

## 6. Electric Wiring

**Electrical installation work must be performed by an electrical installation service provider qualified by a power provider of the country.**

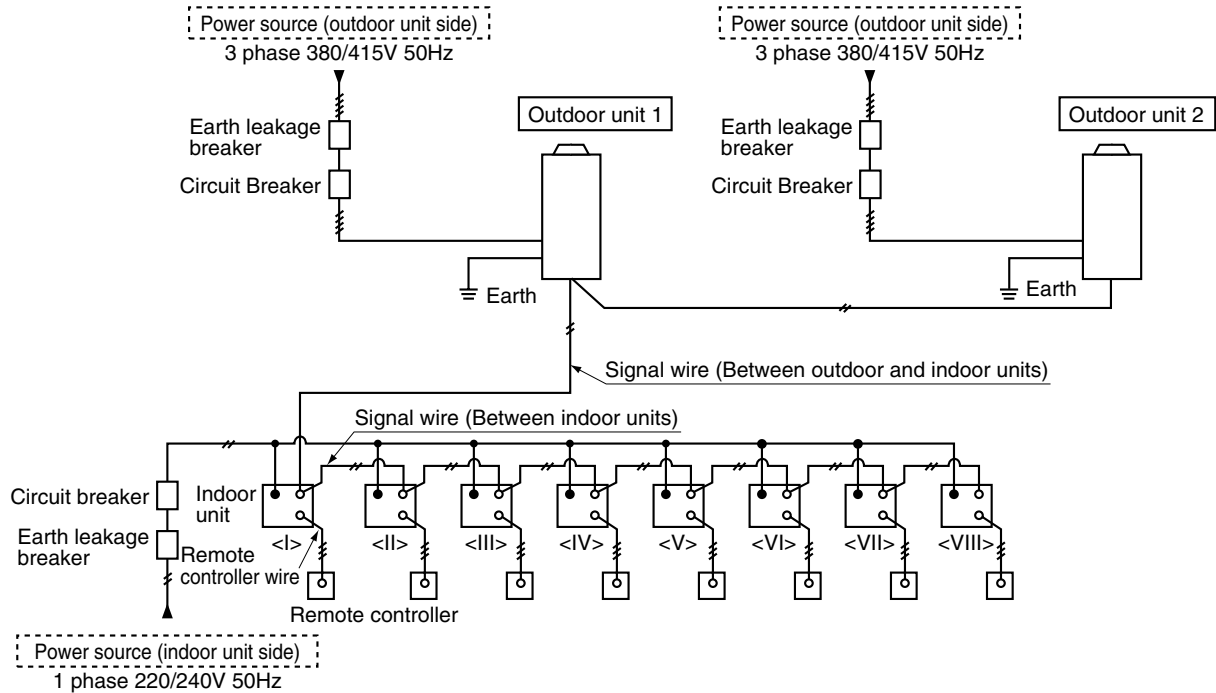
**Electrical installation work must be executed according to the technical standards and other regulations applicable to electrical installations in the country.**

**⚠ Please install an earth leakage breaker without fail. The installation of an earth leakage breaker is compulsory in order to prevent electric shocks or fire accidents.**

### **Please note**

1. Use only copper wires.  
Do not use any supply cord lighter than one specified in parentheses for each type below.
  - braided cord (code designation 60245 IEC 51), if allowed in the relevant part 2;
  - ordinary tough rubber sheathed cord (code designation 60245 IEC 53);
  - flat twin tinsel cord (code designation 60227 IEC 41)
  - ordinary polyvinyl chloride sheathed cord (code designation 60227 IEC 53).Please do not use anything lighter than polychloroprene sheathed flexible cord (cord designation 60245 IEC 57) for supply cords of parts of appliances for outdoor use.
2. Use separate power supplies for the indoor and outdoor units.
3. Ground the unit. Do not connect the grounding wire to a gas pipe, water pipe, lightning rod or telephone grounding wire.  
If improperly grounded, an electric shock or malfunction may result.
4. A grounding wire must be connected before connecting the power cable. Provide a grounding wire longer than the power cable.
5. The installation of an impulse withstanding type earth leakage breaker is necessary. A failure to install an earth leakage breaker can result in an accident such as an electric shock or a fire. Do not turn on the power until the electrical work is completed. Be sure to turn off the power when servicing.
6. Please do not use a running capacitor for power factor improvement under any circumstances. (It does not improve power factor, while it can cause an abnormal overheat accident)
7. For power supply cables, use conduits.
8. Please do not lay electronic control cables (remote control and signaling wires) and other cables together outside the unit. Laying them together can result in malfunctioning or a failure of the unit due to electric noises.
9. Power cables and signaling wires must always be connected to the power cable terminal block and secured by cable fastening clamps provided in the unit.
10. Fasten cable so that they may not touch the piping etc.
11. When cables are connected, please make sure that all electrical components within the electrical component box are free of loose connector coupling or terminal connection and then attach the cover securely. (Improper cover attachment can result in malfunctioning or a failure of the unit, if water penetrates into the box.)
12. A grounding wire must be connected before connecting the power cable. Provide a grounding wire longer than the power cable.

## 6.1 Wiring System Diagrams



## 6.2 Method of Connecting Power Cables

1. Method of leading out cables
  - a) Cables can be laid through the front, right, left or bottom casing.
  - b) In wiring on the installation site, cut off a half-blank ( $\phi 50$  or oblong hole measuring  $40 \times 80$ ) covering a penetration of the casing with nippers.
2. Notabilia in connecting power cables
 

Power cables must always be connected to the power cable terminal block and clamped outside the electrical component box.

In connecting to the power cable terminal block, use round solderless terminals.

  - a) Use specified wires in wiring, and fasten them securely in such a manner that the terminal blocks are not subject to external force.
  - b) In fastening a screw of a terminal block, use a correct-size drive.  
Fastening a screw of a terminal block with excessive force can break the screw.
  - c) When electrical installation work is completed, make sure that all electrical components within the electrical component box are free of loose connector coupling or terminal connection.

## 6.3 Power Supply Wiring

### (1) Outdoor unit power supply specifications

It is a standard method that power supply constructions are carrying out for indoor and outdoor respectively. The table below shows the power supply specification for a single outdoor unit.

Model	Power source	Cable size for power source (mm <sup>2</sup> )	Wire length (m)	Moulded-case circuit breaker (A)		Earth leakage breaker	Earth wire	
				Rated current	Switch capacity		Size (mm <sup>2</sup> )	Screw type
140	3 phase 4 wire 380/ 415V 50Hz	3.5	22	30	30	30A 30mA less than 0.1 sec	2	M5
224		5.5	54	40	50	60A 100mA less than 0.1 sec	3.5	M5
280		5.5	54	40	50	60A 100mA less than 0.1 sec	3.5	M5
335		5.5	54	40	50	60A 100mA less than 0.1 sec	3.5	M5
335-k		14	76	60	50	60A 100mA less than 0.1 sec	3.5	M5
400		14	76	60	60	60A 100mA less than 0.1 sec	5.5	M5
450		14	76	60	60	60A 100mA less than 0.1 sec	5.5	M5
504		14	76	125	100	60A 100mA less than 0.1 sec	5.5	M10
560		14	76	125	100	60A 100mA less than 0.1 sec	5.5	M10
615		14	76	125	100	60A 100mA less than 0.1 sec	8	M10
680		14	76	150	200	60A 100mA less than 0.1 sec	8	M10

- Please note**
- (1) The method of laying cables has been determined pursuant to the Japanese indoor wiring regulations (JEAC8001). (Please adapt it to the regulations in effect in each country)
  - (2) In the case of distributed, separate power supply system, the listed data represent those of an outdoor unit.
  - (3) For details, please refer to the installation manual supplied with the indoor.

\* Notice when connecting power supply line to outdoor unit

For combination outdoor unit, don't get across terminal block and use breaker for wiring separately or use another terminal box to branch.

## (2) Indoor unit power supply specifications

Combined total capacity of indoor units	Cable size for power source (mm <sup>2</sup> )	Wire length (m)	Moulded-case circuit breaker (For ground fault, overload) and short circuit protection	Signal wire size (mm <sup>2</sup> )	
				Outdoor-Indoor	Indoor-Indoor
Less than 7A	2	21	20A100mA less than 0.1 sec	2cores × 0.75-2.0	2cores × 0.75-2.0
Less than 11A	3.5	21	20A100mA less than 0.1 sec		
Less than 12A	5.5	33	20A100mA less than 0.1 sec		
Less than 16A	5.5	24	30A100mA less than 0.1 sec		
Less than 19A	5.5	20	40A100mA less than 0.1 sec		
Less than 22A	8	27	40A100mA less than 0.1 sec		
Less than 28A	8	21	50A100mA less than 0.1 sec		

- Please note**
- (1) The above table shows a standard specification. The power supply is different according to the type of the indoor unit. Please prepare power supply of a single-phase 220V or three-phase 220V.
  - (2) Wire length in the table above is the value for when the indoor unit is connect to the power cable in series also the wire size and minimum length when the power drop is less than 2% are shown. If the current exceeds the value in the table above, change the wire size according to the indoor wiring regulations. (Please adapt it to the regulations in effect in each country)
  - (3) As for connected line to the indoor unit, even 5.5mm<sup>2</sup> is possible, but for connected line of 8mm<sup>2</sup> or more, you must use special pull box and branch to the indoor unit by 5.5mm<sup>2</sup> or less.
  - (4) The above table has been described for unit containing no any electric heater (optional). Please notice that the power supply specification and the wiring specification are different when an electric heater is built in.
  - (5) Please connect three terminals of the terminal blocks of the indoor unit to power supply for the heater, only when you use an optional supplementary heater.

## 6.4 Precaution in Electric Wiring

1. Use separate power supplies for the outdoor and indoor units respectively (Standard specification)
2. Signal wiring (for indoor and outdoor units)
  - Double-core cable with a diameter 0.75 to 2mm<sup>2</sup> should be used for the signal wires.
  - Never make the indoor and outdoor connecting signal line use "co-axial cable" or "strand" with the power wiring for indoor and outdoor unit and other power line.  
(Never use a multiconductor wire together with power line. It may cause erroneous operation.)
  - Do not connect high voltage wires 220V or 380V to signal wires. as these wires are DC 5V. Signal wires should be connected so that the terminal Nos. conform with each other for between outdoor and between indoor units. However, they will work properly if different polarities are connected.  
(Connect (A) and (A), (B)and (B).)
  - Do not strand or run the remote control cord with power line, electric line, etc.
  - The total length of the signal wires Should be 1000m or less.
  - Recommended signal wire list

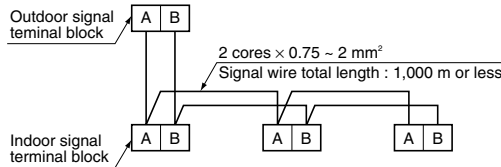
No.	Name	Symbol
1	Vinyl cable round cord	VCTF double-core 0.75 to 2mm <sup>2</sup>
2	Vinyl cable round cable	VCT double-core 0.75 to 2mm <sup>2</sup>
3	Control vinyl insulated, vinyl sheathed cable	CVV double-core 0.75 to 2mm <sup>2</sup>
4	Shielding wire	MVVS double-core 0.75 to 2mm <sup>2</sup>

When No. 4 shielding wire is used, always ground the single wire side of the shielding wire. In addition, using the shielding wire is helpful to prevent the incorrect connection between 5V DC and 220V or 380V AC because the discrimination from the power supply wire is clear.

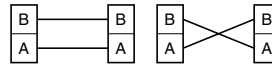
## 6.5 Method of Connecting Signaling Wires

- The signal wires are 5VDC, so absolutely do not connect them to a 220/240V wire. If such a connection is mistakenly made, all the printed circuit boards will be burned out. Signal wires do not have a polarity. Connect them between the indoor and outdoor units, between indoor units, between indoor units, and between the same terminal Nos. (Connection between (A) and (A), (B) and (B).)
- Please use shielded cords for signaling wires. (For grounding of a shielded cord, find a point of connection to the metal casing in the proximity of the terminal block for the AB lines)  
Indoor and outdoor signal wires

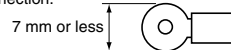
When there is 1 outdoor unit



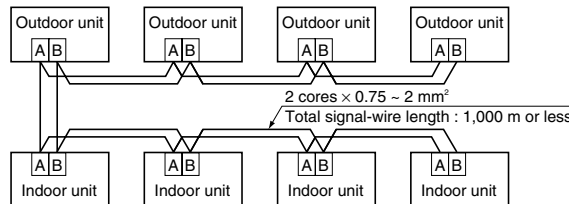
Indoor and outdoor signal wires do not have a polarity. Any of the connections in the following illustration can be made.



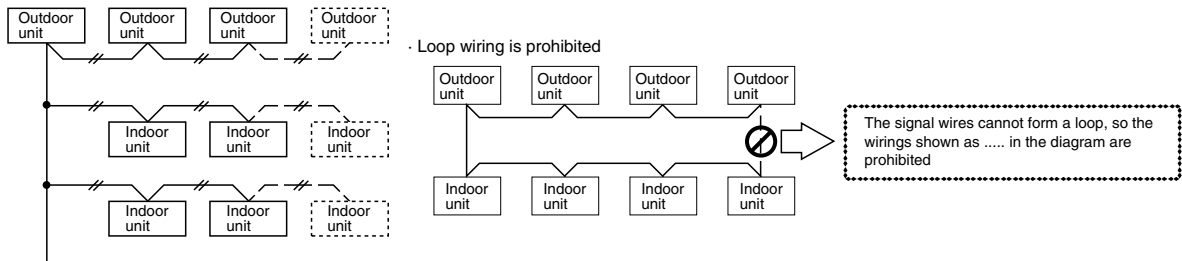
When wiring to the terminal block, use the M3.5 crimp terminals shown in the illustration below to make the connection.



When connecting multiple outdoor units



- The maximum number of indoor units that can be connected in a system is 48 and it is possible to configure outdoor units and/or indoor units as an outdoor or indoor unit group connected with each other with two wiring.
- The signal wires can also be connected using the method shown below.



## 6.6 Remote Controller Wiring Specifications

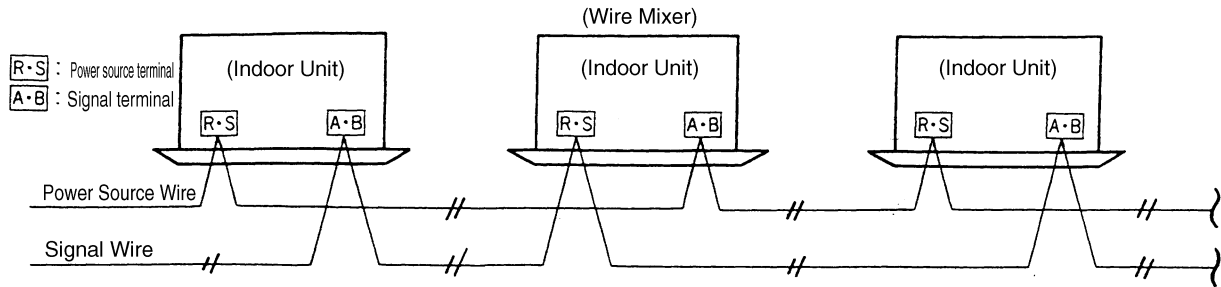
- For the remote controller the standard wire is  $0.3\text{mm}^2 \times 3$  cores. The max. length is up to 600m. When the wire is more than 100m long, use the wire shown in the following table.

Length (m)	Wire size
100 to 200	$0.5\text{mm}^2 \times 3$ cores
To 300	$0.75\text{mm}^2 \times 3$ cores
To 400	$1.25\text{mm}^2 \times 3$ cores
To 600	$2.0\text{mm}^2 \times 3$ cores

- When the remote controller wire runs parallel to another power supply wire or when it is subject to outside noise, such as from a high-frequency device, use shielded wire. (Be sure to ground only one end of the shielded wire.)

## 6.7 Judgment on Mixture of Signal Wires and Power Source Wires

Example of Mixed Wires



### 1. Judgment Procedure

- 1) Check prior to power-on.
- 2) Check and confirm the number of remote controllers for both indoor and outdoor units.
- 3) Measure the resistance at AB signal terminal.

### 2. Judging Method

- 1) Use

$$\frac{9100 \Omega}{(\text{Number of indoor units} + \text{Number of outdoor units} + P)}$$

**P** : Number of units added for SLA-1-E;  
Number of units not added for SLA-2A-E, SLA-200EC

- 2) When the resistance is below 80Ω it means that mixed wires exist in more than 1 unit.
- 3) The resistance of half-way broken signal wires is much greater than the standard value.
- 4) Total number of units and valve between A and B.

Total Number of Units	Normal Value between A and B (Ω)	Resistance Value between A and B in case of 1 unit with mixed wires (Ω)	Resistance Value between A and B in case of 2 units with mixed wires (Ω)	Resistance Value between A and B in case of 3 units with mixed wires (Ω)
2	4550	74	—	—
3	3033	73	37	—
4	2275	73	37	25
5	1820	72	37	25
6	1517	71	37	25
7	1300	71	36	25
8	1138	70	36	24
9	1011	70	36	24
10	910	69	36	24
20	455	64	35	24
40	228	56	32	23
60	152	50	30	22
80	114	45	28	21
97	94	42	27	20

## 6.8 Address Setting

### 6.8.1 FDCA140HKXEN4

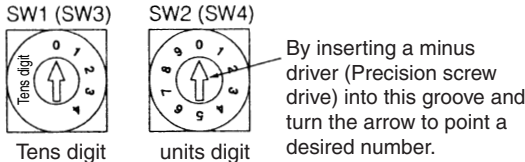
- (a) Addresses can be set either with the automatic address setting, remote control address setting or manual address setting by the combinations of address switches (refer to the table below) of the indoor and outdoor units.
- (b) No mixed use of three kinds of different methods for the same system.

Method of setting address	Outdoor unit		Indoor unit	
	Outdoor No.	Outdoor No.	Indoor No.	Indoor No.
Automatic address setting	49	49	49	49
Remote control address setting	00 ~ 47	49	49	49
Manual address setting	00 ~ 47	00 ~ 47	00 ~ 47	00 ~ 47

- (c) Address No. setting Set setting SW1~4 on the indoor board and setting SW1, 2 on the outdoor board as shown in the figure below.

On the indoor board	SW1, 2 (Blue)	For Indoor No. setting (Tens digit and units digit)
	SW3, 4 (Green)	For Outdoor No. setting (Tens digit and units digit)
On the outdoor board	SW1, 2 (Blue)	For Outdoor No. setting (Tens digit and units digit)

		SW2 (SW4) units digit									
		0	1	2	3	4	5	6	7	8	9
SW1 (SW3) Tens digit	0	00	01	02	03	04	05	06	07	08	09
	1	10	11	12	13	14	15	16	17	18	19
	2	20	21	22	23	24	25	26	27	28	29
	3	30	31	32	33	34	35	36	37	38	39
	4	40	41	42	43	44	45	46	47	48	49



48 and 49 are used for the automatic address setting.

- Notes (1) Set the inverter unit No. of the constant speed outdoor unit connected by refrigerant pipe and outdoor No. of the indoor unit same as the outdoor No. of the inverter unit.
- (2) Indoor No. is a number to identify the indoor unit. Please do not duplicate.

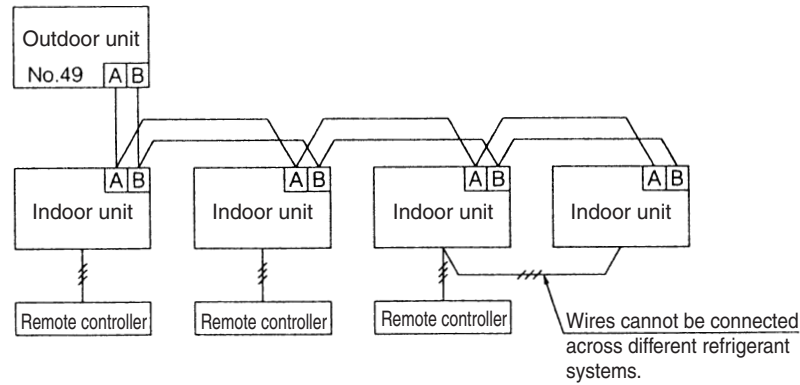
#### 1. Automatic address setting

It is possible when wiring with each outdoor unit.

- a) Set the address switch of the inverter outdoor unit to 49. (The factory setting at shipment is 49.)
- b) Set the address switch of the indoor unit to 49. (The factory setting at shipment is 49.)
- c) Turn on power in the order of the outdoor units and then the indoor units. The address is automatically set. Automatic address setting can be done when power supplies of indoor and outdoor units are both ON. If only power supply of the indoor unit is ON, "Outdoor No." will be displayed in remote controller, then turn on the power supply of outdoor unit, please.
- d) After the power supply is turned on, No. will be set in about one minute.
- e) If the check switch of remote controller is pressed after No. is set, the address of the indoor unit will be displayed. (No. of the outdoor unit is not displayed.)
- f) An automatic address setting can be done even when one remote controller controls several units. However, Wires cannot be connected across different refrigerant systems..  
 Note : The address set once is also memorized in the microcomputer though power is turned off. The remote control address setting and the manual address setting are also possible even if wiring in each refrigerant system as a unit.

#### g) Deletion of the memorized content set in an automatic address setting

Press the "WIND VOL" button while pressing the "CHECK" and "TIMER" buttons on the remote controller to delete the memorized address. Afterwards, if the power supplies of the indoor unit and the outdoor unit are turned OFF, the address will return to the unsetting state. Select the three kinds of method of address setting by combining the address buttons.



## 2. Remote control address setting

### a) The remote control address setting can be done under the following condition.

- ① More outdoor units and indoor units are wired by super-link, and remote controller is individually connected with each one unit.
- ② The outdoor unit address switch is within the range from 0 to 47, and number of indoor unit and the number of outdoor unit of indoor unit address switch both are either 48 or 49 (setting at shipment) until power supplies are turned ON.

### b) Method of address setting

- ① Set the address switch for outdoor No. of inverter and the constant speed outdoor unit in a range from 0 to 47. Avoid duplication.
- ② Set the address switch on the PCB of the indoor unit to 49. (This is set to 49 at shipment from factory.)
- ③ Turn ON power supply.
- ④ Enters into the address setting mode after "Please wait for a moment" is displayed in remote controller. The display changes as follows. "Setting of number of outdoor unit ◆" → "Outdoor unit -- ▲" (flashing)
  - \* The display of "Please turn on the power supply for indoor unit" flashes when the power supply for outdoor unit is OFF or communicating with the outdoor unit. When communicating with the outdoor unit, the display becomes "Outdoor unit ▲".
- ⑤ Set outdoor No.. Outdoor No. increases with 00~01~02 whenever the indoor temperature setting switch ▲ is pressed. Outdoor No. decreases with 47~46~45 if the indoor temperature setting switch ▼ is pressed. Press the switch till set No. of the outdoor unit.
- ⑥ If setting switch is pressed, the display of outdoor No. changes from flashing to lighting and outdoor No. is set. Moreover, ◆ that shows indoor No. flashes at the same time.
  - \* At this time, if the set number of outdoor unit is changed, the reset switch is pressed. "Number of outdoor unit" flashes again, and the address can be changed.
- ⑦ Indoor No. can be set by indoor temperature setting switches ▲ and ▼ as for outdoor No. setting.
- ⑧ The setting of the numbers of outdoor units and indoor units end if set switch is pressed after setting. "Number of outdoor units and number of indoor units" set lights for two seconds, and then it returns to the halt condition.
- ⑨ The address setting is completed.

### c) Change in address

The address set once is memorized in the microcomputer even if power is turned off. If pressing the switch of the number of air-conditioner for more than three seconds, the display will become into "Outdoor unit ◆" (flashing) from "Setting of the number of outdoor unit-- ▲". A new address can be set by a similar operation to the above. The address setting can be done only when the unit stops.

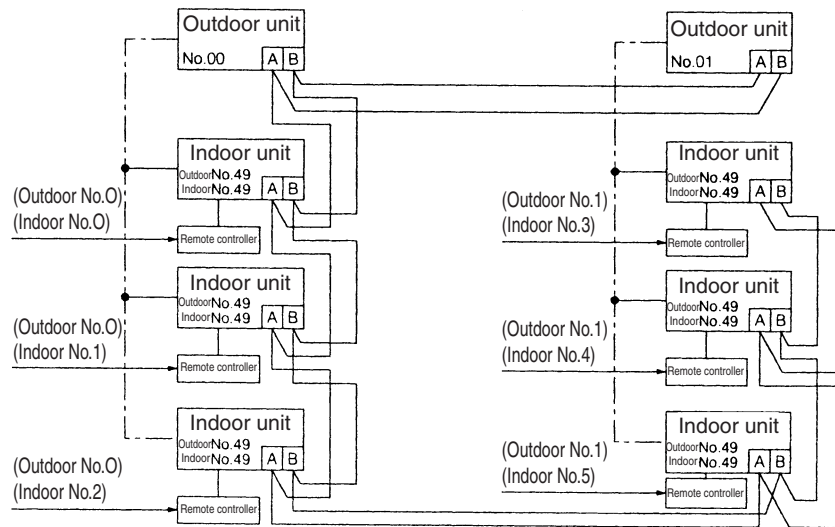
d) If pressing the number of air-conditioner for more than three seconds, the message of "Operation invalid" will be displayed (lighting for three seconds), when the remote control address setting is invalidly set (when it is impossible to combine the remote control address setting for the address setting of the indoor unit and the outdoor unit).

e) The method of deleting the memory of address set by the remote control address can be selected.

Press the "WIND VOL" switch while pressing the "CHECK" and "TIMER" switches on the remote controller. The memory of the address is deleted. Afterwards, if the power supplies of the indoor unit and the outdoor unit are turned OFF, the address will return to the unsetting state. These three kinds of method of address setting can be selected again through changing the combination of dip-switches.



Unit No. shown in the parenthese is the address number set with the remote controller as follows in the diagram stands for refrigerant piping.



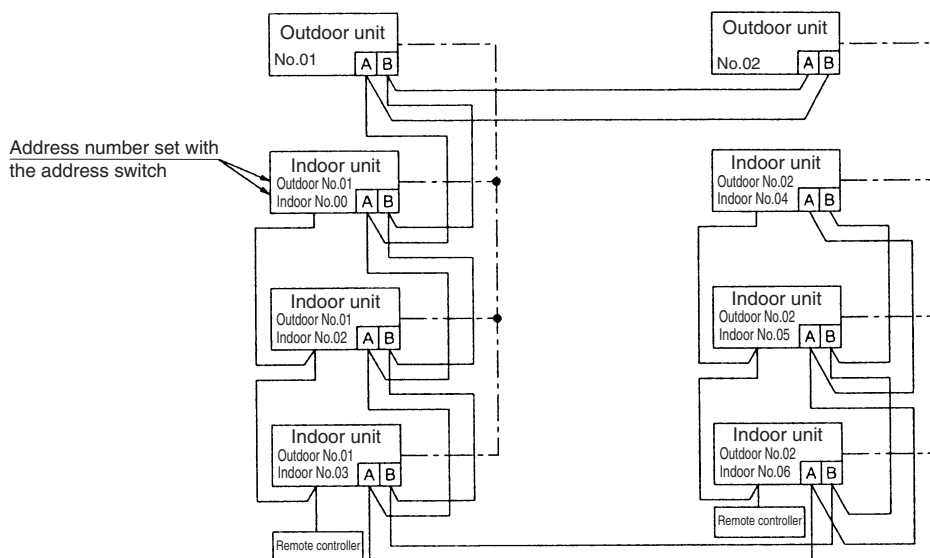
3. Manual address setting

It corresponds to the wiring for all super-links including an automatic address and the remote address setting specification.

Operate the address switches after power supply is turned off. The change of the address switch is not accepted under the energizing state.

- a) Set the address of the outdoor unit with the address switch (green) on the PCB of outdoor unit within a range from 00 to 47 avoiding duplication with another outdoor unit.
- b) Outdoor No. is set with the address switch (green) on the PCB of indoor unit.
- c) Set the number of the indoor unit with the address switch (green) within a range from 00 to 47 avoiding duplication with another outdoor unit among all connecting units.

--- No. shown in refrigerant piping diagram is address number set with the address switch on the printed circuit board.



## 6.8.2 FDCA224HKXE4 ~ FDCA1360HKXE4

Attention: Please note that the mistake of address setting might cause the breakdown of the compressor enough.

### 1. Introduction

This control system performs communication control through the microcomputers built in the outdoor unit, indoor unit and remote control unit. Address setting needs to be done for both outdoor and indoor units. Turn on power in the order of the outdoor units and then the indoor units. Use 1 minute as the rule of thumb for an interval between them.

### 2. Method of address setting

Addresses can be set either with the automatic address setting, remote control address setting or manual address setting by the combinations of address switches of the indoor and outdoor units (refer to the table below). (Operate the address switches before turning power on.) It is recommended that the signal wires are wired separately with respect to each refrigerant system when not doing centralized control.

		Auto address	Manual address	Remote control address
More than one refrigerant system are connected together by signal wires. (For instance, when doing concentrated control.)	Each indoor unit is connected with one remote controller	× (*1)	○	○
	There are some units whose remote controllers are not connected	× (*1)	○	× (*2)
Only single refrigerant system (The signal wire doesn't cover multiple refrigerant system)	Each indoor unit is connected with one remote controller	○	○	○
	There are some units whose remote controllers are not connected	○	○	× (*2)

Notes (1) ○ : OK, × : Not

(2) (\*1) Auto address might cause outdoor units address abnormal duplication in more than one system, so the Auto address setting is unavailable.

(\*2) The address cannot be set when there are indoor unit with which remote controller is not connected because remote control address decides address No. of the indoor unit with which remote control is connected.

### < Notices and requirements >

- ① The address setting method is different depending on how to combine the network. Select it according to the installation situation in field.
- ② When more than one system are controlled centrally, It is recommended that address No. of the indoor each unit is set designed beforehand.
- ③ These three methods cannot be mixed in the same system.
- ④ In general, the signal wire should be wired along the refrigerant pipe.
- ⑤ When more than one refrigerant system are connected by signal wire, if these signal wires are also wired along the refrigerant pipe and the connection between outdoor units is done after the test run of air-conditioners, it will be easy to check wiring mistake in each refrigerant system.
- ⑥ For manual address, if the address No. is decided on the drawing beforehand, and address setting can be executed simultaneously, the work efficiency is good and setting mistake can be prevented.
- ⑦ Loop wiring of signal wires is prohibited.

### 3. Address setting method and setting of address switches

Address setting method	Outdoor unit (main unit)		Outdoor unit (sub unit) <sup>(2)</sup>		Indoor unit	
	Outdoor No.	SW4-7	Outdoor No.	SW4-7	Outdoor No.	Indoor No.
Auto address	49 (shipment)	OFF (shipment)	49 (shipment)	ON	49 (shipment)	49 (shipment)
Remote control address	00~47	OFF (shipment)	same as the master	ON	49 (shipment)	49 (shipment)
Manual address	00~47	OFF (shipment)	same as the master	ON	00~47	00~47

Notes (1) At the shipment from factory, both the indoor unit and outdoor unit are set at 49 and the setting method is prepared for the automatic address setting.

(2) At the shipment from factory, dip switch (SW4-7) for outdoor main unit and sub unit address setting are set all at OFF. Setting is needed only when using outdoor units in combinational way, and when the outdoor unit is used alone, the setting is not needed.

4. Address setting switches and their location

4.1 Outdoor unit address setting

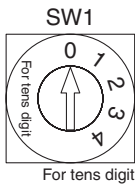
On the control board of the outdoor unit, there are rotary switches (SW1, SW2) for outdoor No. setting and dip switch (SW4) for the master / sub unit setting.

SW1..... Outdoor No. switch (tens digit) [0-4].

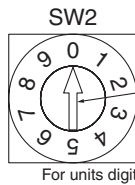
SW2..... Outdoor No. switch (units digit) [0-9].

SW4-7 ... Master/sub unit setting switches.

OFF is for setting as a main unit and ON, a sub unit (The factory setting at shipment is OFF.)



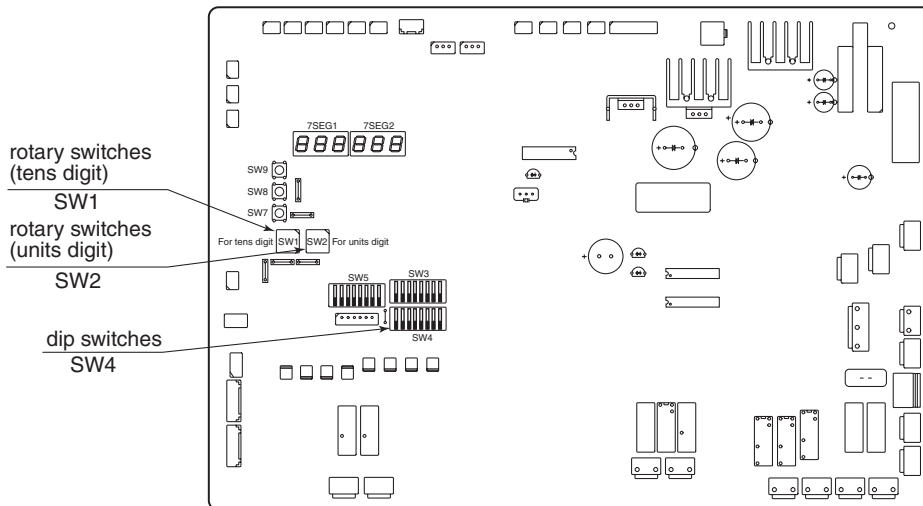
Outdoor unit rotary switches (SW)



By inserting a minus driver (Precision screw driver) into this groove and turn the arrow to point a desired number.



Outdoor unit dip switches (SW)



Parts arrangement diagram of outdoor unit control board

< Address No. setting table >

		units digit									
		0	1	2	3	4	5	6	7	8	9
tens digit	0	00	01	02	03	04	05	06	07	08	09
	1	10	11	12	13	14	15	16	17	18	19
	2	20	21	22	23	24	25	26	27	28	29
	3	30	31	32	33	34	35	36	37	38	39
	4	40	41	42	43	44	45	46	47	48	49

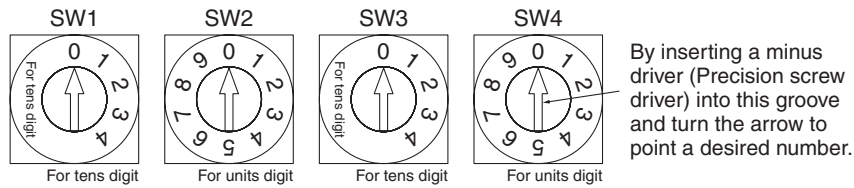
48 and 49(the default setting at shipment from factory) are used for automatic address or the remote control address setting.

4.2 Indoor unit address setting

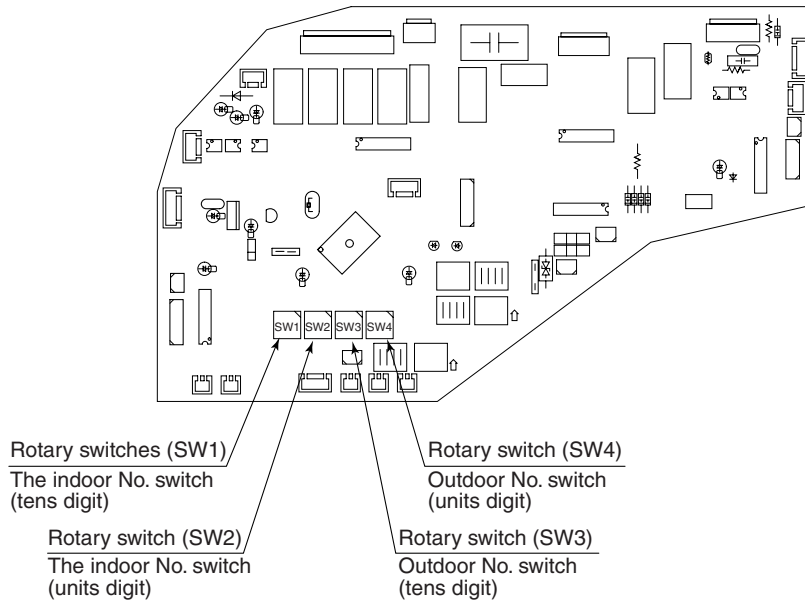
In setting an address of the indoor unit, use rotary switches (SW1,SW2) for indoor No.setting used to communicate with the outdoor unit and rotary switches (SW3,SW4) for outdoor No. setting.

SW1..... Indoor No. switch (tens digit) [0-4]	} Indoor No. is number to identify the indoor unit. Avoid duplication.
SW2..... Indoor No. switch (units digit) [0-9]	

SW3..... Outdoor No. switch (tens digit) [0-4]	} Outdoor No. is number to indicate which outdoor unit is connected with which indoor unit by the refrigerant pipe. Set indoor and the outdoor unit connected by the refrigerant pipe to same number as the outdoor No..
SW4..... Outdoor No. switch (units digit) [0-9]	



Indoor unit rotary SW



Parts arrangement diagram of indoor unit control board  
(for FDT. )

Application Data

5. Automatic address setting

- The automatic address setting is a method by which the address is automatically set by turning on the power like the default setting values of each rotary switch (SW1~4) and dip switch (SW4-7) at the shipment from factory.
- However, only when outdoor units are used in combination by the automatic address setting, it is necessary to set dip switch (SW4-7) for the master/slave setting of the outdoor unit to be used as sub unit to ON.
- Turn on power in the order of the outdoor units and then the indoor units. Use 1 minute as the rule of thumb for an interval between them.

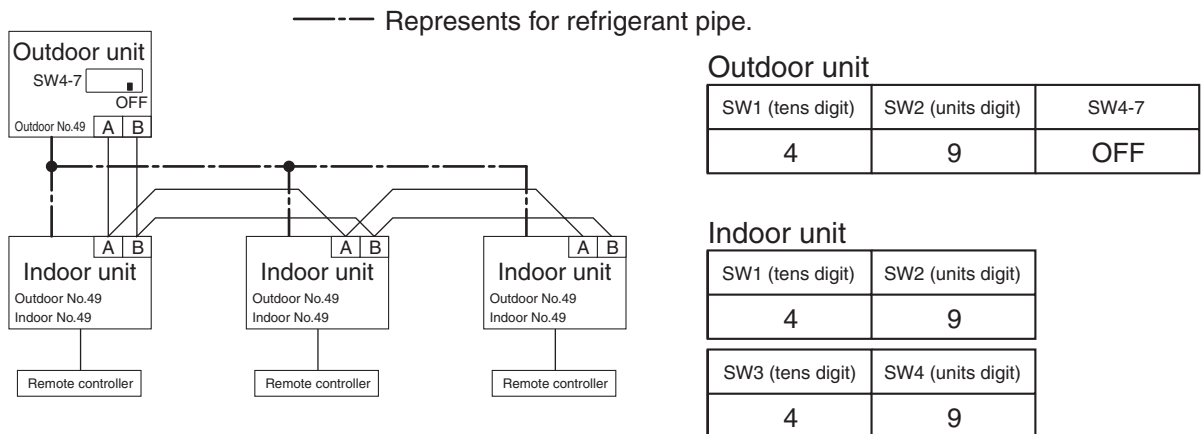
- Notes (1) If making a mistake in the order by which power is turned on, the address might not be recognized. Turn on the power of the indoor unit after making sure LED (green) flashing on the outdoor unit board.
- (2) Turn on all power supplies about the indoor and the outdoor units in the same refrigerant system even when the breaker between the indoor units is different.
- The addresses of outdoor unit and the indoor unit are automatically set and registered to 49 and within the range of 00~47 respectively.

Attentions

- The automatic address setting is available when wiring for the signal wire in each refrigerant system. It is not possible to set it when wiring for the signal wire covering different refrigerant system. Doing automatic address setting in more than one refrigerant system, might cause outdoor unit address abnormal duplication.
- Return to the default setting at the shipment from factory and then start the above-mentioned automatic address setting when the setting has been changed from the default setting at the shipment from factory.

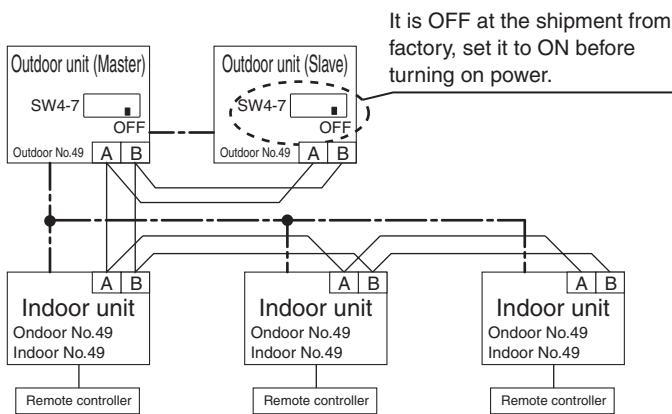
Default setting at the shipment from factory

(1) A single outdoor unit



(2) Combinational outdoor units

--- Represents for refrigerant pipe.



It is OFF at the shipment from factory, set it to ON before turning on power.

It is OFF at the shipment from factory, set it to ON before turning on power.

Outdoor unit

Outdoor unit	SW1 (tens digit)	SW2 (units digit)	SW4-7
Master unit	4	9	OFF
Slave unit	4	9	OFF

Note (1) The network address of a slave unit is registered to the master unit address + 1 depending on the setting of SW4-7.

Indoor unit

SW1 (tens digit)	SW2 (units digit)
4	9
SW3 (tens digit)	SW4 (units digit)
4	9

< method of deleting address >

To delete the address automatically set, the address can be deleted by the operation from remote control.

① With remote controller

Press the **WIND VOL** switch while pressing the **CHECK** and **TIMER** switches on the remote controller.

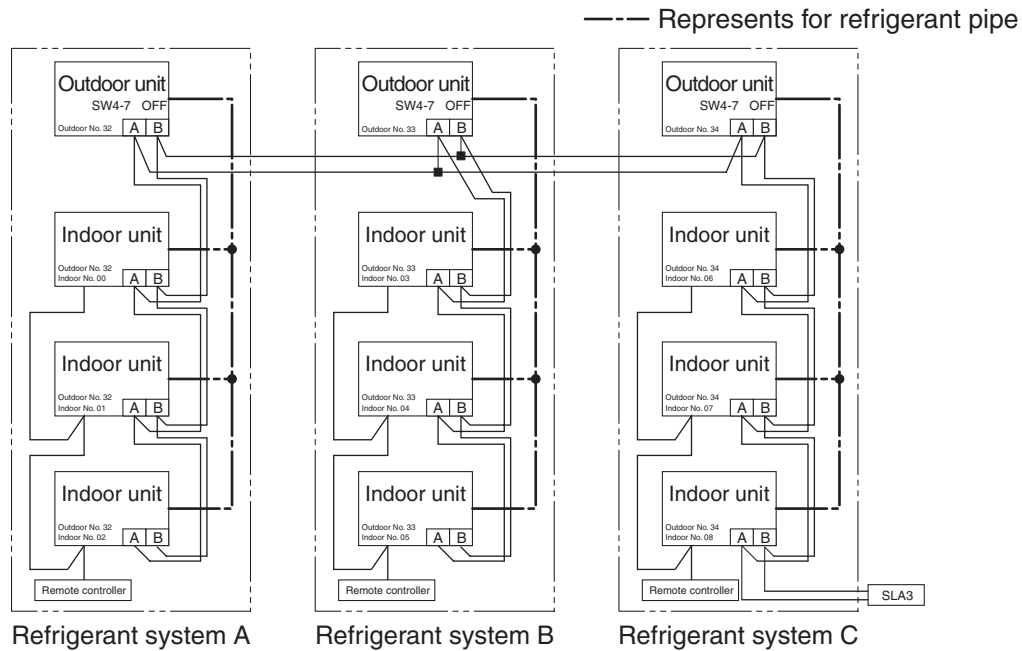
② Without remote controller

- a) Indoor address No. of the indoor unit is manually set in the range of 00 to 47 after the power is turned on.
- b) The power supply of the indoor unit is turned off once and then turned on again after the above-mentioned operation ends. (As the result, the address is deleted.)
- c) Indoor address No. is set to 49 again, then the power supply of the indoor unit is turned off once and turned on again, deleting address operation is completed.

6. Manual address setting

- Manual address setting is a method setting address No. with each rotary switch (SW1~4) and dip switch [SW4-7 (Only for combining outdoor units)] of the indoor and the outdoor unit.
- It is recommended that it is essential to do separately address setting for each individual refrigerant system and prior to address setting address No. of each indoor and outdoor unit should be decided by installation drawing beforehand.

6.1 A single outdoor unit



- Notes (1) Do the wiring of the signal wire along the refrigerant pipe to prevent the faulty wiring across multiple system. It is easy to discover and restore the address setting mistake, if operating check is separately done for each individual system.
- (2) It is recommended that in the view of the loop wiring prevention and work easiness the signal wire wiring of signal wire should be done on the outdoor unit side when extending from more than one system. It is also recommended that the signal wire between systems is connected after the test run, because it is easy to discover and restore the address setting mistake in this way.
- (3) At most two signal wires are allowed to connect with one terminal, and use the close edge connection terminal in case of more than two signal wires. (■mark in figure represents for the close edge connection terminal.)

(1)Outdoor unit address setting

- ① Set the rotary switches (SW1,2) for outdoor unit No. setting to a number within the range of 00 to 47. In setting a number, care must be taken so that no duplicating outdoor unit No. is assigned in the same network.

< Illustration example of above figure >

Refrigerant system	SW1 (tens digit)	SW2 (units digit)	SW4-7	Address on a network
A	3	2	OFF	32
B	3	3	OFF	33
C	3	4	OFF	34

(2)Indoor unit address setting

- ① Set rotary switch (SW1,2) for indoor unit No. setting to a number within the range of 00 to 47. In setting a number, care must be taken so that no duplicating indoor unit No. is assigned in the same network.
- ② Set the rotary switches for outdoor unit number setting to the corresponding outdoor unit's address number.

(3)Turning on power

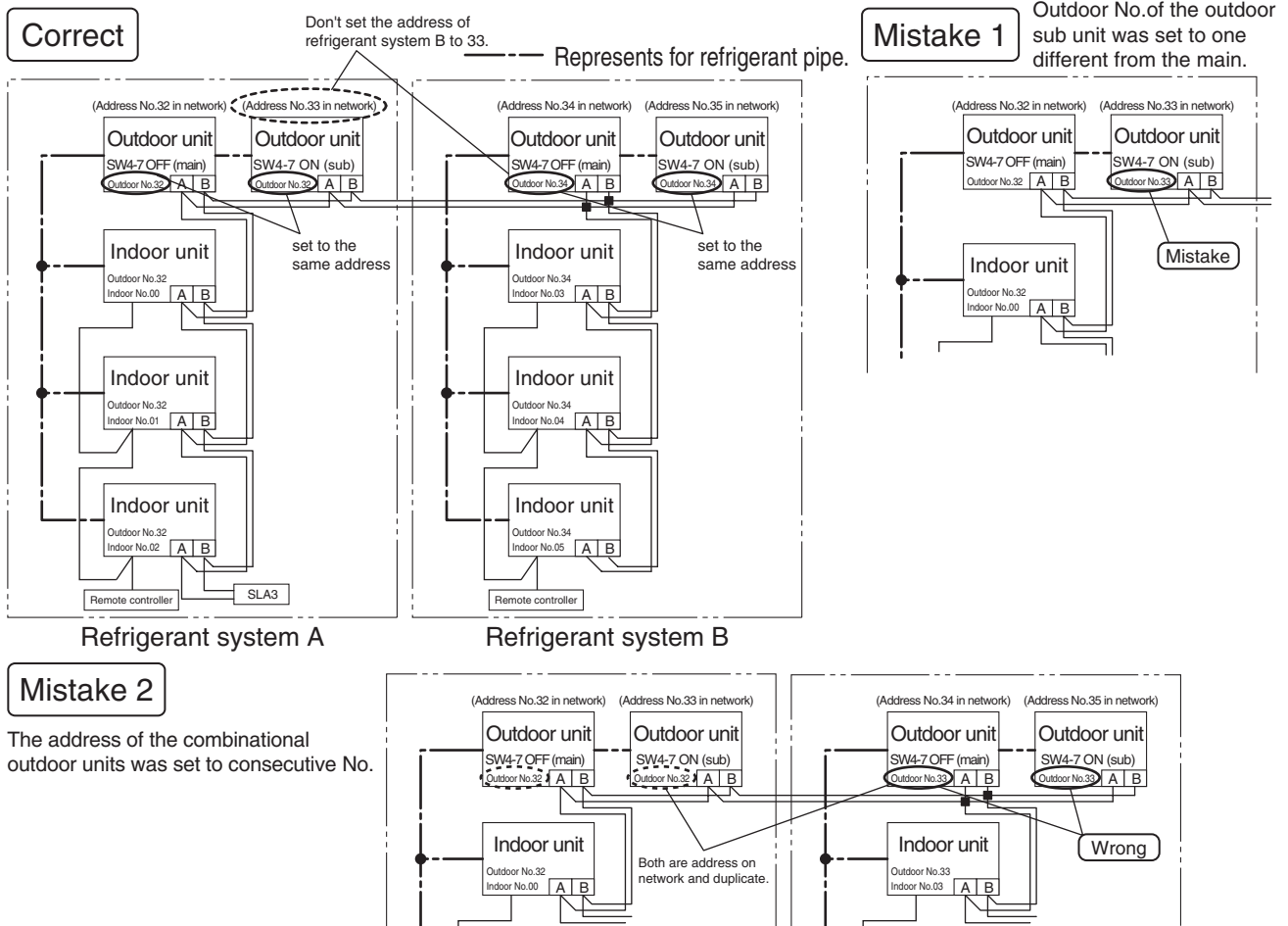
Turn on power in the order of the outdoor units and then the indoor units. Use over 1 minute as the rule of thumb for an interval between them.

Note (1) Turn on the power of the indoor unit after making sure LED (green) flashing on the outdoor unit board when the address cannot be recognized (even if the indoor unit is operated there is communication abnormality).

Attention

- Even when more than one indoor unit are controlled by one remote controller, care must be taken so that no duplicating indoor unit number is assigned within the group of units.
- Dip switch (SW4-7) for the master/sub unit setting of the outdoor unit must be set to OFF (default setting at the shipment from factory).

6.2 Combinational outdoor units



- Notes (1) Do the wiring of the signal wire along the refrigerant pipe to prevent the faulty wiring across the system. It is easy to discover and restore the address setting mistake, if operating check is separately done for each individual system.
- (2) It is recommended that in the view of the loop wiring prevention and work easiness the signal wire wiring of signal wire should be done on the outdoor unit side when extending from more than one system. It is also recommended that the signal wire between systems is connected after the test run, because it is easy to discover and restore the address setting mistake in this way.
- (3) At most two signal wires are allowed to connect with one terminal, and use the close edge connection terminal in case of more than two signal wires. (■mark in figure represents for the close edge connection terminal.)

(1) Outdoor unit address setting

- ① Set dip switches (SW4-7) for master/slave setting to OFF as a main unit and ON as a sub unit. The default setting at shipment from factory is OFF.
- ② Set rotary switches (SW1,2) for outdoor No. setting of the master and sub unit in a same refrigerant system to same number within the range of 00 to 47. In the case of more than one refrigerant system, it is desirable not to set consecutive number and make all an even number. [Setting consecutive number might cause error. Refer to ..... attention (1).]

Note (1) Which one of outdoor units can be set as master or sub unit.

< Illustration example of above figure >

Refrigerant system	Outdoor unit	SW1	SW2	SW4-7	Address on a network
A	Main unit	3	2	OFF	32
	Sub unit	3	2	ON	33
B	Main unit	3	4	OFF	34
	Sub unit	3	4	ON	35



Attention(1)

- The network address of a sub unit is the rotary switch settings +1.
- In the case of more than one refrigerant system, if consecutive addresses are set, an address on the network of a sub unit in a refrigerant systems will duplicate with an address in another refrigerant system.. (Refer to the example about mistake-2 in above figure.)
- Assign the setting of the address of combinational outdoor units to a different even number to avoid such a trouble. The trouble can be avoided. In addition, the odd number setting is also possible. (When the address of the main unit is set as 47, the address of sub unit will become 00.)

(2)Indoor unit address setting

- ① Set rotary switches (SW1, 2) for indoor No. to a number within the range of 00 to 47. In setting a number, care must be taken so that no duplicating indoor unit number is assigned in the same network.
- ② Set the rotary switches (SW3, 4) for outdoor unit No. setting to the corresponding outdoor unit's address No..

(3)Turning on power

Turn on power in the order of the outdoor units and then the indoor units. Use over 1 minute as the rule of thumb for an interval between them.

Note (1) Turn on the power of the indoor unit after making sure LED (green) flashing on the outdoor unit board when the address cannot be recognized (even if the indoor unit is operated there is communication abnormality).

Attention(2)

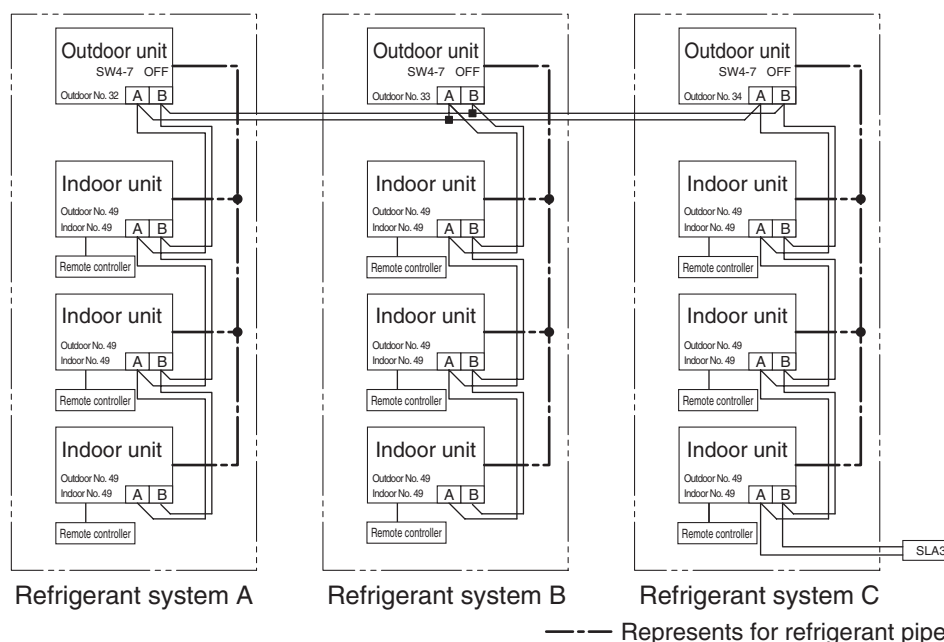
- Even when more than one indoor unit are be controlled by one remote controller, care must be taken so that no duplicating indoor unit number is assigned within the group of units.
- When the outdoor units are used in combination, set the rotary switches (SW1, 2) for outdoor sub unit No. setting to the corresponding master outdoor unit's address No..

< method of deleting address >

The address of a unit can be changed, if setting the rotary switch of this unit again and resetting the power. However, care must be taken so that no duplicating indoor unit number is assigned.

7. Remote control address setting

- Remote control address setting is a method of the address setting by remote controller. However, the address setting by the remote controller is available only when an indoor unit and a remote controller are connected in a one-to-one configuration.
- The remote control address setting cannot be done when one remote controller is connected with more than one indoor unit. In this case, to do remote control address setting, you can select: connect an indoor unit and a remote controller in a one-to-one configuration, or equipping an indoor unit with a remote controller only when the remote control address setting is done.



- Notes (1) Do the wiring of the signal wire along the refrigerant pipe to prevent the faulty wiring across the system. It is easy to discover and restore the address setting mistake, if operating check is separately done for each individual system.
- (2) It is recommended that in the view of the loop wiring prevention and work easiness the signal wire wiring of signal wire should be done on the outdoor unit side when extending from more than one system. It is also recommended that the signal wire between systems is connected after the test run, because it is easy to discover and restore the address setting mistake in this way.
- (3) At most two signal wires are allowed to connect with one terminal, and use the close edge connection terminal in case of more than two signal wires. (■mark in figure represents for the close edge connection terminal.)

7.1 A single outdoor unit

(1)Outdoor unit address setting

- ① Set the rotary switches (SW1,2) for outdoor unit No. setting to a number within the range of 00 to 47 separately for each individual refrigerant system. In setting a number, care must be taken so that no duplicating outdoor unit No. is assigned in the same network.

<Illustration example for above figure>

Refrigerant system	SW1 (tens digit)	SW2 (units digit)	SW4-7	Address on a network
A	3	2	OFF	32
B	3	3	OFF	33
C	3	4	OFF	34

(2)Indoor unit address setting

- ② Set rotary switch (SW1,2) for indoor unit No. setting to 49 that is the default setting at shipment from factory.
- ③ Set the rotary switches (SW3,4) for outdoor unit No. setting to 49 that is the default setting at shipment from factory.

SW1 (Tens digit)	SW2 (Units digit)
4	9

SW3 (Tens digit)	SW4 (Units digit)
4	9

(3)Turning on power

- ① Turn on power in the order of the outdoor units and then the indoor units. Use over 1 minute as the rule of thumb for an interval between them.

Notes (1) "Please wait for a while" will be displayed on the dot part of the screen of the remote controller when turning on the power for the indoor unit. Then a temporary address is assigned, and it is available for indoor unit to communicate with remote controller.

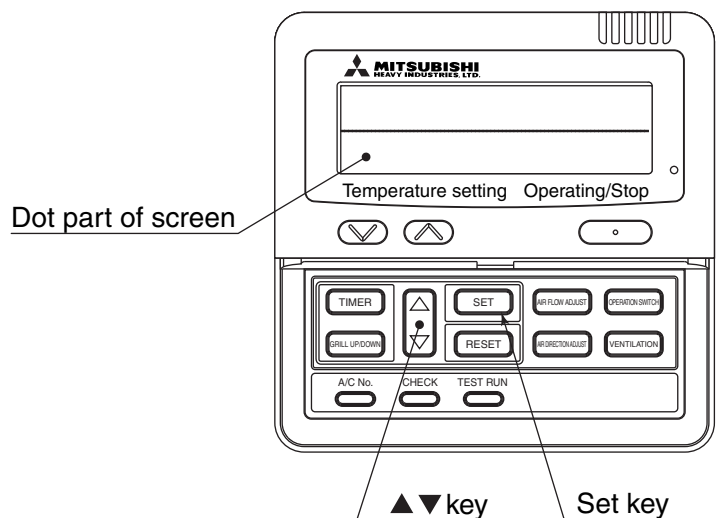
- (2) "Please turn on the power for outdoor unit" will be displayed on the dot part of the screen of the remote controller if there is no power for the outdoor unit.

(4)Setting of the indoor unit by remote controller

- ① "Outdoor No. setting" will be displayed on the dot part of the screen of the remote controller. Next, press the ▲ ▼ key of remote controller, and set outdoor No.. Press the "SET" key of remote controller when the setting ends.

Note (1) Outdoor address No. of each refrigerant system set according to the table of 7.1 (1) ① is displayed in outdoor No..

- ② Next, move to the indoor No. setting. press the ▲ ▼ key of remote controller as well as the outdoor unit and set indoor No.. Press the "SET" key of remote controller when the setting ends. Normal display status is returned to after

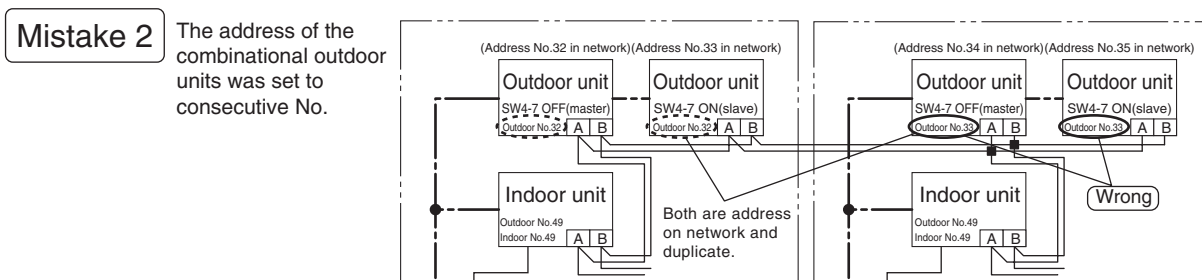
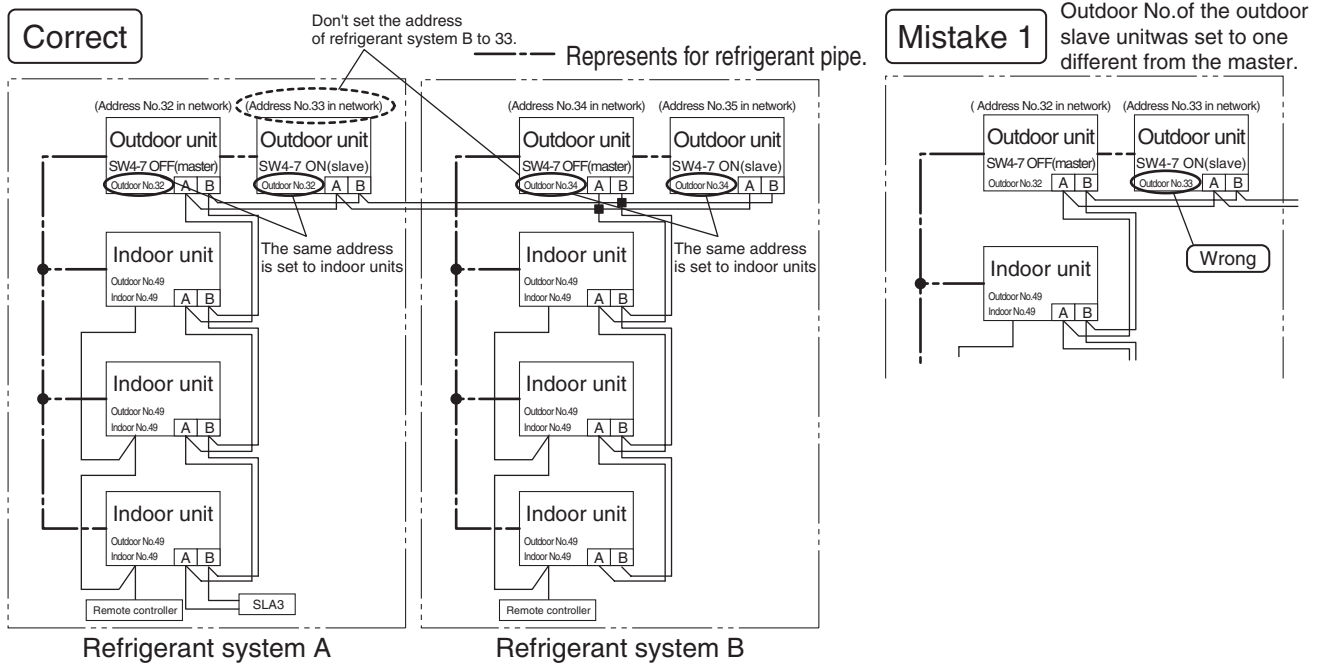


the final content is highlighted on the dot part of the screen of remote controller for about two seconds.

Note (1) Set the indoor No. a number within the range of 00 to 47. In setting a number, care must be taken so that no duplicating outdoor unit No. is assigned in the same network.

- Notes (1) The indoor unit cannot be operated if the setting is done in the order of ① next ②.  
 (2) When two remote controller are connected to an indoor unit, it is allowed to set from the master remote controller only.  
 (3) Press the "air conditioner No." key of remote controller for over three seconds when you want to correct address No. after address No. has been set. Then set address No. again in the order ① next ②.

7.2 Combinational outdoor units



- Notes (1) Do the wiring of the signal wire along the refrigerant pipe to prevent the faulty wiring across the system. It is easy to discover and restore the address setting mistake, if operating check is separately done for each individual system.  
 (2) It is recommended that in the view of the loop wiring prevention and work easiness the signal wire wiring of signal wire should be done on the outdoor unit side when extending from more than one system. It is also recommended that the signal wire between systems is connected after the test run, because it is easy to discover and restore the address setting mistake in this way.  
 (3) At most two signal wires are allowed to connect with one terminal, and use the close edge connection terminal in case of more than two signal wires. (■mark in figure represents for the close edge connection terminal.)

(1) Outdoor unit address setting

- ① Set dip switches (SW4-7) for master/slave setting to OFF as a main unit and ON as a sub unit. The default setting at shipment from factory is OFF.
- ② Set rotary switches (SW1,2) for outdoor No. setting of the master and sub unit in a same refrigerant system to same number within the range of 00 to 47. In the case of more than one refrigerant system, it is desirable not to set consecutive number and make all an even number. [Setting consecutive number might cause error. Refer to Attention.]

Note (1) Which one of outdoor units can be set as master or sub unit.

< Illustration example of figure in above page >

Refrigerant system	Outdoor unit	SW1	SW2	SW4-7	Address on a network
A	Main unit	3	2	OFF	32
	Sub unit	3	2	ON	33
B	Main unit	3	4	OFF	34
	Sub unit	3	4	ON	35

**Attention:**

- The network address of a sub unit is the rotary switch settings +1.
- In the case of more than one refrigerant system, if consecutive addresses are set, an address on the network of a sub unit in a refrigerant systems will duplicate with an address in another refrigerant system.. (Refer to the example about mistake-2 in above figure.)
- Assign the setting of the address of combinational outdoor units to a different even number to avoid such a trouble. The trouble can be avoided. In addition, the odd number setting is also possible. (When the address of the main unit is set as 47, the address of sub unit will become 00.)
- Set rotary switch (SW1,2) for outdoor No. of the outdoor sub unit to same address No as outdoor No. of the corresponding main unit for the combinational outdoor units.

(2) Indoor unit address setting

- ① Set rotary switch (SW1,2) for indoor unit No. setting to 49 that is the default setting at shipment from factory.
- ② Set the rotary switches (SW3,4) for outdoor unit No. setting to 49 that is the default setting at shipment from factory.

SW1 (Tens digit)	SW2 (Units digit)
4	9

SW3 (Tens digit)	SW4 (Units digit)
4	9

(3) Turning on power

Turn on power in the order of the outdoor units and then the indoor units. Use over 1 minute as the rule of thumb for an interval between them.

Notes (1) "Please wait for a while" will be displayed on the dot part of the screen of the remote controller when turning on the power for the indoor unit. Then a temporary address is assigned, and it is available for indoor unit to communicate with remote controller.

(2) "Please turn on the power for outdoor unit" will be displayed on the dot part of the screen of the remote controller if there is no power for the outdoor unit.

(4) Setting of the indoor unit by remote controller

- ① "Outdoor No. setting" will be displayed on the dot part of the screen of the remote controller. Next, press the ▲ ▼ key of remote controller, and set outdoor No..

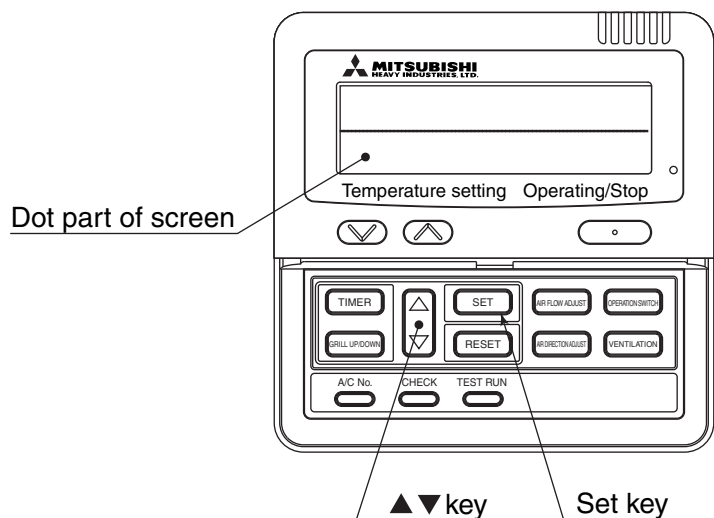
Press the "SET" key of remote controller when the setting ends.

Note (1) Outdoor address No. (main unit) of each refrigerant system set according to the table of 7.1 (1) ② is displayed in outdoor No..

- ② Next, move to the indoor No. setting. press the ▲ ▼ key of remote controller as well as the outdoor unit and set indoor No..

Press the "SET" key of remote controller when the setting ends. Normal display status is returned to after the final content is highlighted on the dot part of the screen of remote controller for about two seconds.

Note (1) Set the indoor No. a number within the range of 00 to 47. In setting a number, care must be taken so



that no duplicating outdoor unit No. is assigned in the same network.

- Notes (1) The indoor unit cannot be operated if the setting is done in the order of ① next ②.
- (2) When two remote controller are connected to an indoor unit, it is allowed to set from the master remote controller only.
- (3) Press the "air conditioner No." key of remote controller for over three seconds when you want to correct address No. after address No. has been set. Then set address No. again in the order ① next ②.

< method of deleting address >

To delete the set address, the address can be deleted by the operation from remote controller.

Operation method

Press the **WIND VOL** key while pressing the **CHECK** and **TIMER** keys on the remote controller.

Attention:

- Turn on the power to the centralized control equipment after over two minutes when addresses are set. If power is turned on in the wrong order, a failure to recognize addresses may occur.
- Turn on the power to the centralized control equipment again after making sure that all the indoor and the outdoor units are operated normally, when failing to recognize the address (The indoor units have not been displayed in the centralized control equipment). It might take about five minutes until all the indoor units are displayed when there are a lot of air conditioners controlled by the centralized control equipment.

## 6.9 Notice on Design and Wiring of Electric Equipment

No.	Classification	Items to be Checked	Standard	Reference Page	Remarks	
1	Outdoor	Electric Equipment	Are different power sources used for the indoor and outdoor units?	■ Different power sources should be used.	P.354	
2			Are different power sources used for the inverter unit and each constant speed unit in the combination KX4?	■ Different power sources should be used for different units.		<ul style="list-style-type: none"> <li>■ The capacity of the terminal block of the inverter unit is only enough for the inverter unit and does not have any spare capacity.</li> <li>■ Obtaining power source for the constant speed unit from the main unit → fire accidents might be caused due to insufficient capacity.</li> </ul>
3			Is the current leakage breaker firmly set up?	■ Separate setting is required.		■ Electric shock may arise.
4			Does the current leakage breaker of the outdoor unit (the unit carrying the inverter compressor) match the inverter type?	■ Circuit breakers corresponding to the inverter type must be used.		■ If the circuit breakers do not match the inverter type, misoperation of the circuit breaker may occur.
5	Outdoor	Power Source	Are different power sources used for the indoor and outdoor units?	■ Different power sources should be used.	P.354	
6			Are different power sources used for the inverter unit and each constant speed unit in the combination KX4?	■ The power source must not be connected from the inverter unit to the constant speed unit (the wiring size is required to be less than 22mm <sup>2</sup> ).		<ul style="list-style-type: none"> <li>■ The current capacity of the terminal block of each group is only enough for itself.</li> <li>■ Leading power from the inverter unit to the constant speed unit → high likelihood of fire accident.</li> </ul>
7			Is the voltage of the power source within the specified limit?	<ul style="list-style-type: none"> <li>■ Imbalance among phases in operation: within ± 10%</li> <li>■ Voltage drop at the compressor start-up: within -15%</li> <li>■ Imbalance among phases: within ± 3%</li> </ul>		
8			Do the specifications of the wiring and circuit breaker comply with laws and regulations of relevant country?			
9			Is the current leakage breaker firmly set up?	■ Current leakage breakers should be properly set up for each unit.		
10	Indoor / Outdoor	Signal Wire	Does the inside / outside signal wire have loop wiring?	■ Loop wiring is not permitted.	P.356	■ Loop wiring → E5 and E2 may happen now and again.
11			Are the signal wire and the power cord crossed?	■ The type of wire must be changed.	P.357	■ Making judgement in accordance with the resistance value between Terminal A and B (If the resistance is below 80Ω, it means there exists crossed wires → the base plate will possibly be burnt and damaged.)
12			Are the inside/outside signal wire and the shared line crossed?	■ The type of wire must be changed.	-	
13			Is the signal wire of the correct type and size?	<ul style="list-style-type: none"> <li>■ Size: 0.75 ~ 2.0mm<sup>2</sup></li> <li>■ Type: VCTF, VCT, CVV, MVVS</li> </ul>	P.355	
14	System	Address	Are proper address numbers determined?	■ Has reasonable determination be made (similarity between the operation time belts) after giving consideration to the combination of indoor unit / outdoor unit, purpose of the room, time of use and sorting of occupants?	P.358	
15			Are the address numbers of the indoor/outdoor units clearly indicated on the equipment diagram (indoor unit configuration diagram, etc.)?		-	<ul style="list-style-type: none"> <li>■ Incomplete instructions except those on the drawings.</li> <li>■ Crossed wires → the base plate of the air-conditioner is burnt and damaged.</li> </ul>
16			Have the drawings been submitted to the address setting operator, and setting instruction been given?	<ul style="list-style-type: none"> <li>■ Instructions must be made via the drawings instead of verbal indication.</li> <li>■ Standards for selection of address setting methods</li> </ul> <ol style="list-style-type: none"> <li>1. Signal wire, individual: automatic address or manual address</li> <li>2. Signal wire, super link, manual address</li> </ol>	-	Incorrect address setting may lead to the following serious accidents: <ol style="list-style-type: none"> <li>1. Poor cooling / heating effect</li> <li>2. Water leakage, anomalous stop (abnormal high pressure, anomalous discharge temperature, etc.)</li> <li>3. Compressor failures, etc.</li> </ol>
17		Signal Wire	Has any confirmation been made on whether there is any crossing of the signal wire and the power cord?	<ul style="list-style-type: none"> <li>■ The resistance should be measured at the terminal block (A, B) of the signal wire and the measured value should be close to the one calculated with the following formula.</li> </ul> <p>Appropriate resistance value (Ω) = 9100 / number of connected units</p> <p>If the actually measured resistance is below 80Ω, there definitely exist some crossed wires.</p>	P.357	■ Crossed wires → base plate of the air-conditioner is burnt and damaged.

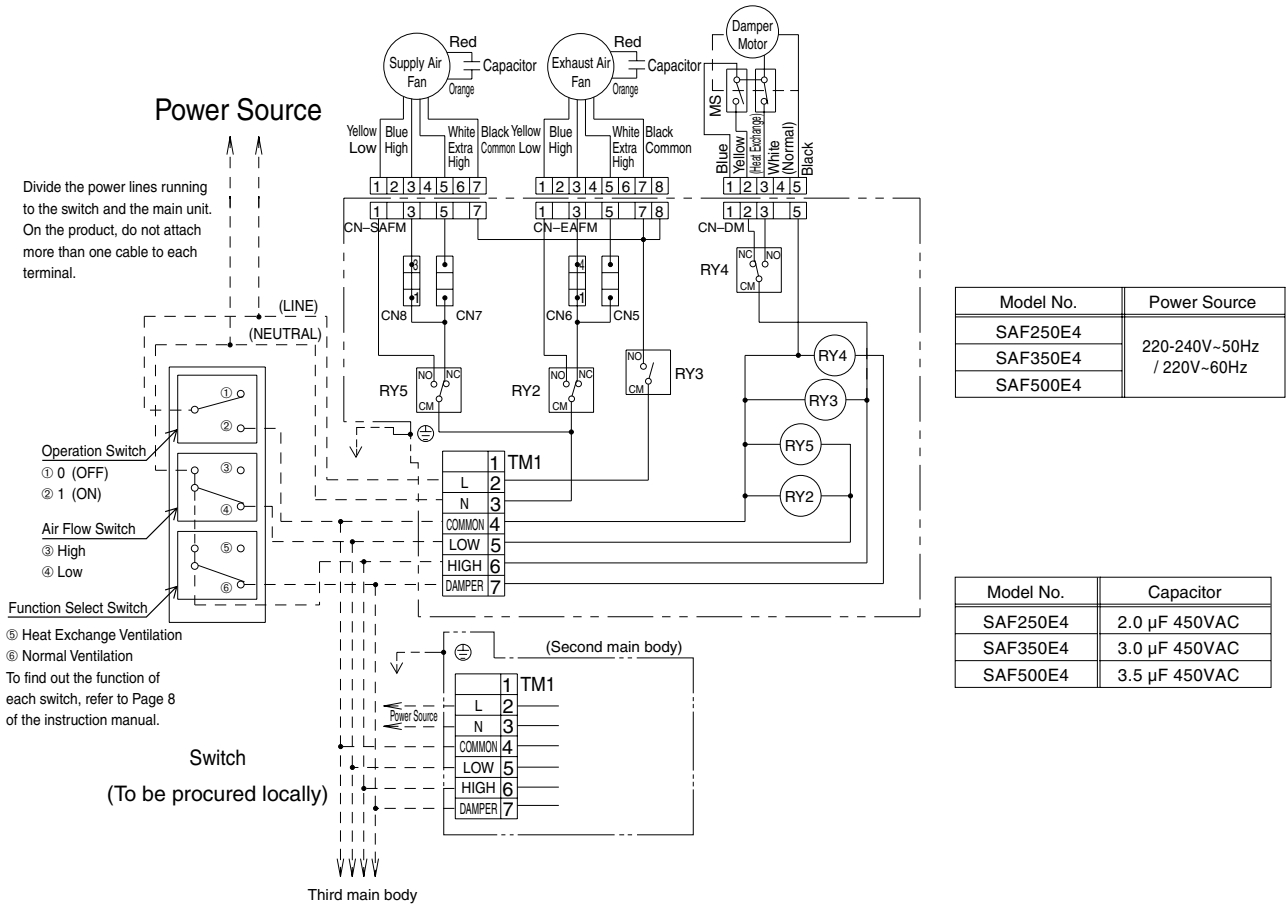
Application Data

## 6.10 Electric Works for Air-to-air Heat Exchange Units

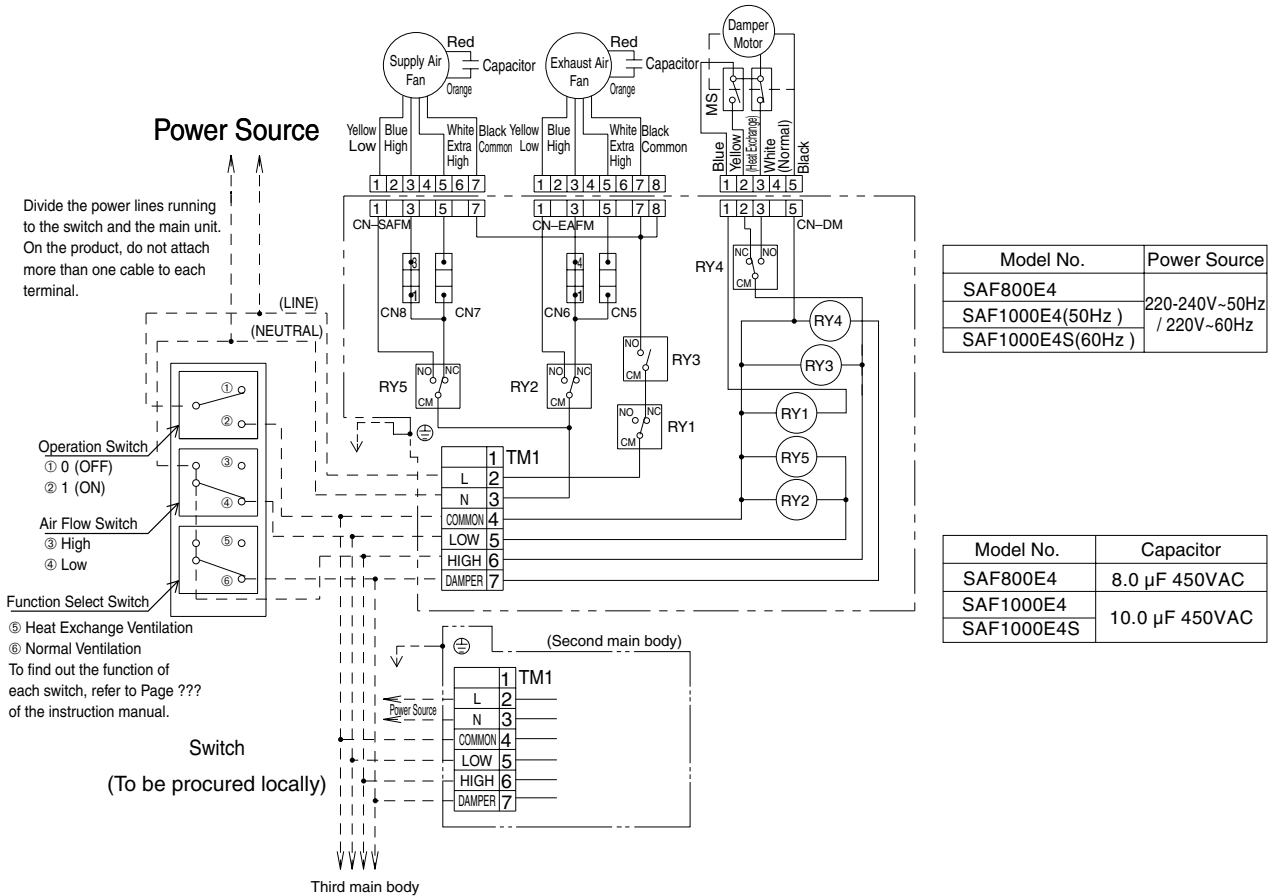
Have a specialized working contractor perform wiring in accordance with the laws and regulations of the country concerned.

1. Connect the wires shown by the broken lines.
2. We recommend that you use a switch having more than 3mm distance to break contact and more than 15A rated current.

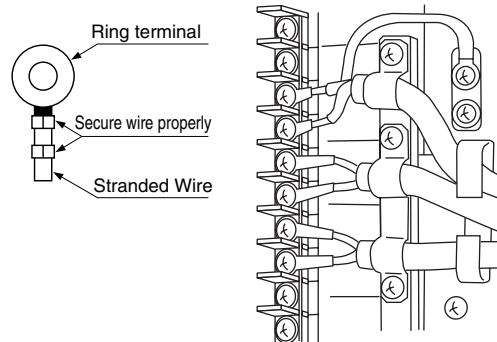
### SAF250E4, SAF350E4, SAF500E4



SAF800E4, SAF1000E4



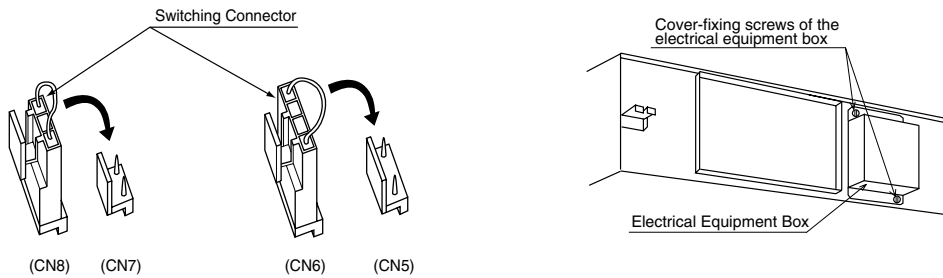
- Use two-core polyvinyl chloride insulated and sheathed cables for fixed wiring that have a cross-sectional conductive area of 2.5mm<sup>2</sup> and conforms to the IEC 60227-4 standard. When using stranded wire, attach a ring terminal securely at two points as shown right.  
(Carry out the work based on the laws, regulations and technical standards of the country concerned.)



- Follow the following steps for wiring.
  - Unfasten two cover-fixing screws of the electrical equipment box, open the box cover, and then connect wiring firmly.
  - Fit the cables from the terminal firmly with a cord clasper.



5. When you need much airflow or a duct is long, change the wire connection from High to Extra High.
  - ① Unfasten two cover-fixing screws of the electrical equipment box and open the box cover.
  - ② Change CN6 to CN5 and CN8 to CN7 inside the electrical Equipment box.
6. It is possible to operate up to 10 units by from one switch set.



- Caution**
- (1) Use the power source corresponding to the name plate. Using a different power source may cause the motor to burn out.
  - (2) Carry out grounding work according to the laws and regulations of the country concerned and the technical standard.
  - (3) After completion of wiring, check again there are no wrong wirings before power ON.
  - (4) After completion of wiring, power ON and perform a pilot run according to the following steps for checking the airflow condition and a damper operation.
  - (5) Check the opening and closing of a damper by opening the inspection cover of the side of the unit. Model No. SAF800E4, SAF1000E4 and SAF1000E4S, two Fan Motors are stopped during an operation of the damper.

	Each switch setting		Checking items	
	Function Select Switch	Air Flow Switch	Airflow condition	Damper
1	Heat Exchange	High (Extra High)	Check if the air from inside supply opening and the one from room intake opening are set to High (Extra High) and to Low, respectively	Open (A Damper is beyond)
		Low		
2	Normal Ventilation	High (Extra High)		Close (A Damper is near)
		Low		

Note(1) In case that any abnormality occurs in a pilot running, its conceivable cause would be a wrong wiring.  
 Don't forget to switch the exclusive breaker to OFF before correcting the wiring. Otherwise, it is likely to cause an electric shock.