperature and resistance, described in (example) 3-1 "Operation mode of a typical model [lower limit to upper limit]".
- Set the Set temperature input switch S4 to "0 to 140 Ω".
- Wiring specifications

  Type: vinyl insulated cord with sheath (shield line recommended)
  Thickness: 1.25 to 2.00 mm^2
  Length: 70 m maximum

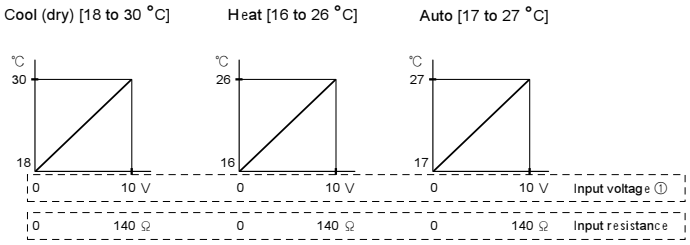


Relationship between connection resistance and temperature



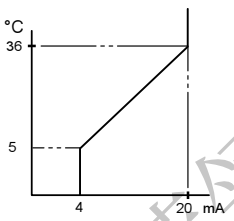
Line connection

(example) 3-1: Operation mode of a typical model [lower limit to upper limit °C]



※4 Analog output

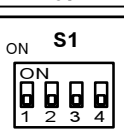
●The indoor temperature monitor output is from 4 to 20 mA DC (5 to 36°C), and the temperature can be set in steps of 0.5°C. Take care of the measurement units used by the central monitor. The wiring specifications are for analog input.
Keep the load resistance below 240 Ω.



Relationship between current value and temperature

Settings switch

Control type setting switch S1

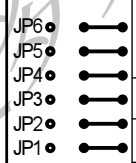


– : OFF ● : ON

Control type	S1 1	S1 2	S1 3	S1 4	Control type	S1 1	S1 2	S1 3	S1 4
0	–	–	–	–	8	–	–	–	●
1	●	–	–	–	9	●	–	–	●
2	–	●	–	–	10	–	●	–	●
3	●	●	–	–	11	●	●	–	●
4	–	–	●	–	12	–	–	●	●
5	●	–	●	–	13	●	–	●	●
6	–	●	●	–	14	–	●	●	●
7	●	●	●	–	15	●	●	●	●

Refer to digital input.

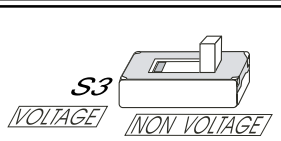
Detail setting switch S2



JP6	Connection	N/C	(factory default)
	Cut	N/C	
JP5	Connection	With Remote controller or centralized control system	(factory default) ※4
	Cut	Without Remote controller or centralized control system	※4
JP4	Connection	Input voltage ①	(factory default) ※3
	Cut	Input voltage ②	※3
JP3	Connection	Output control temperature as room temperature	(factory default) ※2
	Cut	Output intake temperature as room temperature	※2
JP2	Connection	Set temperature push priority	(factory default) ※1
	Cut	Prohibit Remote controller temperature setting	※1
JP1	Connection	N/C	(factory default)
	Cut	N/C	

※1: Switches the local remote control temperature setting operation between push priority and operation prohibited.
※2: Switches the room temperature monitor output between the temperature used by the controller (when heating, the intake temperature with shift, or the remote control sensor) and the intake temperature.
※3: Cut (fixed voltage) JP4, although no change the setting temperature with Seri-Para I/O Unit. Do not input voltage to No.3 and 4 (AI±) of CN1 at the time.
※4: When using the Seri-Para I/O Unit, it is standardized to connect a remote controller or a centralized control system (i.e. System controller). To use the Seri-Para I/O Unit by itself (without a remote controller or a centralized control system), cut JP5. In this regard, however, the operational functions (such as operation mode, fan speed and wind direction) will be limited with only the Seri-Para I/O Unit.

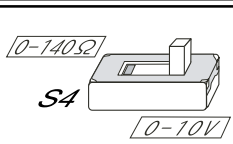
Voltage present / absent switch S3



(factory default)

For digital input, switches between voltage present and voltage absent.

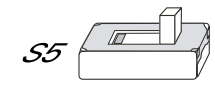
Set temperature input switch S4



(factory default)

For analog input, switches between input voltage and input resistance.

Boot Switch S5



(factory default)

Always set the S5 switch to NORMAL.

LED (Green) display

LED (Green) display

LED display	Meaning	Action to take
Off	Power Off	Check the remote control line connection
Blinking at 3 s intervals	12V (T10 terminal) power supply error	Check the power supply line connection Make sure that the fuse of the T10 cable (accessory components 1) does not meltdown.
On/off out at 1 s intervals	Indoor unit alarm	Clear the indoor unit alarm
On/off out at 100 ms intervals	Initializing communications, communications error	Check the remote control line connection
On ※1	Normal operation	-

※1: When transmitting setting data to an indoor unit, the LED will be turned off for 200 ms.

Product specifications

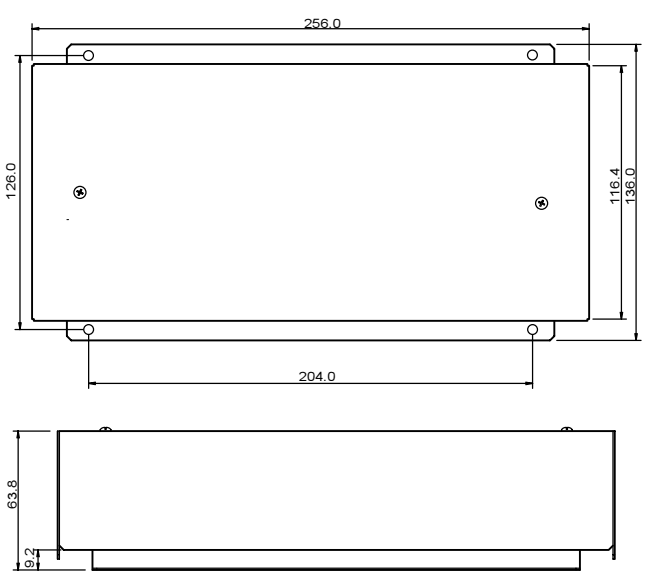
Compatible equipment	PAC: R22 & R407C Type Single H/P model of 3 & 4 Series ECO MULTI Series R410A Type ECO i Series GHP: R407C Type ECO G Series
Power	DC12V
Power consumption	1.2W, 0.1A
Operating environment conditions	Temperature: -10 to 50°C; Humidity: 20 to 80%; for indoor use only
External dimensions	256.0 mm (w) x 136.0 mm (d) x 63.8 mm (h)
Weight	0.9 kg

● DECLARATION OF CONFORMITY

This product is marked "CE" as it satisfies EEC Directive No. 89/336/EEC, 73/23/EEC and 93/68/EEC.
This declaration will become void in case of misusage and/or from non observance though partial of Manufacturer's installation and/or operating instructions.

External dimensions

unit: mm



13. Serial-Parallel I/O Unit (ACC-SP16TAG(B))

For Your Safety

1. Read the following instructions carefully, and carry out secure installation and electrical work.
2. The precautions given in this manual consist of specific "Warnings" and "Cautions." They provide important safety-related information. Be sure to strictly observe all safety procedures. The labels and their meanings are as described below.

⚠**Warning** This symbol refers to a hazard or unsafe procedure or practice that can result in severe personal injury or death.

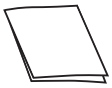
⚠**Caution** This symbol refers to a hazard or unsafe procedure or practice that can result in personal injury or product or property damage.

After installation is completed, perform a test run to check for operating trouble. Explain operating procedures to the customer following the central control device Operation Manual and then request the customer to store the Procedures for Installation (Electrical Work) of Serial-Parallel I/O Unit together with the central control device Operation Manual

⚠Warning
● Be sure to arrange installation by the dealer where the system was purchased or by a professional installer. Electric shock or fire may result if an inexperienced person performs any installation or wiring procedures incorrectly. ● Be sure that this unit is securely installed in accordance with the Procedures for Installation (Electrical Work) of Serial-Parallel I/O Unit. Electric shock or fire may result if any installation or wiring procedures are incorrectly performed. ● Only a qualified electrician should attempt to connect this system, in accordance with the instructions in this manual. Use a dedicated electrical circuit. Insufficient electrical circuit capacity or incorrect installation may cause electric shock and fire. ● Use the specified cables for the electrical connections, and connect the cables securely. Run and fasten the cables securely so that external forces or pressure placed on the cables will not be transmitted to the connection terminals. Overheating or fire may result if connections or attachments are not secure.

⚠Caution
● Depending on the installation conditions and location, an earth leakage breaker may be required. If an earth-leakage breaker is not installed, there is a danger of electric shock or fire.

1. Accessories attached with the Serial-Parallel I/O Unit

Accessories					
No.	Accessory	Quantity	No.	Accessory	Quantity
①	Installation Plan 	1	②	Installation Screws (tapping screws 4x12) 	4

2. Installing the Serial-Parallel I/O Unit

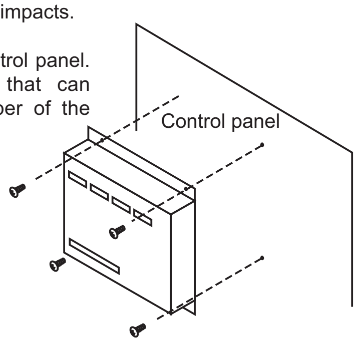
<Note 1> Do not run the indoor/outdoor control lines, input/output lines, and power cables through the same conduit, or twist those cables together, or place the cables near one another. It can cause malfunction.

<Note 2> Install the Serial-Parallel I/O Unit away from any sources of electrical noise.

<Note 3> Avoid installing in any locations where the unit may come into contact with water, or in any extremely humid locations.

<Note 4> Avoid installing in any location that is subject to excessive vibration or physical impacts.

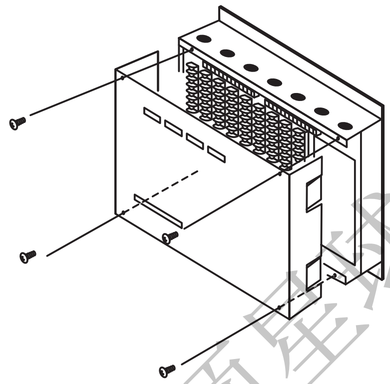
This unit is mounted on a control panel. Prepare the control panel that can accommodate required number of the Serial-Parallel I/O Units.



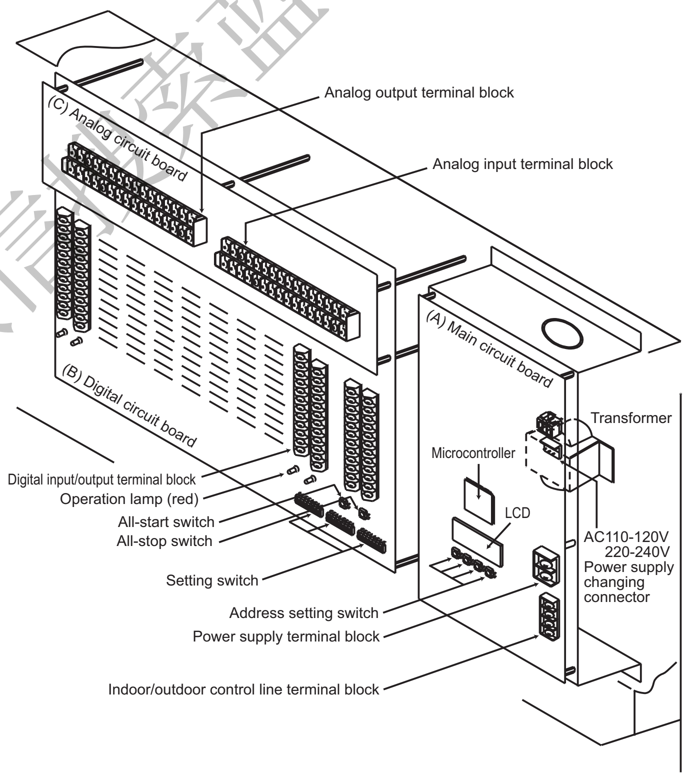
3. Wiring the Serial-Parallel I/O Unit

For safety, turn off the main power supply (breaker) before installing or removing the Serial-Parallel I/O Unit.

Remove the 4 screws from the body and remove the top cover.



< Arrangement of the Serial-Parallel I/O components >



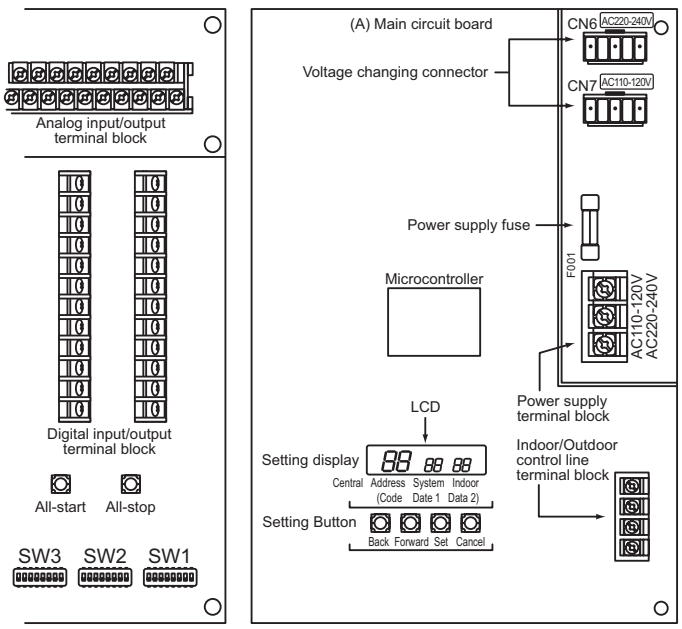
(1) Connecting the Power Supply

This unit can operate either on AC110-120V or AC220-240V.
Connect the primary side of the transformer to the CN6 connector (for AC220-240V) or the CN7 (for AC110-120V) on the main circuit board (A) after confirming which power voltage you use. This unit is originally set for CN6 (AC220-240V) before shipment.

(Note) If the combination of the power voltage and the transformer primary-side selection is incorrect, the unit may be damaged. Turn off the main power supply before changing the connector. Because this is a high-voltage circuit, there is a danger of electric shock.

7

<Arrangement of the Terminals and Switches on the Circuit Boards>

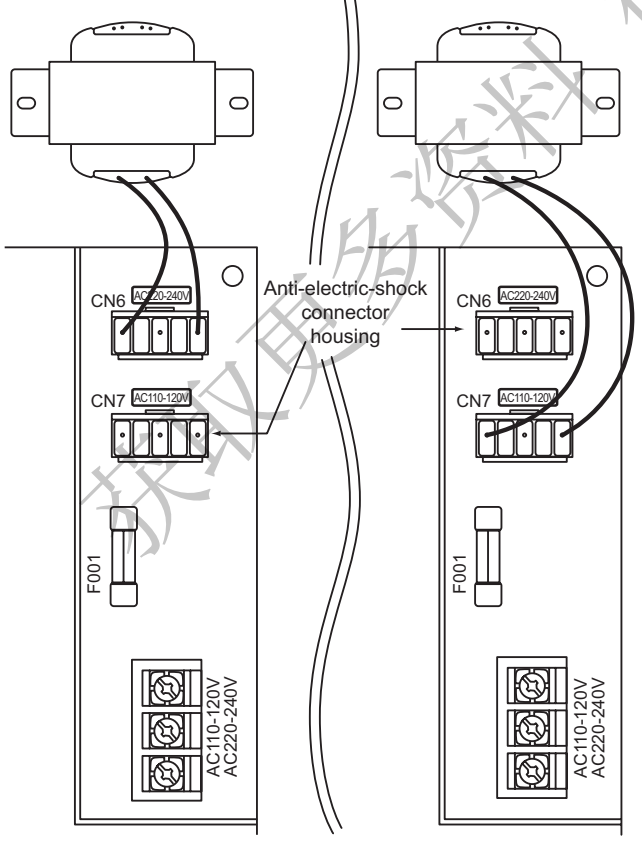


Before shipment from the plant,

CN7 (for AC110-120V) on the main circuit board (A) is covered by a connector housing to prevent electric shock. To change the voltage to AC110-120V, disconnect the primary cable of the power supply transformer from CN6 (AC220-240V) and connect the cable to CN7 (AC110-120V). And attach the connector housing on CN6 (see the following figure).

In Case of AC220-240V
(At the time of shipment from the plant)
Changing the connector is not necessary.

In Case of AC110-120V
Disconnect the primary cable of the transformer from CN6, and then connect it to CN7.



(2) Connecting the Serial-Parallel I/O Unit with the Indoor/Outdoor Control Line

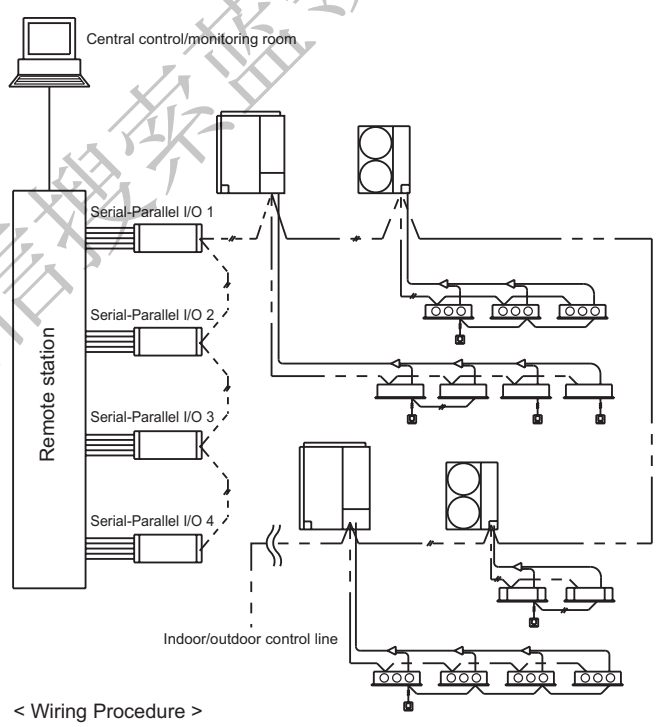
Use 2-wire codes with 0.5 - 2.0 mm^2 in thickness for indoor/outdoor control lines. There is no polarity for signal wires (up to 1000 m in total length). Do not run the control lines and power cables in a same conduit, not connect those lines and cables with a same wire, and not place those lines closer. For indoor/outdoor control lines, use signal wires that can be easily differentiated from power supply cables.

<Type of Signal Wire> Thickness: 0.5 - 2.0 mm^2

CVV (JIS C3401) : Vinyl-insulated vinyl-sheath control cable
VCTF (JIS C3306) : Vinyl cabtyre round code
VCT (JIS C3401) : 600V vinyl cabtyre cable
VVR (JIS C3342) : Vinyl-insulated vinyl sheathed round cable
MVVS : Braid-shielded instrument-use cable
CPEVS : Shielded polyethylene-insulated vinyl sheathed cable

< Basic Wiring>

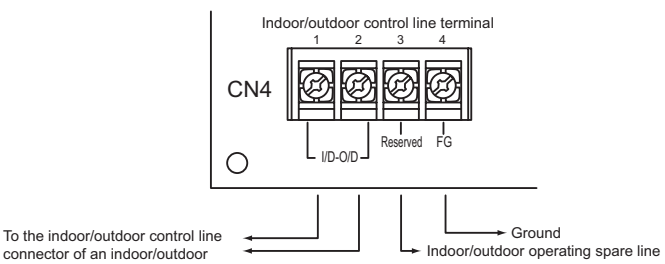
- Connect the indoor/outdoor control line of the Serial-Parallel I/O Unit as the figure shown below.
- The maximum number of indoor/outdoor units that can be connected to one system is 64 for indoor units and 30 for outdoor units.
- One system can be connected with four Serial-Parallel I/O Units at maximum. In the system, one Serial-Parallel I/O Unit can control 16 groups. Therefore, with a system with four Serial-Parallel I/O Units, the



< Wiring Procedure >

1) Indoor/outdoor control line

Connect the indoor/outdoor control line to Terminal 1 and Terminal 2 on the CN4 terminal block on the main circuit board (A).



Be sure not to connect the power supply line (AC110-120/220-240V) to the indoor/outdoor control line terminal block. If the power supply is mistakenly turned on, the fuse on the circuit board (F3.0.5A) is melted to protect the circuit board. After connecting the power supply line correctly, connect the indoor/outdoor control line to Terminal 2 and Terminal 3 on CN4. (Perform the wiring after turning off the power supply.)

13. Serial-Parallel I/O Unit (ACC-SP16TAG(B))

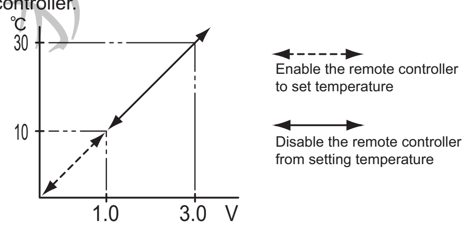
(3) Connecting the Serial-Parallel I/O Unit with the Remote Stations

Name	Input/output item	Serial-Parallel I/O Unit side: Input/output conditions	Serial-Parallel I/O Unit side: Terminal number	Remote Station side: Isolating terminal	Remote Station side: Example circuit	Input/Output Condition
Digital input/output terminal	Status output	Start output, Alarm output; No-voltage a-contact static; Allowable contact voltage and current: DC 30 V, 0.5 A (Minimum load: 1 V, 1 mA)	12P-1, 12P-2, 12P-3	CPEV0.9 ~ ϕ1.2	Digital input	Response time for start/stop input: Max.40 seconds
		COS output (answerback); No-voltage a-contact static; Allowable contact voltage and current: DC 30 V, 0.5 A (Minimum load: 1 V, 1 mA)	12P-4, 12P-5	CPEV0.9 ~ ϕ1.2	Digital input	Response time for start/stop input: Max.1 second
		Filter sign output; Allowable contact voltage and current: DC 30 V, 0.5 A (Minimum load: 1 V, 1 mA)	12P-6, 12P-7	CPEV0.9 ~ ϕ1.2	Digital input	ON with a filter sign
	Control input	Start input, Stop input; Voltage a-contact pulses; Allowable contact voltage and current: DC 24 V, 10 mA	CX, TX; 12P-8, 12P-9, 12P-10	CPEV0.9 ~ ϕ1.2	+24V; COM	Pulse width: 300 msec or longer
		Central input; Voltage a-contact static; Allowable contact voltage and current: DC 24 V, 10 mA	CX; 12P-11, 12P-12	CPEV0.9 ~ ϕ1.2	+24V; COM	Remote controller disabled on rising and enabled on falling of static input
	*1	Emergency stop input; Voltage a-contact static; Allowable contact voltage and current: DC 24 V, 10 mA	CX; 12P-8, 12P-9	CPEV0.9 ~ ϕ1.2	+24V; COM	Operation stopped and remote controller disabled on rising and remote controller enabled on falling of static input
Analog input/output	Analog output *3	Indoor temperature monitor output; Output current:4 to 20 mA; Temperature indication range: 5 to 36 ℃, 0.5 ℃ step; Input impedance:250 Ω; Remote controller sensor: Remote controller; On-the-body sensor: Air intake temperature	Detector, Modulator; B(+), A(-)	CPEV-S0.9 ~ ϕ1.2	Insulated analog input; G	Analog outputs for 16 units are provided. Use insulated individual analog input.
	Analog input *2	Indoor temperature setting input; Input voltage:1 to 5 V; Temperature setting range: Within the indoor temperature setting range; Temperature reading: In steps of 1 ℃; Input impedance:1MΩ	Modulator; B(+), A(-)	CPEV-S0.9 ~ ϕ1.2	Analog output; G	Analog inputs for 16 units are provided. Use within 0.1% of reference accuracy

The length of a wire that connects a Serial/Parallel I/O unit and the equipment should be less than 50 m for analog signal, and less than 100 m for digital signal.

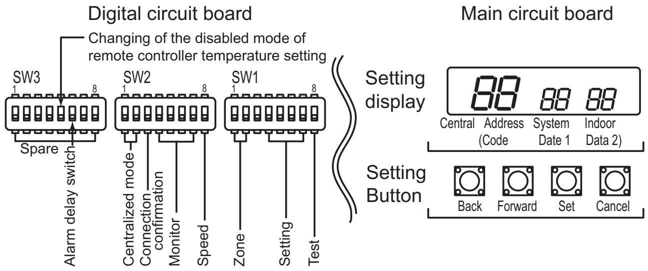
*1 About Emergency Stop Signal
This signal immediately stops all indoor units connected to the Serial/Parallel I/O unit and disables any manual operations through the remote controller. When this signal is off, manual operations through remote controllers become enabled.

*2 About Temperature Setting Input (analog input)
When the setting signal for room temperature is within DC1 - 5 V, the setting value is sent to the applicable group, and each air conditioner in the group sets a setting temperature within a predetermined range for the air conditioner. Temperature is indicated in 1°C intervals. Check the precision (resolution) of the central monitor. When a signal more than 1.0 V is inputted, temperature setting can not be carried out with the remote controller that shows the sign, "Under Centralized Control". With a signal less than 1.0 V, temperature setting can be made with the remote controller.

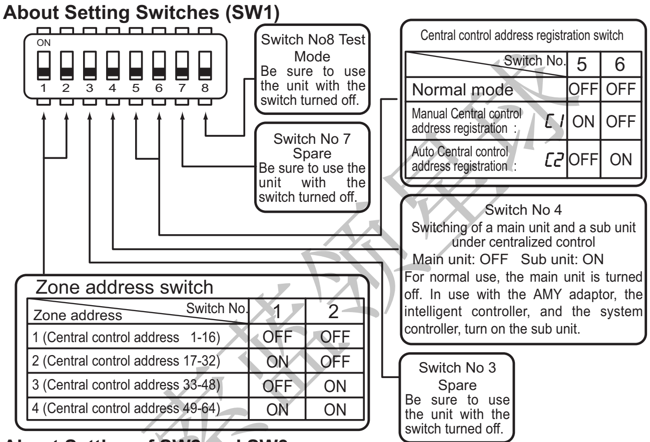


*3 About the Room Temperature Monitor (analog output)
The current of the room temperature monitor signal is within DC4 - 20 mA (5 - 35℃). And temperature is indicated in 0.5℃ intervals. Check the precision (resolution) of the central monitor.

4. About Setting Switches and Display



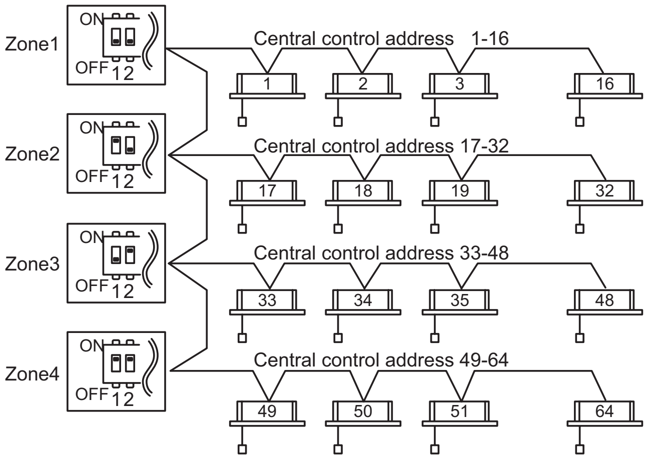
About Setting Switches (SW1)



About Setting of SW2 and SW3
Spare switch: Be sure that all switches are turned off to use.

5. Zone Address Setting Switch of Serial-Parallel I/O

When controlling the Serial/Parallel I/O units in two or more zones, set the zone address for each unit (setting switches No. 1 and 2 on SW1).
To control a Serial/Parallel I/O unit in only one zone, adjust the setting of the unit for Zone 1.
To control Serial/Parallel I/O units in two or more zones, adjust the setting of one of the Serial/Parallel I/O units for Zone 1.
Serial/Parallel I/O SW1



6. Setting Procedure for Central Control Address

Turn on the main powers of all air conditioners.
After completing test run of the air conditioners, set central control addresses as follows.

Set central control addresses automatically?
(Central control addresses will be automatically set in increasing order of Unit No.)

- Automatic setting
  - 1.Automatic registration of central control addresses by Serial-Parallel I/O: **C2**
- Manual setting
  - Set addresses through the wired remote controller?
    - Central control addresses are manually set through Serial-Parallel I/O.
      - 2.Manual registration of central control addresses: **C1**
    - Central control addresses are manually set through the wired remote controller.
      - 3.Registration of central control addresses through the wired remote controller

Carry out each input after the display return to the normal mode, and check the operating status of each air conditioner. The number shown on the setting display is the central control address and the Unit No. of the air conditioner.

13. Serial-Parallel I/O Unit (ACC-SP16TAG(B))

Automatic Setting

1.Automatic registration of central control addresses by Serial-Parallel I/O unit: C2
- The central control addresses of all zones can be automatically set by only one Serial-Parallel I/O unit.

1) Turn off the setting switch (SW1) No. 5 and turn on No. 6, both of which are on the digital circuit board of the Serial-Parallel I/O unit. (The display shows C2.)
2) Push "Set" Button (C2 will disappear, then the display will show 1 in the central control address readout) to start automatic registration of central control addresses. (It will take a few minutes.)
3) After the registration is completed, the setting display shows "C2 End ". (During the registration, this display shows a central control address and Unit No currently being registered.)
4) Turn off the setting switch No. 5 and 6.
5) The Serial-Parallel I/O unit automatically performs the initial setting for communication through indoor/outdoor control lines and completes the registration. While the unit is carrying out the initial setting, the operation (start) lamps (red) on the terminal block 15 and 16 alternately flash.

Manual Setting through the Serial-Parallel I/O unit

2. Manual setting of central control addresses: C1
- The central control addresses of all zones can be manually set through only one Serial-Parallel I/O unit.

1) Connect the remote controller and check the Unit No. of the indoor unit. Then, prepare an Installation Plan.
2) Turn on the setting switch (SW1) No. 5 and turn off No. 6, both of which are on the digital circuit board of the Serial-Parallel I/O unit. (The display will show C1, and flashing "--" is indicated as Unit No.)
3) Push "Set" button. (C1 will disappear, and then the display will show a central control address)
4) Select a desirable central control address by pushing "Back" and "Forward" buttons. If a central control address has been already set, the display shows the Unit No.
5) When the "Set" button is pushed, the flashing central control address shown in the display will keep lighting on. Then the Unit No. in the display will start flashing .
6) Select a desirable Unit No. (a main unit for group control) by pushing "Back" and "Forward" buttons. (If there is no applicable system, the display shows "--" as Unit No. System 31 is for local adaptor. Regardless of the presence or absence of systems, the display shows Unit No. 1 through 64.)
7) When the "Set" button is pushed, the flashing Unit No. in the display will keep lighting on. (If Unit No. is impossible to be set, the central control address in the display will start flashing and the display shows "--" as Unit No.) For cancellation, push "Cancel" button.
8) To continue the registration, repeat step 4) through 7). To end the registration, turn off the setting switch No. 5 and 6.
9) The Serial-Parallel I/O unit automatically carries out the initial setting for communication through indoor/outdoor control lines and completes the registration. While the unit is carrying out the initial setting, the operation lamps (red) on the terminal block 15 and 16 alternately flash.

Setting through the Wired Remote Controller

3. Registration of central control addresses through the wired remote controller
- Carry out the registration while the air conditioners stop.
- Carry out the following procedure from 1) to 6) for all air conditioners.

1) Vent/Inspection Keep pushing these buttons more than 4 sec.
2) Unit Selection Do not push this button.
3) Adjust the item code to "03" by pushing the temperature setting buttons. △ ▽
4) Set central control addresses by pushing the timer buttons. △ ▽

Address	Zone	Group	Address	Zone	Group	Address	Zone	Group	Address	Zone	Group
1	1	1	17	2	1	33		1	49	4	1
2		2	18		2	34		2	50		2
3		3	19		3	35		3	51		3
4		4	20		4	36		4	52		4
5		5	21		5	37		5	53		5
6		6	22		6	38		6	54		6
7		7	23		7	39		7	55		7
8		8	24		8	40		8	56		8
9		9	25		9	41		9	57		9
10		10	26		10	42		10	58		10
11		11	27		11	43		11	59		11
12		12	28		12	44		12	60		12
13		13	29		13	45		13	61		13
14		14	30		14	46		14	62		14
15		15	31		15	47		15	63		15
16		16	32		16	48		16	64		16
									99	Not set	

5) Push the "Set" button. (The Flashing "Setting" in the display will keep lighting on.)
6) Push the "Inspection" button to complete the setting of the central control addresses. (The controller will show the normal stop mode.)

7. Test Run

1) Turn on the main switches of all air conditioners.
2) Turn on the power of the Serial-Parallel I/O unit.
3) Operate the air conditioners through the Serial-Parallel I/O unit, and check their operating status.
4) Push the "All start" switch to check whether all conditioners will start.
5. Push the "All stop" switch to check whether all conditioners will stop.

- In the following cases, the operation (start) lamp lights out or flashes. Check the equipment as follows.

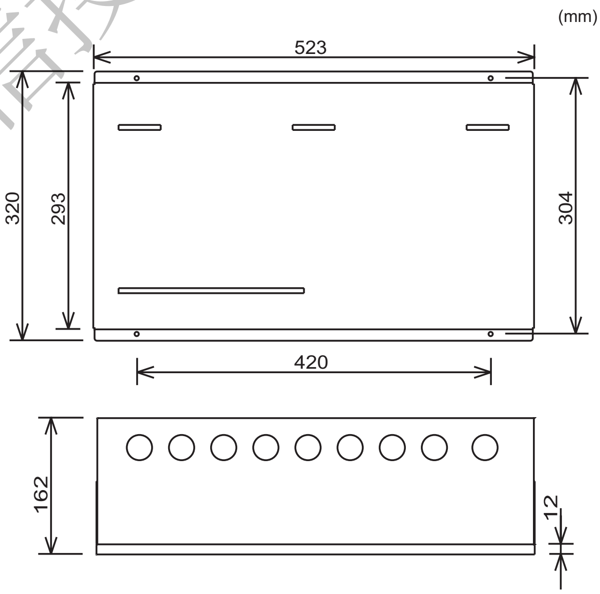
(1) After pushing the "All start" switch, the connected operation (start) lamp does not light on.
Are the setting switches of the Serial-Parallel I/O unit set correct?
Has the central control address of the air conditioner been correctly set?
Has the main switch of the air conditioner been turned on?
Are the signal wires broken or short-circuited?
* When the connection check switch (the setting switch No. 3 on SW2) is turned on, the operation (start) lamps of connected air conditioners will light on.

(2) The operation (start) lamp flashes.
Check the operation status of the air conditioner. The protection device of the conditioner is working.

(3) The operation (start) lamp 15 and 16 alternately flash.
The initial setting for communication through the indoor/outdoor control lines is being carried out. Wait for a while.

6.Check for operating problems of the equipment by operating it through the outside device (remote station).

8. Outer Dimensions



9. Specifications

Rated voltage	single phase AC220-240/110-120V
Rated frequency	50/60 Hz
Power consumption	max. 40 W
Mass	8.0 kg

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SANYO

200611M DC