DAIKIN

INSTALLATION MANUAL

English

SPLIT SYSTEM Air Conditioners

MODELS
(Ceiling mounted Cassette Corner type)

FH(Y)K35FJV1	**FHK35FV1**		**FHYKP35BV1**	**FHK35BZV1**
FH(Y)K45FJV1	**FHK45FV1**		**FHYKP45BV1**	**FHK45BZV1**
FH(Y)K60FJV1	**FHK60FV1**		**FHYKP60BV1**	**FHK60BZV1**
FHYK71FJV1	**FHK71FV1**		**FHYKP71BV1**	

READ THESE INSTRUCTIONS CAREFULLY BEFORE INSTALLATION.
KEEP THIS MANUAL IN A HANDY PLACE FOR FUTURE REFERENCE.

CONTENTS

1. SAFETY CONSIDERATIONS

Please read these "SAFETY CONSIDERATIONS" carefully before installing air conditioning equipment and be sure to install it correctly. After completing the installation, make sure that the unit operates properly during the start-up operation. Please instruct the customer on how to operate the unit and keep it maintained. Also, inform customers that they should store this installation manual along with the operation manual for future reference.
This air conditioner comes under the term "appliances not accessible to the general public".

Meaning of warning and caution symbols.

⚠ **WARNING** ..... Failure to observe a warning may result in death.

⚠ **CAUTION** ..... Failure to observe a caution may result in injury or damage to the equipment.

⚠ WARNING

- Ask your dealer or qualified personnel to carry out installation work. Do not try to install the machine yourself. Improper installation may result in water leakage, electric shocks or fire.
- Perform installation work in accordance with this installation manual. Improper installation may result in water leakage, electric shocks or fire.
- Be sure to use only the specified accessories and parts for installation work. Failure to use the specified parts may result in water leakage, electric shocks, fire or the unit falling.
- Install the air conditioner on a foundation strong enough to withstand the weight of the unit. A foundation of insufficient strength may result in the equipment falling and causing injuries.
- Carry out the specified installation work after taking into account strong winds, typhoons or earthquakes. Improper installation work may result in the equipment falling and causing accidents.

- Make sure that a separate power supply circuit is provided for this unit and that all electrical work is carried out by qualified personnel according to local laws and regulations and this installation manual.
  An insufficient power supply capacity or improper electrical construction may lead to electric shocks or fire.
- Make sure that all wiring is secured, the specified wires and used, and no external forces act on the terminal connections or wires.
  Improper connections or installation may result in fire.
- When wiring the power supply and connecting the wiring between the indoor and outdoor units, position the wires so that the switch box cover can be securely fastened.
  Improper positioning of the switch box cover may result in electric shocks, fire or the terminals overheating.
- If the refrigerant gas leaks during installation, ventilate the area immediately.
  Toxic gas may be produced if the refrigerant gas comes into contact with fire.
- After completing the installation work, check that the refrigerant gas does not leak.
  Toxic gas may be produced if the refrigerant gas leaks into the room and comes into contact with a source of fire, such as a fan heater, stove or cooker.
- Before touching electrical parts, turn off the unit.

⚠ CAUTION

- Ground the air conditioner.
  Do not connect the ground wire to gas or water pipes, lightning conductor or a telephone ground wire.
  Incomplete grounding may result in electric shocks.
- Be sure to install an earth leakage breaker.
  Failure to install an earth leakage breaker may result in electric shocks.
- While following the instructions in this installation manual, install drain piping in order to ensure proper drainage and insulate piping in order to prevent condensation.
  Improper drain piping may result in water leakage and property damage.
- Remote controller (wireless kit) transmitting distance can result shorter than expected in rooms with electronic fluorescent lamps (inverter or rapid start types).
  Install the indoor unit as far away from fluorescent lamps as possible.
- Do not install the air conditioner in the following locations:
  (a) where a mineral oil mist or an oil spray or vapor is produced, for example in a kitchen
  Plastic parts may deteriorate and fall off or result in water leakage.
  (b) where corrosive gas, such as sulfurous acid gas, is produced
  Corroding copper pipes or soldered parts may result in refrigerant leakage.
  (c) near machinery emitting electromagnetic waves
  Electromagnetic waves may disturb the operation of the control system and result in a malfunction of the equipment.
  (d) where flammable gases may leak, where there are carbon fiber or ignitable dust suspensions in the air, or where volatile flammables such as thinner or gasoline are handled.
  Operating the unit in such conditions may result in fire.

2. BEFORE INSTALLATION

Do not exert pressure on the resin parts when opening the unit or when moving it after opening

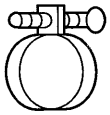
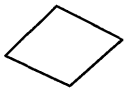
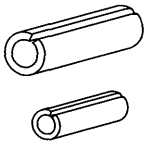
- When moving the unit while removing it from the box, be sure to lift it by holding on to the lifting lugs without exerting any pressure on other parts, especially swing flap, the refrigerant piping, drain piping, and other resin parts.
- Decide upon a line of transport.
- Leave the unit inside its packaging while moving, until reaching the installation site. Use a sling of soft material, where unpacking is unavoidable or protective plates together with a rope when lifting, to avoid damage or scratches to the unit.
- Refer to the installation manual of the outdoor unit for items not described in this manual.
- Installation should only be carried out after checking in advance the type of refrigerant to be used. (Using the wrong refrigerant will prevent the unit from functioning properly.)
- Do not dispose of any parts necessary for installation until the installation is complete.

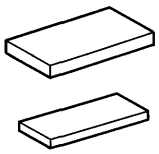
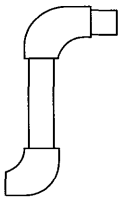
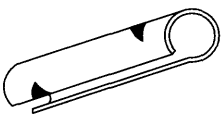
1. PRECAUTIONS

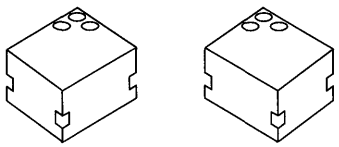
- Be sure to read this manual before installing the indoor unit.
- When selecting installation site, refer to the paper pattern.
- This unit is suitable for installation in a household, commercial and light industrial environment.
- Do not install or operate the unit in rooms mentioned below.
  - Laden with mineral oil, or filled with oil vapor or spray like in kitchens. (Plastic parts may deteriorate.)
  - Where corrosive gas like sulfurous gas exists. (Copper tubing and brazed spots may corrode.)
  - Where volatile flammable gas like thinner or gasoline is used.
  - Where machines can generate electromagnetic waves. (Control system may malfunction.)
- Where the air contains high levels of salt such as that near the ocean and where voltage fluctuates greatly such as that in factories. Also in vehicles or vessels.

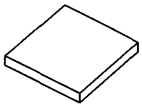
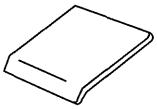
2. ACCESSORIES

Check if the following accessories are included with the unit.

Name	(1) Clamp	(2) Paper pattern for installation	(3) Drain hose	Insulation for fitting
Quantity	2 pcs.	1 pc.	1 pc.	1 each
Shape				(4) For gas pipe  (5) For liquid pipe

Name	Sealing pad	(8) Drain raising pipe	(9) Insulation for drain pipe
Quantity	1 each	1 pc.	1 pc.
Shape	(6) Large  (7) Small		

Name	(10) Installation guide	(11) Washer for hanging bracket	(12) Clamp
Quantity	2 each	8 pcs.	7 pcs.
Shape	 Screws × 4		

Name	(13) Insulation for hanging bracket	(14) Air outlet blocking pad	(Other)
Quantity	4 pcs.	1 pc.	• Operation manual • Installation manual • Auxilialy piping set (FHYK45, 60 FJV1 only)
Shape			

- Screws for fixing panels are attached to the decoration panel.

3. OPTIONAL ACCESSORIES

- The optional decoration panel and remote controller are required for this indoor unit. (However, the remote controller is not required for the slave unit of a simultaneous operation system.)
- These are two types of remote controllers: wired and wireless. Select a remote controller from Table 1 according to customer request and install in an appropriate place. (For installation, follow the Installation manual included with the remote controllers.)

Table 1

Remote controller	Wired type	For FJV1 type	BRC1C517 or BRC1B517
		For FV1 type	BRC1C61 or BRC1B61
		For BV1, BZV1 type	BRC1C517
	Wireless type	For BV1,BZV1 type	BRC4C61,BRC4C63

NOTE

- If you wish to use a remote controller that is not listed in Table 1, select a suitable remote controller after consulting catalogs and technical materials.

- The optional decoration panel is required for this indoor unit.

Model	Min. height above ceiling	Optional decoration panel	
		Color	White
FH(Y)K35,45 FHYKP35,45	22 cm	BYK45FJW1	
FH(Y)K60,71 FHYKP60,71		BYK71FJW1	

FOR THE FOLLOWING ITEMS, TAKE SPECIAL CARE DURING CONSTRUCTION AND CHECK AFTER INSTALLATION IS FINISHED.

1. Items to be checked after completion of work

Items to be checked	If not properly done, what is likely to occur	Check
Is the indoor unit fixed firmly?	The unit may drop, vibrate or make noise.	
Is the gas leak test finished?	It may result in insufficient cooling.	
Is the unit fully insulated?	Condensate water may drip.	
Does drainage flow smoothly?	Condensate water may drip.	
Does the power supply voltage correspond to that shown on the name plate?	The unit may malfunction or the components burn out.	
Are wiring and piping correct?	The unit may malfunction or the components burn out.	
Is the unit safely grounded?	Dangerous at electric leakage.	
Is wiring size according to specifications?	The unit may malfunction or the components burn out.	
Is something blocking the air outlet or inlet of either the indoor or outdoor units?	It may result in insufficient cooling.	
Are refrigerant piping length and additional refrigerant charge noted down?	The refrigerant charge in the system is not clear.	

2. Items to be checked at time of delivery *Also review the "SAFETY CONSIDERATIONS"

Items to be checked	Check
Did you explain about operations while showing the instruction manual to your customer?	
Did you hand the instruction manual over to your customer?	

3. Items to be checked at time of delivery

Items to be checked	Check
Did you explain about operations while showing the instruction manual to your customer?	
Did you hand the instruction manual over to your customer?	

Points for explanation about operations

The items with ⚠ WARNING and ⚠ CAUTION marks in the instruction manual are the items pertaining to possibilities for bodily injury and material damage in addition to the general usage of the product. Accordingly, it is necessary that you make a full explanation about the described contents and also ask your customers to read the instruction manual.

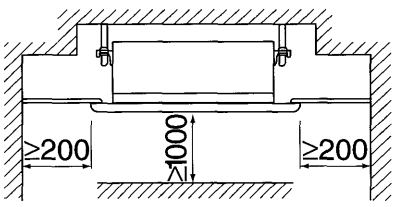
4. NOTE TO THE INSTALLER

Be sure to instruct customers how to properly operate the unit (especially cleaning filters, operating different functions, and adjusting the temperature) by having them carry out operations themselves while looking at the manual.

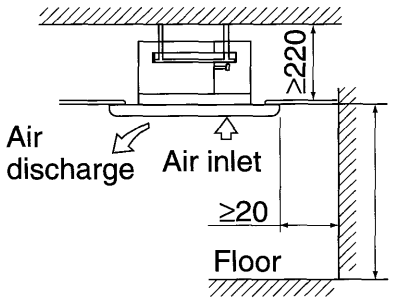
3. SELECTING INSTALLATION SITE

1. Select an installation site where the following conditions are fulfilled and that meets your customer's approval.

- In the upper space (including the back of the ceiling) of the indoor unit where there is no possible dripping of water from the refrigerant pipe, drain pipe, water pipe, etc.
- Where optimum air distribution can be ensured.
- Where nothing blocks air passage.
- Where condensate can be properly drained.
- Where the ceiling is strong enough to bear the indoor unit weight.
- Where the false ceiling is not noticeably on an incline.
- Where sufficient clearance for maintenance and service can be ensured.
- Where there is no risk of flammable gas leakage.
- Where piping between indoor and outdoor units is possible within the allowable limit. (Refer to the installation manual for the outdoor unit.)



Obstruction



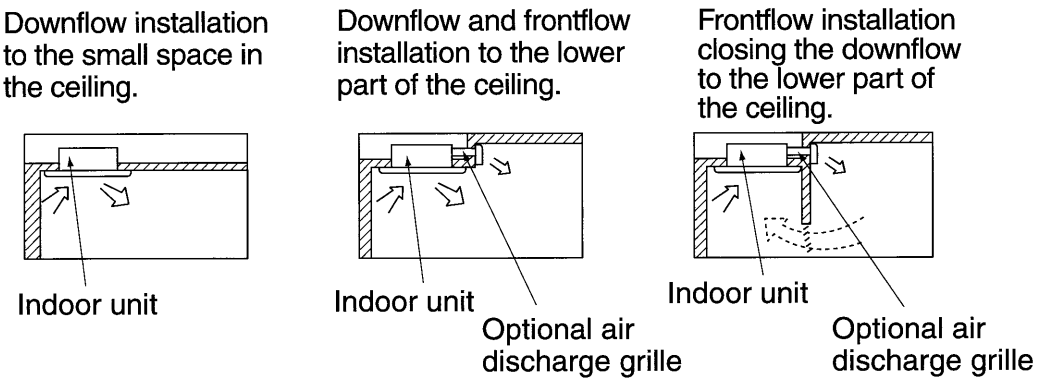
Space required for installation

2. Ceiling height

This indoor unit may be installed on ceiling up to 3.8 m in height. However, it becomes necessary to make field settings by remote controller and install the air outlet blocking pad when installing the unit at a height of over 3.0 m. Refer tothe section entitled INSTALLATION ON HIGH CEILINGS.
Install this unit where the height of bottom panel is more than 2.5m so that user cannot easily touch.

3. **Use suspension bolts for installation. Check whether the ceiling is strong enough to support the weight of the unit or not. If there is a risk, reinforce the ceiling before installing the unit.** (Installation pitch is marked on the paper pattern for installation. Refer to it to check for points requiring reinforcement.)

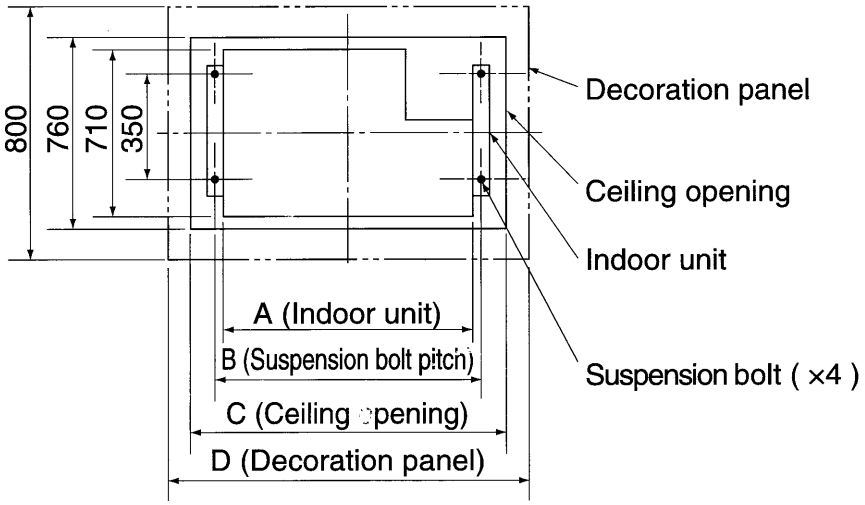
4. **Select the air flow direction best suited to the room and point of installation.**



- Refer to the section entitled AIR DISCHARGE UNIT CONSTRUCTION for frontflow installation.

4. PREPARATIONS BEFORE INSTALLATION

1. Relation of ceiling opening to unit and suspension bolt position. (Refer to Fig. 1)



Model	A	B	C	D
FH(Y)K35,45 FHYKP35,45	1110	1150	1200	1240
FH(Y)K60,71 FHYKP60,71	1310	1350	1400	1440

Fig. 1

2. Make the ceiling opening needed for installation where applicable.

(For existing ceilings)

- For ceiling opening dimensions, refer to the paper pattern for installation.
- Create the ceiling opening required for installation. From the side of the opening to the casing outlet, implement the refrigerant and drain piping and wiring for remote controller and indoor-outdoor unit casing outlet. (Refer to each PIPING or WIRING section.)
- After making an opening in the ceiling, it may be necessary to reinforce the ceiling beams to keep the ceiling level and to prevent it from vibrating. Consult the builder for detaills.

NOTE

- All the above parts are field supplied.

3. Install the supension bolts.

(Use M8-M10 size bolts.)
Use anchors for exising ceilings, and a sunken anchor or other field supplied parts for new ceilings to reinforce the ceiling to bear the weight of the unit. Adjust clearance from the ceiling before proceeding further.
(Refer to Fig. 2)

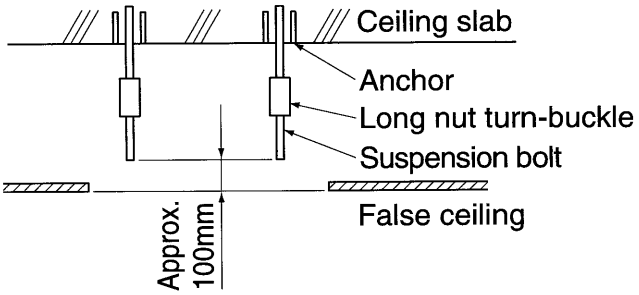


Fig. 2

5. INDOOR UNIT INSTALLATION

Installing optional accessories (except for the decoration panel) before installing the indoor unit is easier. Refer also to the installation manual attached to the optional accessories.

Refer to the installation guide attached to the unit body for installation of the indoor unit.

1. Install the indoor unit temporarily.

- Attach the hanger bracket to the suspension bolt. Be sure to fix it securely by using a nut and washer from the upper and lower sides of the hanger bracket.
(Refer to Fig. 3)

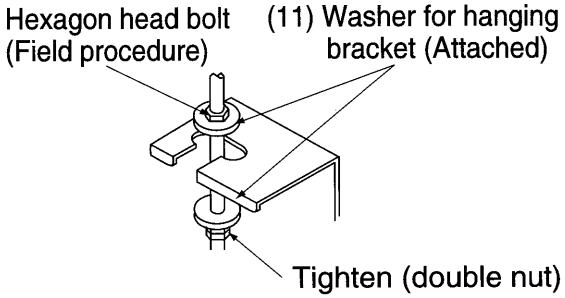


Fig. 3

[FOR EXISTING CEILINGS]

2. Adjust the height of the unit. (Refer to Fig. 4 and 5)

Install the installation guide to the unit body with 4 screws. Adjust the height of the unit by adjusting the installation guide to the lower surface of the ceiling.

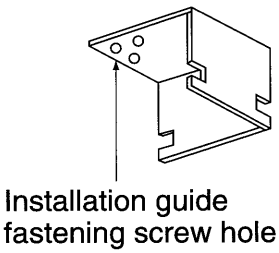


Fig. 4

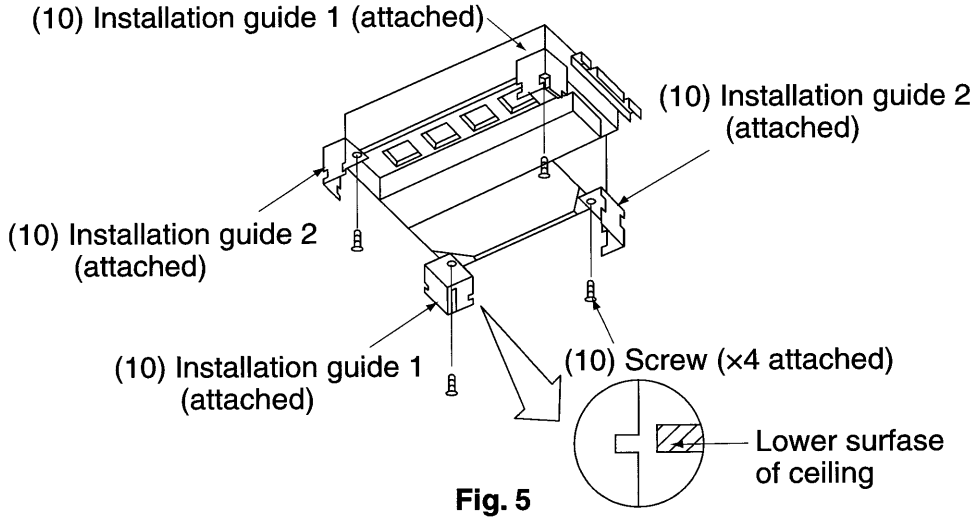


Fig. 5

3. Adjust the unit to proper position for installation.

(Refer to the section entitled PREPARATIONS BEFORE INSTALLATION.)

4. **Make sure the unit is level. (Refer to Fig. 6)**

⚠ CAUTION

- he indoor unit is equipped with a built-in drain pump and float swith, so be sure not to tilt the unit.
  (If the unit is tilted against the condensate flow, the float switch may malfunction and cause water to drip.)
- Make sure the unit is level at each of the unit's 4 corners using a water level or a water-filled vinyl tube.

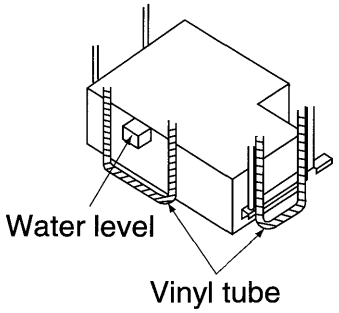
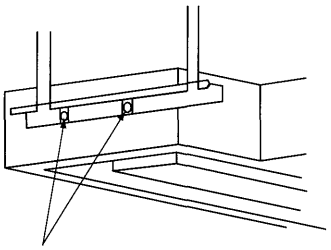


Fig. 6

5. **Screw the upper nut.**

6. **Attach the insulation for hanging bracket (×4) to the hanger bracket fixing bolt on the unit body. (Refer to Fig. 7)**

7. **Detach the installation guide after installing the unit body.**



(13) Insulation for hanging bracket (attached)

Fig. 7

[FOR NEW CEILINGS]

2. **Refer to the paper pattern and the installation guide for ceiling opening dimensions. Consult with the builder or carpenter for details.**
   - Adjust the height of the unit.
   - Attach the installation guide to the indoor unit with 4 screws.
   - Adjust the installation guide to the position of the lower surface of the ceiling.

Ceiling work

- Perform items **3, 4, 5, 6,** and **7** of the section "FOR EXISTING CEILINGS".

6. REFRIGERANT PIPING WORK

- **See the installation manual for the outdoor unit for details on how to connect the refrigerant piping.**
- Be sure to insulate both the gas piping as well as the liquid piping.
  - Not doing so may cause leaks. (Use insulation material which can fully resist the 120°C temperature that the gas piping can sometimes reach when using a heat pump.)
  - If the temperature and humidity of the branch piping could possibly exceed 30°C or RH80%, reinforce the refrigerant insulation (20mm or thicker). Condensation may form on the surface of the insulation.
- Installation should only be carried out after checking in advance the type of refrigerant to be used. (Using the wrong refrigerant will prevent the unit from functioning properly.)

⚠ CAUTION

- **Do not allow air or other substances other than the designated refrigerant to get mixed into the freezing cycle.**
  Ventilate the room if refrigerant gas leaks.
- **Be sure to use the flare nuts included with the main unit.**
- **Follow the instructions to the right when using the new R407C refrigerant.**
  - Do not use pipe cutters and flare tools which have been used with refrigerant other than R407C.
  - When connecting the flares, coat the flare section with ether oil or ester oil.
  - In order to prevent dirt, liquid, or dust from entering the piping, cure the piping with a pinch or taping.

- Use copper alloy seamless pipes (ISO 1337).
- The outdoor unit is charged with refrigerant.
- Be sure to use both a spanner and torque wrench together, when connecting or disconnecting pipes to/from the unit. **(Refer to Fig. 8)**
- Refer to the Table 2 for flare dimensions and tightening torque.

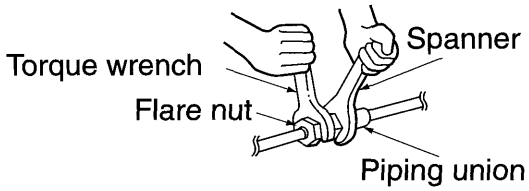


Fig. 8

⚠ CAUTION

Over-tightening the flare nut may break it and/or cause the refrigerant to leak.

- When connecting the flare nut, apply ester oil or ether oil to the flare section (both inside and outside), and spin 3-4 times before screwing in. **(Refer to Fig. 9)**

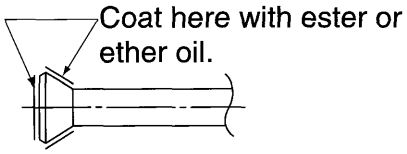
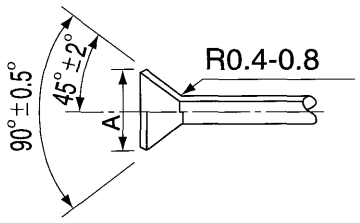


Fig. 9

Table 2

Pipe size	Tightening torque	Flare dimensions A (mm)	Flare shape
ϕ 6.4	1420 - 1720N·cm (144 - 176 kgf·cm)	8.3 - 8.7	
ϕ 9.5	3270 - 3990N·cm (333 - 407 kgf·cm)	12.0 - 12.4	
ϕ 12.7	4950 - 6030N·cm (504 - 616 kgf·cm)	15.4 - 15.8	
ϕ 15.9	6180 - 7540N·cm (630 - 770 kgf·cm)	18.6 - 19.0	
ϕ 19.1	9720 - 11860N·cm (990 - 1210 kgf·cm)	22.9 - 23.3	

For reference

If a torque wrench is not available, use the following method as a rule of thumb.
After the work is finished, make sure to check that there is no gas leak.

When you keep on tightening the flare nut with a spanner, there is a point where the tightening torque suddenly increases. From that position, further tighten the flare nut the angle shown below:

Table 3

Pipe size	Further tightening angle	Recommended arm length of tool
ϕ 6.4 (1/4")	60 to 90 degrees	Approx. 150mm
ϕ 9.5 (3/8")	60 to 90 degrees	Approx. 200mm
ϕ 12.7 (1/2")	30 to 60 degrees	Approx. 250mm
ϕ 15.9 (5/8")	30 to 60 degrees	Approx. 300mm
ϕ 19.1 (3/4")	20 to 35 degrees	Approx. 450mm

- After piping work is done, check all the pipe connections to ensure no nitrogen or other gases are leaking.
- Check the pipe connector for gas leaks, then insulate it as shown in Fig. 10.

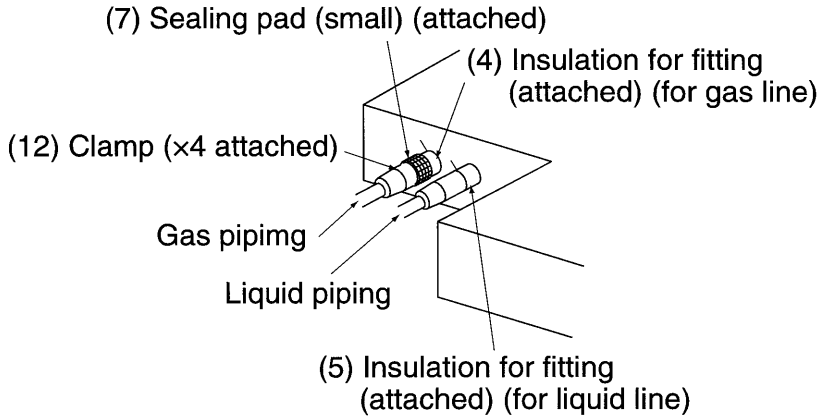


Fig. 10

7. DRAIN PIPING WORK

1. Rig drain piping (Refer to Fig. 11)

- As for drain work, perform piping in such a manner that water can be drained properly.
- Keep the drain pipe short and sloping downwards to prevent air pockets from forming.

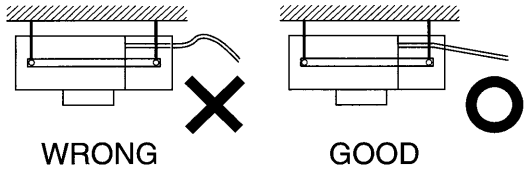


Fig. 11

- The diameter of the drain pipe should be greater than or equal to the diameter of the connecting pipe. (vinyl tube; pipe size: 25 mm; outer dimension: 32 mm)
- Use the attached drain hose and clamp. Tighten the clamp firmly. **(Refer to Fig. 12)**
- Wrap the attached sealing pad (large) over the clamp and drain hose to insulate. **(Refer to Fig. 13)**

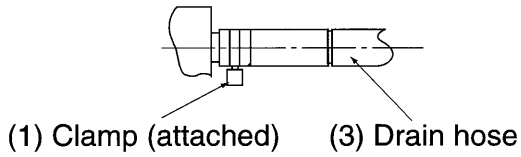


Fig. 12

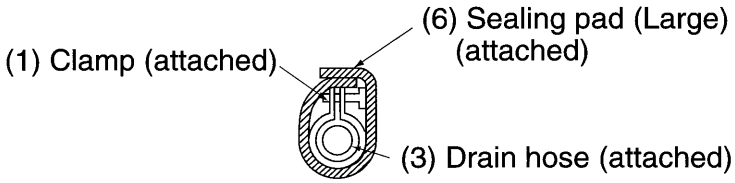


Fig. 13

- Insulate the drain hose that runs inside the building.
- Use the attached drain hose, drain raising pipe, clamp, and insulation for drain pipe.
- Keep the drain pipe sloping downwards at a gradient of at least 1/100. Install the hanger brackets at intervals of 1-1.5 m. **(Refer to Fig. 14)**

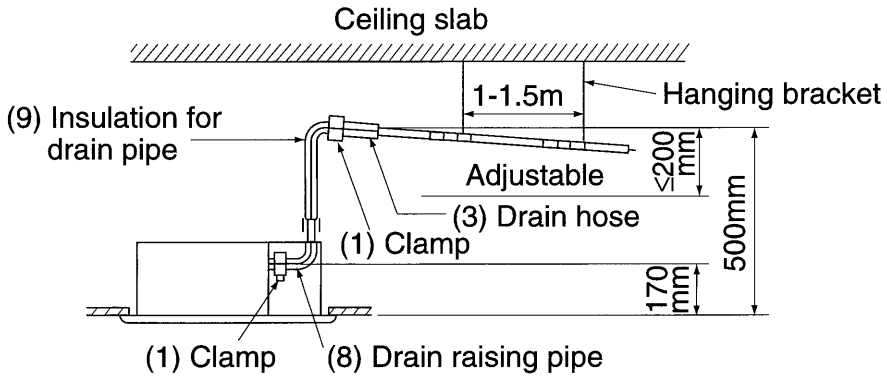


Fig. 14

[PIPING PROCEDURE]

1. Connect the drain raising pipe and the drain hose, and tighten the clamp.
2. Attach the insulation for drain pipe and wrap it with vinyl tape.
3. After performing items **1** and **2** install the drain raising pipe to the drain pipe opening on the indoor unit and tighten with the clamp.
   - Adjust the drain raising height by turning. **(Refer to Fig. 15)**
   - If converging multiple drain pipes, install according to the Fig. 16.

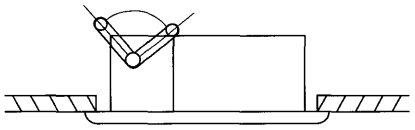


Fig. 15

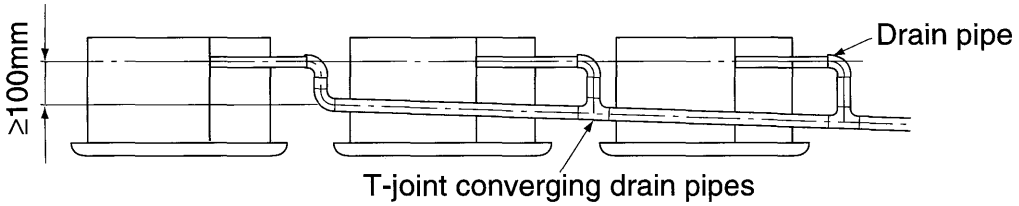


Fig. 16

⚠ CAUTION

If the upward running drain hose leans at a slant, the float switch will malfunction and water will leak.

2. After piping work is finished, check if drainage flows smoothly.

- Open the inspection opening, add approximately 1000 cc of water slowly into the drain pan and check drainage flow. **(Refer to Fig. 17)**

NOTE

- Use the drain outlet for maintenance to drain water from the drain pan.

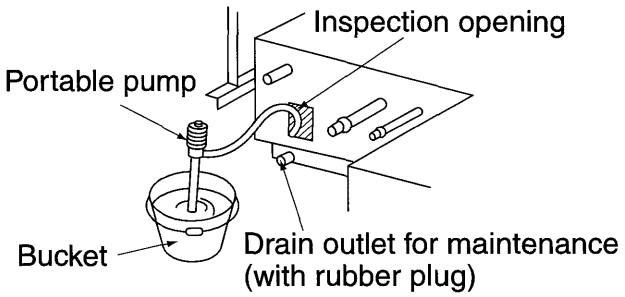


Fig. 17

WHEN ELECTRIC WIRING WORK IS FINISHED.

- Check drainage flow during cool running, explained in the section entitled. "TEST OPERATION"

WHEN ELECTRIC WIRING WORK IS NOT FINISHED

- Remove the control box lid and change the emergency switch above the PC board assembly of the indoor unit from "NORM." to "EMERG.".
  Connect the single-phase power supply (50Hz 220-240V) to connections No. 1 and No. 3 on the power supply terminal board and confirm drain operation. Be sure to change the switch before turning on the power. **(Refer to Fig. 18)**
- Be aware that the fan will turn during the operation.
- After confirming drainage, turn off the power and be sure to change the emergency switch back to "NORM.".

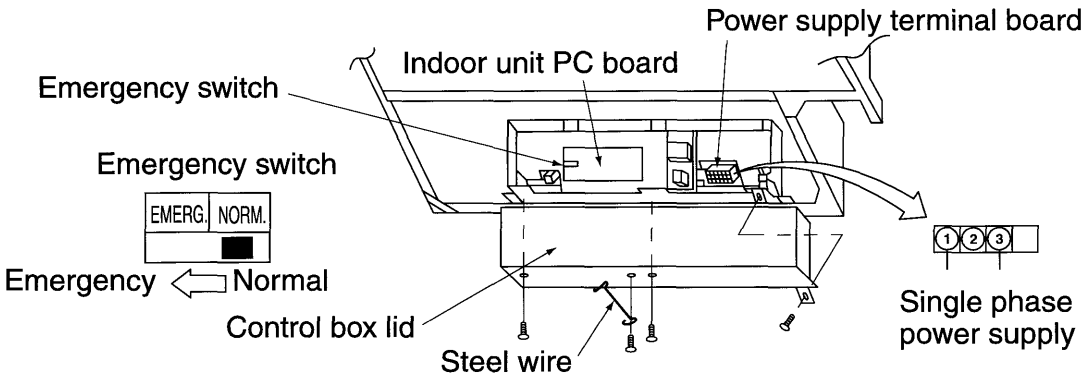


Fig. 18

[Caution]

Drain piping connections

- Do not connect the drain piping directly to sewage pipes that smell of ammonia. The ammonia in the sewage might enter the indoor unit through the drain pipes and corrode the heat exchanger.

8. AIR DISCHARGE UNIT CONSTRUCTION

- When installing both frontflow and flontflow + downflow, use optional air outlet unit.

NOTE

- If you use a commercially available air dischage outlet, you may not be able to control air flow direction, or condensate may drip from the indoor unit in rooms where the humidity is high, such as in restaurants. You should therfore attach flocking material to the blade.
  Such problems do not apply, however, if you use our optional accessories.
- Optional air outlet unit consists of the air discharge and fiexible duct.
- Refer to the optional handbook for air outlet unit construction.

List of optional accessories

	Optional Accessories	Model	Specification	Applicable model
Air outlet unit	Air outlet grille	KDGJ52F56W	Grille color: White	FH(Y)K35,45 FHYKP35,45
	Flexible duct	KFDJ52F56	—	
	Air outlet grille	KDGJ52F80W	Grille color: White	FH(Y)60,71 FHYKP60,71
	Flexible duct	KFDJ52F80	—	

9. INSTALLATION ON HIGH CEILINGS

1. **This indoor unit may be installed on ceilings up to 3.8 m in height. However, it becomes necessary to make field setting by remote controller and close the air outlet when installing the unit at a height over 3.0 m.**

Ceiling height (m)		Mode No.	FIRST CODE NO.	SECOND CODE NO.
Less than 3	Normal	13(23)	6	01
3 - 3.8	High ceiling			02

2. **Attach the air discharge sealing material that matches the setting of item 1.**
   (1)For FH(Y)K(P)35, 45
   - Attach to the left side of the 3 position for drain pan opening. **(Refer to Fig. 19)**

   (2)For FH(Y)K(P)60, 71
   - Attach to the right side of the 4 position for drain pan opening. **(Refer to Fig. 20)**

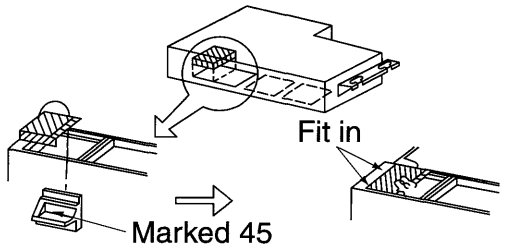


Fig. 19

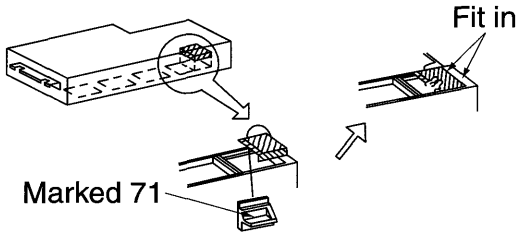


Fig. 20

NOTE

- Field setting with the remote controller is also necessary at frontflow installation, and frontflow + downflow installation. Refer to the optional handbook for details.

10. ELECTRIC WIRING WORK

- All field supplied parts and materials and electric works must conform to local codes.
- Use copper wire only.

- For electric wiring work, refer also to "WIRING DIAGRAM"
- For remote controller wiring details, refer to the installation manual attached to the remote controller.
- All wiring must be performed by an authorized electrician.
- A circuit breaker capable of shutting down power supply to the entire system must be installed.
- Refer to the installation manual attached to the outdoor unit for the size of power supply electric wire connected to the outdoor unit, the capacity of the circuit breaker and switch, and wiring instructions.
- Be sure to ground the air conditioner.
- Do not connect the ground wire to gas pipes, plumbing pipes, lightning rods, or telephone ground wires.
  - Gas pipes: might cause explosions or fire if gas leaks.
  - Plumbing: no grounding effect if hard vinyl piping is used.
  - Telephone ground wires or lightning rods: might cause abnormally high electric potential in the ground during lighting storms.
- **Specifications for field wire**

The remote control cord should be procured locally. Refer to Table 4 when preparing one.

Table 4

	Wire	Size (mm^2)	Length
Wiring the units	H05VV-U4G (NOTE 1)	2.5	–
Remote controller cord	Vinyl cord with sheath or cable (2 wire) (NOTE 2)	0.75 - 1.25	Max. 500m

NOTE

1. Shows only in case of protected pipes. Use H07RN-F in case of no protection.
2. Insulated thickness: 1 mm or more

⟨Methods of wiring units and connecting remote controller cords.⟩ (Refer to Fig. 21)

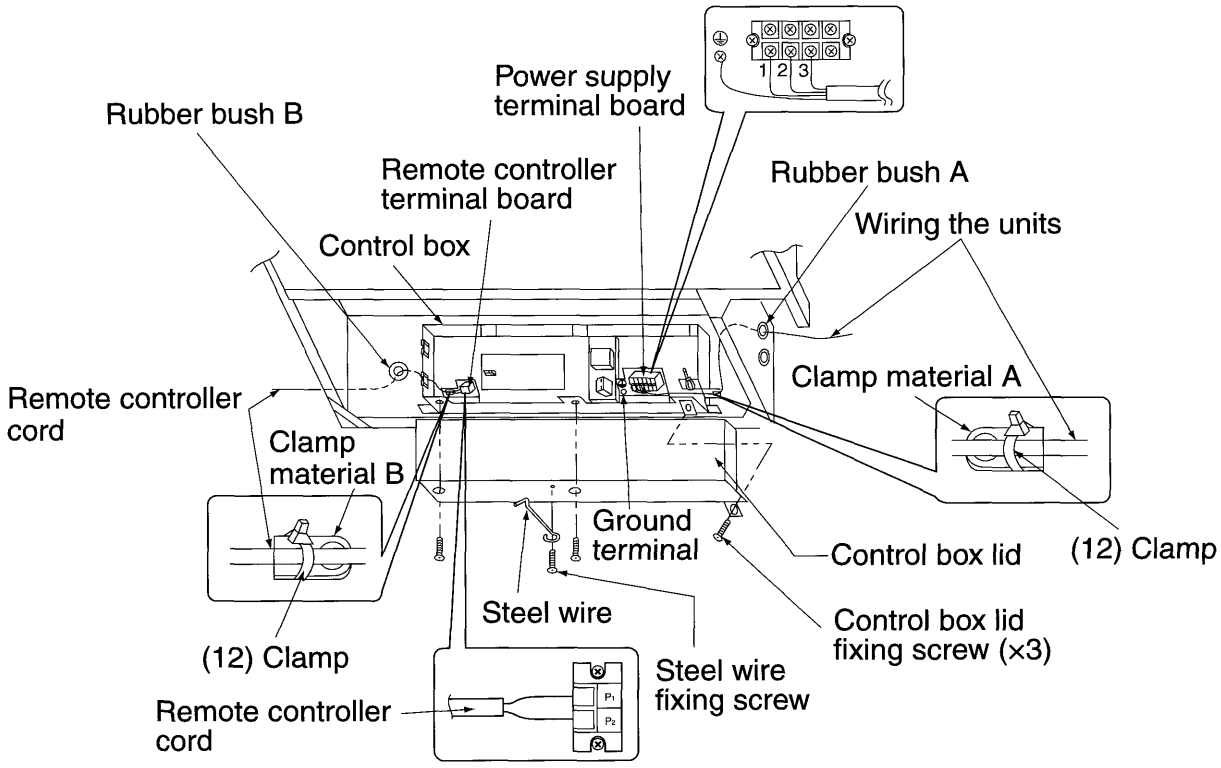


Fig. 21

- Wiring the units connections

  Remove the control box lid and connect wires of maching phase power supply terminal board inside. At that point, lead the wires inside the unit from the rubber bush A, then bind them together to the clamp material A with the clamp.

- Remote controller cords connections
  (No necessary for slave unit of simultaneous operation system)
  Remove the control box lid and connect wires to the remote controller terminal board. (2 P, no polarity) At that point, lead the remote controller cord inside the unit from the rubber bush B, then bind it to the clamp material B with the clamp.

[PRECAUTIONS]

- Do not clamp remote controller cords together with wiring the units. Doing so may cause malfunction.
- Remote controller cords and wiring the units should be located at least 50 mm from other electric wires. Not following this guideline may result in malfunction due to electrical noise.
- Arange the wires and fix a lid firmly so that the lid does not float during wiring work.

⚠ CAUTION

- Observe the notes when wiring to the power supply terminal board.
  (Use a round crimp-style terminal for connection to the power supply terminal board. In case it cannot be used due to unavoidable reasons, be sure to observe the following instructions.)
  - Do not connect wires of different gauge to the same power supply terminal.
    (Looseness in the connection may cause overheating.)
  - When connecting wires of the same gauge, connect them according to Fig. 22.
- In wiring, make certain that prescribed wires are used, carry out complete connections, and fix the wires so that outside forces are not applied to the terminals.

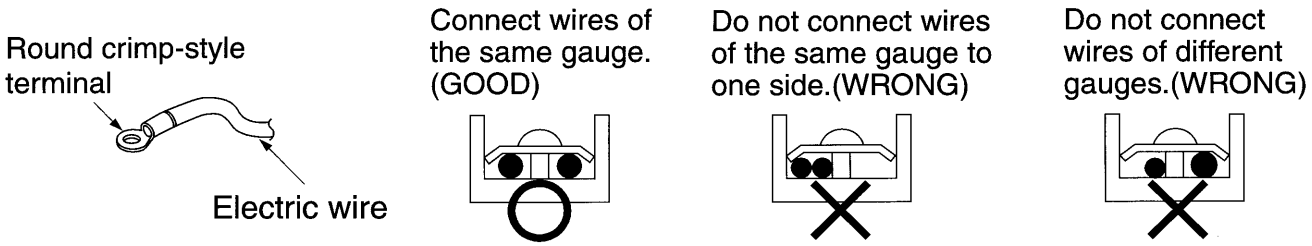


Fig. 22

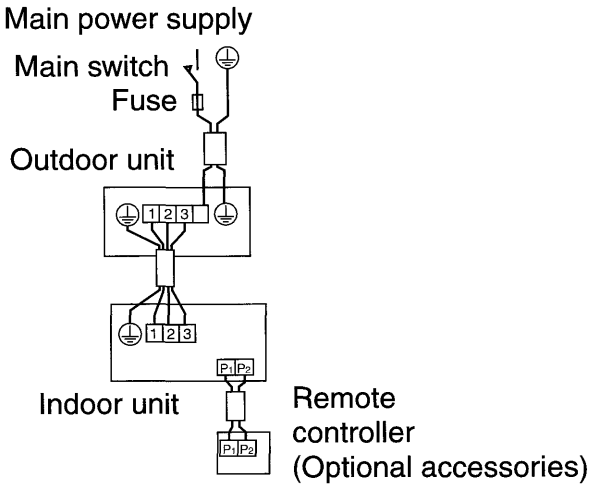
11. WIRING EXAMPLE

For the wiring of outdoor units, refer to the installation manual attached to the outdoor units.
Confirm the system type.

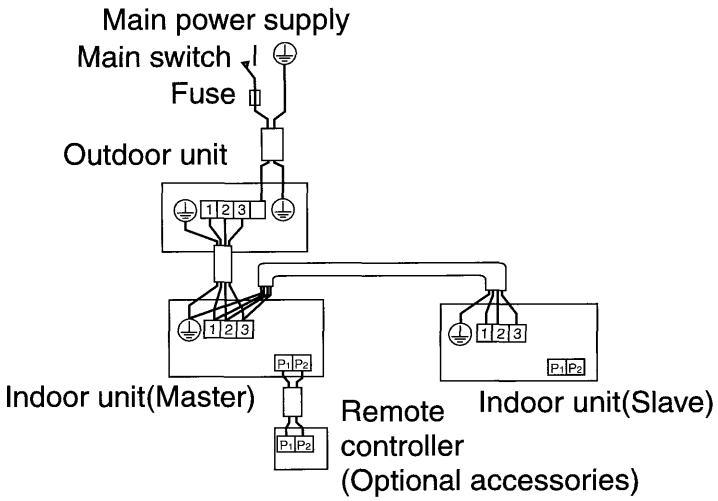
- **Pair type**: 1 remote controller controls 1 indoor unit (standard system).
- **Simultaneous operation system**: 1 remote controller controls 2 indoor units
  (2 indoor units operates equally.)
- **Group control**: 1 remote controller controls up to 16 indoor units
  (All indoor units operate according to the remote controller).

• **2 remote controller control**: 2 remote controller control 1 indoor unit.

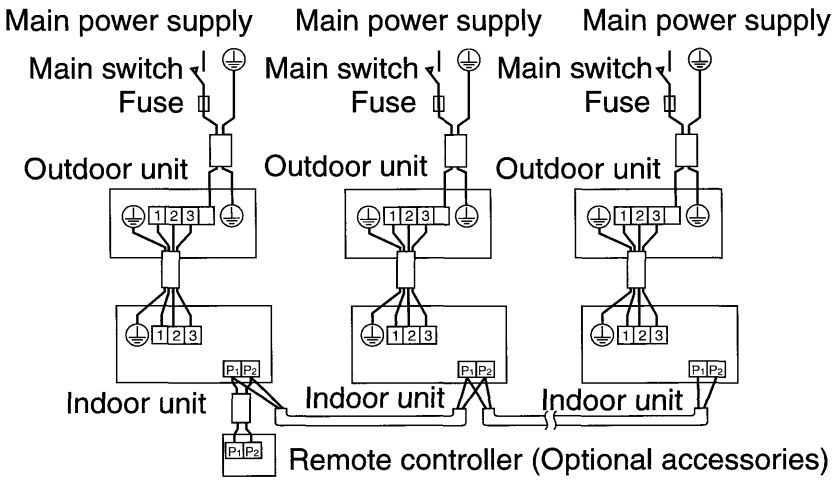
Pair type



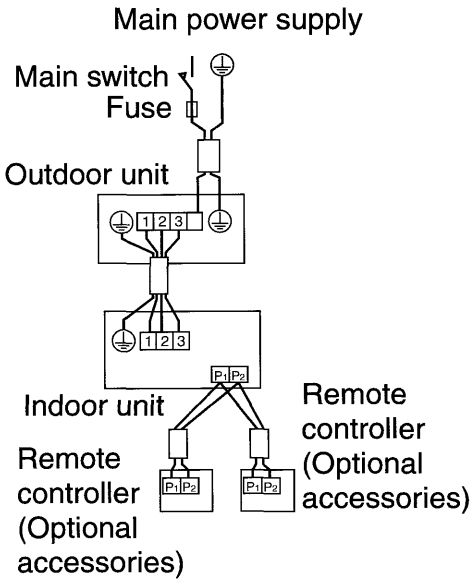
Simultaneous operation system



Group control



2 remote controller control



NOTE

1. All transmission wiring except for the remote controller wires is polarized and must match the terminal symbol.
2. When BRC1B517 is connected, use shield wire in transmission wiring. Ground the shield of the shield wire, at the grounding screw of the remote controller cord grounding terminal inside the control box.
3. In case of group control, perform the remote controller wiring to the master unit when connecting to the simultaneous operation system. (wiring to the slave unit is unnecessary)
4. For group control remote controller, choose the remote controller that suits the indoor unit which has the most functions (as attached swing flap).
5. For simultaneous operation system, connect the remote controller cord to the master unit.

12. FIELD SETTING

Field setting must be made from the remote controller in accordance with the installation condition.

- Setting can be made by changing the "Mode No.", "FIRST CODE NO.", and "SECOND CODE NO.".
- For setting and operation, refer to the "FIELD SETTING" in the installation manual of the remote controller.

1. Setting air filter sign

- Remote controllers are equipped with liquid crystal display air filer signs to display the time to clean air filters.
- Change the SECOND CODE NO. according to Table 5 depending on the amount of dirt or dust in the room.
  (SECOND CODE NO. is factory set to "01" for filter contamination-light)

Table 5

Setting	Spacing time of display air filter sigh (long life type)	Mode No.	FIRST CODE NO.	SECOND CODE NO.
Air filter contamination-light	Approx. 2500 hrs.	10 (20)	0	01
Air filter contamination-heavy	Approx. 1250 hrs.			02

2. Setting indoor unit number of simultaneous operation system

- When using in simultaneous operation system mode, change the SECOND CODE NO. as shown in Table 6.
  (SECOND CODE NO. is factory set to "01" for Pair system.)

Table 6

Setting	Mode No.	FIRST CODE NO.	SECOND CODE NO.
Pair system (1 unit)	11 (21)	0	01
Simultaneous operation system (2-unit)			02
Simultaneous operation system (3-unit)			03
Simultaneous operation system (4-unit)			04

- When using in simultaneous operation system mode, refer to **"Simultaneous Operation System Individual Setting"** section to set master and slave units separately.

〈When using wireless remote controllers〉

- When using wireless remote controllers, wireless remote controller address setting is necessary. Refer to the installation manual attached to the wireless remote controller for setting instructions.

3. Settings for options

- For settings for options, see the installation instructions provided with the option.

4. Simultaneous operation system individual setting

It is easier if the optional remote controller is used when setting the slave unit.

- Perform the following procedures when setting the master and slave unit separately.

Procedure

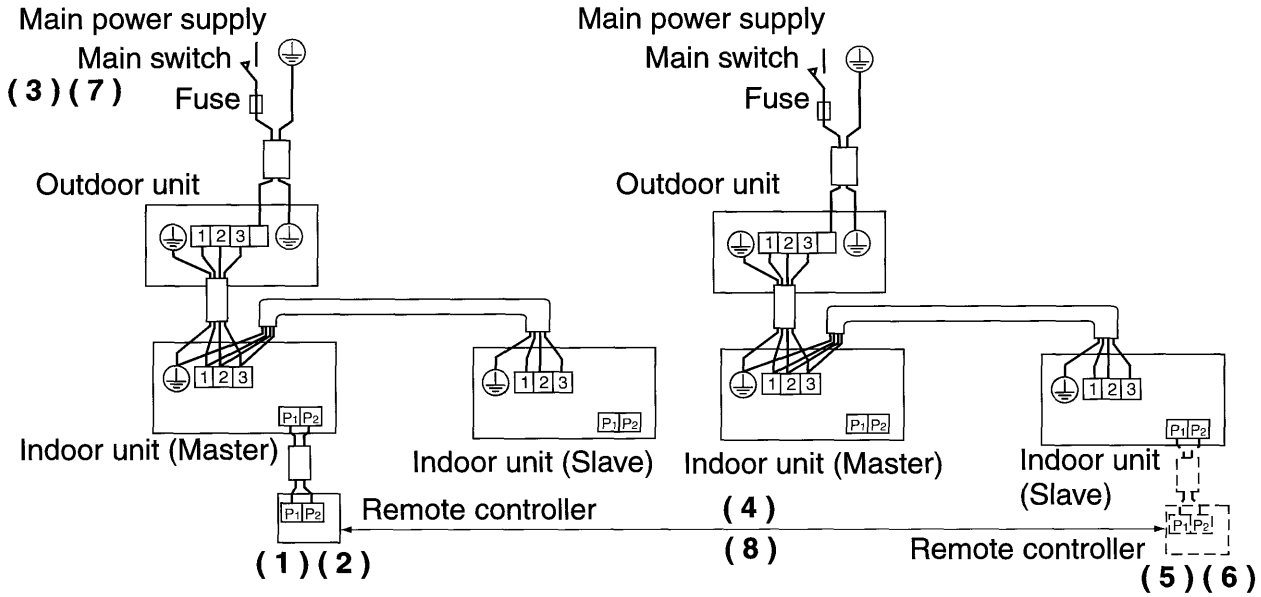
(1) Change the SECOND CODE NO. to "02", individual setting, so that the slave unit can be individually set. (Refer to Table 7)
(SECOND CODE NO. is factory set to "01", unified setting.)

Table 7

Setting	Mode No.	FIRST CODE NO.	SECOND CODE NO.
Unified setting	11 (21)	1	01
Individual setting			02

(2) Perform field setting for the master unit.

(3) Turn off the main power supply switch after (2).
(4) Detach remote controller from the master unit and connect it to the slave unit.
(5) Turn on the main power supply switch again, and as in (1), change the SECOND CODE NO. to "02", individual setting.
(6) Perform field setting for the slave unit.
(7) Turn off the main power supply switch after (6).
(8) If there is more than one slave unit, repeat steps 4 to 7.
(9) Detach the remote controller from the slave unit after the setting, and reattach to the master unit. This is the end of the setting procedure.
* You do not need to rewire the remote controller from the master unit if the optional remote controller for slave unit is used.
(However, remove the wires attached to the remote controller terminal board of the master unit.)



5. CONTROL BY 2 REMOTE CONTROLLERS
(Controlling 1 indoor unit by 2 remote controllers)

- When using 2 remote controllers, one must be set to "MAIN" and the other to "SUB".

MAIN/SUB CHANGEOVER

1. Insert a wedge-head screwdriver into the recess between the upper and lower parts of remote controller and, working from the 2 positions, remove carefully the upper part. **(Refer to Fig. 23)**
(The remote controller PC board is attached to the upper part of the remote controller.)
2. Turn the MAIN/SUB changeover switch on one of the two remote controller PC board to "S".
(Leave the switch of the other remote controller set to "M".) **(Refer to Fig. 24)**

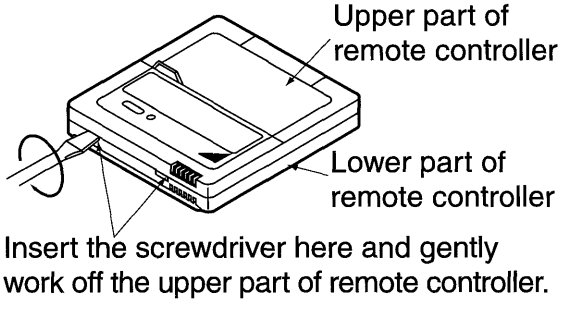


Fig. 23

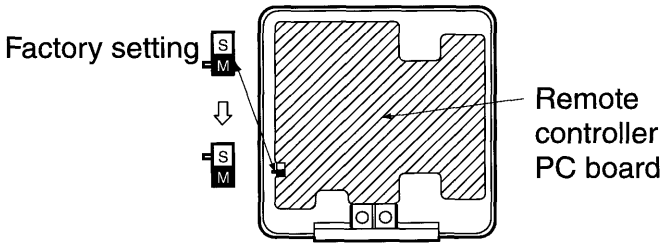


Fig. 24

13. INSTALLATION OF THE DECORATION PANEL

Read the section ontitled TEST OPERATION if conducting the test without installing the decoration panel.

Refer to the installation manual attached to the decoration panel.

After installing the decoration panel, make sure there is no space between the unit body and the decoration panel.

[CAUTION]

SWING FLAP MOTOR WIRING METHOD (Refer to Fig. 25)

(1) Connect two lead wires of swing flap motor mounted on the decoration panel to the conectors of main body.

(2) Slide the insulation tube according to the arrow as shown in Fig. 25. So that the connector can be completely covered. (only high voltage side)

(3) Bind the opening of insulation tube with the attached clamp material.

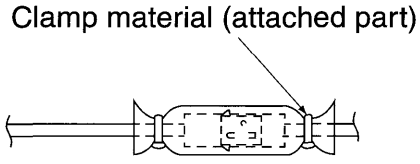


Fig. 25

14. TEST OPERATION

Refer to the section of "FOR THE FOLLOWING ITEMS, TAKE SPECIAL CARE DURING CONSTRUCTION AND CHECK AFTER INSTALLATION IS FINISHED" .

- After finishing the construction of refrigerant piping, drain piping, and electric wiring, conduct test operation accordingly to protect the unit.

1. HOW TO TEST OPERATION

1 Open the gas side stop valve.
2 Open the liquid side stop valve.
3 Electrify crank case heater for 6 hours (Not required in case of a unit exclusively designed for cooling only).
4 Set to cooling operation with the remote controller and start operation by pushing ON/OFF button (⏻).
5 Press INSPECTION/TEST OPERATION button (TEST) 4 times (2 times for wireless remote controller) and operate at Test Operation mode for 3 minutes.
6 Push AIR FLOW DIRECTION ADJUST button ( ) to make sure the unit is in operation.
7 Press INSPECTION/TEST OPERATION button (TEST) and operate normally.
8 Confirm function of unit according to the operation manual.

PRECAUTIONS

- Refer to the diagnoses below if the unit does not operate properly.
- After completing the test run, press the INSPECTION/TEST OPERATION button once to put the unit in inspection mode, and make sure the malfunction code is "00" (=normal).
  If the code reads anything other than "00", refer to the malfunction diagnoses below.

2. HOW TO DIAGNOSE FOR PROBLEMS

With the power on. Troubles can be monitored on the remote controller or the LED's on the PC board of the indoor unit.

■Trouble shooting with the display on the liquid crystal display remote controller.

1 With the wired remote controller. (NOTE 1)
When the operation stops due to trouble, operation lamp flashed, and " " and the error code are indicated on the liquid crystal display . In such a case, diagnose the fault contents by referning to

the table on the Error code list it case of group control, the unit No. is displayed so that the indoor unit no with the trouble can be recognized. (NOTE 2)

2 With the wireless remote controller.
(Refer also to the operation manual attached to the wireless remote controller)
When the operation stops due to trouble. the display on the indoor unit flashes. In such a case, diagnose the fault contents with the table on the Error code list looking for the error code which can be found by following procedures. (NOTE 2)

(1) Press the INSPECTION /TEST OPERATION button, " ⊛ " is displayed and " 0 " flashes.

(2) Press the PROGRAMMING TIME button and find the unit No. which stopped due to trouble.
Number of beeps 3 short beeps.....Perform all the following operations
1 short beep.....Perform (3) and (6)
1 long beep.....No trouble

(3) Press the OPERATION MODE SELECTOR button and upper figure of the error code flashes.

(4) Continue pressing the PROGRAMMING TIME button unit it makes 2 short beeps and find the upper code.

(5) Press the OPERATION MODE SELECTOR button and lower figure of the error code flashes.

(6) Continue pressing the PROGRAMMING TIME button unit it makes a long beep and find the lower code.

- A long beep indicate the error code.

■Trouble shooting with the LEDs on the PC board (Refer to Table 8)

The following checking can be made with the service monitor LEDs (green). (Normal when flashing)

☼ : LED on ● : LED off ◑ : LED flashing

— : Not used for trouble shooting

Table 8

Microcomputer normal monitor	Transmission normal monitor	Details	
HAP(H1P)	HBP(H2P)	FH(Y)K–F, FHK-BZ	FHYKP–B
◑	◑	Indoor unit is normal → Diagnose the outdoor unit	
	☼	Malfunction of indoor unit PC board assembly or miswiring between indoor and outdoor units	Miswiring between the indoor and outdoor units
◑	●	If the outdoor unit HAP(H1P) does not light, diagnose the outdoor unit. If it is flashes, it is due to euther miswiring or malfunction of the indoor unit PC board assembly. (NOTE 4)	If the outdoor unit HAP(H1P) does not light, diagnose the outdoor unit. If it is flashed, it is due to either miswiring or malfunction of the indoor or outdoor unit PC board assembly. (NOTE 4)
☼	—	Malfunction of the indoor unit PC board (NOTE 5)	
●		Abnormal power supply, malfunction of PC board assembly or disconnection between the indoor and outdoor units (NOTE 5)	

NOTE

1. In case wired remote controller. Press the INSPECTION /TEST OPERATION button on remote controller, " ⊛ " starts flashing.
2. Keep down the ON/OFF button for 5 seconds or longer in the inspection mode and the above trouble history disappears, after the trouble code goes on and off twice, followed by the code "00"(normal). The display changes from the inspection mode to the normal mode.
3. Depending on the model or the conditions, it may carry out an emergency shut-down.
4. If the HBP(H2P) is off, the branch wiring between each of the indoor and outdoor units may either be incorrectly connected or broken. Before taking any of the diagnostic steps listed above, check the branch wiring.

If the HBP(H2P) is off on an inverter, there is a possibility that the fuse on the outdoor unit's PC board is burnt out.

5. Cut off the power and wait for 5 seconds or longer. Turn on the power again and see if the LED is in the same state again.

3. Malfunction code

- For places where the error code is left blank, the "" indication is not displayed. Though the system continues operating, be sure to inspect the system and make repairs as necessary.
- Depending on the type of indoor or outdoor unit, the malfunction code may or may not be displayed.

Code	Malfunction/Remarks
A1	Indoor unit's PC board faulty
A3	Drain water level abnormal
A6	Indoor fan motor overloaded, overcurrent or locked
A7	Swing flap motor locked
	Only the air flow direction can not be controlled.
AF	Humiditier faulty
AH	Air cleaner faulty
	Only the air cleaner does not function.
AJ	Type set improper
	Capacity data is wrongly proset. Or there is nothing programmed in the data hold IC.
C4	Sensor for heat exchanger lamp is fault
C9	Sensor for suction air lamp is fault
CJ	Sensor for remote controller is fault
	The remote controller thermistor does not function, but the system thermo run is possible.
E0	Action of safety device (outdoor unit)
E1	Outdoor unit's PC board faulty (outdoor unit)
E3	High pressure abnormal(outdoor unit)
E4	Low pressure abnormal (outdoor unit)
E5	Compressor motor lock malfunction (outdoor unit)
E7	Outdoor fan motor lock malfunction Outdoor fan instantneous overcurrent malfunction (outdoor unit)
E9	Electronic expansion valve faulty (outdoor unit)
F3	Discharge pipe temperature abnormal (outdoor unit)
H3	High pressure switch faulty (outdoor unit)
H4	Low pressure switch faulty (outdoor unit)
H7	Outdoor motor position signal malfunction (outdoor unit)
H9	Outdoor air thermistor faulty (outdoor unit)
	(NOTE 3)
J3	Discharge pipe thermistor faulty (outdoor unit)
	(NOTE 3)
J5	Suction pipe thermistor faulty (outdoor unit)
J6	Heat exchanger thermistor faulty (outdoor unit)
	(NOTE 3)
L4	Overheated heat-radiating fin (outdoor unit)
	Inverter cooling defect.
L5	Instantaneous overcurrent (outdoor unit)
	Possible earth fault or short circuit in the compressor motor.

L8	Electric thermal (outdoor unit)
	Possible electrical overload in the compressor or cut line in the compressor motor.
L9	Stall prevention (outdoor unit)
	Compressor possibly locked.
LC	Transmission malfunction between the outdoor control units' inverters (outdoor unit)
P1	Open-phase (outdoor unit)
P3	PC board temperature sensor malfunction (outdoor unit)
P4	Heat-radiating fin temperature sensor malfunction (outdoor unit)
PJ	Type set improper (outdoor unit)
	Capacity data is wrongly proset. Or there is nothing programmed in the data hold IC.
U0	Suction pipe temperature abnormal
U1	Reverse phase
	Reverse two of the L1,L2 and L3 leads.
U2	Power source voltage malfunction (outdoor unit)
	Includes the defect in K1M.
U4 UF	Transmission error (indoor unit – outdoor unit)
	Wrong wiring between indoor and outdoor units or malfunction of the PC board mounted on the indoor and the outdoor units. If UF is shown, the wiring between the indoor and outdoor units is not properly wired. Therefore, immediately disconnect the power supply and correct the wiring. (The compressor and the fan mounted on the outdoor unit may start operation independent of the remote controller operation.)
U5	Transmission error (indoor unit – remote controller)
	Transmission is improper between the indoor unit and the remote controller.
U8	Malfunction in transmission between main and sub remote controls. (Malfunction in sub remote control.)
UA	Miss setting for multi system
	Setting is wrong for selector switch of multi-system. (see switch SS2 on the main unit's PC board)
UC	Central control address overlapping

15. OUTDOOR UNIT INSTALLATION

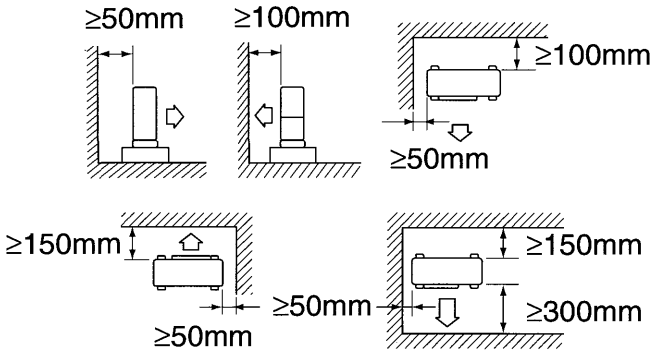
The following information is for R35, 50, 60 or RY35, 50, 60 outdoor unit types. Refer to the installation manual attached to the outdoor unit for other outdoor unit types.

1. SELECTING INSTALLATION SITE

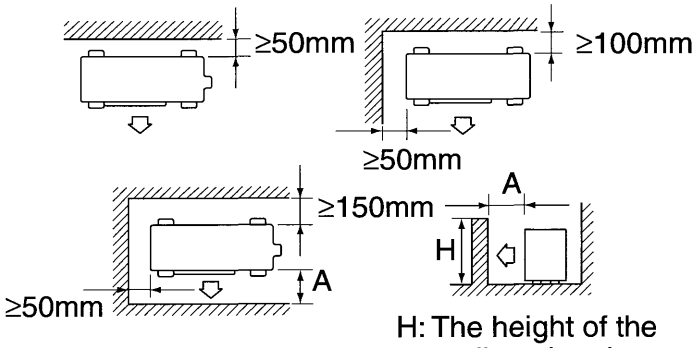
Select an installation site where the following conditions are satisfied and that meets with your customer's approval.

- Places which are well-ventilated.
- Safe places which can withstand the unit's weight and vibration and where the unit can be installed level.
- Places where the unit does not bother next-door neighbors.
- Places where there is no possibility of flammable gas leak.
- Places where things distressed in water do not exist because water drains off the outdoor unit.
- Places where servicing space can be well ensured.

R35, RY35



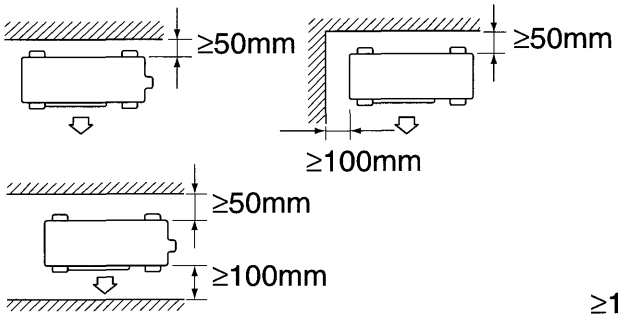
R50, R60



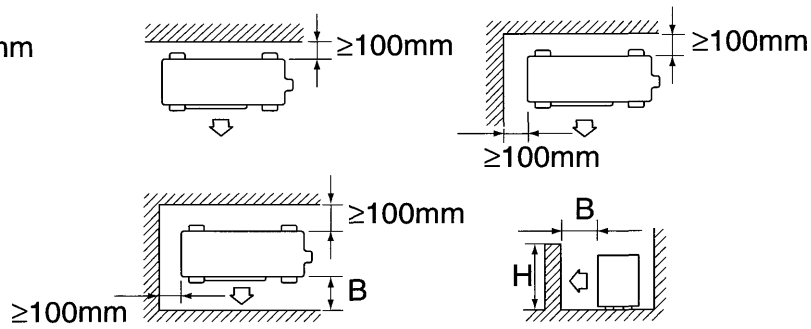
H: The height of the wall on the air discharge side

	A dimension
H: 1000 mm or less	300
H: 1000 mm or more	600

RY50



RY60

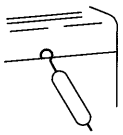


H: The height of the wall on the air discharge side

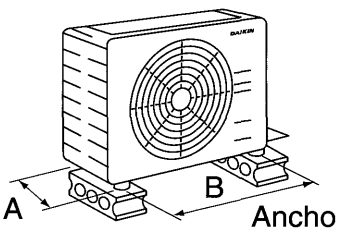
	B dimension
H: 1000 mm or less	350
H: 1000 mm or more	600

2. INSTALLATION

- In case of bad drainage, build frames with concrete blocks, etc. under the outdoor unit.
- To prevent the outdoor unit from falling or inclining from the frame, hang block strap around the hook or use turnbuckle.



Use turnbuckle (on suction grille side)



Anchor bolt hole pitch

(mm)

MODEL	A	B
R35,RY35	290	530
R50	290	530
R60,RY50	330	540
RY60	370	500

3. REFRIGERANT PIPING

Model	Cooling only			Heat pump		
	R35	R50	R60	RY35	RY50	RY60
Max. allowable length	25 m	30 m		20 m	30 m	
Max. allowable height	15 m					
Additional refrigerant required for refrigerant pipe exceeding 10m in length. (NOTE 1)	20 g/m				30 g/m	60 g/m
Gas pipe	ϕ12.7 × t0.9	ϕ15.9 × t0.95		ϕ12.7 × t0.9	ϕ15.9 × t0.95	
Liquid pipe	ϕ6.4 × t0.8					

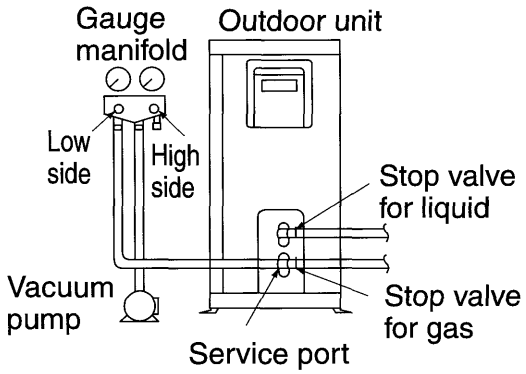
NOTE

1. If R60 or RY60 type is connected, extra refrigerant is needed if 5m is exceeded.
2. For pipe connection refer to "6. REFRIGERANT PIPING WORK" on page 8

4. AIR PURGE

- Leak test

1. Evaluate the pipes and check vacuum. (No pressure increase for 1 minute)
2. Charge Nitrogen (N_2)
3. Check for leaks by applying soap water to pipe connections.
4. Discharge Nitrogen.
5. Conduct air purge again and check vacuum.
6. Open valves and charge refrigerant into the connection pipe and into the indoor unit.
7. Leak test must follow the standard pr. EN378-7.

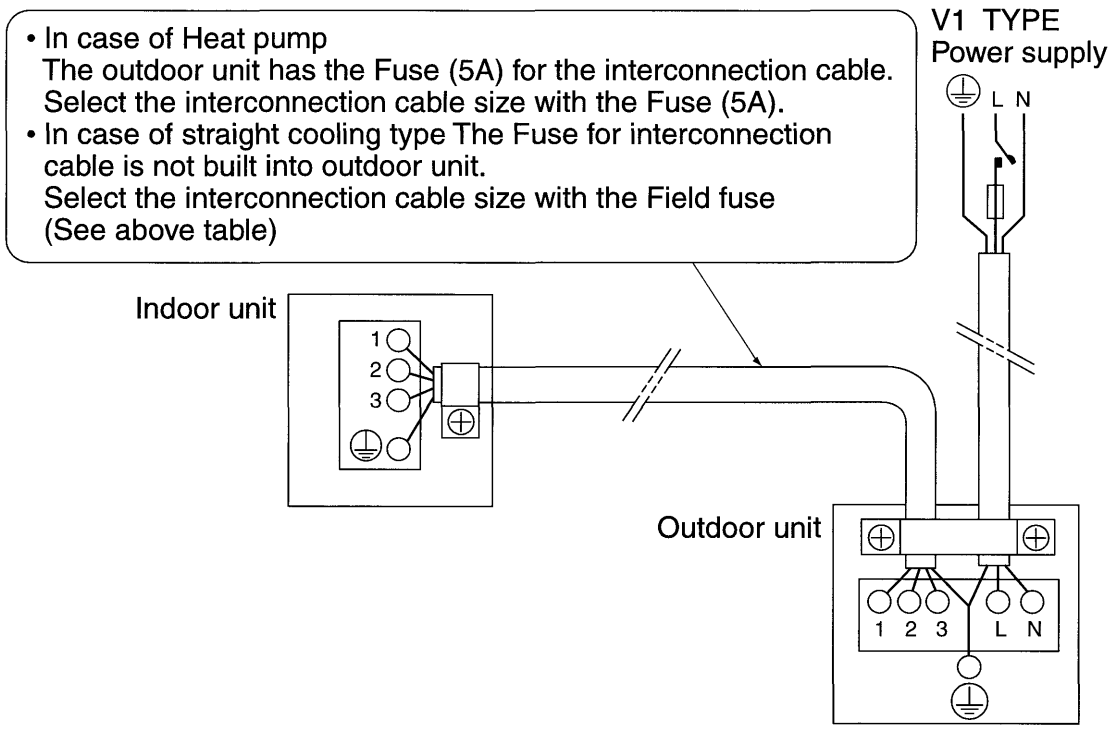


5. ELECTRIC WIRING WORK

- All field supplied parts and materials and electric works must conform to local codes.
- All wiring must be performed by an authorized electrician.
- Use copper wires only.
- For electric wiring work, refer also to the "WIRING DIAGRAM" attached to the outdoor unit.
- A circuit breaker capable of shutting down power supply to the entire system must be installed.

Model		Power supply		Interconnection cable type (*)	Size
Series	Type	Field fuse ⎓	Cable type (*)		
R35,RY35	V1	15	H05VV-U3G	H05VV-U4G	Wiring size must comply with the applicable local and national code.
R50,RY50	V1	20	H05VV-U3G	H05VV-U4G	
R60	V1	25	H05VV-U3G	H05VV-U4G	
RY60	V1	20	H05VV-U3G	H05VV-U4G	

* Only in protected pipes, for outdoor installation use type H07RN-F.



16. WIRING DIAGRAM

(Refer to Fig. 26 and 27)

1	TO OUTDOOR UNIT	2	WIRED REMOTE CONTROLLER
3	SWITCH BOX	4	IN CASE OF SIMULTANEOUS OPERATION SYSTEM
5	INDOOR UNIT (MASTER)	6	INDOOR UNIT (SLAVE)

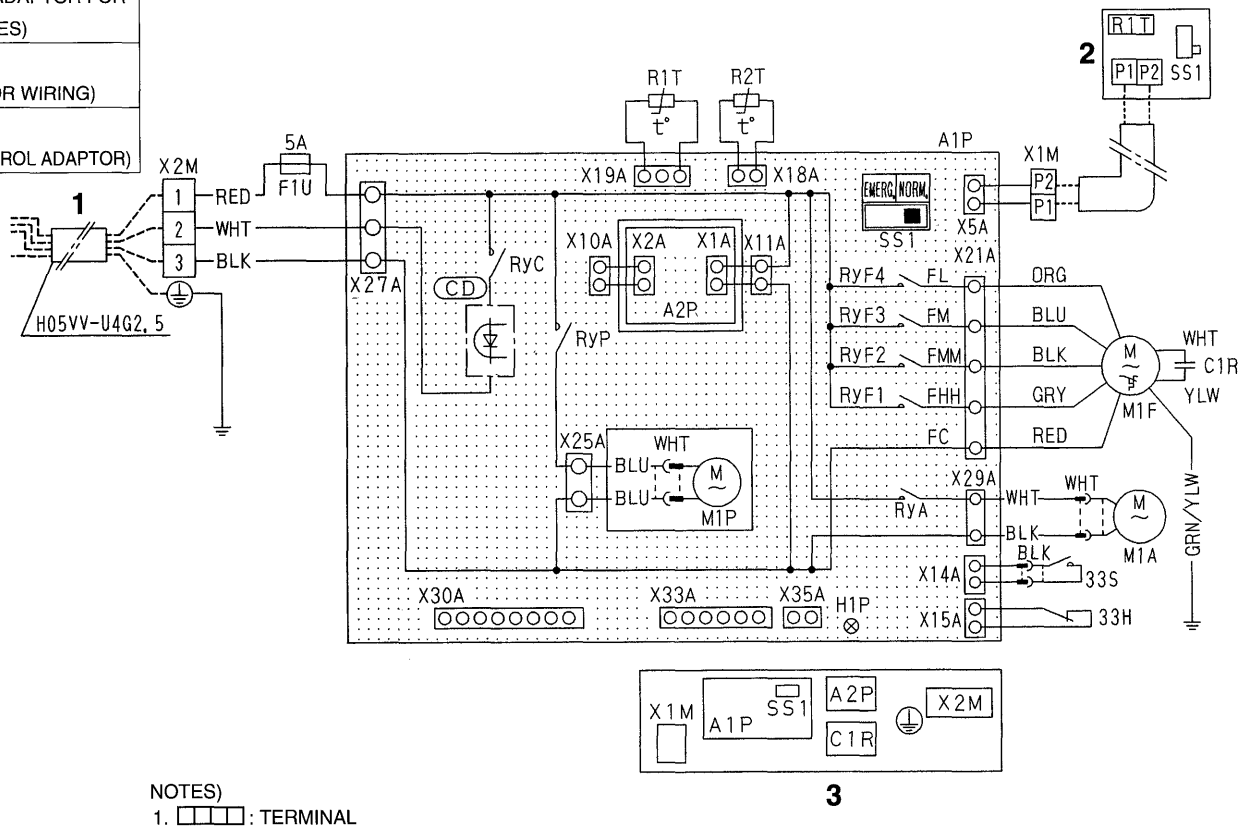
WIRING DIAGRAM

1-RED	2-WHITE	3-BLACK

33H	FLOAT SWITCH
33S	LIMIT SWITCH (SWING FLAP)
A1P	PRINTED CIRCUIT BOARD
A2P	PRINTED CIRCUIT BOARD (TRANSFORMER 220-240V/16V)
C1R	CAPACITOR (M1F)
F1U	FUSE (250V,5A)
H1P	LIGHT EMITTING DIODE (SERVICE MONITOR GREEN)
M1A	MOTOR (SWING FLAP)
M1F	MOTOR (INDOOR FAN)
M1P	MOTOR (DRAIN PUMP)
Q1F	THERMO SWITCH (M1F EMBEDDED)
R1T	THERMISTOR (AIR)
R2T	THERMISTOR (COIL)
RyA	MAGNETIC RELAY (M1A)
RyC	MAGNETIC RELAY (OUTDOOR UNIT COMPRESSOR)
RyF1-4	MAGNETIC RELAY (M1F)
RyP	MAGNETIC RELAY (M1P)
SS1	SELECTOR SWITCH (EMERGENCY)
X1M	TERMINAL STRIP
X2M	TERMINAL STRIP
(CD)	CURRENT DETECT CIRCUIT

CONNECTOR FOR OPTIONAL PARTS	
X30A	CONNECTOR (INTERFACE ADAPTOR FOR SKY AIR SERIES)
X33A	CONNECTOR (ADAPTOR FOR WIRING)
X35A	CONNECTOR (GROUP CONTROL ADAPTOR)

WIRED REMOTE CONTROLLER	
R1T	THERMISTOR (AIR)
SS1	SELECTOR SWITCH (MAIN/SUB)



NOTES)
1. ☐☐☐☐: TERMINAL
   ⊙⊙, ⊐⊏: CONNECTOR
2. - - - - : FIELD WIRING
3. IN CASE USING CENTRAL REMOTE CONTROLLER, CONNECT IT TO THE UNIT IN ACCORDANCE WITH THE ATTACHED INSTALLATION MANUAL.
4. REMOTE CONTROLLER MODEL VARIES ACCORDING TO THE COMBINATION SYSTEM, CONFIRM ENGINEERING MATERIALS AND CATALOGS, ETC. BEFORE CONNECTING.
5. SYMBOLS SHOW AS FOLLOWS
   RED: RED BLK: BLACK WHT: WHITE YLW: YELLOW GRN: GREEN GRY: GRAY BLU: BLUE ORG: ORANGE
6. CONFIRM THE METHOD OF SETTING THE SELECTOR SWITCH (SS1) BY INSTALLATION MANUAL AND ENGINEERING MATERIALS, ETC.

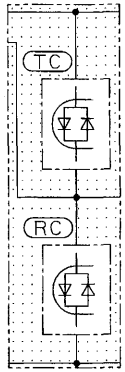
Fig. 26

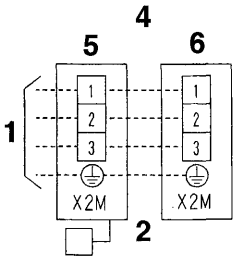
WIRING DIAGRAM

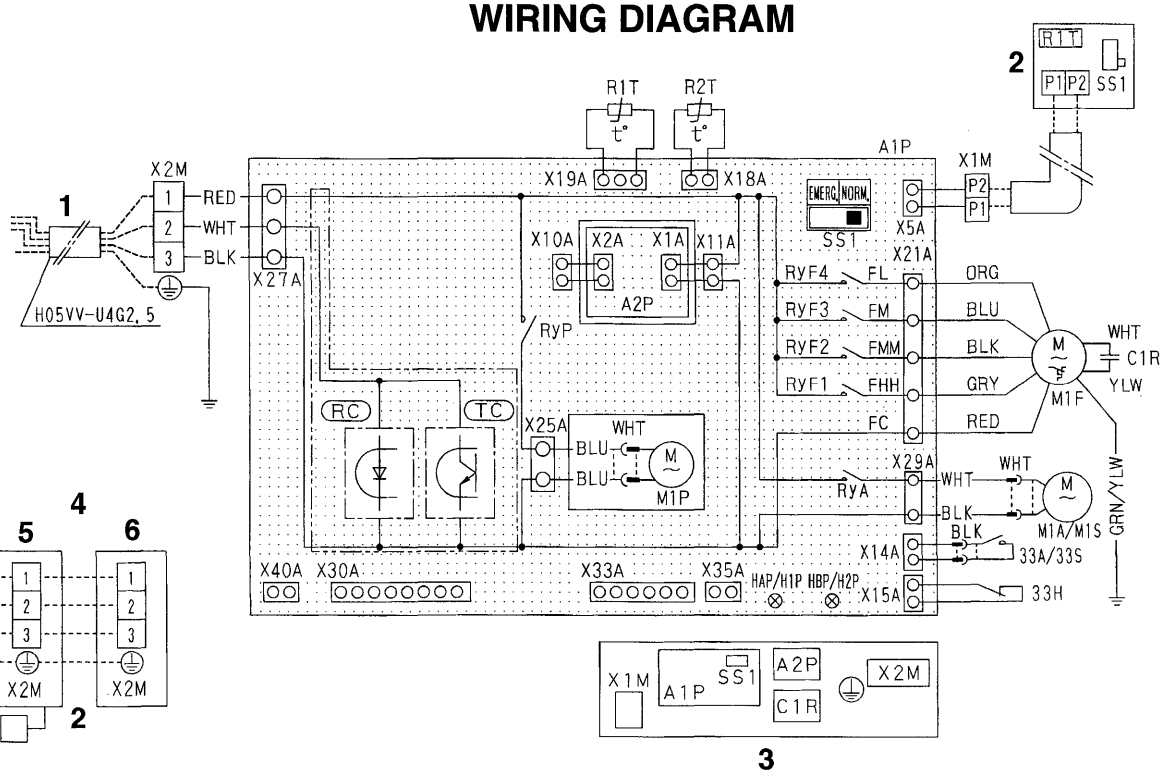
1-RED	2-WHITE	3-BLACK

33A/33S	LIMIT SWITCH (SWING FLAP)
33H	FLOAT SWITCH
A1P	PRINTED CIRCUIT BOARD
A2P	PRINTED CIRCUIT BOARD (TRANSFORMER 230V/16V)
C1R	CAPACITOR (M1F)
HAP H1P	LIGHT EMITTING DIODE (SERVICE MONITOR GREEN)
HBP H2P	LIGHT EMITTING DIODE (SERVICE MONITOR GREEN)
M1A M1S	MOTOR (SWING FLAP)
M1F	MOTOR (INDOOR FAN)
M1P	MOTOR (DRAIN PUMP)
Q1F	THERMO SWITCH (M1F EMBEDDED)
R1T	THERMISTOR (AIR)
R2T	THERMISTOR (COIL)
RyA	MAGNETIC RELAY (M1A/M1S)
RyF1-4	MAGNETIC RELAY (M1F)
RyP	MAGNETIC RELAY (M1P)
SS1	SELECTOR SWITCH (EMERGENCY)
X1M	TERMINAL STRIP
X2M	TERMINAL STRIP
(RC)	SIGNAL RECEIVER CIRCUIT
(TC)	SIGNAL TRANSMISSION CIRCUIT
WIRED REMOTE CONTROLLER	
R1T	THERMISTOR (AIR)
SS1	SELECTOR SWITCH (MAIN/SUB)

CONNECTOR FOR OPTIONAL PARTS	
X30A	CONNECTOR (INTERFACE ADAPTOR FOR SKY AIR SERIES)
X33A	CONNECTOR (ADAPTOR FOR WIRING)
X35A	CONNECTOR (GROUP CONTROL ADAPTOR)
X40A (FHYKP TYPE ONLY)	CONNECTOR (ON/OFF INPUT FROM OUTSIDE)







NOTES)
1. ☐☐☐☐ : TERMINAL
   ⊙⊙, ⊃⊂ : CONNECTOR
2. – – – – : FIELD WIRING
3. IN CASE USING CENTRAL REMOTE CONTROLLER, CONNECT IT TO THE UNIT IN ACCORDANCE WITH THE ATTACHED INSTALLATION MANUAL.
4. REMOTE CONTROLLER MODEL VARIES ACCORDING TO THE COMBINATION SYSTEM, CONFIRM ENGINEERING MATERIALS AND CATALOGS, ETC. BEFORE CONNECTING.
5. SYMBOLS SHOW AS FOLLOWS
   RED: RED BLK: BLACK WHT: WHITE YLW: YELLOW GRN: GREEN GRY: GRAY BLU: BLUE ORG: ORANGE
6. CONFIRM THE METHOD OF SETTING THE SELECTOR SWITCH (SS1) BY INSTALLATION MANUAL AND ENGINEERING MATERIALS, ETC.

Fig. 27