

HITACHI

Operation Installation & Maintenance Manual

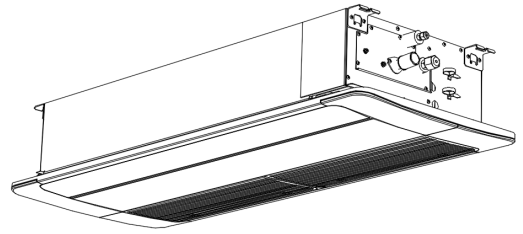
*VRF AIR-CONDITIONER
(HEAT PUMP)*

- INDOOR UNIT -

Type	Model	
1-Way Cassette Type	RCIS-1.0FSKDNQ	RCIS-2.0FSKDNQ
	RCIS-1.3FSKDNQ	RCIS-2.5FSKDNQ
	RCIS-1.6FSKDNQ	

IMPORTANT:

*READ AND UNDERSTAND
THIS MANUAL BEFORE
USING THIS HEAT-PUMP
AIR CONDITIONERS.
KEEP THIS MANUAL FOR
FUTURE REFERENCE.*



P01959Q

ORIGINAL INSTRUCTIONS

IMPORTANT NOTICE

- HITACHI pursues a policy of continuing improvement in design and performance of products. The right is therefore reserved to vary specifications without notice.
- HITACHI cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioner is designed for standard air conditioning only. Do not use this heat pump air conditioner for other purposes such as drying clothes, refrigerating foods or for any other cooling or heating process.
- The installer and system specialist shall secure safety against leakage according to local regulations or standards. The following standards may be applicable if local regulations are not available. British Standard, BS4434 or Japan Standard, KHKS0010.
- No part of this manual may be reproduced without written permission.
- Signal words (DANGER, WARNING and CAUTION) are used to identify levels of hazard seriousness. Definitions for identifying hazard levels are provided below with their respective signal words.

⚠ DANGER	:	Immediate hazards which WILL result in severe personal injury or death.
⚠ WARNING	:	Hazards or unsafe practices which COULD result in severe personal injury or death.
⚠ CAUTION	:	Hazards or unsafe practices which COULD result in minor personal injury or product or property damage.
NOTE	:	Useful information for operation and/or maintenance.

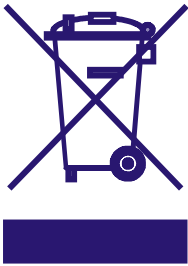
- It is assumed that this heat pump air conditioner will be operated and serviced by English speaking people. If this is not the case, add safety, caution and operating signs in the native language.
- If you have any questions, contact your distributor or dealer of HITACHI.
- This manual gives a common description and information for this heat pump air conditioner which you operate as well as for other models.
- This heat pump air conditioner has been designed for the following temperatures. Operate the heat pump air conditioner within this range.

Temperature		(°C)	
		Maximum	Minimum
Cooling Operation	Indoor	32 DB/23 WB	21 DB/15 WB
	Outdoor	43 DB	-5 DB
Heating Operation	Indoor	27 DB	15 DB
	Outdoor	15 WB	- 20 WB

DB: Dry Bulb, WB: Wet Bulb

This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

IMPORTANT NOTICE



Correct Disposal of this product

This marking indicates that this product should not be disposed with other household wastes. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.

CHECKING PRODUCT RECEIVED

- Upon receiving this product, inspect it for any shipping damage.
Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
- Check the model number, electrical characteristics (power supply, voltage and frequency) and accessories to determine if they are correct.

The standard utilization of the unit shall be explained in these instructions.

Therefore, the utilization of the unit other than those indicated in these instructions is not recommended.

Please contact your local agent, as the occasion arises.

HITACHI's liability shall not cover defects arising from the alteration performed by a customer without HITACHI's consent in a written form.

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Section1 Operation Manual

1. Safety Summary

DANGER

- Do not pour water into the indoor or outdoor unit. These products are equipped with electrical parts. If poured, it will cause a serious electrical shock.
- Do not touch or adjust safety devices inside the indoor or outdoor units. If these devices are touched or readjusted, it may cause a serious accident.
- Do not open the service cover or access the indoor or outdoor units without turning OFF the main power supply.

WARNING

- Refrigerant leakage can cause difficulty with breathing due to insufficient air.
If leakage occurs, turn OFF the main switch, put out fire at once and contact your service contractor.
- Do not use any sprays such as insecticide, lacquer, hair spray or other flammable gases within approximately one (1) meter from the system.
- If earth leakage breaker (ELB) or fuse is often activated, stop the system and contact your service contractor.

CAUTION

- The appliance is not to be used by children or person with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Children should be supervised that they do not play with the appliance.
- The appliance should not be installed in the laundry.

NOTE

- It is recommended that the room be ventilated every 3 to 4 hours.

2. System Description

A maximum total capacity of 130% and a minimum total capacity of 50% can be chosen by combination of the indoor units (Table 2.1).

The heat pump air conditioner is designed to offer cooling, heating, dry and fan operations. These operation modes are controlled by the remote control switch (optional).

Table 2.1 Indoor Unit Type List

Indoor Unit Type	Nominal Capacity (HP)				
	1.0	1.3	1.6	2.0	2.5
1-Way Cassette Type	○	○	○	○	○

○ : Available

3. Remote Control Switch

CAUTION

Press switches only with fingers. Do not press switches by any other item, as it may break switches.

Do not touch the CHECK switch. This switch is only for servicing. If touched, press the CHECK switch again to reset.

- **Temperature Setting**

When the TEMP switch is pressed, temperature increases by 1 degree. The minimum setting indication is 17°C and the maximum setting indication is 30°C.

- **Set and Actual Temperature**

The set temperature is for the air temperature at the sensor (thermistor) of the indoor unit. The actual room temperature may be different

from the air temperature of the sensor due to the difference of the sensing location.

- **Touching Type Switches**

This control switch is of touching type. Slightly press the switch by finger. The operation can be checked by the display of the liquid crystal.

- **Multiple-Unit Control**

16 indoor units, as a maximum number, can be controlled by one remote control switch. Refer to the Installation Manual for Remote Control Switch.

4. Before Operation

CAUTION

Supply electrical power to the system for approximately 12 hours before start-up after long shutdown. Do not start the system immediately after power supply, it may cause a compressor failure, because the compressor is not heated well.

Make sure that the outdoor unit is not covered with snow or ice. If covered, remove it by using hot water (approximately 50°C).

If the water temperature is higher than 50°C, it will cause damage to plastic parts.

When the system is started after a shutdown longer than approximately 3 months, it is recommended that the system be checked by your service contractor.

Turn OFF the main switch when the system is stopped for a long period of time. If the main switch is not turned OFF, electricity is consumed, because the oil heater is always energized during compressor stopping.

5. Operation Method

Regarding the instructions of Wired Remote Control Switch or Wireless Remote Control Switch, read the operation manual attached to the control switch.

6. Setting of Automatic Swing Louver

When the SWING LOUVER switch is pressed, the swing louver starts its operation.

When “” is moving, it indicates the operation of the louver continuously. When the swinging operation of the louver is not required, press the SWING LOUVER switch again. The louver is stopped at an angle indicated by the direction of this mark “”.

NOTE

1. There exists a time lag between the actual outlet air angle and the liquid crystal indication.
2. When the SWING LOUVER switch is pressed, the louver will not stop immediately. The louver will move one extra swing at the next.
3. During the cases in item (A), the louvers are fixed automatically.
However, indication of the louvers is changed at setting before.
(A) Outlet air angle is fixed at horizontal position during start-up of heating operation and defrosting operation and when thermostat is ON.
When the outlet air temperature reaches higher than approximately 30°C, swinging of louvers is started.
4. During the defrosting operation, fan stops running.

CAUTION

Do not turn the air louver by hand. If moved, the louver mechanism will be damaged.

7. Filter Cleaning

CAUTION

Do not operate the system without the air filter to protect the indoor unit heat exchanger against being clogged.

Turn OFF the main power switch before taking out the filter. (The previous operation mode may appear.)

7.1 Taking Out the Filter

The indication, “FILTER” is shown on the display of the remote control switch after approximately 1,200 hour operation.

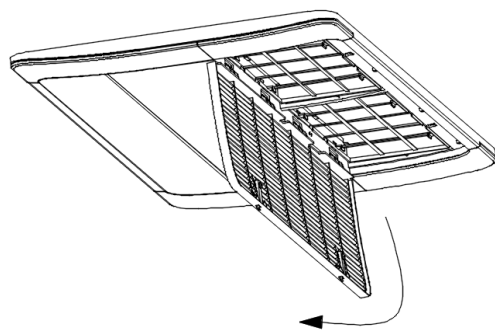
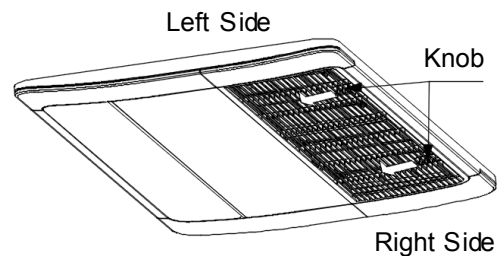
Take out the air filter according to the following steps.

Step 1

Open the air inlet grille after pushing the two knobs as shown by the arrow mark.

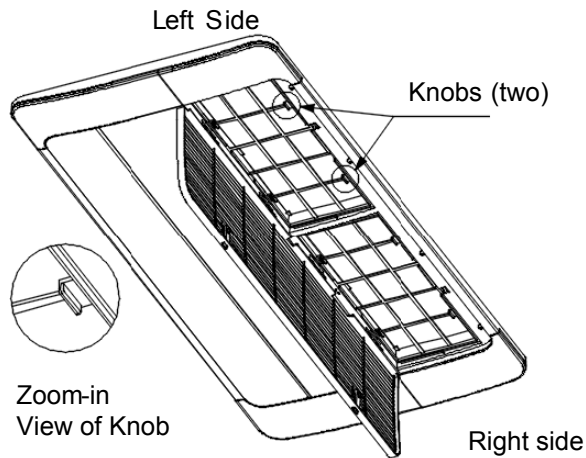
Step 2

Take out the air filter from the air inlet grille by supporting the air grille and lifting the air filter after detaching the filter from hinges.



Note:

There are two grilles on the panel of P-N71SNKQAE, which should be removed respectively.



Remove the other filter screen in the same way.

7.2 Clean the Filter

Clean the air filter according to the following steps.

Step 1

Use a vacuum cleaner or let water flow onto the air filter for removing the dirt from the air filter.

CAUTION

Do not use hot water higher than approximately 40°C.

Step 2

Dry the air filter in the shade after shaking off moisture.

7.3 Reset of Filter Indication

After cleaning the air filter, press the "RESET" button. The FILTER indication will disappear and the next filter cleaning time will be set.

8. Troubleshooting

CAUTION

When overflow of drain water from the indoor unit occurs, stop the operation and contact your contractor.

When you smell or see white smoke coming from the unit, turn OFF the main power supply and contact your contractor.

8.1 If Trouble Still Remains ...

If the trouble still remains even after checking the following, contact your contractor and inform them of the following items.

- (1) Unit Model Name
- (2) Content of Trouble
- (3) Alarm Code No. on Liquid Crystal Display

8.2 No Operation

Check whether the SET TEMP is set at the correct temperature.

8.3 Not Cooling or Heating Well

- Check for obstruction of air flow of the outside or inside units.
- Check if too much heat source exists in the room.
- Check if the air filter is clogged with dust.
- Check to see if the doors or windows are opened or not.
- Check if the temperature condition is not within the operation range.

8.4 This is Not Abnormal

● Smells from Indoor Unit

Smell adheres on indoor unit after a long period of time. Clean the air filter and panels or allow a good ventilation.

● Sound from Deforming Parts

During system starting or stopping, an abrading sound might be heard. However, this is due to thermal deformation of plastic parts. It is not abnormal.

● Steam from Outdoor Heat Exchanger

During defrosting operation, ice on the outdoor heat exchanger is melted, resulting in making steam.

● Dew on Air Panel

When the cooling operation continues for a long period of time under high humidity conditions (higher than 27°C/80% R.H.), dew can form on the air panel.

● Refrigerant Flow Sound

While the system is being started or stopped, sound from the refrigerant flow may be heard.

NOTE

Except for a long period of shutdown, keep the main switch ON, since the oil heater is energized when the compressor is stopping.

Section2 Installation & Maintenance Manual

1. Safety Summary

WARNING

- Do not perform installation work, refrigerant piping work, drain piping and electrical wiring connection without referring to the installation manual.
- Check that the ground wire is securely connected.
- Connect a fuse of specified capacity.
- Pay a special attention to the place, such as a basement, etc. where refrigerant can stay, since refrigerant is heavier than air.

CAUTION

Do not install the indoor unit, outdoor unit, remote control switch and cable within approximately 3 meters from strong electromagnetic wave radiators such as medical equipment.

2. Structure

2.1 Indoor Unit & Refrigerant Cycle

Regarding the structural drawings and the refrigerant cycle diagrams, refer to Technical Catalogue II.

2.2 Necessary Tools and Instrument List for Installation

No.	Tool	No.	Tool
1	Handsaw	12	Charging Cylinder
2	Phillips Screwdriver	13	Gauge Manifold
3	Vacuum Pump	14	Cutter for Wires
4	Refrigerant Gas Hose	15	Gas Leak Detector
5	Megohmmeter	16	Leveller
6	Copper Pipe Bender	17	Clamper for Solderless Terminals
7	Manual Water Pump	18	Hoist (for Indoor Unit)
8	Pipe Cutter	19	Ammeter
9	Brazing Kit	20	Voltage Meter
10	Hexagon Wrench	21	Wrench
11	Spanner		

NOTE

About vacuum pump, gas hose, charging cylinder, gauge manifold, please use suitable equipments for R410A respectively. Do not mix other refrigerant.

3. Transportation and Handling

3.1 Transportation

Transport the product as close to the installation location as practical before unpacking.

CAUTION

Do not put any material on the product.

3.2 Handling of Indoor Unit

WARNING

Do not put any foreign material into the indoor unit and check to ensure that none exists in the indoor unit before the installation and test run. Otherwise, a fire or failure, etc. may occur.

CAUTION

Be careful not to damage on insulation materials of unit's surface when lifting.

* To avoid damage to the resin covers, before lifting or moving the indoor unit, put a cloth on the resin covers.

4. Indoor Unit Installation

DANGER

Do not install the indoor unit in a flammable environment to avoid fire or an explosion.

WARNING

- Check to ensure that the ceiling slab is strong enough. If not strong enough, the indoor unit may fall down on you.
- Do not install the indoor unit outdoors. If installed outdoors, an electric hazard or electric leakage will occur.

NOTE

- Before installing indoor units, firstly take down the air grille, and get the factory-supplies accessories out from the indoor unit, or the unit will be damaged.
- After taking out the accessories, install the air grille again using the same screws.

It is recommended that indoor units be installed higher than 2.3 meters from the floor level.

4.1 Factory-Supplied Accessories

Check to ensure that the following accessories are packed with the indoor unit.

Air Panel(optional)

Indoor Unit	Panel Selected
1.0~1.6	P-N45SNKQAE
2.0-2.5	P-N71SNKQAE

NOTE

If any of these accessories are not packed with the unit, please contact your contractor.

WARNING

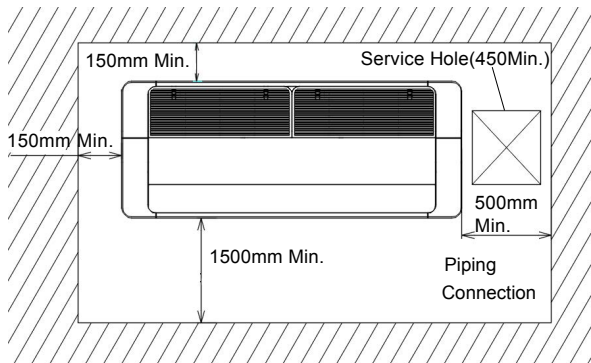
After checking the accessories, make sure the air grille is installed on the unit again, or it may cause a serious accident.

Table 4.1 Factory-Supplied Accessories

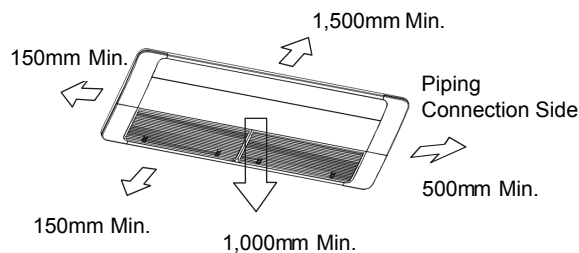
Accessory	Q'ty	Purpose
Screw 	8	For Unit Installation
Washer 	8	
Drain Hose 	1	For Drain Hose Connection
Hose Clamp 	1	
Magnet Ring 	1	
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4.2 Initial Check

- Install the indoor unit with a proper clearance around it for operation and maintenance working space, as shown in Fig. 4.1.
- Provide a service access door near the unit piping connection area on the ceiling.
- Check to ensure that the ceiling has a sufficient strength to hang the indoor unit.
- Check the ceiling surface is flat for the air panel installation work.



Distance From Wall Side



Service Space

Fig. 4.1 Space around Indoor Unit

- Select the installation location as follows:
 - (A) Minimum Space
 - (B) Down Slope Pitch of Drain Piping:
1/25~1/100

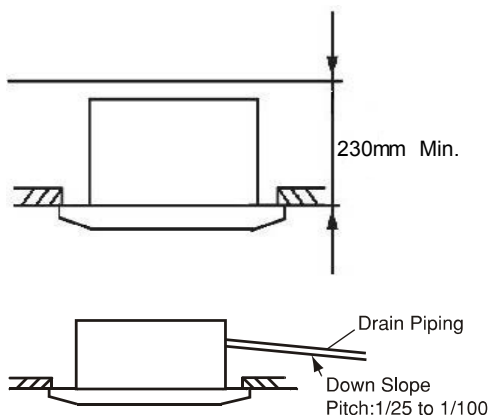


Fig. 4.2 Installation Location of Indoor Unit

- Consider the air distribution from the indoor unit to the space of the room, and select a suitable location so that uniform air temperature in the room can be obtained.
- Do not install flammable parts in the service space for the indoor unit.
- Avoid obstacles which may hamper the air intake or the air discharge flow.
- Do not install the indoor unit in a machinery shop or kitchen where vapor from oil or its mist flows to the indoor unit.
The oil will deposit on the heat exchanger, thereby reducing the indoor unit performance, and may deform and in the worst case, break the plastic parts of the indoor unit.
- Pay attention to the following points when the indoor unit is installed in a hospital or other facilities where there are electronic waves from medical equipment, etc.
 - (A) Do not install the indoor unit where the electromagnetic wave is directly radiated to the electrical box, remote control cable or remote control switch.
 - (B) Install the indoor unit and components as far as practical or at least 3 meters from the electromagnetic wave radiator.
 - (C) Prepare a steel box and install the remote control switch in it. Prepare a steel conduit tube and wire the remote control cable in it. Then, connect the ground wire with the box and the tube.
 - (D) Install a noise filter when the power supply emits harmful noises.
- To avoid any corrosive action to the heat exchangers, do not install the indoor unit in an acid or alkaline environment. In an application where the indoor unit is to be utilized under such environmental conditions, it is recommended that the corrosion-proof type unit be used.

! WARNING

Check to ensure that the number of below is within 0.39 kg/cm³. Otherwise it may cause danger situation if the refrigerant in the Outdoor Unit leaks into the room where this Indoor Unit is installed.

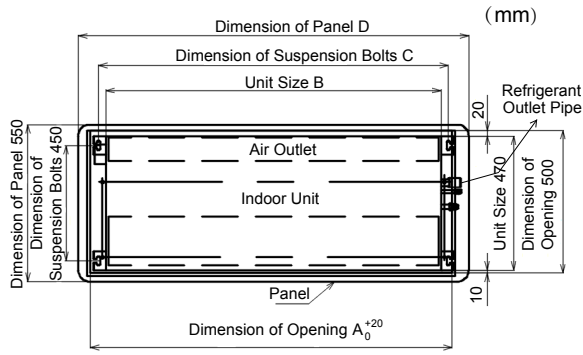
$$\frac{(\text{Total Refrigerant Quantity per one Outdoor Unit})}{(\text{Volume of the room where this Indoor Unit is installed.})} \leq 0.39 \text{ kg/m}^3$$

In detail, refer to the Installation Manual for outdoor unit.

4.3 Installation

4.3.1 Opening of False Ceiling and Suspension Bolts

- (1) Determine the final location and installation direction of the indoor unit paying careful attention to the space for the piping, wiring and maintenance.
- (2) Cut out the area for the indoor unit in the false ceiling and install suspension bolts, as shown in Fig. 4.3.



Unit: mm

Model	Sizes	A	B	C	D
RCIS-1.0FSKDNQ					
RCIS-1.3FSKDNQ		1000	910	958	1100
RCIS-1.6FSKDNQ					
RCIS-2.0FSKDNQ		1270	1180	1228	1370
RCIS-2.5FSKDNQ					

Fig. 4.3 Opening of False Ceiling and Suspension Bolts

- (3) Check to ensure that the ceiling is horizontally level, otherwise drainage can not flow.
- (4) Strengthen the opening parts of the false ceiling.
- (5) Mount suspension bolts, as shown in Fig. 4.4.

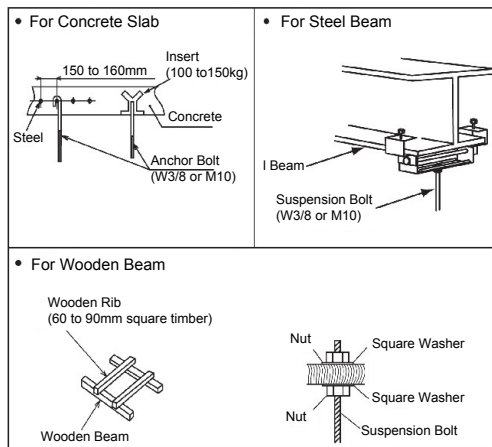


Fig. 4.4 Mounting the Suspension Bolts

4.3.2 Mounting the Indoor Unit

- (1) Mount the nuts and washers to the suspension bolts.

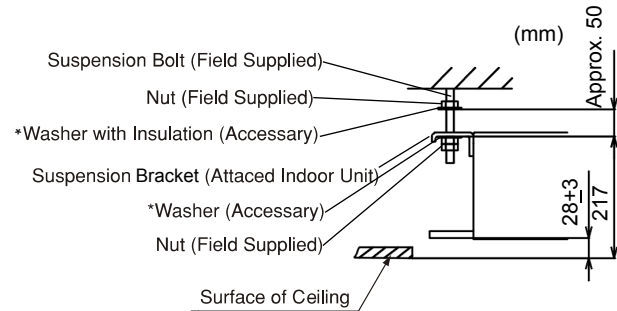


Fig. 4.5 Mounting Nuts and Washers

- * Put the washer so that the surface with insulation can face downwards.
- (2) Lift the Indoor Unit by hoist, and do not put any force on the drain pan.
 - (3) Use a gradienter or transparent plastic hose filled with water to level the two directions of indoor unit, length and width sides.

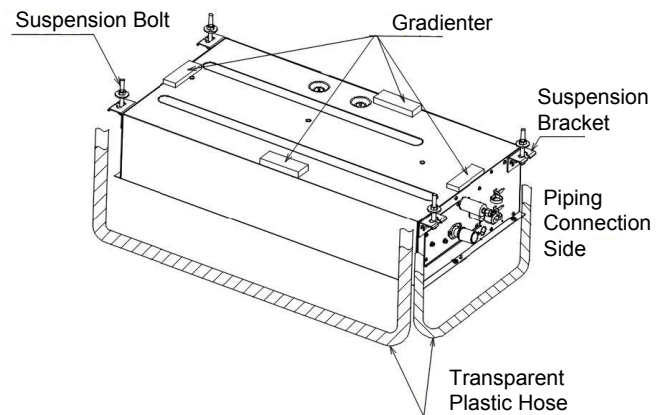


Fig. 4.6 Mounting the Indoor Unit

CAUTION

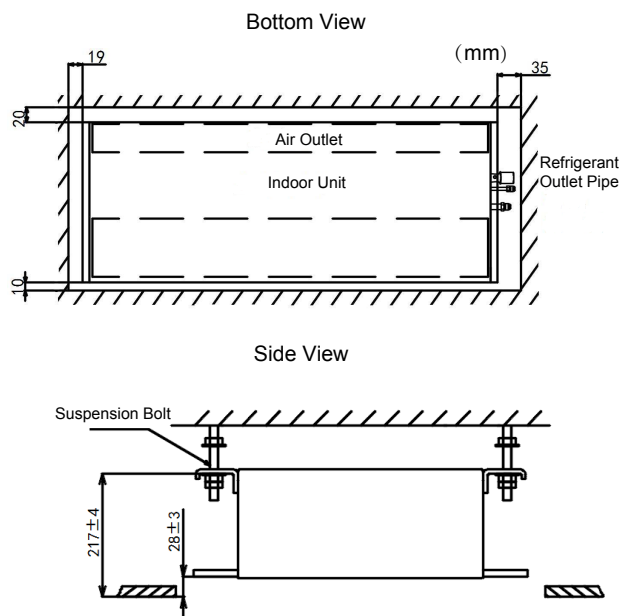
If indoor unit is installed in a position inclined to the reverse direction, it may cause false operation of float switch and result in leakage.

- (4) Secure the indoor unit using the nuts, washers.

NOTE

If a false ceiling has already been installed, complete all piping and wiring work inside the ceiling before hooking-up the indoor unit.

4.3.3 Adjusting the Space between Indoor Unit and False Ceiling Opening

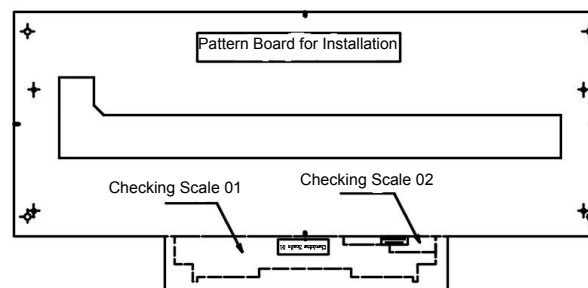


CAUTION

- Check the level of the drain pan using a water level to avoid incorrect operation of the drain discharge mechanism in the indoor unit. The drain piping side of the indoor unit must be approximately 5mm lower than the other part.
- Tighten the nuts of the suspension brackets after the adjustment is completed. Apply LOCK-TIGHT paint* to the bolts and nuts in order to prevent them from loosening. If not done, abnormal noises or sounds may occur and the indoor unit may fall down.

LOCK-TIGHT paint*: Paint the lock bolts and nuts. Adjust the indoor unit to the correct position while checking with the checking scales (factory-supplied).

- (1) Pattern Board for Installation is provided in the packing, please cut it off.



- (2) Adjust the distance between indoor unit and ceiling.
Adjust the indoor unit to a proper position with the checking scale provided by the factory

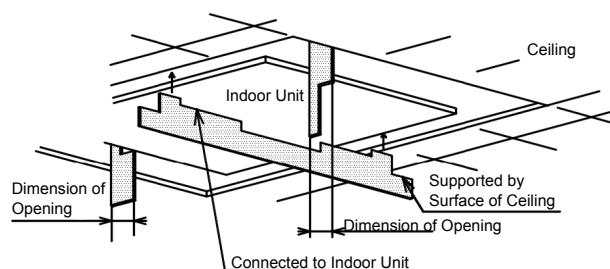
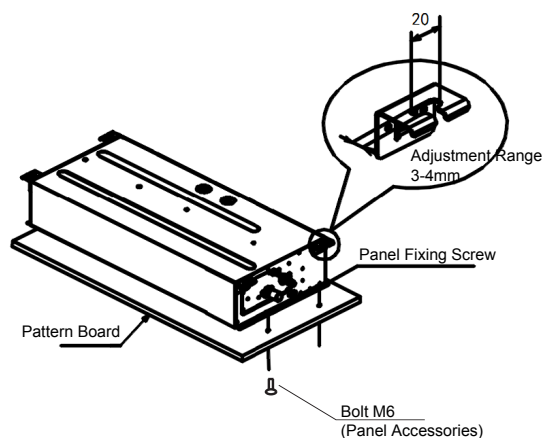


Fig. 4.7 Adjustment of Distance to Indoor Unit

- (3) Cutting the Ceiling

Mount ceiling opening to the indoor unit with screws (four) by using Pattern Board. Cut the ceiling based on opening dimension of the pattern board and mount the panel.



After installation is completed, remove the pattern board off the ceiling.

Installation Details for Air Panel

- The details of installation work for air panel shall be according to the Installation Manual for Air Panel.
- Check to ensure that the connection of connectors between the indoor unit and the air panel.

5. Refrigerant Piping Work

⚠ DANGER

Use refrigerant R410A in the refrigerant cycle. Do not charge oxygen, acetylene or other flammable and poisonous gases into the refrigerant cycle when performing a leakage test or an air-tight test. These types of gases are extremely dangerous and can cause an explosion. It is recommended that compressed air, nitrogen or refrigerant be used for these types of tests.

5.1 Piping Materials

- (1) Prepare locally-supplied copper pipes.
- (2) Select the piping size from the following table.

mm (in.)		
Model	Gas Piping	Liquid Piping
1.0~ 1.6	φ12.7 (1/2) ※	φ6.35 (1/4)
2.0	φ15.88 (5/8) ※	φ6.35 (1/4)
2.5	φ15.88 (5/8) ※	φ9.53 (3/8)

- (3) Select clean copper pipes. Make sure there is no dust and moisture inside. Blow the inside of the pipes with nitrogen or dry air, to remove any dust or foreign materials before connecting pipes.

5.2 Piping Connection

- (1) Position of piping connection is shown in Fig. 5.1. (Indoor Unit)

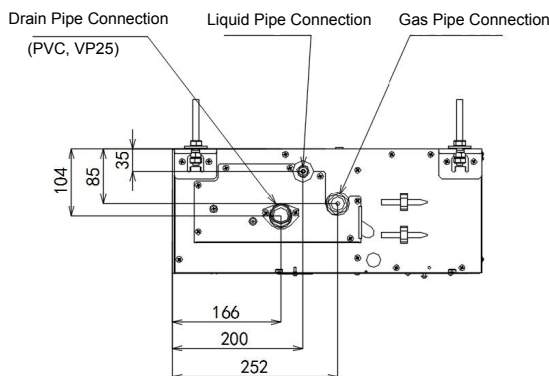
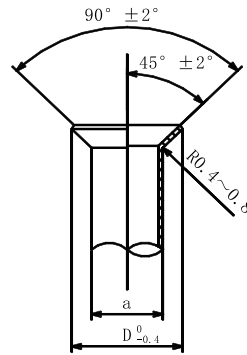


Fig. 5.1 Position of Piping Connection

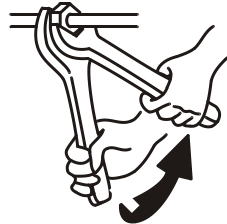
※ Flaring Dimension

Perform the flaring work as shown below.



		mm(in.)	
Pipe Diameter (a)		φ 12.7 (1/2)	φ 15.88 (5/8)
Flaring Diameter (D)	R22, R407C	16.2	19.4
	R410A	16.6	19.7

- (2) When tightening the flare nut, use two spanners as shown in Fig. 5.2.



Pipe Size	Tightening Torque (N.m)
φ6.35mm	20
φ9.53mm	40
φ12.7mm	60
φ15.88mm	80

Fig. 5.2 Tightening Work of Flare Nut

- (3) After connecting the refrigerant piping, seal the refrigerant pipes by using the factory-supplied insulation material as shown in Fig 5.3.

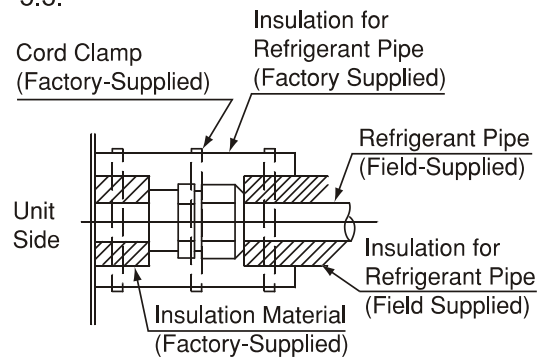
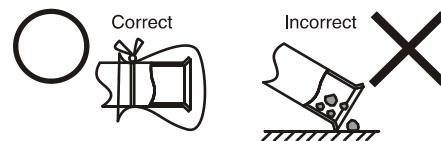


Fig. 5.3 Insulation on Pipes

⚠ CAUTION

- Cap the end of the pipe when the pipe is to be inserted through a hole.
- Do not put pipes on the ground directly without a cap or vinyl tape at the end of the pipe.



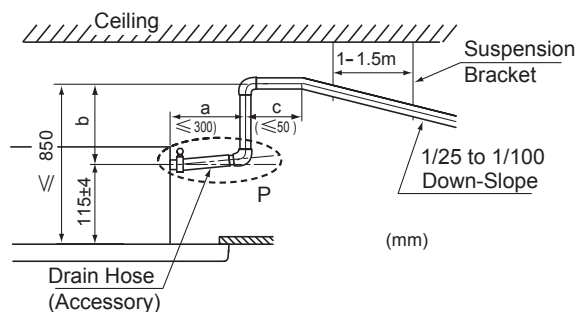
- (4) Evacuation and refrigerant charging procedures should be performed according to "Installation & Maintenance Manual" of the outdoor unit.

6. Drain Piping

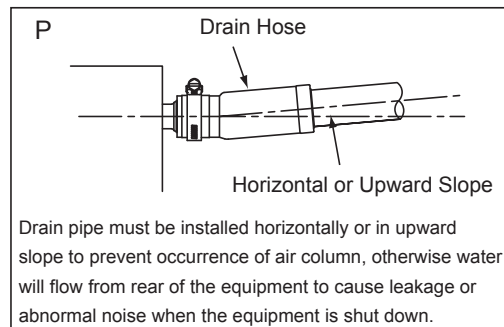
CAUTION

- Do not create an upper-slope or rise for the drain piping, since drain water can flow back to the indoor unit and leakage into the room will occur when the system operation is stopped.
- Do not connect the drain pipe with sanitary or sewage piping or any other drainage piping.
- When the common drain piping is connected with other indoor units, the connected position of each indoor unit must be higher than the common piping. The pipe size of the common drain pipe must be large enough according to the unit size and number of units.
- After performing drain piping work and electrical wiring, check to ensure that water flows smoothly as in the following procedure.
- Checking with the Float Switch
 - (A) Switch ON the power supply.
 - (B) Pour 2 or 2.5 liters of water into the drain pan.
 - (C) Check to ensure that the water flows smoothly or whether no water leakage occurs.
When water cannot be found at the end of the drain piping, pour another 2 liters of water into the drain.
 - (D) Switch ON the power supply and press the RUN/STOP button.

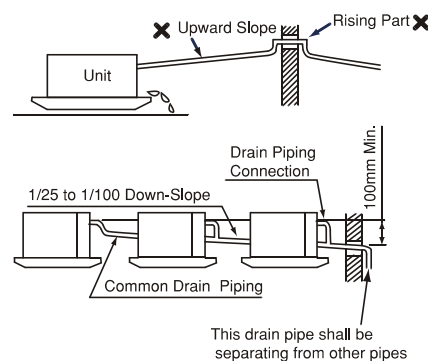
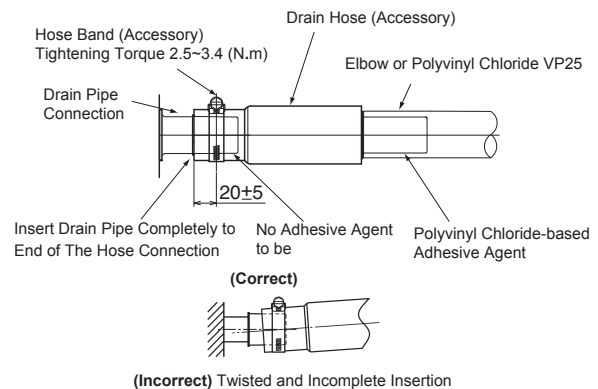
- (1) The position of the drain pipe connection is shown in Fig.5.1.
- (2) Prepare a polyvinyl chloride pipe with a 32mm outer diameter.
- (3) Fasten the tubing to the drain hose with the adhesive agent and the factory-supplied clamp. The drain piping must be performed with a down-slope pitch of 1/25 to 1/100.



- The total length of a+b+c shall be within 950mm.



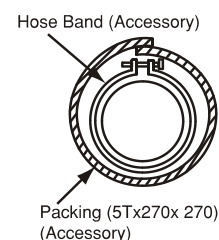
- (a) Use the drain pipe and hose clamp provided by the manufacture.
- (b) Do not impose too much force on the pipe joint to prevent damage to it.
- (c) Do not use any bent or twisted pipe, which may cause leakage.
- (d) Complete insert the drain pipe provided by the manufacturer, or otherwise leakage may be caused.



- In case of lifting the drain pipe at the outlet part, perform the drain piping work as shown in the above figure.

Fig.6.1 Drain Piping

- (4) Insulate the drain pipe after connecting the drain hose.



7. Electrical Wiring

WARNING

- Turn OFF the main power switch to the indoor unit and the outdoor unit and wait for at least 10 minutes before electrical wiring work or a periodical check is performed.
- Check to ensure that the indoor fan and the outdoor fan have stopped before electrical wiring work or a periodical check is performed.
- Protect the wires, drain pipe, electrical parts, etc. from rats or other small animals. If not protected, rats may gnaw at unprotected parts and at the worst, a fire will occur.
- Avoid any wire from contacting with Refrigerant tube, edge of metal plate and electrical part in the equipment, or otherwise the wire may be damaged or even thereby cause fire.
- ELB with intermediate induction rate (with shorter than 0.1 second or fewer) shall be used, or otherwise electric shock or fire may be caused.
- Wire shall be fixed securely, since external force imposed to the connecting terminal may make it loose and thereby cause fire.
- Do not use the power terminal strip used for the air conditioner to sub-connect any power cable, but use power branch box to sub-connect power wire at indoor unit side instead, and be sure to calculate wire capacity, or otherwise too low capacity may cause fire.
- The system shall not be started until all inspections have been performed properly.

CAUTION

- Wrap the accessory packing around the wires, and plug the wiring connection hole with the seal material to protect the product from any condensate water or insects.
- Tightly secure the wires with the cord clamp inside the indoor unit.
- Secure the cable of the remote control switch using the cord clamp inside the electrical box.
- Tighten screws according to the following torque.

M4:1.0~1.3 N.m
M5:2.0~2.4 N.m
M6:4.0~5.0 N.m
M8:9.0~11.0 N.m
M10:18.0~23.0 N.m

7.1 General Check

- (1) Make sure that the field-selected electrical components (main power switches, circuit breakers, wires, conduit connectors and wire terminals) have been properly selected according to the electrical data given in "Technical Catalog I". Make sure that the components comply with National Electrical Code (NEC).
- (2) Check to ensure that the power supply voltage is within $\pm 10\%$ of the rated voltage.
- (3) Check the capacity of the electrical wires. If the power source capacity is too low, the system cannot be started due to the voltage drop.
- (4) Check to ensure that the ground wire is connected.
- (5) Power Source Main Switch
Install a multi-pole main switch with a space of 3.5mm or more between each phase.

7.2 Electrical Wiring Connection

The electrical wiring connection for the indoor unit is shown in Fig. 7.1. The intermediate connection between the indoor unit and the air panel should be referred to in the "Installation Manual for Air Panel".

- (1) Connect the cable of an optional remote control switch or an optional extension cable to the connectors on the printed circuit board inside the electrical box through the connecting hole in the cabinet.
- (2) Connect the power supply and earth wires to the terminals in the electrical box.
- (3) Connect the wires between the indoor unit and the outdoor unit to the terminals in the electrical box.
- (4) Tightly clamp the wires using the cord clamp.

■ Field Minimum Wire Sizes for Power Source

Refer to the item "10. Common".

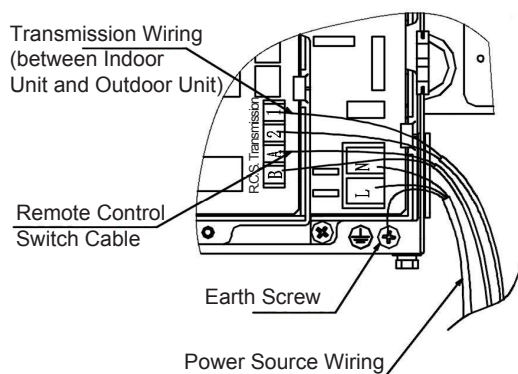
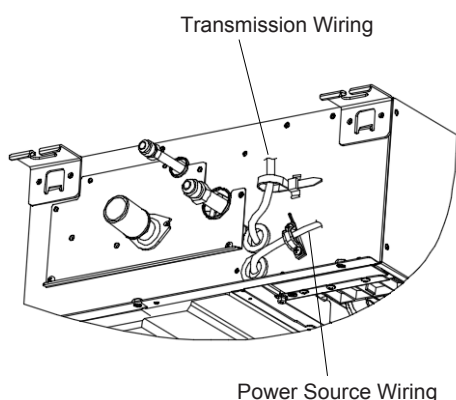
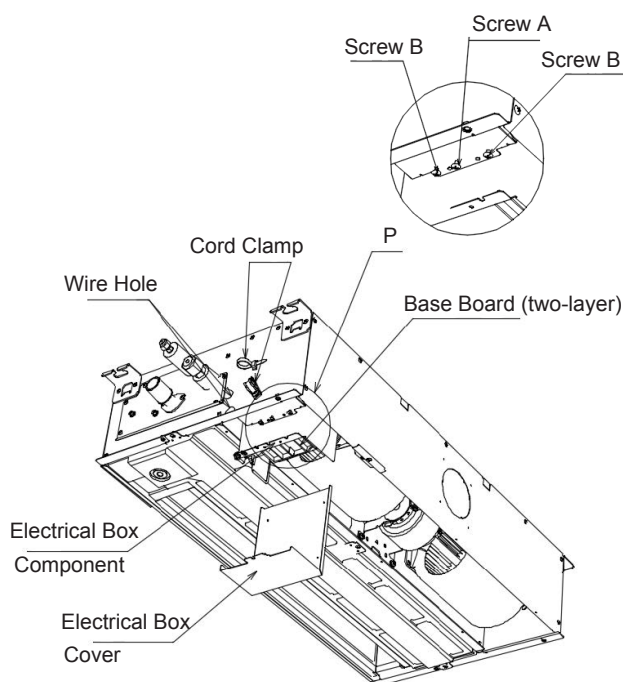


Fig. 7.1 Electrical Wiring Connection for Indoor Unit

- (a) Remove electrical box cover (by loosening one screw (A)).
- (b) Loosen two screws (B) on electrical box component and pull out the component.
- (c) Fix the wire harness from connecting port to electrical box with cord clamp to prevent it from scratched by edge of container of other component.
- (d) Mount a magnetic ring to the communication wire, which shall be wound by three circles around the wire and then fixed with cord clamp provided in the accessory bag.
- (e) Upon completion of wiring, mount electrical box, and take care not to press any wire.

⚠ CAUTION

• After wire is connected to terminal board, be sure to fix it with cord clamp and lay the wire in cable tray to prevent it from being squeezed and fire caused thereby.

8. Test Run

Test run should be performed according to "Installation & Maintenance Manual" of the outdoor unit.

⚠ WARNING

- Do not operate the system until all the check points have been cleared.
 - (A) Check to ensure that the electrical resistance is more than 1 megohm, by measuring the resistance between ground and the terminal of the electrical parts. If not, do not operate the system until the electrical leakage is found and repaired.
 - (B) Check to ensure that the stop valves of the outdoor unit are fully opened, and then start the system.
 - (C) Check to ensure that the switch on the main power source has been ON for more than 12 hours, to warm the compressor oil by the crankcase heater.
- Pay attention to the following items while the system is running.
 - (A) Do not touch any of the parts by hand at the discharge gas side, since the compressor chamber and the pipes at the discharge side are heated higher than 90°C.
 - (B) DO NOT PUSH THE BUTTON OF THE MAGNETIC SWITCH(ES). It will cause a serious accident.

9. Safety and Control Device Setting

Indoor Unit

Model			1.0 ~ 2.5
For Control Circuit			
Fuse Capacity		A	5
Freeze Protection			
Thermostat	Cut-Out	°C	0
	Cut-In	°C	14
Thermostat			
Differential		°C	2

10. Common

10.1 Field Minimum Wire Sizes for Power Source

WARNING

- Use an ELB (Electric Leakage Breaker). If not used, it will cause an electric shock or a fire.
- Run through the cables using conduit tube, and completely seal the end of conduit tube with sealing materials.

Field Minimum Wire Sizes for Power Source

Model	Maximum Current	Power Source Cable Size	Transmitting Cable Size
		EN60 335-1 *1	EN60 335-1 *1
1.0	0.4A	2.5mm ²	0.75mm ²
1.3	0.5A		
1.6	0.7A		
2.0	0.7A		
2.5	0.9A		

NOTES:

- 1) Follow local codes and regulations when selecting field wires.
- 2) The wire sizes marked with *1 in the above table are selected at the maximum current of the unit according to the European Standard, EN60335-1. Use the wires which are not lighter than the ordinary polyvinyl chloride sheathed flexible cord (code designation H05VV-F).
- 3) Use a shielded cable for the transmitting circuit and connect it to ground.
- 4) In the case that power cables are connected in series, add each unit maximum current and select wires below.

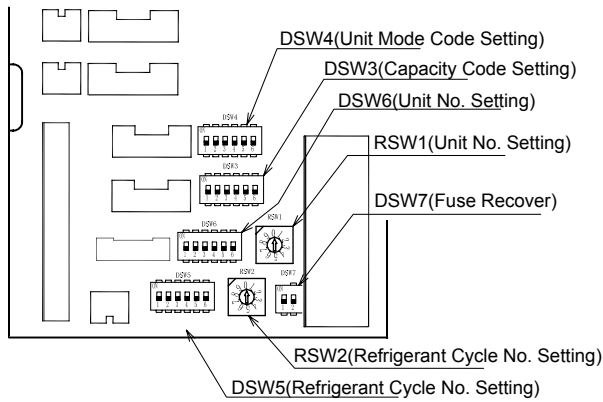
Selection According to EN60 335-1

Current i (A)	Wire Size (mm ²)
$i \leq 6$	2.5
$6 < i \leq 10$	2.5
$10 < i \leq 16$	2.5
$16 < i \leq 25$	4
$25 < i \leq 32$	6
$32 < i \leq 40$	10
$40 < i \leq 63$	16
$63 < i$	※1

※1: In the case that current exceeds 63A, do not connect cables in series.

10.2 Setting of Dip Switches

(A) Position of Dip Switches



(B) The PCB in the indoor unit is equipped with 2 rotary switches and 5 dip switches. Before testing unit, set these dip switches according to the following instructions. Unless these dip switches are set in the field, the unit can not be operated.

(1) Unit No. Setting (RSW1 & DSW6)

Setting is required. Set the unit No. of all indoor units respectively and serially by following setting position shown in the table below. Numbering must start from "0" for every outdoor unit.

Unit No. Setting		
DSW6 (Tens Digit)	RSW1 (Units Digit)	Ex.) Set at No. 16 Unit
Before shipment, DSW6 and RSW1 are set to "0". Max. 64 units are available to set when all the equipment to be connected are corresponding to H-LINK II. Max. 16 units when the units non-corresponding to H-LINK II.		

(2) Unit Mode Code Setting (DSW4)

No setting is required.

Setting the model code of the indoor unit.



(3) Capacity Code Setting (DSW3)

NO setting is required, due to setting before shipment. This switch is utilized for setting the capacity code which corresponds to the Horse Power of the indoor unit.

Capacity ×10 ³ Btu/h	1.0	1.3	1.6
Setting Position			
Capacity ×10 ³ Btu/h	2.0	2.5	
Setting Position			

(4) Refrigerant Cycle No. Setting (RSW2 & DSW5)

Setting is required.

Setting positions before shipment are all OFF.

Refrigerant Cycle No. Setting

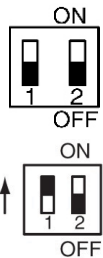
DSW5 (Tens Digit)	RSW2 (Units Digit)	Ex.) Set at No. 5 Cycle
Before shipment, DSW5 and RSW2 are set to "0". Max. 64 cycles are available to set when all the equipment to be connected are corresponding to H-LINK II. Max. 16 cycles when the units non-corresponding to H-LINK II.		

(5) Fuse Recover (DSW7)

* Factory Setting

* In the case of applying high voltage to the terminal 1, 2 of TB2, the fuse on the PCB is cut.

In such a case, firstly connect the wiring to ↑ TB2, and then turn on NO.1 pin.



NOTE

- The "■" mark indicates position of dip switches. Figures show setting before shipment.

CAUTION

Before setting dip switches, firstly turn OFF power source and set the position of the dip switches. If the switches are set without turning OFF the power source, the switches can not function.



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