DAIKIN

INSTALLATION MANUAL

English

SPLIT SYSTEM Air Conditioners

MODELS
(Ceiling suspension type)

FH(Y)35BVE	**FH(Y)71BVE**
FH(Y)50BVE	**FH(Y)100BVE**
FH(Y)60BVE	**FH(Y)125BVE**

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

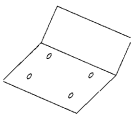
- Ground the air conditioner.
  Do not connect the ground wire to gas or water pipes, lightning conductor or a telephone ground wire.
  Incomplete grounding may result in electric shocks.
- Be sure to install an earth leakage breaker.
  Failure to install an earth leakage breaker may result in electric 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.
- Install the indoor and outdoor units, power cord and connecting wires at least 1 meter away from televisions or radios in order to prevent image interference or noise.
  (Depending on the radio waves, a distance of 1 meter may not be sufficient enough to eliminate the noise.)
- 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

- **When moving the unit while removing it from the box, be sure to lift it by holding on to the four lifting lugs without exerting any pressure on other parts, especially swing flap, the refrigerant piping, drain piping, and other resin parts.**
- Be sure to check the type of refrigerant to be used before installing the unit. (Using an incorrect refrigerant will prevent normal operation of the unit.)
- The accessories needed for installation must be retained in your custody until the installation work is completed. Do not discard them!
- Decide upon a line of transport.
- Leave the unit inside its packaging while moving, until reaching the installation site. Where unpacking is unavoidable, use a sling of soft material or protective plates together with a rope when lifting, to avoid damage or scratches to the unit.
- When selecting installation site, refer to the paper pattern.
- For the installation of an outdoor unit, refer to the installation manual attached to the outdoor unit.
- Do not use the unit in locations with high salt content in the air such as beachfront property, locations where the voltage fluctuates such as factories, or in automobiles or marine vessels.

2-1 ACCESSORIES

Check the following accessories are included with your unit.

Name	1) Drain hose	2) Clamp	3) Washer for hanging bracket	4) Clamp	5) Washers fixing plate
Quantity	1 pc.	1 pc.	8 pcs.	6 pcs.	1 pc.
Shape					

Name	Insulation for fitting	Sealing pad	
Quantity	1 each.	1 each.	
Shape	6) For gas pipe  7) For liquid pipe 	8) Large  9) Small 	(Other) Operation manual Installation manual

2-2 OPTIONAL ACCESSORIES

- The remote controller are required for this indoor unit "Table 1" on page 3. (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" on page 3 according to customer request and install in an appropriate place.

Table 1

Remote controller type	Cooling only type	Heat pump type
Wired type	BRC1C61	
Wireless type	BRC7E66	BRC7E63W

NOTE

- If you wish to use a remote controller that is not listed in "Table 1" on page 3, select a suitable remote controller after consulting catalogs and technical materials.

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

a. 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.	

b. 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?	

c. Points for explanation about operations

The items with ⚠ WARNING and ⚠ CAUTION marks in the instruction manual are the items pertaining to possibillties 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.

2-3 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.

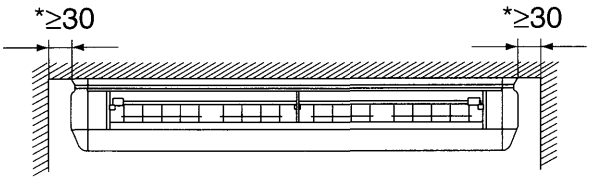
3. SELECTING INSTALLATION SITE

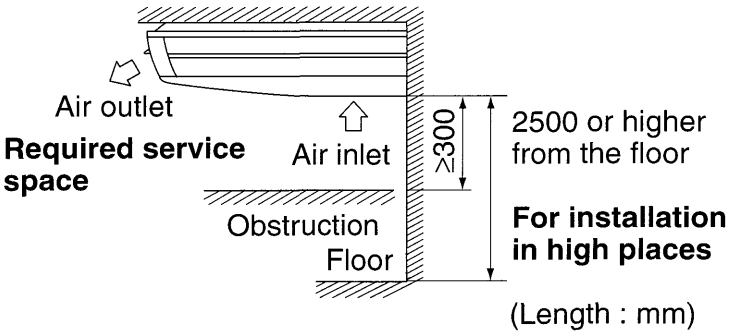
(1) Select an installation site where the following conditions are fulfilled and that meets your customer's approval.

- 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 there is no risk of flammable gas leakage.
- Where sufficient clearance for maintenance and service can be ensured.

NOTE

- If there is space left over in the * section, opening it up 200 mm will make servicing easier.





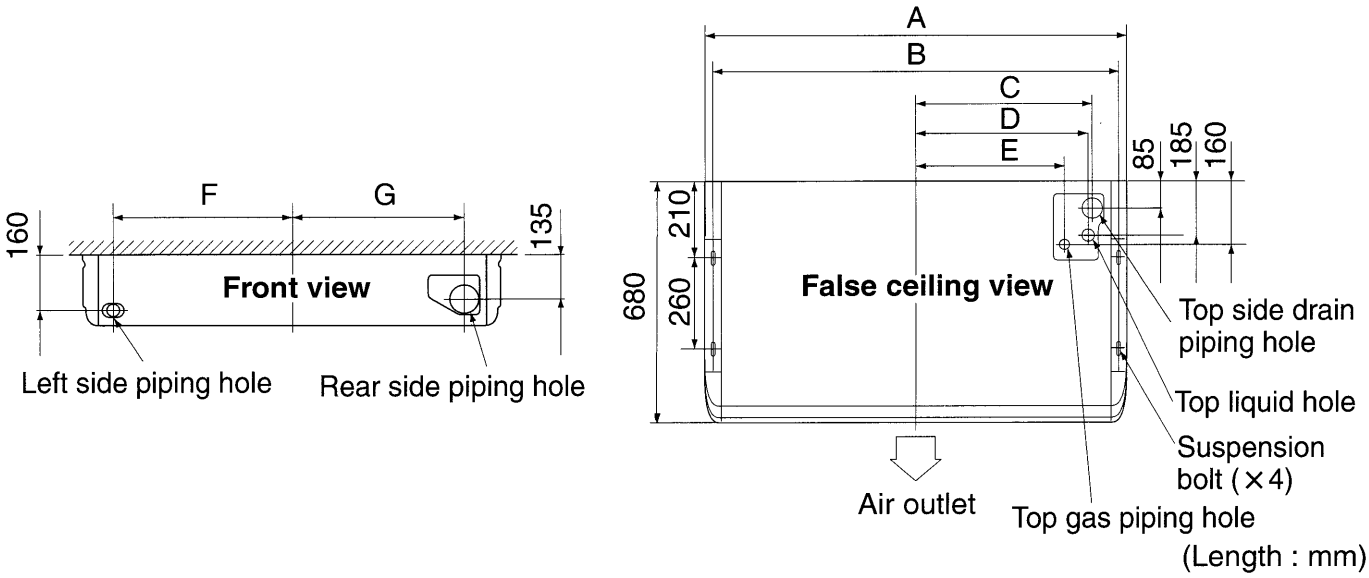
- Where piping between indoor and outdoor units is possible within the allowable limit. (Refer to the installation manual for the outdoor unit.)
- Keep indoor unit, outdoor unit, power supply wiring and transmission wiring at least 1 meter away from televisions and radios. This is to prevent image interference and noise in those electrical appliances. (Noise may be generated depending on the conditions under which the electric wave is generated, even if 1 meter is kept.)

(2) 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 reinforcing.)

(3) This product may be installed on ceilings up to 3.5 m in height. However, if the ceiling is higher than 2.7 m, the remote control will have to be set locally. (Refer to "10. FIELD SETTINGS" on page 18)

4. PREPARATIONS BEFORE INSTALLATION

(1) Relation of holes for indoor unit, suspension bolt position, piping and wiring.



(Length : mm)

Model (FH~,FHY~)	A	B	C	D	E	F	G
Type 35, 50	960	920	390	375	310	400	375
Type 60, 71	1160	1120	490	475	410	500	475
Type 100	1400	1360	610	595	530	620	595
Type 125	1590	1550	705	690	625	715	690

(2) Make holes for suspension bolts, refrigerant and drain piping, and wiring.

- Refer to the paper patten for the locations.
- Select the location for each of holes and open the holes in the ceiling.

(3) Remove the parts from the indoor unit.

(3-1) Detach the air intake grille.

- Slide the locking knobs (×2) on the air intake grille inward (direction of arrows) and lift upwards. **(Refer to fig. 1)**
- With the intake grill open, remove the intake grill forward, holding on to the rear tabs on the intake grill. **(Refer to fig. 2)**

Fig.1

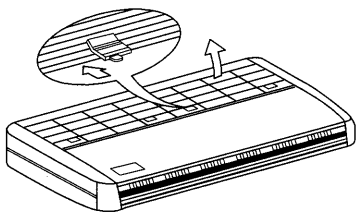
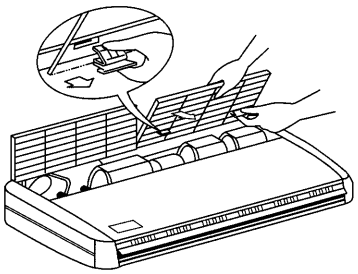


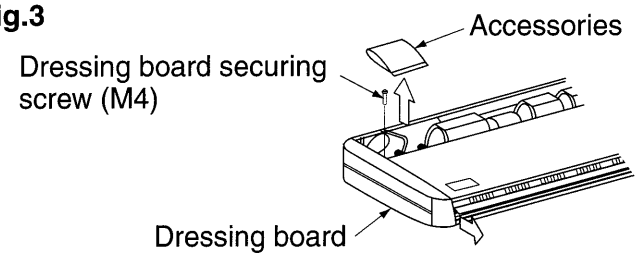
Fig.2



(3-2) Remove the dressing boards (left and right).

- After removing the securing screw for the dressing boards (one each), pull them forward (in the direction of the arrow) and remove them. **(Refer to fig. 3)**
- Take out the included parts.

Fig.3



(3-3) Remove the hooks.

- Loosen the 2 bolts (M8) used to attach the hooks which are on each side (4 locations left and right) to within 10 mm. **(Refer to fig. 4.5)**
- After removing the securing screws (M5) for the hooks which are on the rear side, pull the hooks back (in the direction of the arrow), and remove them. **(Refer to fig. 5)**

Fig.4

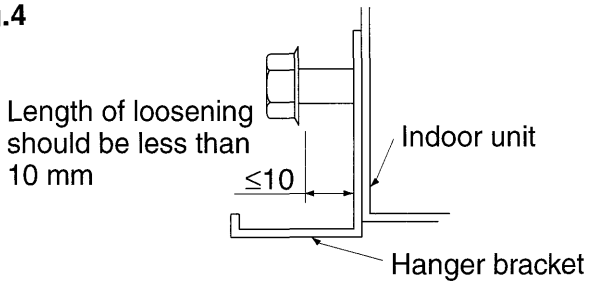
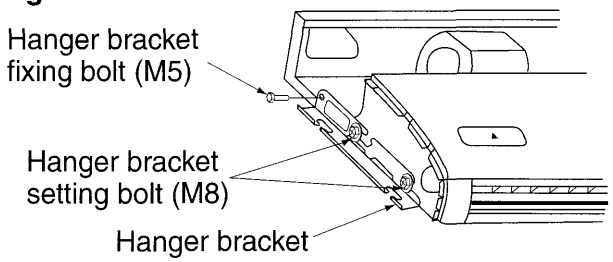


Fig.5



(4) Attach the eyebolts. (Use eyebolts which are W3/8 or M8-M10 in size.)

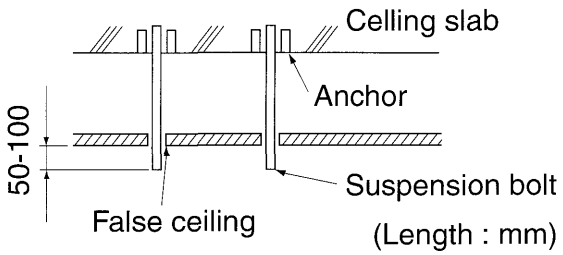
- Adjust the distance of the eyebolts from the ceiling in advance. **(Refer to fig. 6)**

NOTE

- Use a hole-in anchor for existing ceilings, and a sunken insert, 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.

*All the above parts are field supplied.

Fig.6



5. INDOOR UNIT INSTALLATION

Installing optional accessories before installing the indoor unit is easier.
As for the parts to be used for installation work, be sure to use the provided accessories and specified parts designated by our company.

(1) Secure the hooks to the eyebolts. (Refer to fig. 7)

NOTE
- To ensure they are safely secured, use the included washers, and secure them with a double nut to make sure.

(2) Lift the indoor unit's main body, insert the bolt (M8) for the hook into the attachment part on the hook, while sliding the main body from the front. (Refer to fig. 8)

(3) Fasten the bolts for the hooks (M8) securely in the four locations, left and right. (Refer to fig. 8)

(4) Replace the screws for the hooks which had been removed (M5) securely in 2 places left and right. This is necessary to prevent any forward and back deviance in the main body of the indoor unit. (Refer to fig. 8)

Fig.7

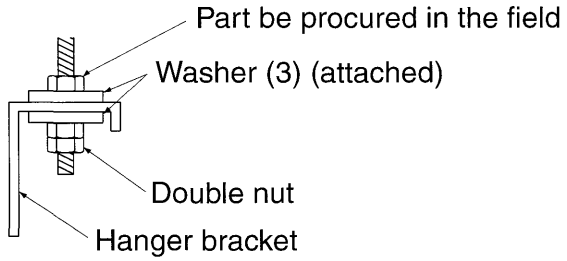
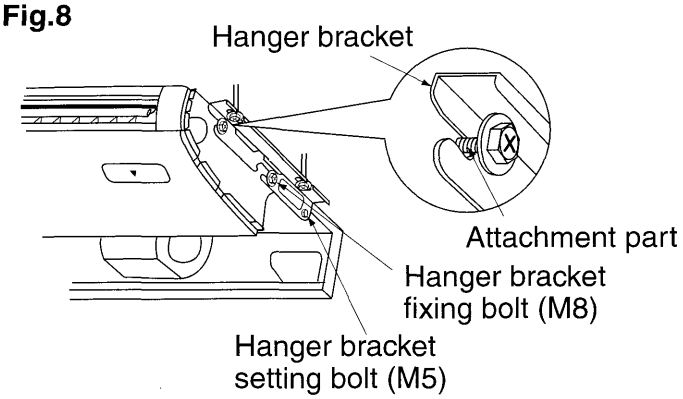
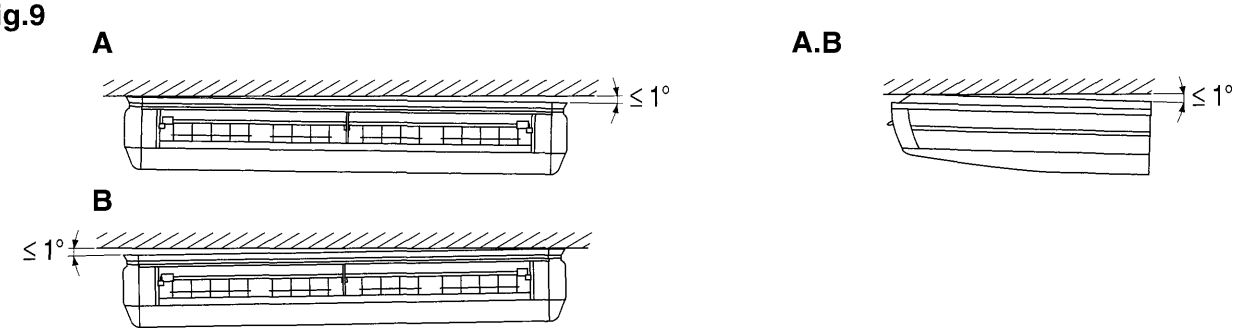


Fig.8



(5) When hanging the indoor unit main body, be sure to use a level or a plastic tube with water in it to make sure the drain piping is set either level or slightly tilted, in order to ensure proper drainage. (Refer to fig. 9)

Fig.9



A.When the drain piping is tilted to the right, or to the right and back.
Place it level, or tilt it slightly to the right or the back. (Within 1°.)

B.When the drain piping is tilted to the left, or to the left and back.
Place it level, or tilt it slightly to the left or the back. (Within 1°.)

⚠ CAUTION
Setting the unit at an angle opposite to the drain piping might cause leaks.

6. REFRIGERANT PIPING WORK

〈For refrigerant piping of outdoor units, see the installation manual attached to the outdoor unit.〉
〈Execute heat insulation work completely on both sides of the gas piping and the liquid piping. Otherwise, a water leakage can result sometimes.〉
(When using a heat pump, the temperature of the gas piping can reach up to approximately 120°C, so use insulation which is sufficiently resistant.)
〈Also, in cases where the temperature and humidity of the refrigerant piping sections might exceed 30°C or RH80 %, reinforce the refrigerant insulation. (20 mm or thicker) Condensation may form on the surface of the insulating material.〉
〈Be sure to check the type of refrigerant to be used before doing any work. (Using an incorrect refrigerant will prevent normal operation of the unit.)〉

CAUTION
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.

⚠ CAUTION
Do not allow anything other than the designated refrigerant to get mixed into the freezing cycle, such as air, etc. If any refrigerant gas leaks while working on the unit, ventilate the room thoroughly right away.

- Be sure to use both a spanner and torque wrench together, as shown in the drawing, when connecting or disconnecting pipes to/ from the unit. **(Refer to fig. 10)**
- Refer to "Table 2" for the dimensions of flare nut spaces.
- When connecting the flare nut, coat the flare part (both inside and outside) with ester oil or ether oil, rotate three or four times first, then screw in. **(Refer to fig. 11)**

Fig.10

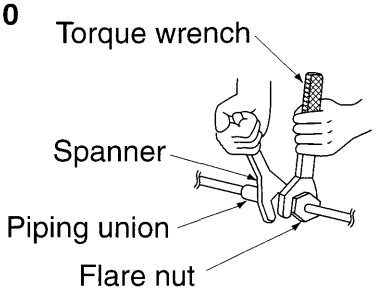
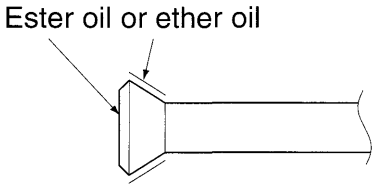
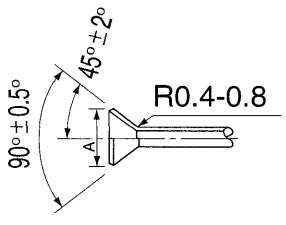


Fig.11



NOTE
- Use the flare nut included with the unit main body.

Table 2

Pipe size	Tightening torque	Flare dimensions A (mm)	Flare
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	

- Refer to "Table 2" to determine the proper tightening torque.

⚠ CAUTION
Overtightening may damage the flare and cause leaks.

— Not recommendable but in case of emergency

You must use a torque wrench but if you are obliged to install the unit without a torque wrench, you may follow the installation method mentioned below

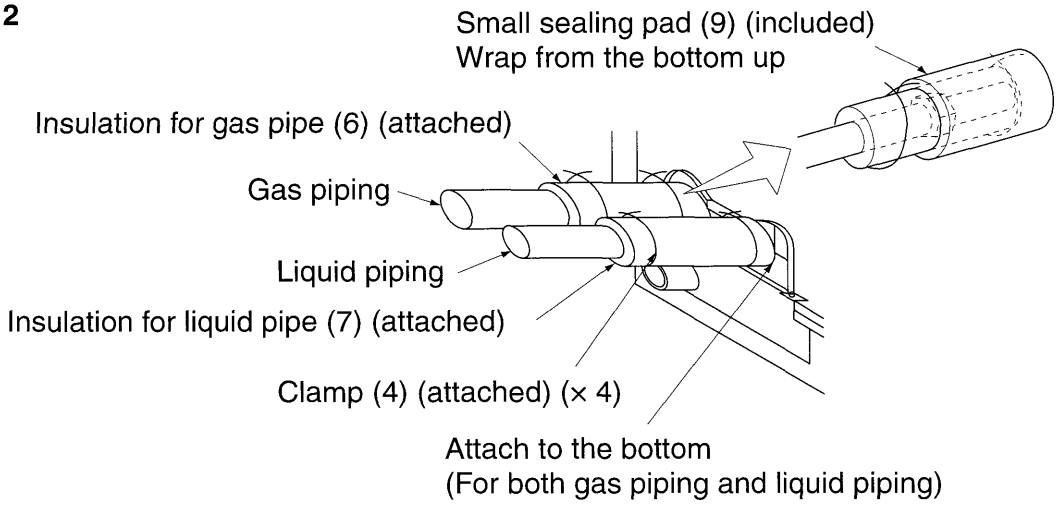
After the work is finished, make sure to check that there is no gas leak.

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:

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

- Make absolutely sure to execute heat insulation works on the pipe-connecting section after checking gas leakage by thoroughly studying the following figure and using the attached heat insulating materials for fitting (6) and (7). (Fasten both ends with the clamps (4).)
  (Refer to fig. 12)
- Wrap the sealing pad (9) only around the insulation for the joints on the gas piping side.
  (Refer to fig. 12)

Fig.12



(1) For piping facing back.
- Remove the rear penetration lid and set the piping. **(Refer to fig. 13.15)**

(2) For piping facing up.
- When setting the piping to face up, the L-shaped branch piping kit sold separately is required.
- Removing the top penetration lid and use the L-shaped branch piping kit sold separately to set the piping. **(Refer to fig. 13.14)**

(3) For piping facing right.
- Cut out a slit hole on the dressing board (right) and set the piping. **(Refer to fig. 14)**

Fig.13

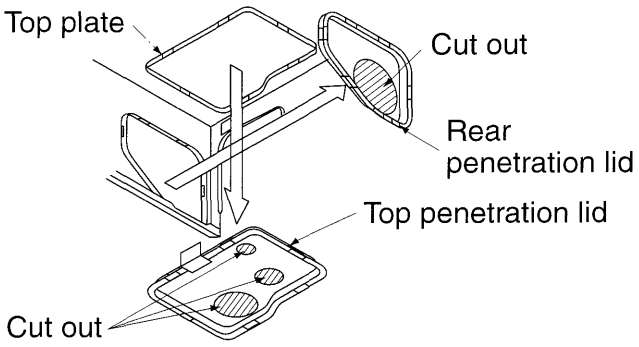


Fig.14

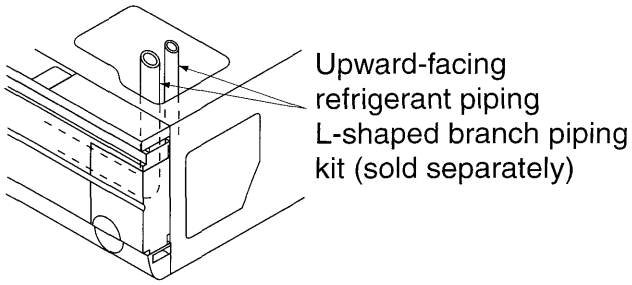


Fig.15

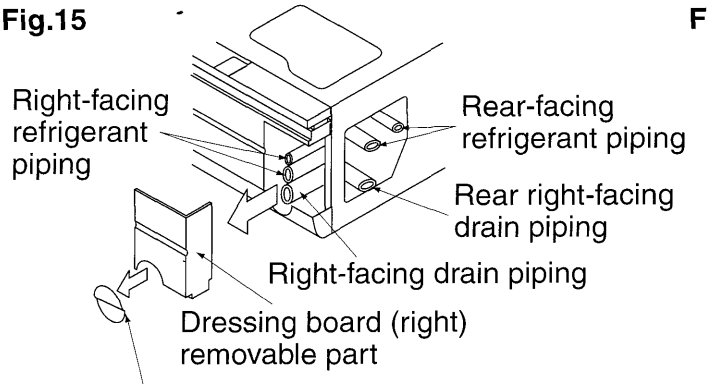
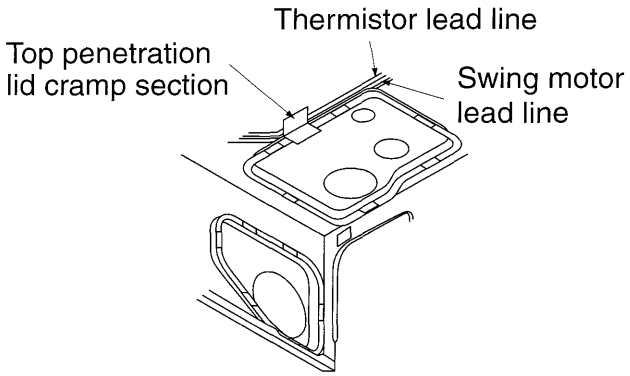


Fig.16



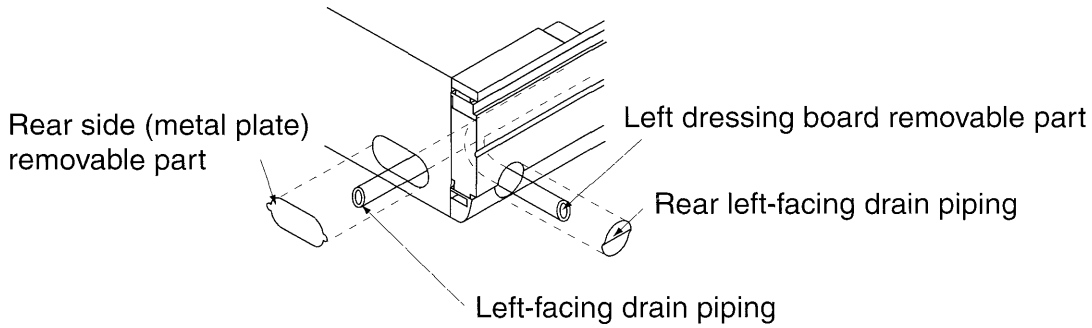
- When piping is complete, cut the removed penetration lid into the shape of the piping using scissors and attach.
  As when before removing the top penetration lid, secure the lead lines for the swing motor and thermistor by passing them through the cramp part on the top penetration lid.
  (Refer to Fig. 13.16)
- When doing this, block any gaps between the piping penetration lid and the pipes using putty to prevent dust from entering the indoor unit.

7. DRAIN PIPING WORK

(1) Carry out the drain piping.

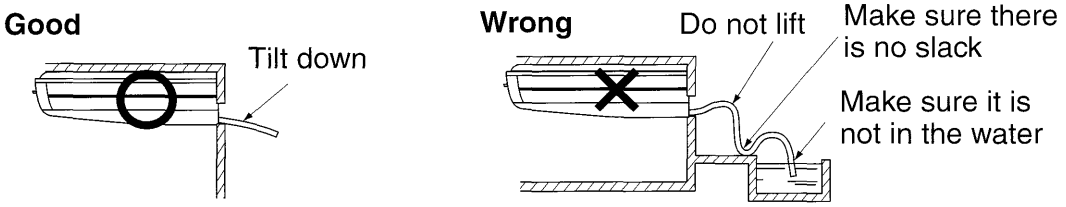
- Make sure piping provides proper drainage.
- You can select whether to bring the drain piping our from the rear right, right, rear left, or left. For rear right-facing and right-facing situations, refer to "6. REFRIGERANT PIPING WORK" on page 9 for rear left-facing and left-facing situations. **(Refer to Fig. 17)**

Fig.17



- When setting piping facing left, move the rubber stopper and insulation which are attached to the drain pipe connection hole on the left side of the indoor unit to the right-side drain pipe connection hole. When doing this, insert the rubber stopper all the way in to prevent leaks.
- Make sure the pipe diameter is the same or bigger than the branch piping. (vinyl-chloride piping, nominal diameter 20 mm, external diameter 26 mm)
- Make sure the piping is short, has at least a 1/100 slope, and can prevent air pockets from forming. **(Refer to Fig. 18)**

Fig.18



- Be sure to use the included drain hose (1) and cramp (2). Also, insert the drain hose completely into the drain socket, and securely attach the cramp bracket inside the gray tape area on the inserted tip of the hose. **(Refer to Fig. 19)** Screw the screws on the cramp bracket until there is 4 mm left. (Pay attention to the direction of the attachment to prevent the cramp bracket from coming into contact with the intake grill.) **(Refer to Fig. 20)**

Fig.19

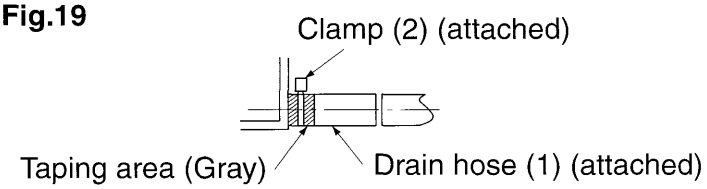


Fig.20

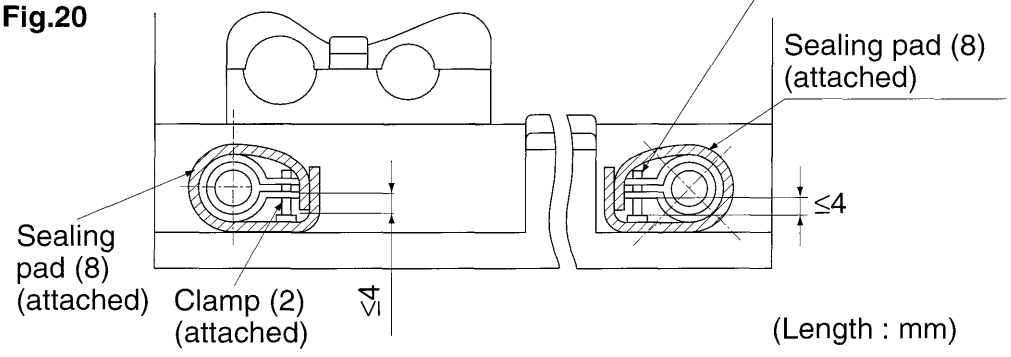
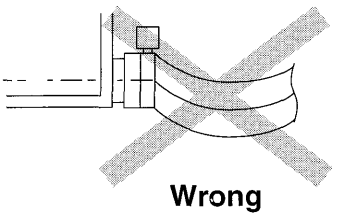


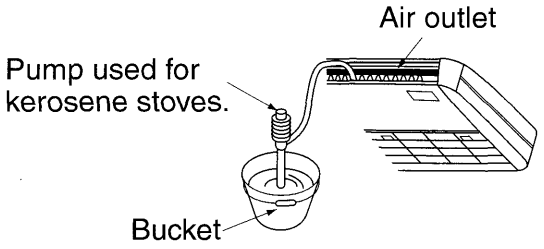
Fig.21



- Insulate the cramp bracket and drain hose from the bottom using the included sealing pad (9). **(Refer to Fig. 20)**
- Be sure to insulate all drain piping running indoors.
- Do not allow any slack to gather in the drain hose inside the indoor unit. **(Refer to Fig. 21)** (Slack in the drain hose can cause the intake grill to break.)

(2) Check to make sure the drain flows smoothly after piping is complete.

- Slowly pour 600 ml of drain-checking fluid into the drain pan through the drain outlet.



⚠ 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. 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) **(Refer to Fig. 22)**
- Simultaneous operation system: 1 remote controller controls 2 indoor units. (2 indoor units operates equally) **(Refer to Fig. 23)**
- Group control: 1 remote controller controls up to 16 indoor units. (All indoor units operate according to the remote controller) **(Refer to Fig. 24)**
- 2 remote controller control: 2 remote controller control 1 indoor unit. **(Refer to Fig. 25)**

Fig.22

Pair type

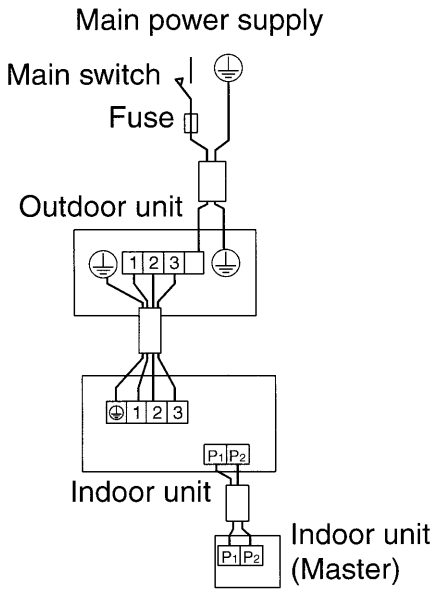


Fig.23

Simultaneous operation system

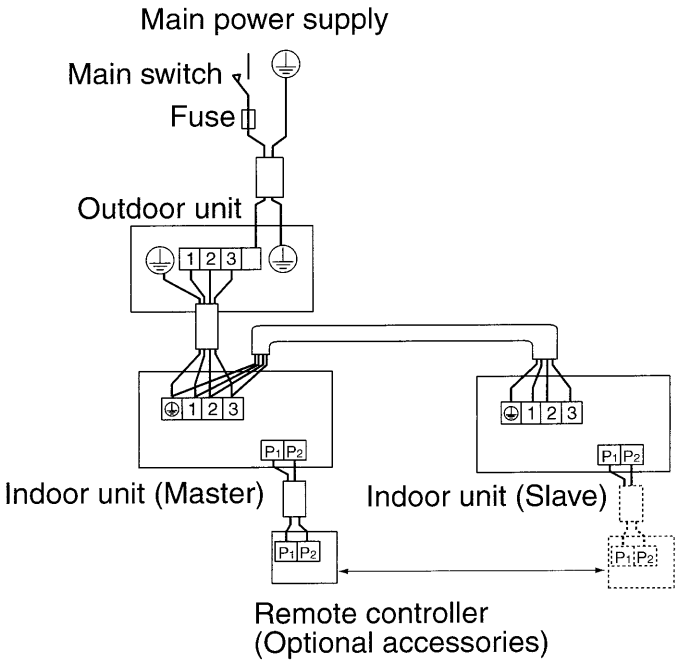


Fig.24

Group control

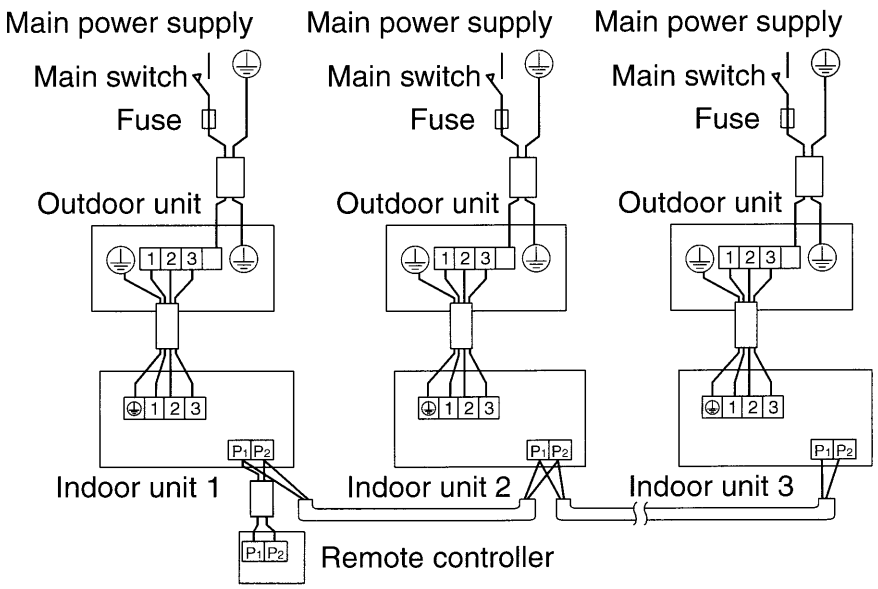
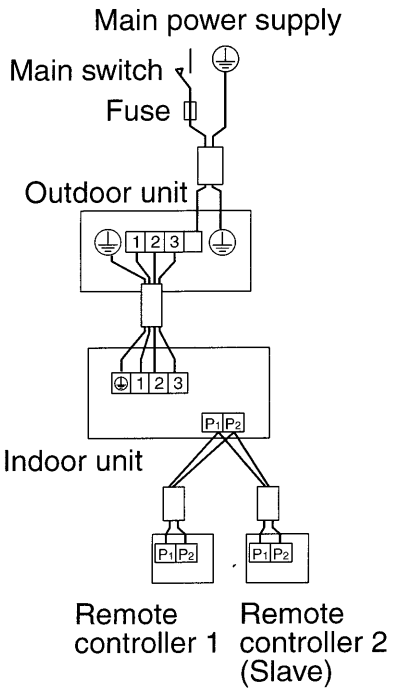


Fig.25

Control by 2 remote controllers



NOTE

1. All transmission wiring except for the remote controller wires is polarized and must match the terminal symbol.
2. When BRC1C61 is used, connect a shielded portion with the ground terminal.
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. When controlling the simultaneous operation system with 2 remote controllers, connect it to the master unit. (wiring to the slave unit is unnecessary)

9. 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 to also "8. WIRING EXAMPLE" on page 14 attached to the unit body.
- 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**

Table 3

	Wire	Size (mm^2)	Length
Between indoor units	H05VV – U4G (NOTE 1)	2.0	–
Unit-Remote controller	NOTE 2 (2 wire)	0.75 – 1.25	Max. 500 m

NOTE

1. Shows only in case of protected pipes. Use H07RN-F in case of no protection.
2. For Asian market : Vinyl cord with sheath or cable (Insulated thickness : 1mm or more)
   For Australian regular : Shield wire (Insulated thickness : 1mm or more)

PRECAUTION

Arrange the wires and fix a lid firmly so that the lid does not float during wiring work.

⚠ CAUTION

- Do not clamp remote controller cords together with wires connecting the units together. Doing so may cause malfunction.
- Remote controller cords and wires connecting 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.
- Make sure to avoide external force to the field wiring (*)such as by laying them in protection pipes or in the wall. **(Refer to Fig. 26)**

Connection of wiring between units and for the remote control cord (Refer to Fig. 26)

- Wiring between units
  Holding the switch box lid, loosen the two securing screws, remove the switch box lid, match up the phases on the power source terminal block inside (3P), and make the connections.
  After this is done, use the included cramp material (4) to bind the ground wire to the anchor point. **(Refer to Fig. 27)**
- Remote control cord: The simultaneous operation multi sub-unit is not required. **(Refer to Fig. 26.28)**
  Connect to the remote control terminal block (2P). (There is no polarity.) After this is done, use the included cramp material (4) to bind the ground wire to the anchor point. **(Refer to Fig. 27)**

Attaching the intake grill and the dressing boards

- Once wiring is complete, firmly attach the dressing side board by reversing the steps taken to remove the intake grill.

Fig.26

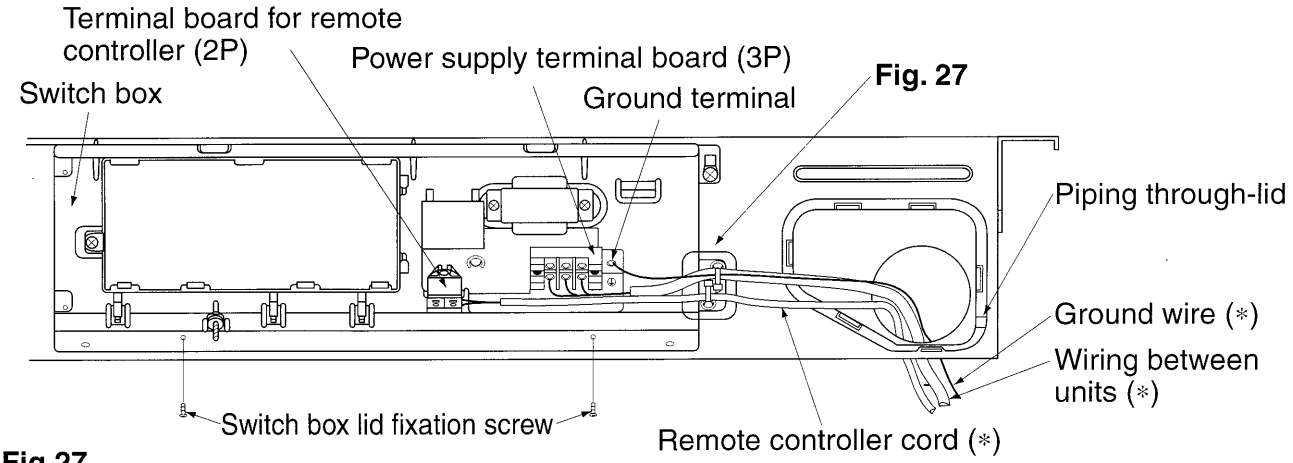
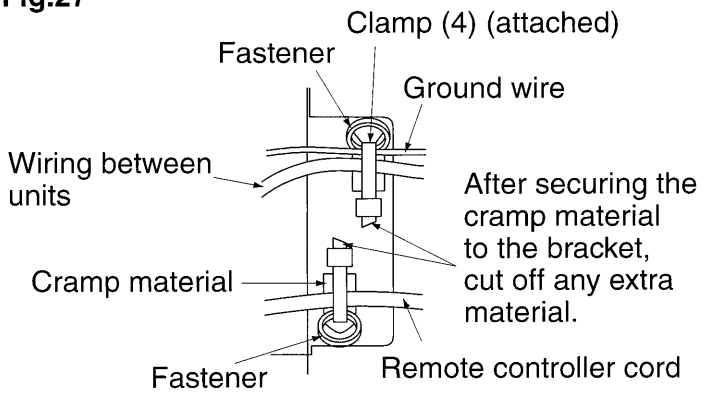
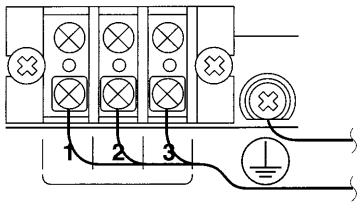


Fig. 27

Fig.27

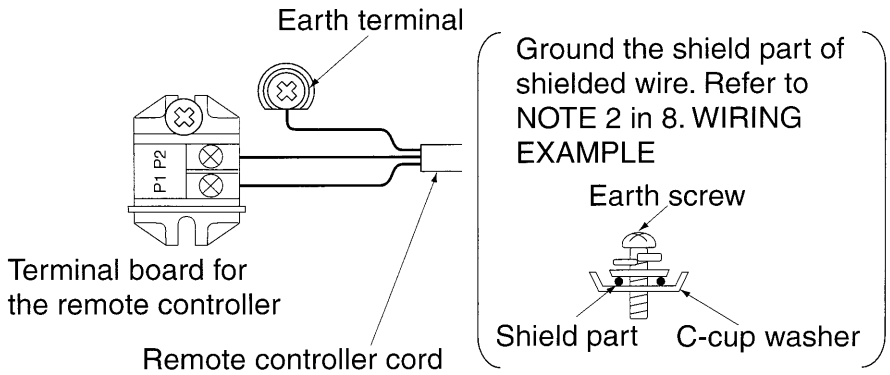




Wiring between units (If wiring the slave unit, connect to master unit)

How to connect power supply terminal board (3P)

Fig.28



Observe the notes mentioned below when wiring to the power supply terminal board.

Precautions to be taken for power supply wiring

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.
(Refer to Fig. 29)

- Do not connect wires of different gauge to the same power supply terminal. (Looseness in the connection may cause overheating.) **(Refer to Fig. 30)**
- When connecting wires of the same gauge, connect them according to. **(Refer to Fig. 30)**
- 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.29

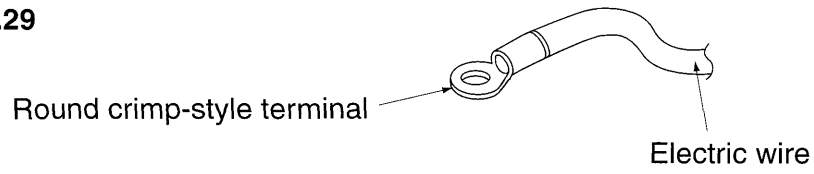
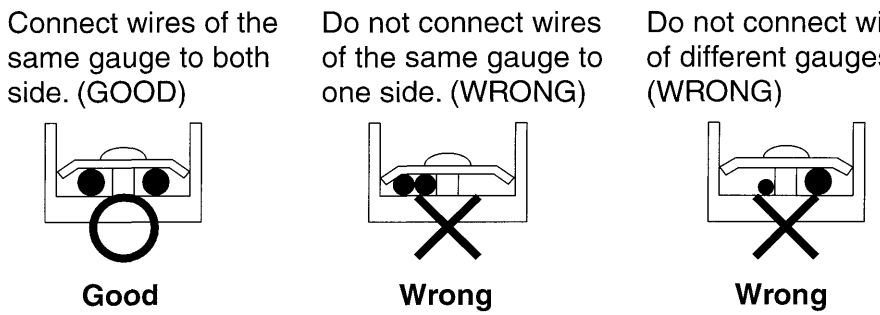


Fig.30



10. FIELD SETTINGS

Field settings must be made from the remote controller and in accordance with installation conditions.

- Settings can be made by changing the "Mode number", "FIRST CODE No." and "SECOND CODE No.".
- The "Field Settings" included with the remote control lists the order of the settings and method of operation.

10-1 Setting ceiling height

- Select the SECOND CODE No. that corresponds to the ceiling height "Table 4".
  (SECOND CODE No. is factory set to "01" for a ceiling height of less than 2.7m .)

Table 4

Ceiling height (m)	Mode No.	**First code No.**	**Second code No.**
Less than 2.7 m	13 (23)	0	01
2.7 to 3.5			02

10-2 Settings for options

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

10-3 Setting air filter sign

- Remote controllers are equiped 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 sign (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

10-4 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 Number attached: 1.)

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
Double twin multi (4-unit)			04

- When using in simultaneous operation system mode, refer to "10-5 Simultaneous operation system individual setting" on page 19 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.

10-5 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. (SECOND CODE No. is factory set to "01", unified setting.)

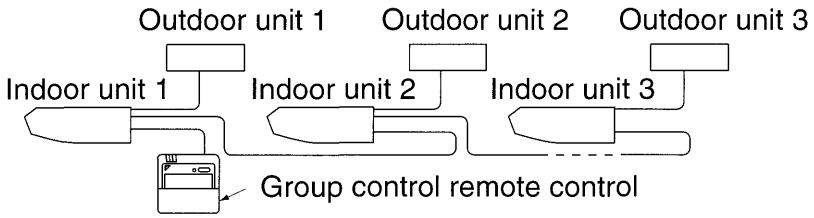
Setting	Mode No.	FIRST CODE No.	SECOND CODE No.
Unified setting	11 (21)	1	01
Individual setting			02

(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 sub-unit, repeat steps (4) – (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.)
(Refer to Fig.23 on page 14)

10-6 When implementing group control

- When using as a pair unit or as a parent unit for simultaneous operation multi, you may simultaneous start/stop (group) control up to 16 unit with the remote control.
- In this case, all the indoor units in the group will operate in accordance with the group control remote control.
- Select a remote control which matches as many of the functions (swing flap, etc.) in the group as possible.



Wiring Method (See "9. ELECTRIC WIRING WORK" on page 15.)

(1) Remove the switch box lid.
(2) Cross-wire the remote control terminal block (P_1 P_2) inside the switch box. (There is no polarity.) (Refer to Fig. 24 on page 14 and Table 3 on page 15)

NOTE

- When combining with a simultaneous operation multi-type, be sure only to connect the wiring to the parent unit.

10-7 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 ⊖ screwdriver into the recess between the upper and lower part of remote controller and, working from the 2 positions, pry off the upper part. (The remote controller PC board is attached to the upper part of remote controller.) **(Refer to Fig. 31)**

(2) Turn the **main/sub changeover** switch on one of the two remote controller PC boards to "S". (Leave the switch of the other remote controller set to "M".) **(Refer to Fig. 32)**

Fig.31

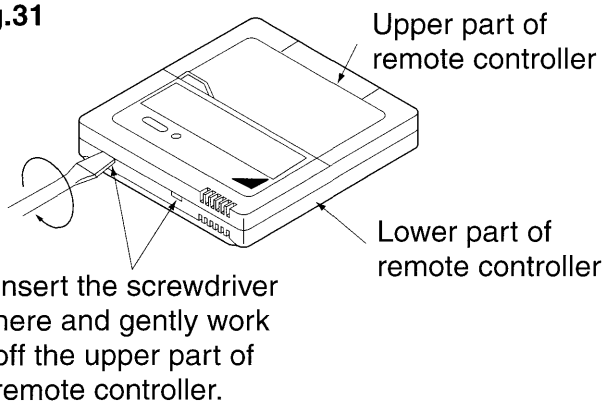
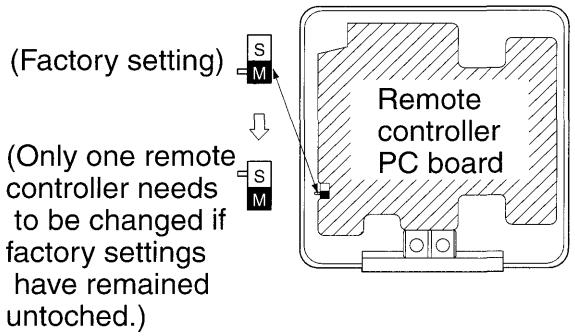


Fig.32



Wiring Method (See "9. ELECTRIC WIRING WORK" on page 15.)

(3) Remove the switch box lid

(4) Add remote control 2 (slave) to the remote control terminal block (P_1, P_2) in the switch box. (There is no polarity.) (Refer to Fig.25 on page 14 and Table 3 on page 15)

PRECAUTION

For simultaneous operation system, connect the remote controller cord to the master unit.

11. TEST OPERATION

Refer to the section of "FOR THE FOLLOWING ITEMS, TAKE SPECIAL CARE DURING CONSTRUCTION AND CHECK AFTER INSTALLATION IS FINISHED." on page 4.

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

11-1 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 4 times (TEST) (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

1. Refer to the diagnoses below if the unit does not operate properly.
2. After completing the test run, press the inspection/test run 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.

NOTE

- If a malfunction is preventing operation, refer to the malfunction diagnoses below.

11-2 Cautions for servicing

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 beeps3 short beepsPerform 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 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.
3. Trouble shooting with the LEDs on the PC board
   The following checking can be made with the service monitor LEDs (green). (Normal when flashing)

☼ : LED lit ● : LED off ◑ : LED flashing
— : Unrelated to diagnosis

Microcomputer normal monitor	Transmission normal monitor	Details
HAP	HBP	FH(Y)-BVE(R22)
◑	◑	Indoor unit is normal→Diagnose the outdoor unit
◑	☼	Malfunction of indoor unit PC board assembly or miswiring between indoor and outdoor unit
	●	If the outdoor unit LED-A does not light, diagnose the outdoor unit. If it flashes, it is due to either miswiring or malfunction of the indoor unit PC board assembly. (NOTE 4)
☼	—	Malfunction of the indoor unit PC board (NOTE 5)
●		Abnomal 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. Equipment operation in response to errors will vary according to model.
4. If the HBP 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 is off on an inverter, ther is a possibility that the fuse on the outdoor unit's P-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.

11-3 Error code list

- For plases 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
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
E3	High pressure abnormal(outdoor unit)
E4	Low pressure abnormal (outdoor unit)
E5	Compressor motor lock malfunction
E7	Outdoor fan motor lock malfunction Outdoor fan instantneous overcurrent malfunction
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
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)
	Inverter cooling defect.
L5	Instantaneous overcurrent (outdoor)
	Possible earth fault or short circuit in the compressor motor.
L8	Electric thermal (outdoor)
	Possible electrical overload in the compressor or cut line in the compressor motor.
L9	Stall prevention (outdoor)
	Compressor possibly locked.
LC	Transmission malfunction between the outdoor control units' inverters (outdoor)
P1	Open-phase (outdoor)
P3	P-board temperature sensor malfunction (outdoor)
P4	Heat-radiating fin temperature sensor malfunction (outdoor)
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,L2and L3 leads.
U2	Power source voltage malfunction (NOTE 3)
	Includes the defect in 52C.
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

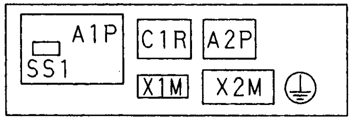
12. WIRING DIAGRAM

(Refer to Fig. 33.34)

1	TO OUTDOOR UNIT	2	NOTE) 6
3	WIRED REMOTE CONTROLLER	4	IN CASE OF SIMULTANEOUS OPERATION SYSTEM
5	INDOOR UNIT (MASTER)	6	INDOOR UNIT (SLAVE)
7	RECEIVER/DISPLAY UNIT	8	REMOTO CONTROLLER
9	NOTE) 7	10	NOTE) 4
11	SWITCH BOX		

WIRING DIAGRAM

1-RED	2-WHITE	3-BLACK	
33A	LIMIT SWITCH (SWING FLAP)	H1P	LIGHT EMITTING DIODE (ON-RED)
A1P	PRINTED CIRCUIT BOARD		
A2P	PRINTED CIRCUIT BOARD (TRANSFORMER 220-240V/16V)	H2P	LIGHT EMITTING DIODE (TIMER-GREEN)
C1R	CAPACITOR (M1F)	H3P	LIGHT EMITTING DIODE (FILTER SIGN-RED)
F1U	FUSE (250V,5A)		
HAP	LIGHT EMITTING DIODE (SERVICE MONITOR GREEN)	H4P	LIGHT EMITTING DIODE (DEFROST-ORANGE)
M1A	MOTOR (SWING FLAP)	SS1	SELECTOR SWITCH (MAIN/SUB)
M1F	MOTOR (INDOOR FAN)		
Q1F	THERMO SWITCH (M1F EMBEDDED)	SS2	SELECTOR SWITCH (WIRELESS ADDRESS SET)
R1T	THERMISTOR (AIR)	CONNECTOR FOR OPTIONAL PARTS	
R2T	THERMISTOR (COIL)	X15A	CONNECTOR (FLOAT SWITCH)
RyA	MAGNETIC RELAY (M1A)		
RyC	MAGNETIC RELAY (OUTDOOR UNIT COMPRESSOR)	X25A	CONNECTOR (DRAIN PUMP)
RyP	MAGNETIC RELAY (M1P)	X30A	CONNECTOR (INTERFACE ADAPTOR FOR SKY AIR SERIES)
SS1	SELECTOR SWITCH (EMERGENCY)		
X1M	TERMINAL STRIP	X33A	CONNECTOR (ADAPTOR FOR WIRING)
X2M	TERMINAL STRIP		
(CD)	CURRENT DETECT CIRCUIT	X35A	CONNECTOR (GROUP CONTROL ADAPTOR)
(PC)	PHASE CONTROL CIRCUIT		
WIRED REMOTE CONTROLLER			
R1T	THERMISTOR (AIR)		
SS1	SELECTOR SWITCH (MAIN/SUB)		
WIRELESS REMOTE CONTROLLER (RECEIVER/DISPLAY UNIT)			
A3P	PRINTED CIRCUIT BOARD		
A4P	PRINTED CIRCUIT BOARD		
BS	PUSH BUTTON (ON/OFF)		



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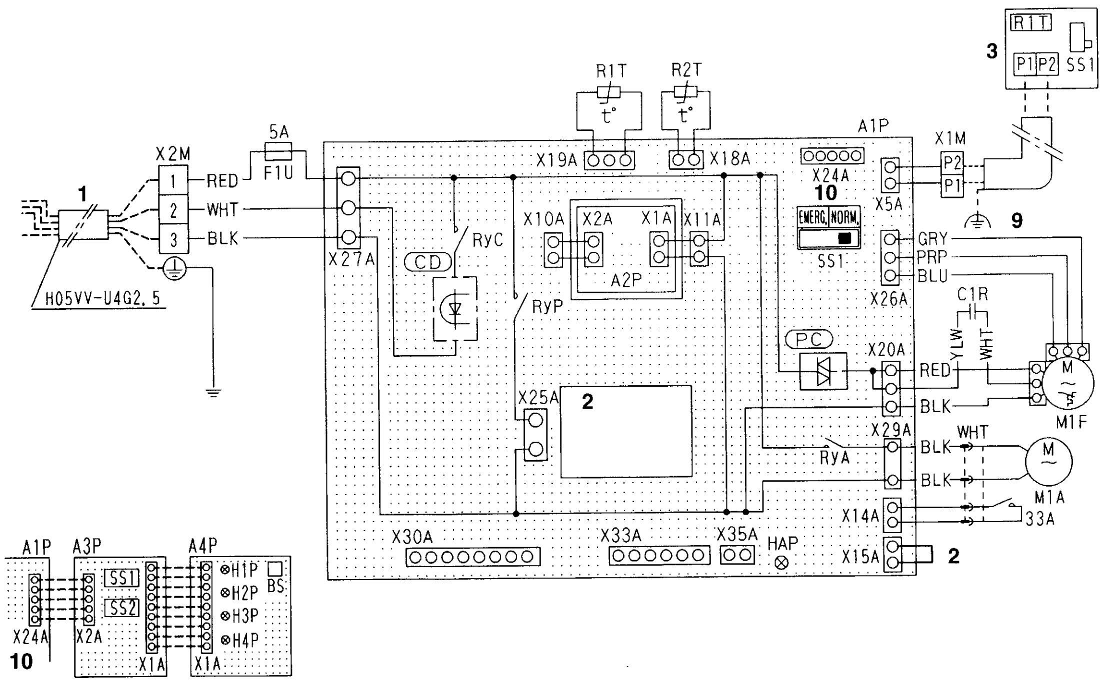


7

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. X24A IS CONNECTED WHEN THE WIRELESS REMOTE CONTROLLER KIT IS BEING USED.
5. REMOTE CONTROLLER MODEL VARIES ACCORDING TO THE COMBINATION SYSTEM, CONFIRM ENGINEERING MATERIALS AND CATALOGS, ETC. BEFORE CONNECTING.
6. IN CASE INSTALLING THE DRAIN PUMP, REMOVE THE JUMPER CONNECTOR OF X15A AND EXECUTE THE ADDITIONAL WIRING FOR FLOAT SWITCH AND DRAIN PUMP.
7. GROUND THE SHIELD OF THE REMOTE CONTROLLER CORD TO THE INDOOR UNIT OF THE FH-BVE TYPE.
8. SYMBOLS SHOW AS FOLLOWS: RED: RED BLK: BLACK WHT: WHITE YLW: YELLOW PRP:PURPLE GRY: GRAY BLU: BLUE
9. CONFIRM THE METHOD OF SETTING THE SELECTOR SWITCH (SS1) BY INSTALLATION MANUAL AND ENGINEERING MATERIALS, ETC.

3D027501-1

FH35 • 50 • 60 • 71 • 100 • 125BVE , FH71 • 100 • 125BV1S , FH35 • 45 • 60BJV1 , FH35 • 45 • 60BZV1

Fig.33

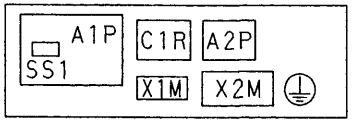
WIRING DIAGRAM

1-RED	2-WHITE	3-BLACK

33A	LIMIT SWITCH (SWING FLAP)	H1P	LIGHT EMITTING DIODE (ON-RED)
A1P	PRINTED CIRCUIT BOARD	H2P	LIGHT EMITTING DIODE (TIMER-GREEN)
C1R	CAPACITOR (M1F)	H3P	LIGHT EMITTING DIODE (FILTER SIGN-RED)
HAP	LIGHT EMITTING DIODE (SERVICE MONITOR GREEN)	H4P	LIGHT EMITTING DIODE (DEFROST-ORANGE)
HBP	LIGHT EMITTING DIODE (SERVICE MONITOR GREEN)	SS1	SELECTOR SWITCH (MAIN/SUB)
M1A	MOTOR (SWING FLAP)	SS2	SELECTOR SWITCH (WIRELESS ADDRESS SET)
M1F	MOTOR (INDOOR FAN)	CONNECTOR FOR OPTIONAL PARTS	
Q1F	THERMO SWITCH (M1F EMBEDDED)	X15A	CONNECTOR (FLOAT SWITCH)
R1T	THERMISTOR (AIR)	X25A	CONNECTOR (DRAIN PUMP)
R2T	THERMISTOR (COIL)	X30A	CONNECTOR (INTERFACE ADAPTOR FOR SKY AIR SERIES)
RyA	MAGNETIC RELAY (M1A)	X33A	CONNECTOR (ADAPTOR FOR WIRING)
RyP	MAGNETIC RELAY (M1P)	X35A	CONNECTOR (GROUP CONTROL ADAPTOR)
SS1	SELECTOR SWITCH (EMERGENCY)		
T1R	TRANSFORMER (220-240V/22V)		
X1M	TERMINAL STRIP		
X2M	TERMINAL STRIP		
(PC)	PHASE CONTROL CIRCUIT		
(RC)	SIGNAL RECEIVER CIRCUIT		
(TC)	SIGNAL TRANSMISSION CIRCUIT		

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

WIRELESS REMOTE CONTROLLER (RECEIVER/DISPLAY UNIT)	
A3P	PRINTED CIRCUIT BOARD
A4P	PRINTED CIRCUIT BOARD
BS	PUSH BUTTON (ON/OFF)



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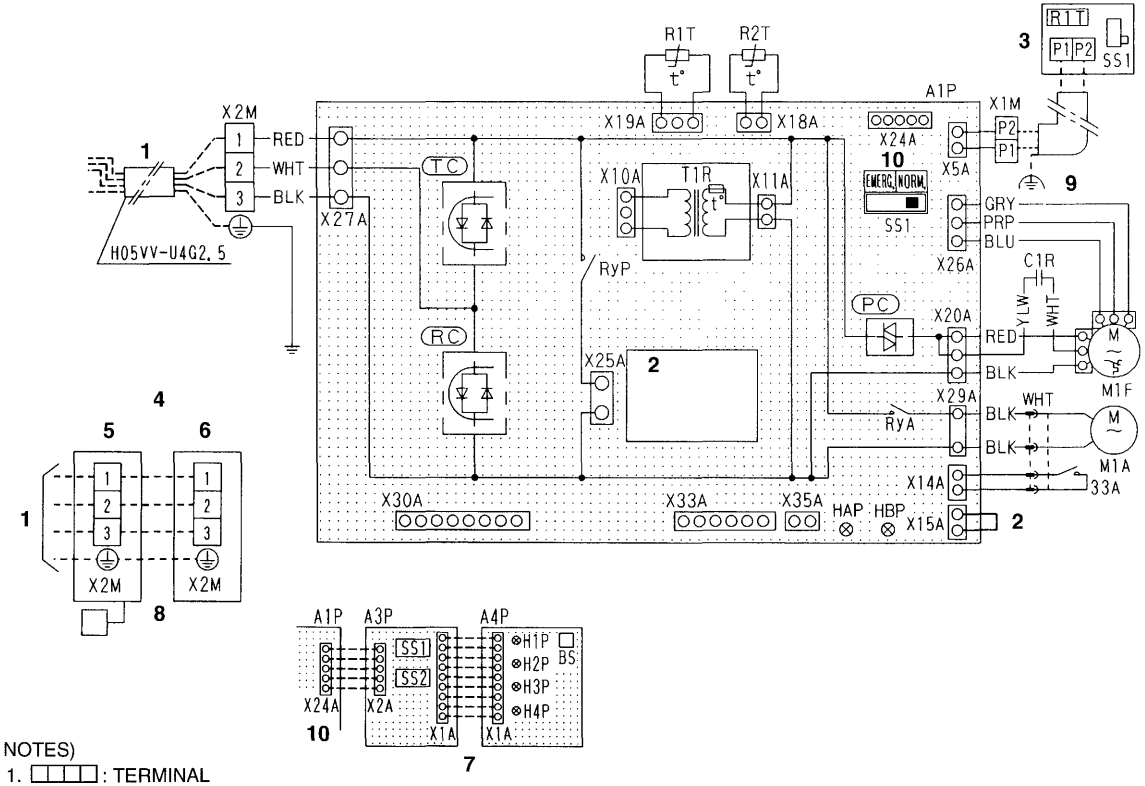

NOTES)
1. ☐☐☐☐: TERMINAL
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9. CONFIRM THE METHOD OF SETTING THE SELECTOR SWITCH (SS1) BY INSTALLATION MANUAL AND ENGINEERING MATERIALS, ETC.

Fig.34

13. OUTDOOR UNIT INSTALLATION

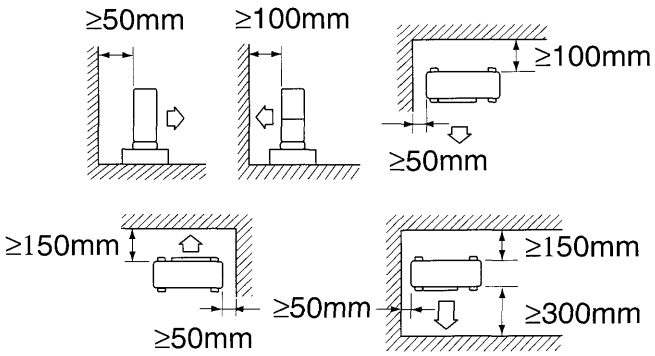
The following information is for R35, 50, 60 or RY35, 50, 60 outdoor unit types. Refer to the installation manual attached to the outdoor unit for other outdoor unit types.

13-1 SELECTING INSTALLATION SITE

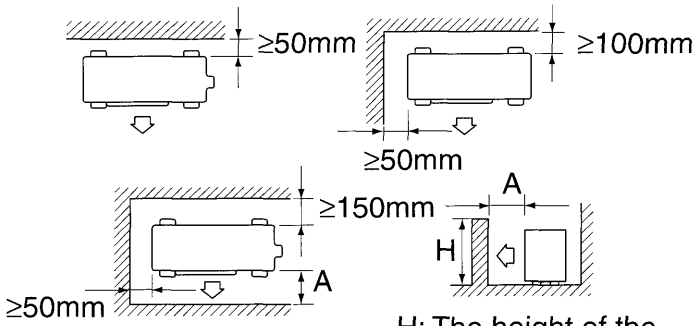
Select an installation site where the following conditions are satisfied and that meets with your customer's approval.

- 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



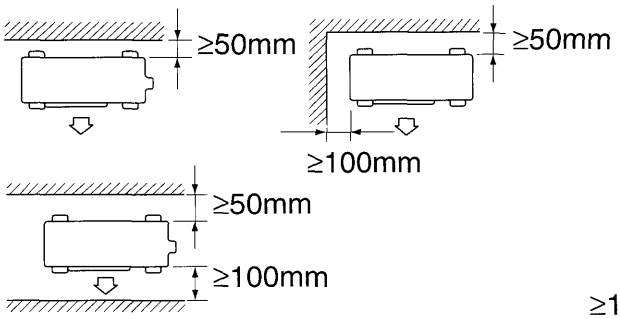
R50, R60



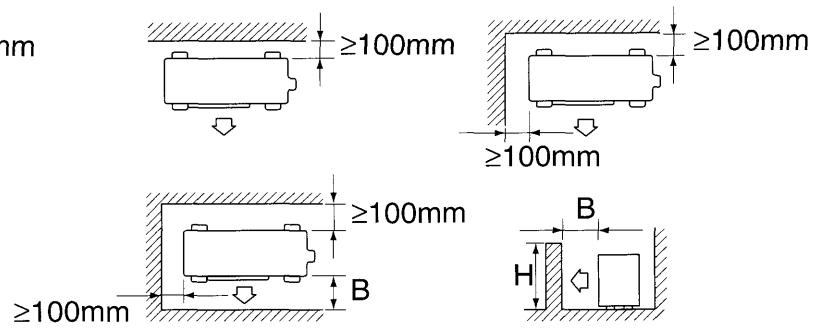
H: The height of the wall on the air discharge side

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

RY50



RY60

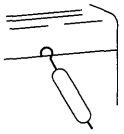


	B dimension
H: 1000 mm or less	350
H: 1000 mm or more	600

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

13-2 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)

(mm)

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

13-3 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

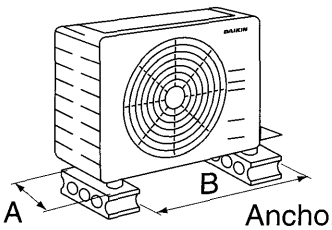
1. If R60 or RY60 type is connected, extra refrigerant is needed if 5m is exceeded.
2. For pipe connection refer to "6. REFRIGERANT PIPING WORK" on page 9.

13-4 AIR PURGE

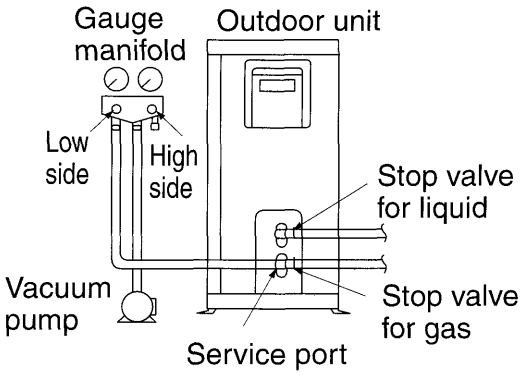
- **Leak test**

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.

R60



Anchor bolt hole pitch



13-5 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	
Series	Type	Field fuse ⎓	Cable type (*)
R35,RY35	V1	15	H05VV-U3G
R50,RY50	V1	20	H05VV-U3G
	VAL	20	
R60	V1	25	H05VV-U3G
	VAL	25	
RY60	V1	20	H05VV-U3G
	VAL	25	

Model		Power supply	
Series	Type	Interconnection cable type (*)	Size
R35,RY35	V1	H05VV-U4G	Wiring size must comply with the applicable local and national code.
R50,RY50	V1	H05VV-U4G	
	VAL		
R60	V1	H05VV-U4G	
	VAL		
RY60	V1	H05VV-U4G	
	VAL		

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