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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 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 accesible 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 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 are 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 control box lid can be securely fastened.
Improper positioning of the control box lid 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 rods or telephone ground wires. 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.
-

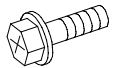
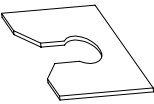
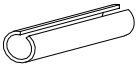
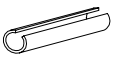
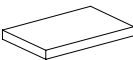

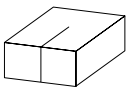
2. BEFORE INSTALLATION

- When moving the unit while removing it from the carton box, be sure to lift it by holding on to the four lifting lugs without exerting any pressure on other parts, especially, the refrigerant piping, drain piping, and other resin parts.
- Be sure to check the type of R410A 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.
- **Especially, do not unfasten packing case(top) guarding the control box until suspending 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)Paper pattern for installation
Quantity	1 pc.	1 pc.	8 pcs.	(Big) 6 pcs.	(Small) 1 pc.	1 pc.
Shape						Also used as packing material 

Name	(6)Screws (M5)	(7)Washer fixing plate	Insulation for fitting	Sealing pad	(12)Sealing material	(Other)
Quantity	4 pcs.	4 pcs.	1 each.	1 each.	2 pcs.	<ul style="list-style-type: none"> • Operation manual • Installation manual
Shape	For paper pattern for installation 		(8)For gas pipe  (9)For liquid pipe 	(10)Large  (11)Small 		

2-2 OPTIONAL ACCESSORIES

- The optional decoration panel and remote controller are required for this indoor unit.(Refer to Table 1, 2)

Table 1

Unit model	Optional decoration panel
FFQ25·35·50·60BV1B	BYFQ60BW1
	Colour : White

- These are two types of remote controllers: wired and wireless. Select a remote controller from Table 2 according to customer request and install in an appropriate place.

Table 2

Remote controller type	European market		Australian market
	Cooling only type	Heat Pump type	Heat Pump type
Wired type	BRC1C517		BRC1C61
Wireless type	BRC7E531W	BRC7E530W	BRC7E530W

NOTE 

- If you wish to use a remote controller that is not listed in “Table 2” on page 4, 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
Are the indoor and outdoor unit fixed firmly?	The units 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.	
Dose drainage flow smoothly?	Condensate water may drip.	
Dose 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 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.

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

Please attach additional thermal insulation material to the unit body when it is believed that the relative humidity in the ceiling exceeds 80%. Use glass wool, polyethylene foam, or similar with a thickness of 10 mm or more as thermal insulation material.

For this unit, you are able to select air flow direction.

To enable the discharge of air in 2 or 3 directions, it is necessary to purchase the sealing member of air discharge outlet.

(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.)

[Space required for installation] (mm)

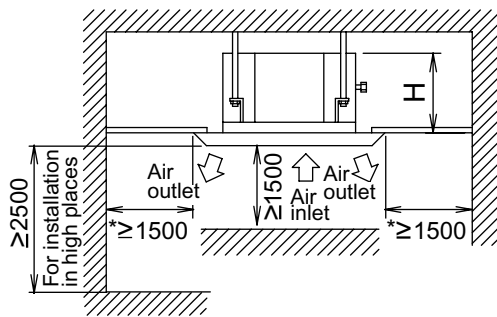


Fig. 1

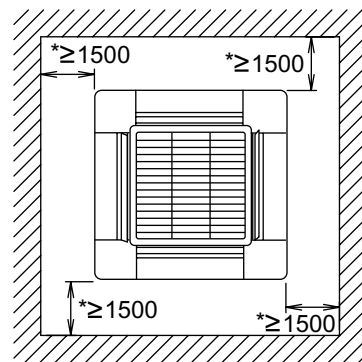


Fig. 2

NOTE

- Leave 200 mm or more space where marked with the *, on sides where the air outlet is closed.

Model	H
FFQ25·35·50·60	285 (Confirm the space of 295 or more)

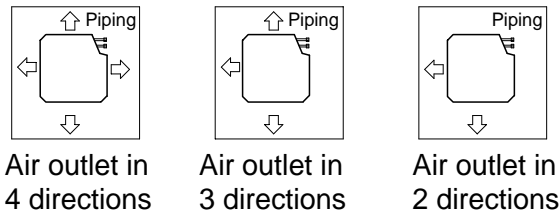
CAUTION

- 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.)

(2) Air flow direction

Select the air flow directions best suited to the room and point of installation. (For air outlet in 2 or 3 directions, it is necessary to make field settings by remote controller and to close the air outlet(s). Refer to the installation manual of the sealing member of air discharge outlet and the section entitled 10. FIELD SETTING)

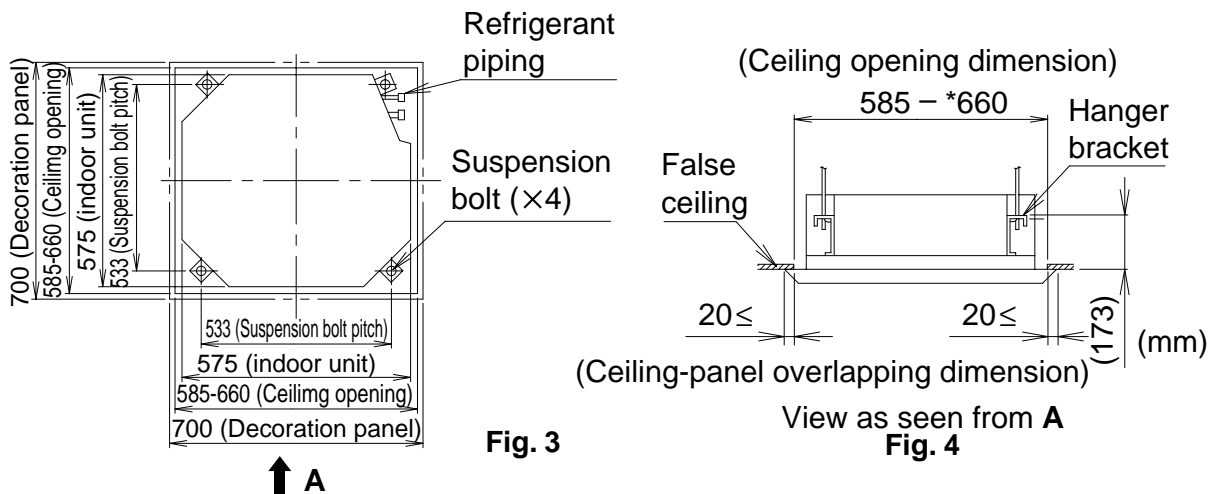
[Air flow direction] (Example)




- (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 reinforcing.)

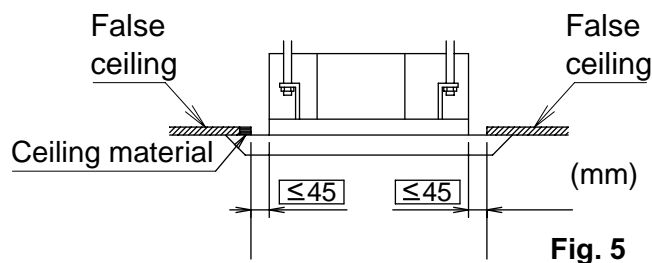
4. PREPARATIONS BEFORE INSTALLATION

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



NOTE

- Installation is possible with a ceiling dimension of 660 mm (marked with *). However, to achieve a ceiling-panel overlapping dimension of 20 mm, the spacing between the ceiling and the unit should be 45 mm or less. If the spacing between ceiling and the unit is over 45 mm, attach ceiling material to  part or recover the ceiling.



- (2) Make the ceiling opening needed for installation where applicable. (For existing ceilings)

- Refer to the paper pattern for installation (5) for ceiling opening dimensions.
- 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 (unnecessary for wireless type) and wiring between units. Refer to each PIPING or WIRING section.
- After making an opening in the ceiling, it may be necessary to reinforce ceiling beams to keep the ceiling level and to prevent it from vibrating. Consult the builder for details.

(3) Install the suspension bolts.

(Use either a M8 ~ M10 size bolt)
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 (50 – 100 mm) from the ceiling before proceeding further.

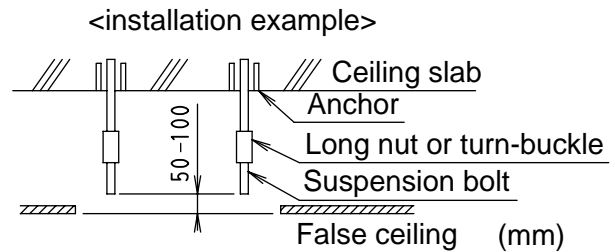


Fig. 6

NOTE

- All the above parts are field supplied.

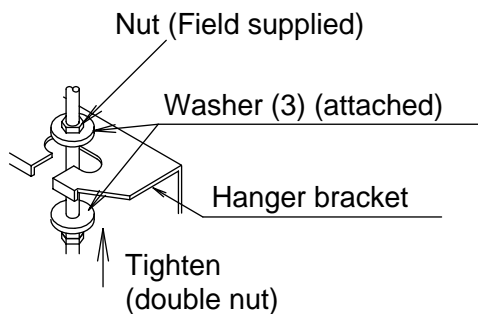
5. INDOOR UNIT INSTALLATION

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) For new ceilings

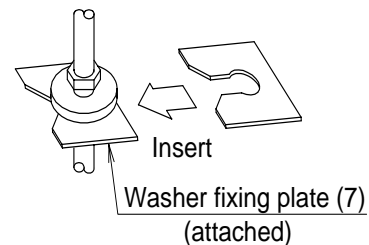
(1-1) Install the indoor unit temporarily.

- Attach the hanger bracket to the suspension bolt. Be sure to fix it securely by using a nut and washer (3) from the upper and lower sides of the hanger bracket.
The washer fixing plate (7) will prevent the washer from falling.



[Securing the hanger bracket]

Fig. 7



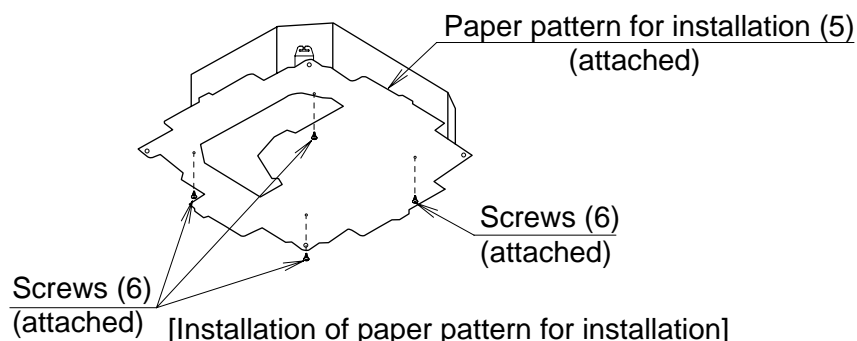
[Securing the washer]

Fig. 8

(1-2) Refer to the paper pattern for installation (5) for ceiling opening dimension.

Consult the builder or carpenter for details.

- The center of the ceiling opening is indicated on the paper pattern for installation.
The center of the unit is indicated on the paper pattern for installation.
- Fix the paper pattern to the unit with screws (6) (×4).



[Installation of paper pattern for installation]

Fig. 9

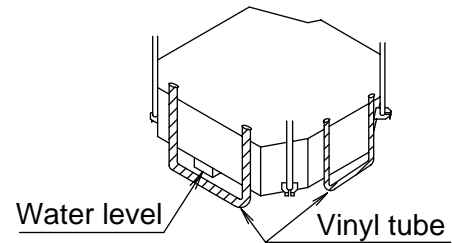
<Ceiling work>

- (1-3) Adjust the unit to the right position for installation.
(Refer to **4.PREPARATIONS BEFORE INSTALLATION-(1).**)
- (1-4) Check the unit is horizontally level.

⚠ CAUTION

- The indoor unit is equipped with a built-in drain pump and float switch. Verify that it is level by using a water level or a waterfilled vinyl tube.
(If the unit is tilted against condensate flow, the float switch may malfunction and cause water to drip.)

- (1-5) Remove the washer fixing plate (7) used for preventing the washer from falling and tighten the upper nut.
- (1-6) Remove the paper pattern for installation (5).



[Maintaining horizontality]

Fig. 10

(2) For existing ceilings

- (2-1) 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 (3) from the upper and lower sides of hanger bracket. The washer fixing plate (7) will prevent the washer from falling.

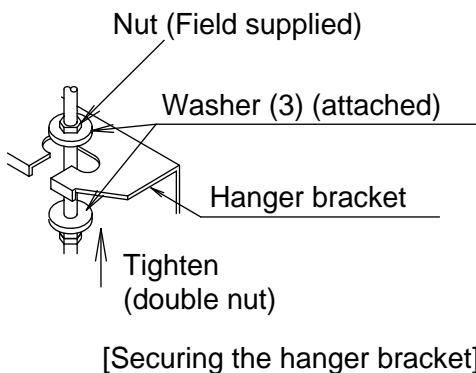


Fig. 11

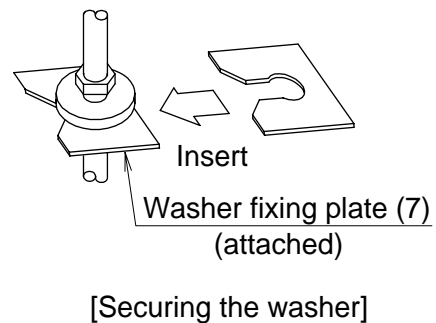


Fig. 12

- (2-2) Adjust the height and position of the unit.
(Refer to **4.PREPARATIONS BEFORE INSTALLATION-(1).**)
- (2-3) Perform steps (1-4), (1-5) in (1) For new ceilings.

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.>

<Before refrigerant piping work, check which type of refrigerant is used. Proper operation is not possible if the types of refrigerant are not the same.>

⚠ CAUTION

- Use a pipe cutter and flare suitable for the type of refrigerant.
- Apply ester oil or ether oil around the flare portions before connecting.
- To prevent dust, moisture or other foreign matter from infiltrating the tube, either pinch the end or cover it with tape.
- Do not allow anything other than the designated refrigerant to get mixed into the refrigerant circuit, such as air, etc. If any refrigerant gas leaks while working on the unit, ventilate the room thoroughly right away.

- The outdoor unit is charged with refrigerant.
- 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. 13)
- Refer to "Table 3" for the dimensions of flare nut spaces.
- When connecting the flare nut, coat the flare section (both inside and outside) with ester oil or ether oil, rotate three or four times first, then screw in. (Refer to Fig. 14)

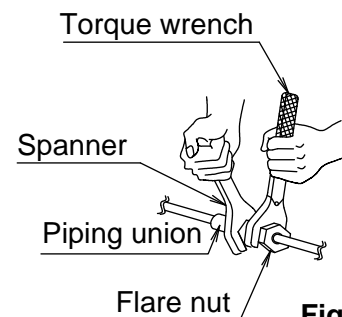


Fig. 13

⚠ CAUTION

Over-tightening may damage the flare and cause a refrigerant leakage.

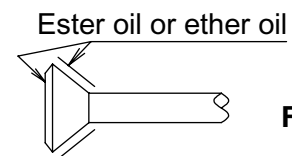


Fig. 14

NOTE

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

Table 3

Pipe size	Tightening torque	Flare dimensions A (mm)	Flare
ø6.4(1/4")	14.2 - 17.2 N·m (144 - 175 kgf·cm)	8.7-9.1	
ø9.5(3/8")	32.7 - 39.9 N·m (333 - 407 kgf·cm)	12.8-13.2	
ø12.7(1/2")	49.5 - 60.3 N·m (505 - 615 kgf·cm)	16.2 - 16.6	

- Refer to "Table 3" to determine the proper tightening torque.

⚠ CAUTION

Over-tightening may damage the flare and cause a refrigerant leakage.

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
ø6.4 (1/4")	60 to 90 degrees	Approx. 150mm
ø9.5 (3/8")	60 to 90 degrees	Approx. 200mm
ø12.7 (1/2")	30 to 60 degrees	Approx. 250mm

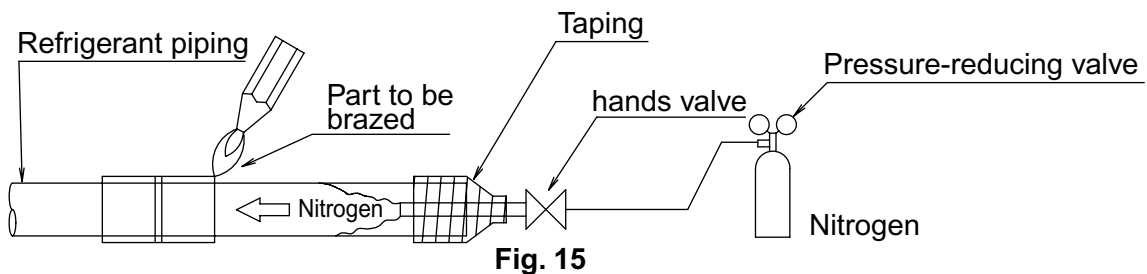
CAUTION

CAUTION TO BE TAKEN WHEN BRAZING REFRIGERANT PIPING

“ Do not use flux when brazing refrigerant piping. Therefore, use the phosphor copper brazing filter metal (BCuP) which does not require flux. ”

(Flux has extremely harmful influence on refrigerant piping systems. For instance, if the chlorine based flux is used, it will cause pipe corrosion or, in particular, if the flux contains fluorine, it will damage the refrigerant oil.)

- Before brazing local refrigerant piping, nitrogen gas shall be blown through the piping to expel air from the piping.
If your brazing is done without nitrogen gas blowing, a large amount of oxide film develops inside the piping, and could cause system malfunction.
- When brazing the refrigerant piping, only begin brazing after having carried out nitrogen substitution or while inserting nitrogen into the refrigerant piping. Once this is done, connect the indoor unit with a flared or a flanged connection.
- Nitrogen should be set to 0.02 Mpa (0.2 kg/cm²) with a pressure-reducing valve if brazing while inserting nitrogen into the piping. (Refer to Fig.15)



- 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 (8) and (9). (Fasten both ends with the clamps (4).) (Refer to Fig. 16)
- Wrap the sealing pad (11) only around the insulation for the joints on the gas piping side. (Refer to Fig. 16)

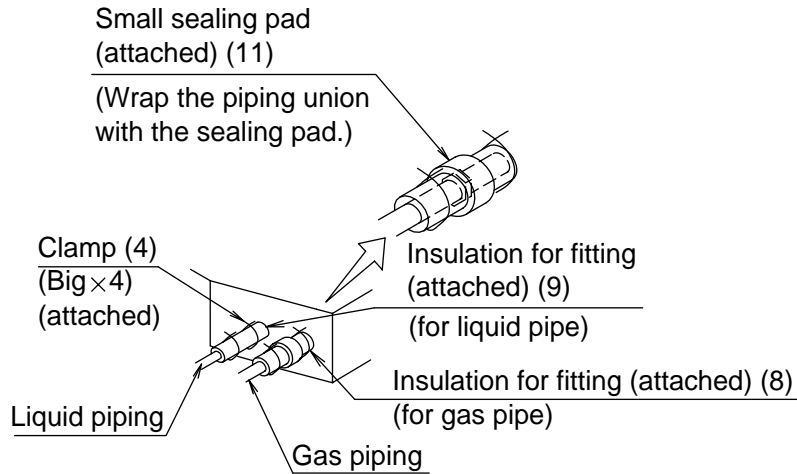


Fig. 16

CAUTION

Be sure to insulate any field piping all the way to the piping connection inside the unit. Any exposed piping may cause condensation or burns if touched.

7. DRAIN PIPING WORK

(1) Carry out the drain piping

- Lay pipes so as to ensure that drainage can occur with problems.
- Employ a pipe with either the same diameter or with the diameter larger (excluding the raising section) than that of the connecting pipe (PVC pipe, nominal diameter 20 mm, outside diameter 26 mm).
- keep the drain pipe short and sloping downwards at a gradient of at least 1/100 to prevent air pockets from forming.
- If the drain hose cannot be sufficiently set on a slope, refer to PRECAUTIONS FOR DRAIN RAISING PIPING on page 12.
- To keep the drain hose from sagging, space hanger bracket every 1 to 1.5 m.

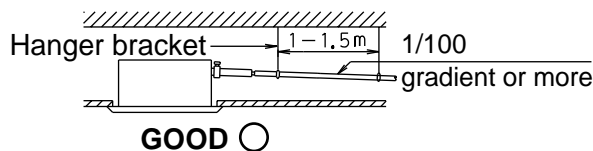


Fig. 17

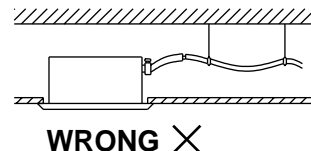


Fig. 18

- Use the attached drain hose (1) and clamp (2).
- Insert the drain hose into the drain socket up to the base, and tighten the clamp securely within the portion of a gray tape of the hose-inserted tip. Tighten the clamp until the screw head is less than 4 mm from the hose.
- Make sure that heat insulation work is executed on the following 2 spots to prevent any possible water leakage due to dew condensation.
 - Indoor drain pipe

- Drain socket
- Wrap the attached sealing pad (10) over the clamp and drain hose to insulate.

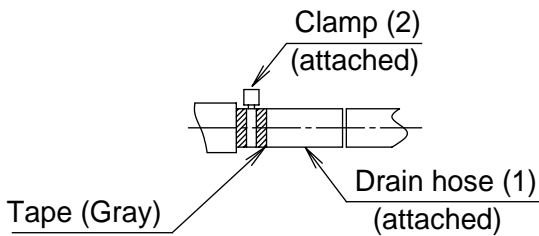


Fig. 19

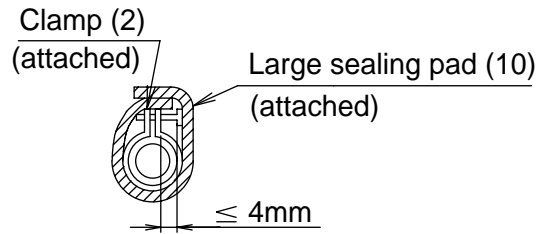


Fig. 20

<PRECAUTIONS FOR DRAIN RAISING PIPING>

- Install the drain raising pipes at a height of less than 545 mm.
- Install the drain raising pipes at a right angle to the indoor unit and no more than 300 mm from the unit.

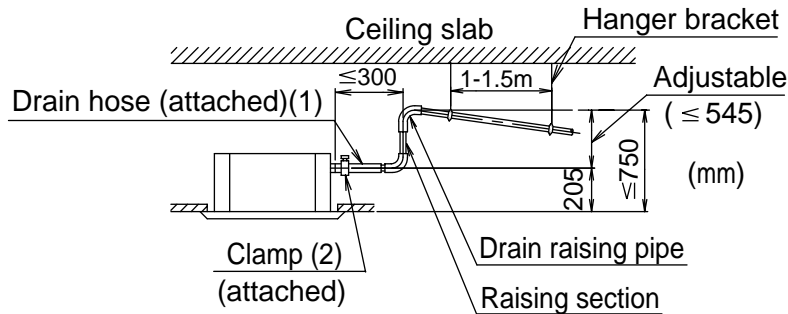


Fig. 21

NOTE

- To ensure no excessive pressure is applied to the included drain hose (1), do not bend or twist when installing. (This may cause leakage.)
- If converging multiple drain pipes, install according to the procedure shown below.

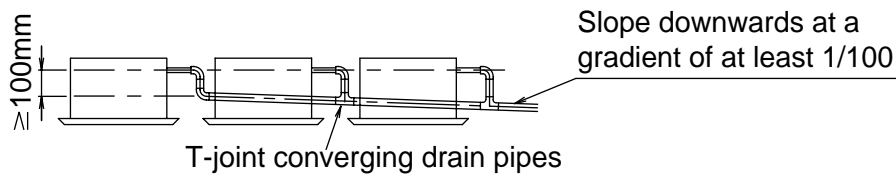


Fig. 22

Select converging drain pipes whose gauge is suitable for the operating capacity of the unit.

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

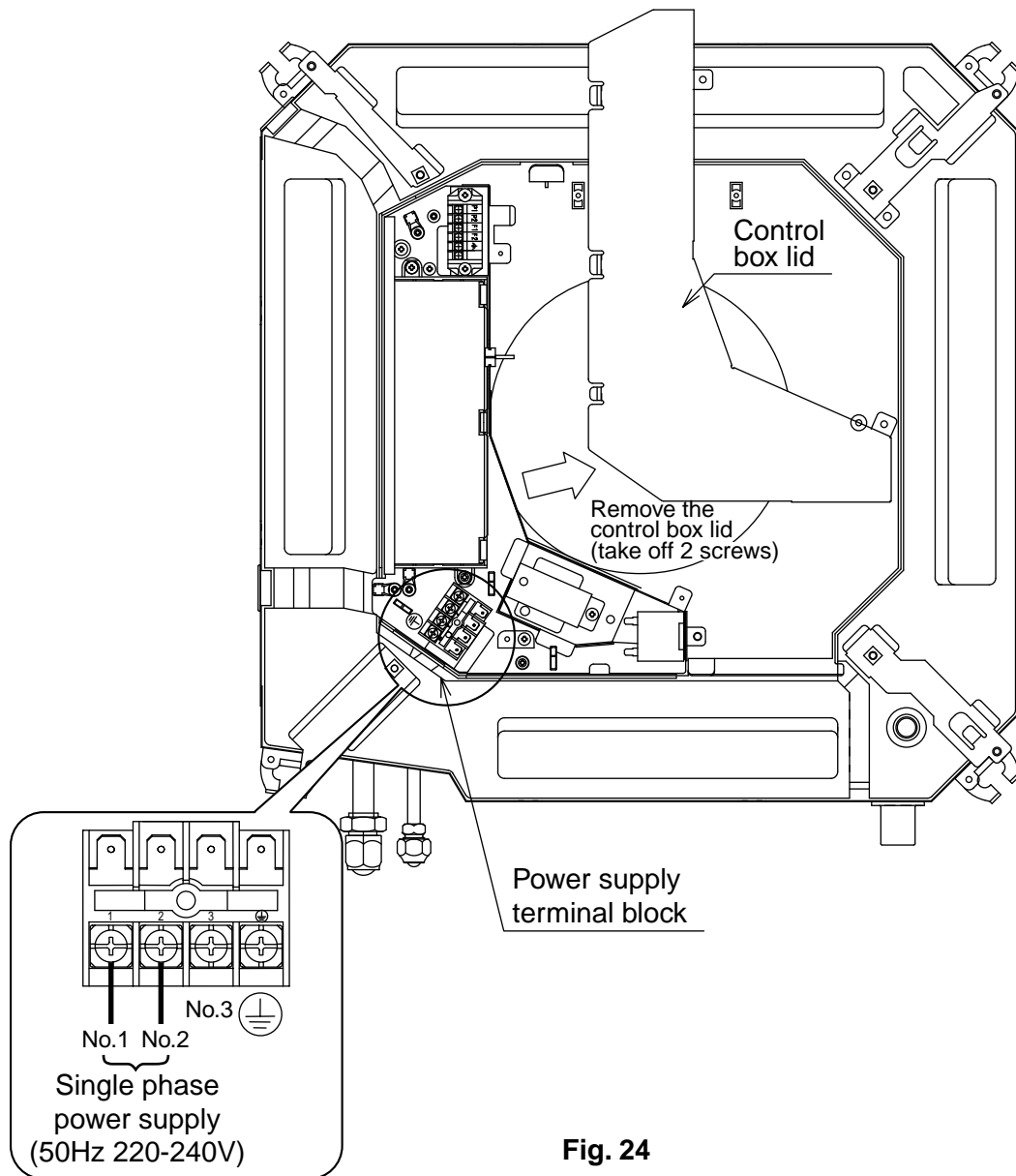
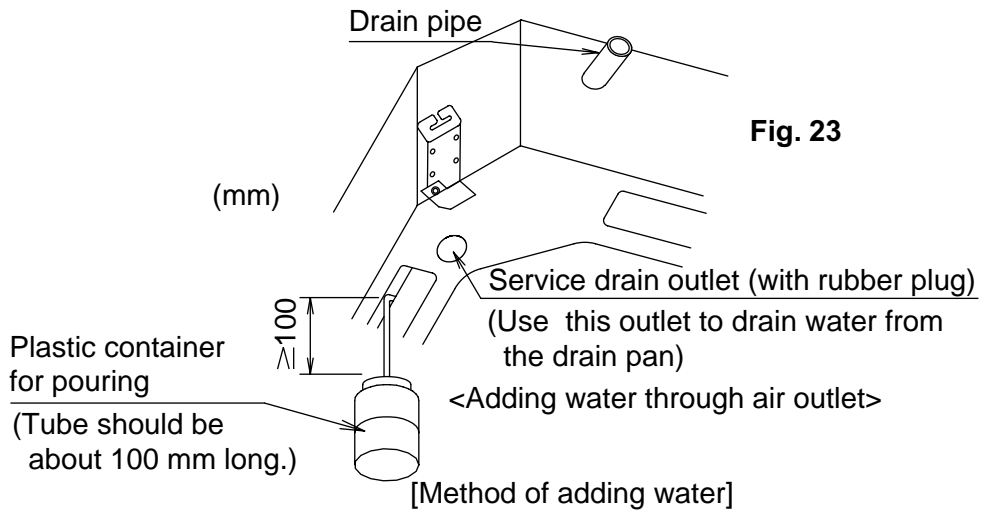
- Add approximately 1000 cc of water slowly from the air outlet and check drainage flow.

WHEN ELECTRIC WIRING WORK IS FINISHED

- Check drainage flow during cooling operation.

WHEN ELECTRIC WIRING WORK IS NOT FINISHED

- Remove the control box lid. Connect the single phase power supply (SINGLE PHASE 50Hz 220-240V) to connections No.1 and No.2 on the power supply terminal block. Do not connect to No.3 of the power supply terminal block. (The drain pump will not operate.) When carrying out wiring work around the control box, make sure none of the connectors come undone. Be sure to attach the control box lid before turning on the power.
- After confirming drainage (Fig.23, Fig.24), turn off the power and remove the power supply.
- Attach the control box lid as before.



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. 25)
- **Multi system:** 1 through 4 indoor units connect to 1 outdoor unit. The indoor unit is controlled by remote controller connected to each indoor unit. (Refer to Fig. 26)
However, the group control is not expected.
- **Group control:** 1 remote controller controls up to 16 indoor units. (All indoor units operate according to the remote controller) (Refer to Fig. 27)
- **2 remote controllers control:** 2 remote controllers control 1 indoor unit. (Refer to Fig. 28)

Pair type

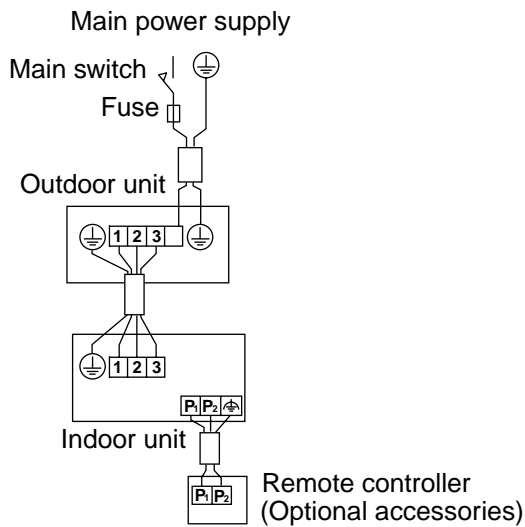


Fig. 25

Multi system

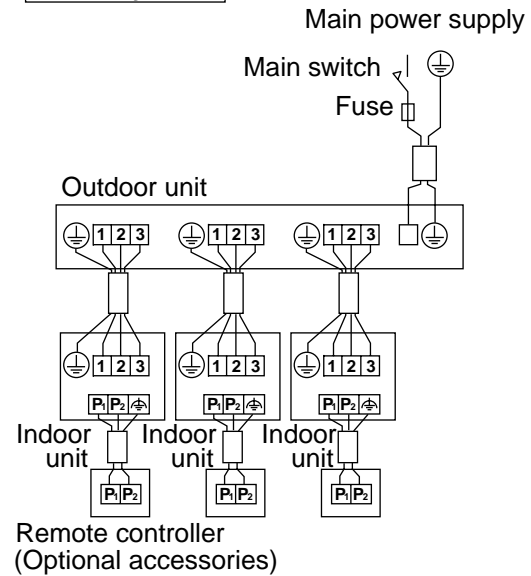


Fig. 26

Group control

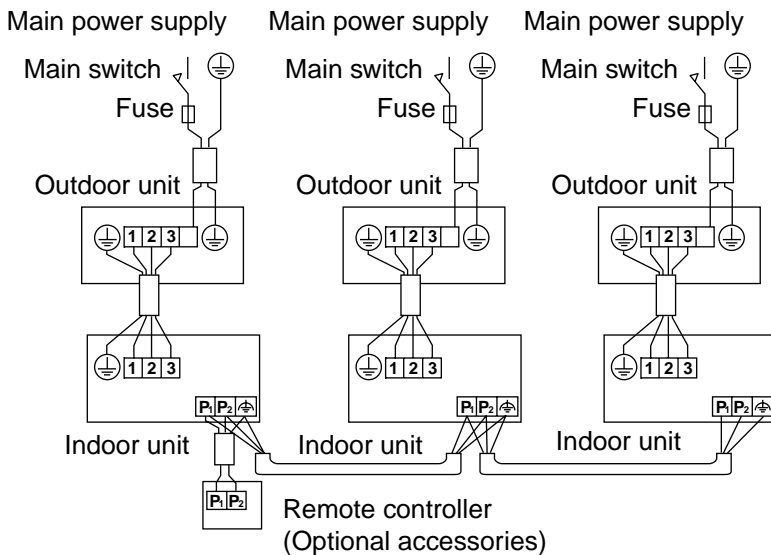


Fig. 27

2 remote controllers control

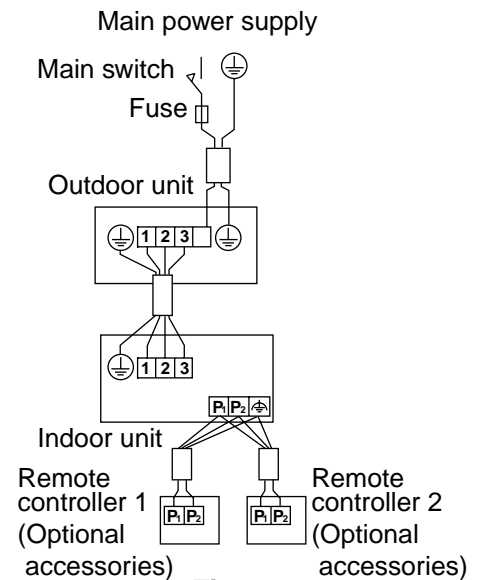


Fig. 28

NOTE

1. All transmission wiring except for the remote controller wires is polarized and must match the terminal symbol.
2. In case a shielding wire is to be used, connect a shielded portion with the \oplus of a remote controller terminal board. (Also, connect the ground for the remote control to a grounded metal part.)
3. For group control remote controller, choose the remote controller that suits the indoor unit which has the most functions (as attached swing flap)

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 “Wiring diagram label” attached to the Control box lid.
- 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 and water pipes, lightning rods, or telephone ground wires.
 - Gas pipes : might cause explosions or fire if gas leaks.
 - Water pipes : 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 lightning storms.

• Specifications for field wire

Table 4

	Wire	Size(mm ²)	Length
Wiring between 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 *
Wiring to ground terminal	Ground wire conform to local codes	2.0	–

*This will be the total extended length in the system when doing group control.

NOTE

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



CAUTION

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

Connection of wiring between units, ground wire and for the remote control cord (Refer to Fig. 29)

- Wiring between units and ground wire

Remove the control box lid and connect wires of matching number to the power supply terminal block (4P) inside. And connect the ground wire to the terminal block. In doing this, pull the wires inside through the hole and fix the wires securely with the included clamp (4).

- Give enough slack to the wires between the clamp (4) and power supply terminal block. (Use Fig. 30 as a guide and allow at least 80mm for removing the sheath.)
- Remove the control box lid and pull the wires inside through the hole and connect to the terminal block for remote controller (6P). (no polarity) Securely fix the remote controller cord with the included clamp (4).
- Give enough slack to the wires between the clamp (4) and the terminal block for the remote controller.
- After connection, attach sealing material (12)
- Be sure to attach it to prevent the infiltration of water from the outside.

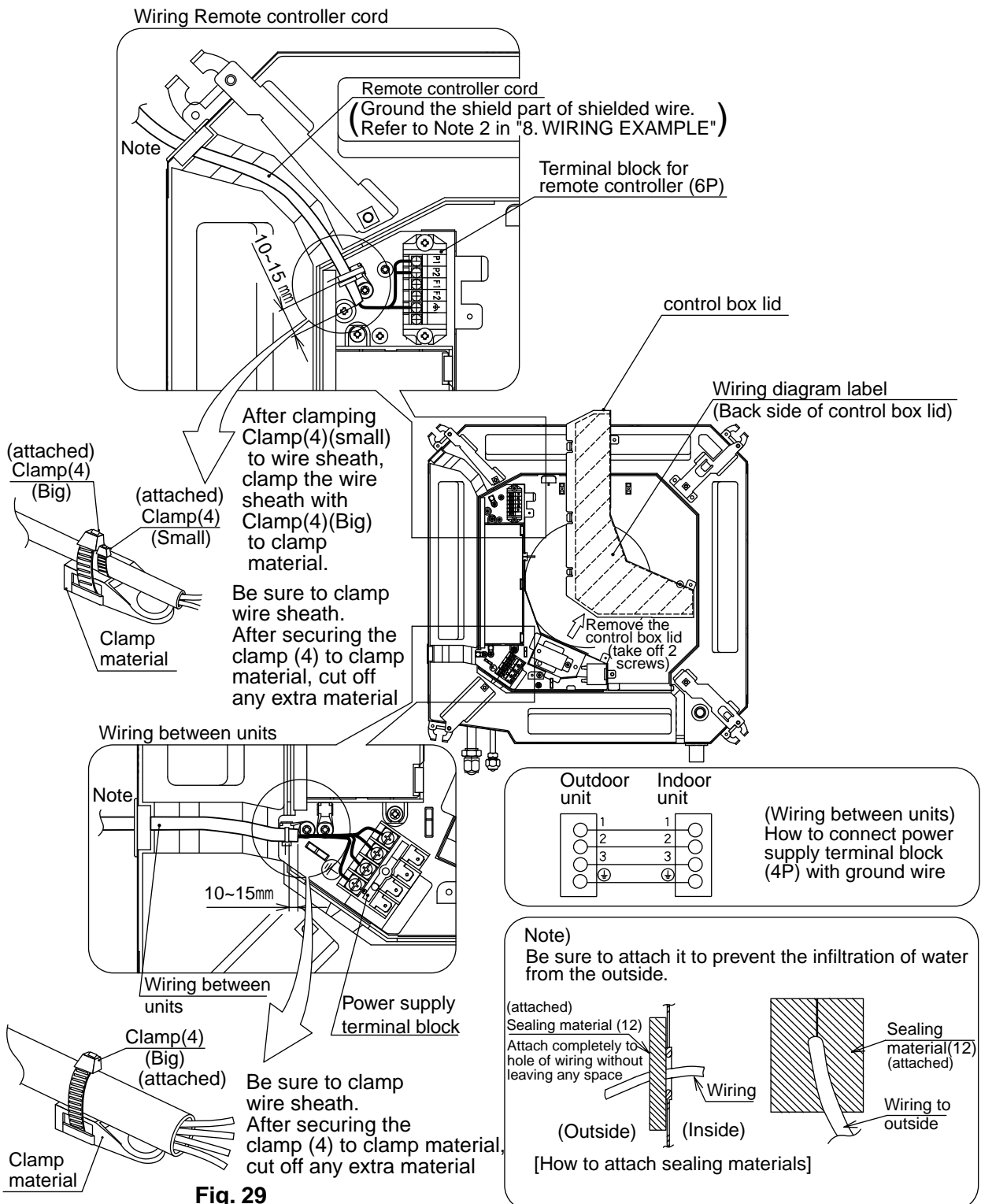


Fig. 29

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

Tightening torque for the terminal blocks.

- Use the correct screwdriver for tightening the terminal screws. If the blade of screwdriver is too small, the head of the screw might be damaged, and the screw will not be properly tightened.
- If the terminal screws are tightened too hard, screws might be damaged.
- Refer to the table below for the tightening torque of the terminal screws.

	Tightening torque
Terminal block for remote controller (6P)	0.79 - 0.97 N·m
Power supply terminal block (4P)	1.18 - 1.44 N·m

Precautions to be taken for power supply wiring

Use a round crimp-style terminal for connection to the power supply terminal block. In case it cannot be used due to unavoidable reasons, be sure to observe the following instructions.

Be sure to peel off the sheath of wiring between units more than 80 mm.

(Refer to Fig. 30)

- In wiring, make certain that prescribed wires are used, carry out complete connections, and fix the wires so that external forces are not applied to the terminals.

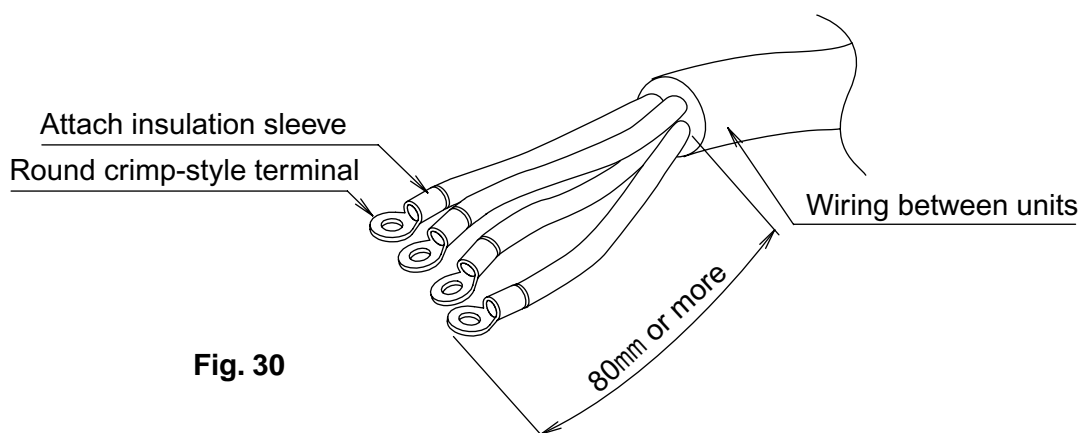


Fig. 30

CAUTION

When clamping the wires, be sure no pressure is applied to the wire connections by using the included clamping material to make appropriate clamps. Also, when wiring, make sure the lid on the control box fits snugly by arranging the wires neatly and attaching the control box lid firmly. When attaching the control box lid, make sure no wires get caught in the edges. Pass wiring through the wiring through holes to prevent damage to them.

Make sure the remote control cord, the wiring between units, and other electrical wiring do not pass through the same locations outside the machine, separating them by at least 50mm, otherwise electrical noise (external static) could cause mistaken operation or breakage.

10. FIELD SETTINGS

(1) Make sure the control box lids are closed on the indoor and outdoor units.

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

- Setting can be made by changing the “Mode No.,” “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 air outlet direction

- For changing air outlet direction (2 or 3 directions), refer to the optional installation manual of the sealing member of air discharge outlet kit or the service manual.
(SECOND CODE NO. is factory set to “01” for air outlet in 4 directions.)

10-2 Setting for options

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

10-3 Setting air filter sign

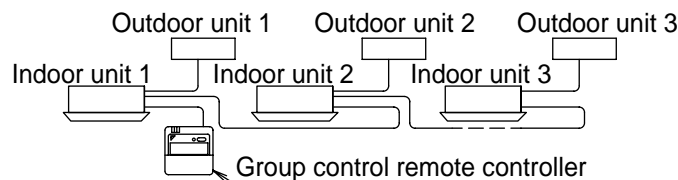
- Remote controllers are equipped with liquid crystal display air filter signs to display the time to clean air filters.
- Change the SECOND CODE NO. according to “Table 5” depending on the amount of dirt or dust in the room.
(SECOND CODE NO. is factory set to “01” for air filter contamination-light.)

Table5

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 When implementing group control

- When using as a pair unit, you may control up to 16 unit with the remote controller.
- In this case, all the indoor units in the group will operate in accordance with the group control remote controller.
- Select a remote controller 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 control box lid.

(2) Cross-wire the remote control terminal block (P₁ P₂) inside the control box. (There is no polarity.)
(Refer to Fig. 27 on page 14 and Table 4 on page 15)

10-5 Two 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

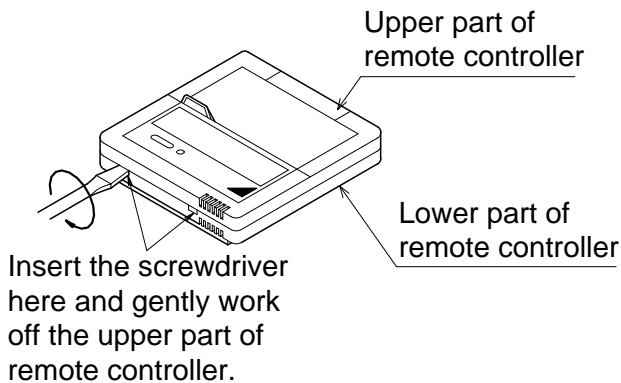
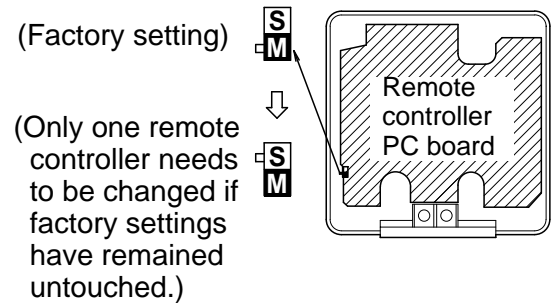


Fig. 32



Wiring Method (See 9. ELECTRIC WIRING WORK on page15.)

- (3) Remove the control box lid.
- (4) Add remote controller 2 to the remote control terminal block (P₁, P₂) in the control box. (There is no polarity.) (Refer to Fig. 28 on page 14 and Table 4 on page 15)

11. INSTALLATION OF THE DECORATION PANEL



<Read “12. TEST OPERATION” before making a test run without attaching the decorated panels.>
Refer to the installation manual attached to the decoration panel.



After installing the decoration panel, ensure that there is no space between the unit body and decoration panel.

12. TEST OPERATION

- (1) Make sure the control box lids are closed on the indoor and outdoor units.
- (2) 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.

12-1 TEST OPERATION

1. Open the gas side stop valve.
2. Open the liquid side stop valve.
3. Electrify for 6 hours.
4. Set to cooling operation with the remote controller and start operation by pressing ON/OFF button ().
5. Press INSPECTION/TEST OPERATION button () 4 times (2 times for wireless remote controller) and operate at Test Operation mode for 3 minutes.

6. Press AIR FLOW DIRECTION ADJUST button () to make sure the unit is in operation.
7. Press INSPECTION/TEST OPERATION button () and operate normally.
8. Confirm function of unit according to the operation manual.

PRECAUTIONS

1. Refer to “12-2 HOW TO DIAGNOSE FOR MALFUNCTION” if the unit does not operate properly.
2. 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 12-2 HOW TO DIAGNOSE FOR MALFUNCTION.

NOTE

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

12-2 HOW TO DIAGNOSE FOR MALFUNCTION


- If the air conditioner does not operate normally after installing the air conditioner, a malfunction shown in the table below may happen.

Remote control display	Malfunction
No display	<ul style="list-style-type: none"> • Power supply trouble or Open phase connection • Wrong wiring between indoor and outdoor unit • Indoor PC board faulty • Power supply PCB assy faulty • Wrong remote control connection wiring • Remote control faulty • Fuse faulty
88*	<ul style="list-style-type: none"> • Indoor PC board faulty • Wrong wiring between indoor and outdoor unit
88 flashing	<ul style="list-style-type: none"> • Wrong wiring between indoor and outdoor unit

*After turning on the power, the maximum is 90 seconds, although it will only display “88”. This is not a problem, and it will be set for 90 seconds.

■ Diagnose 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 flashes, and “  ” and the malfunction code are indicated on the liquid crystal display. In such a case, diagnose the fault contents by referring to the table on the malfunction code list in 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)

NOTE

1. In case wired remote controller. Press the INSPECTION/TEST OPERATION button on remote controller, “  ” starts flashing and changes the inspection mode.
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.

12-3 Malfunction code

- For places where the malfunction 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
A5	Freeze-up protector “or stopped by high pressure control”
A6	Indoor fan motor overloaded, overcurrent or locked
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 (R2T) for heat exchanger temperature is fault
C5	Sensor (R3T) for heat exchanger temperature is fault
C9	Sensor for suction air temperature 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
E6	Compressor motor lock by over current (outdoor)
E7	Outdoor fan motor lock malfunction
	Outdoor fan instantaneous overcurrent malfunction
E8	Input overcurrent (outdoor unit)
E9	Electronic expansion valve faulty (outdoor unit)
EA	Cooling/heating swich malfunction. (outdoor unit)
F3	Discharge pipe temperature abnormal (outdoor unit)
H3	High pressure switch faulty (outdoor unit)
H4	Low pressure switch faulty (outdoor unit)
H6	Faulty position defection sensor (outdoor unit)
H7	Outdoor motor position signal malfunction
H8	CT abnormality (outdoor unit)
H9	Outdoor air thermistor faulty (outdoor unit)
J3	Discharge pipe thermistor faulty (outdoor unit)
J5	Suction pipe thermistor faulty (outdoor unit)
J6	Heat exchanger thermistor faulty (outdoor unit)
J8	Liquid piping thermistor malfunction (heating) (outdoor)
J9	Gas piping thermistor malfunction (cooling) (outdoor)
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 unit's inverters (outdoor unit)
P1	Open-phase or main circuit low voltage (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 or refrigerant shortage.
U1	Reverse phase
	Peverse two phase of the L1, L2 and L3 leads.
U2	Power source voltage malfunction (NOTE 3)
	Includes the defect in 52C.
U4 UF	Transmission error (indoor unit - outdoor unit)
	Incorrect 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 unit 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 - outdoor unit)
	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) Incorrect combination with indoor unit and outdoor unit.
UC	Central control address overlapping

13. WIRING DIAGRAM

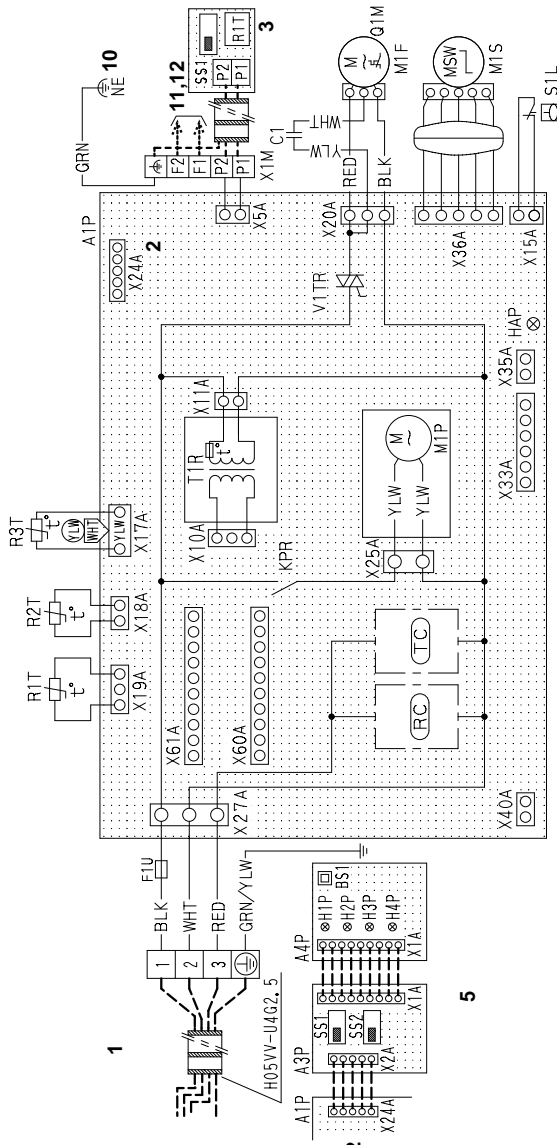
(Refer to Fig. 33)

1	TO OUTDOOR UNIT	2	NOTE) 3
3	WIRED REMOTE CONTROLLER	4	CONTROL BOX
5	RECEIVER/DISPLAY UNIT	6	IN CASE OF SIMULTANEOUS OPERATION SYSTEM
7	INDOOR UNIT (MASTER)	8	INDOOR UNIT (SLAVE)
9	REMOTE CONTROLLER	10	NOTE) 5
11	CENTRAL REMOTE CONTROLLER	12	NOTE) 1

WIRING DIAGRAM

: CONNECTOR DISCRIMINATION COLOUR FOR COMPONENTS.
 : CONNECTOR COLOUR FOR COMPONENTS.
 : CONNECTOR COLOUR FOR PRINTED CIRCUIT BOARD.

A1P	PRINTED CIRCUIT BOARD	SS1	SELECTOR SWITCH (MAIN/SUB)
C1	CAPACITOR (MIF)	SS2	SELECTOR SWITCH (WIRELESS ADDRESS SET)
F1U	FUSE (F5A, 250V)		CONNECTOR FOR OPTIONAL PARTS
HAP	LIGHT EMITTING DIODE (SERVICE MONITOR GREEN)	X33A	CONNECTOR
KPR	MAGNETIC RELAY (M1P)	X35A	(ADAPTOR FOR WIRING)
MIF	MOTOR (INDOOR FAN)	X40A	CONNECTOR
MIP	MOTOR (DRAIN PUMP)	X60A	(ON/OFF INPUT FROM OUTSIDE)
MIS	MOTOR (SWING FLAP)	X61A	CONNECTOR (INTERFACE ADAPTOR FOR SKY AIR SERIES)
Q1M	THERMO SWITCH (MIF EMBEDDED)		
R1T	THERMISTOR (AIR)		
R2T	THERMISTOR (COIL-1)		
R3T	THERMISTOR (COIL-2)		
S1L	FLOAT SWITCH		
T1R	TRANSFORMER(220-240V/22V)		
V1TR	PHASE CONTROL CIRCUIT		
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)		
	WIRELESS REMOTE CONTROLLER (RECEIVER/DISPLAY UNIT)		
A3P	PRINTED CIRCUIT BOARD		
A4P	PRINTED CIRCUIT BOARD		
BS1	PUSH BUTTON (ON/OFF)		
H1P	LIGHT EMITTING DIODE (ON-RED)		
H2P	LIGHT EMITTING DIODE (TIMER-GREEN)		
H3P	LIGHT EMITTING DIODE (FILTER SIGN-RED)		
H4P	LIGHT EMITTING DIODE (DEFROST-ORANGE)		



NOTES

- : TERMINAL : FIELD WIRING
- : CONNECTOR
- IN CASE USING CENTRAL REMOTE CONTROLLER, CONNECT IT TO THE UNIT IN ACCORDANCE WITH THE ATTACHED INSTALLATION MANUAL.
- X24A IS CONNECTED WHEN THE WIRELESS REMOTE CONTROLLER KIT IS BEING USED.
- REMOTE CONTROLLER MODEL VARIES ACCORDING TO THE COMBINATION SYSTEM, CONFIRM ENGINEERING MATERIALS AND CATALOGS, ETC. BEFORE CONNECTING.
- GROUND THE SHIELD OF THE REMOTE CONTROLLER CORD TO THE INDOOR UNIT (IN CASE OF USING SHIELD WIRE).
- SYMBOLS SHOW AS FOLLOWS:
 RED:RED BLK:BLACK WHT:WHITE YLW:YELLOW PRP:PURPLE GRY:GRAY BLU:BLUE

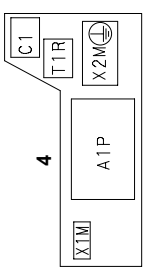
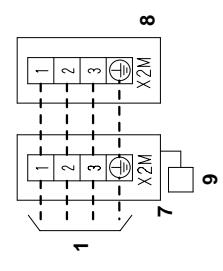


Fig. 33