

— Split System Heat Pump Air Conditioner —

Model Combinations

Combine indoor and outdoor units only as listed below.

Indoor Units and Outdoor Units

	Indoor Units Type	24	36	42
① X	4-Way Air Discharge Semi-Concealed (Matching Ceiling Panel)	XH2442 (PNR-XH2442)	XH3642 (PNR-XH3642)	XH4242 (PNR-XH3642)
② K	Wall-Mounted	KH2442	KH3642	
③ T	Ceiling-Mounted	TH2442	TH3642	TH4242
④ U	Concealed-Duct	UH2442	UH3642	
⑤ C	Outdoor Units	CH2442	CH3642	CH4242
⑥	Wired Remote Controller	RCS-SH80UG (Optional part)		
⑦	Wireless Remote Controller	Built-in type: RCS-SH80UA.WL (Optional part) External type: RCS-BH80UA.WL (Optional part)		
⑧	Weekly Timer	TM-SH80UG (Optional part)		
⑨	System Controller	SHA-KC64UG (Optional part)		

OPERATING LIMITS

■ Maximum Conditions	Cooling	/	Heating
Outdoor temperature	: 115°F DB	/	65°F WB
Room temperature	: 71°F WB	/	80°F DB
■ Minimum Conditions			
Outdoor temperature	: 23°F (0°F)* DB	/	15°F WB
Room temperature	: 57°F WB	/	59°F DB

* When air discharge chamber is installed.

Units should be installed by licensed contractor according to local code requirements.

Important

Please Read Before Starting

This air conditioning system meets strict safety and operating standards. As the installer or service person, it is an important part of your job to install or service the system so it operates safely and efficiently.

For safe installation and trouble-free operation, you must :

- Carefully read this instruction booklet before beginning.
- Follow each installation or repair step exactly as shown.
- Observe all local, state, and national electrical codes.
- Pay close attention to all warning and caution notices given in this manual.



WARNING

This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.



CAUTION

This symbol refers to a hazard or unsafe practice which can result in personal injury or product or property damage.

If Necessary, Get Help

These instructions are all you need for most installation sites and maintenance conditions. If you require help for a special problem, contact our sales/service outlet or your certified dealer for additional instructions.

In Case of Improper Installation

The manufacturer shall in no way be responsible for improper installation or maintenance service, including failure to follow the instructions in this document.

SPECIAL PRECAUTIONS

When Wiring



ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. ONLY A QUALIFIED, EXPERIENCED ELECTRICIAN SHOULD ATTEMPT TO WIRE THIS SYSTEM.

- Do not supply power to the unit until all wiring and tubing are completed or reconnected and checked.
- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause **accidentally injury or death**.
- **Ground the unit** following local electrical codes.
- Connect all wiring tightly. Loose wiring may cause overheating at connection points and a possible fire hazard.

When Transporting

Be careful when picking up and moving the indoor and outdoor units. Get a partner to help, and bend your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut your fingers.

When Installing

...In a Room

Properly insulate any tubing run inside a room to prevent "sweating" that can cause dripping and water damage to walls and floors.

...In Moist or Uneven Locations

Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the outdoor unit. This prevents water damage and abnormal vibration.

...In an area with High Winds

Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.

...In a Snowy Area (for Heat Pump-type Systems)

Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.

When Connecting Refrigerant Tubing

- Ventilate the room well, in the event that refrigerant gas leaks during the installation. Be careful not to allow contact of the refrigerant gas with a flame as this will cause the generation of poisonous gas.
- Keep all tubing runs as short as possible.
- Use the flare method for connecting tubing.
- Apply refrigerant lubricant to the matching surfaces of the flare and union tubes before connecting them, then tighten the nut with a torque wrench for a leak-free connection.
- Check carefully for leaks before starting the test run.

NOTE

Depending on the system type, liquid and gas lines may be either narrow or wide. Therefore, to avoid confusion the refrigerant tubing for your particular model is specified as either "narrow" or "wide" rather than as "liquid" or "gas".

When Servicing

- Turn the power OFF at the main power box (mains) before opening the unit to check or repair electrical parts and wiring.
- Keep your fingers and clothing away from any moving parts.
- Clean up the site when installation is finished. Check that no metal scraps or bits of wiring have been left inside the unit.



CAUTION

- Ventilate any enclosed areas when installing or testing the refrigeration system. Contact of refrigerant gas with fire or heat can produce poisonous gas.
- Confirm after installation that no refrigerant gas is leaking. If the gas comes in contact with a burning stove, gas water heater, electric room heater or other heat source, it can cause the generation of poisonous gas.

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1. GENERAL

This booklet briefly outlines where and how to install the air conditioning system. Please read over the entire set of instructions for the indoor and outdoor units and make sure all accessory parts listed are with the system before beginning.



CAUTION

Check local electrical codes and regulations before obtaining wire. Also, check any specified instructions or limitations.

1-1. Tools Required for Installation (Not Supplied)

1. Standard screwdriver
2. Phillips head screwdriver
3. Knife or wire stripper
4. Tape measure
5. Level
6. Sabre saw or key hole saw
7. Hacksaw
8. Core bits
9. Hammer
10. Drill
11. Tube cutter
12. Tube flaring tool
13. Torque wrench
14. Adjustable wrench
15. Reamer (for deburring)

1-4. Additional Materials Required for Installation

1. Refrigeration (armored) tape
2. Insulated staples or clamps for connecting wire (See your local codes.)
3. Putty
4. Refrigeration tubing lubricant
5. Clamps or saddles to secure refrigerant tubing
6. Scale for weighing

1-2. Accessories Supplied with Unit

See Table 1-1 to 1-9.

Table	Type
1-1	4-Way Air Discharge Semi-Concealed
1-2	Wall-Mounted
1-3	Ceiling-Mounted
1-4	Concealed-Duct
1-5	Outdoor Unit
1-6	Wired Remote Controller
1-7	Wireless Remote Controller
1-8	Weekly Timer
1-9	System Controller

1-3. Type of Copper Tube and Insulation Material

Copper tubing for connecting the outdoor unit to the indoor unit is available in kits which contain the narrow and wide tubing, fittings and insulation. Consult your nearest sales outlet or A/C workshop.

If you wish to purchase these materials separately from a local source, you will need:

1. Deoxidized annealed copper tube for refrigerant tubing.
2. Foamed polyethylene insulation for copper tubes as required to precise length of tubing. Wall thickness of the insulation should be not less than 5/16 in..
3. Use insulated copper wire for field wiring. Wire size varies with the total length of wiring. Refer to Section 5. "Electrical Wiring" for details.

Table 1-1 XH (4-Way Air Discharge Semi-Concealed)











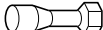
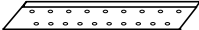

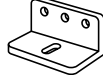


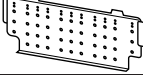





Part Name	Figure	Q'ty	Remarks
Full-scale installation diagram		1	For determining suspension bolt pitch
Flare insulator		2	For wide and narrow tubes
Washer		8	For suspending indoor unit from ceiling
Insulating tape	 (White)	1	For wide tube flare nuts
Hose band		2	For securing drain hose
Packing		1	For drain joint
Drain insulator		1	For drain joint
Drain hose		1	
Drain hose adaptor		1	For drain outlet
Sealing putty		1	For sealing recessed portion of power supply
Tube connector		1	For sizing up of narrow tube from 1/4 in. to 3/8 in. (only for 24 type)

Table 1-2 KH (Wall-Mounted)

Part Name	Figure	Q'ty	Remarks
Wall fixture *1		1	For supporting the indoor unit
Insulator *1		1	For insulation of the tubing of the indoor unit
Mounting plate *1		1	For securing the indoor unit
Tapping screw *1	Truss-head Phillips 4 × 1 in. 	20	For fixing the wall fixture
Full-scale diagram		1	For determining the place where the indoor unit is installed
Wall fixture *2		1	For supporting the indoor unit
Rawl plug *2		10	For fixing the wall fixture
Cover *2		1	For improved tubing appearance
Tapping screw *2	Truss-head Phillips 4 × 5/8 in. 	10	For fixing the wall fixture
Insulator		1	For insulation of the tubing of the indoor unit
Tube connector		1	For sizing up of narrow tube from 1/4 in. to 3/8 in. (only for 24 type)

* 1 KH3642 only
* 2 KH2442 only

Table 1-3 TH (Ceiling-Mounted)


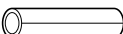
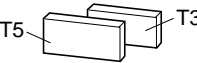













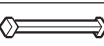







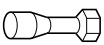
Part Name	Figure	Q'ty	Remarks
Special washer		4	For temporarily suspending indoor unit from ceiling
Drain insulator		1	For drain hose joint
Flare insulator		1 Set	For wide tube joints
Drain hose adaptor		1	
Drain hose clamp		4	
Insulating tape	 Black	2	For wide tube and drain hose joint
	 White (heat-resisting)	1	For wide flare joints
Vinyl clamp		2	For ends of flare insulator
Full-scale installation diagram		1	For determining suspension bolt pitch
Sealing putty		1	For sealing recessed portion of power supply
Drain hose		1	
Tube connector		1	For sizing up of narrow tube from 1/4 in. to 3/8 in. (only for 24 type)

Table1-4 UH (Concealed-Duct)

Part Name	Figure	Q'ty	Remarks
Flare insulator		2	For wide and narrow tubes
Insulating tape	 (Black)	2	For wide and narrow tubes
	 (White)	2	For wide and narrow tube flare nuts
Tapping screw TOTA4-10		14 or 20 or 24	For air intake duct connection
Jumper cable*		1	For increasing the fan speed
Hose band		1	For securing drain hose
Packing		1	For drain joint
Sealing putty		1	For sealing recessed portion of power supply
Drain insulator		1	For drain joint
Drain hose		1	
Drain hose adaptor		1	
Clamp		9	For securing drain hose & refrigerant tubing
Tube connector		1	For sizing up of narrow tube from 1/4 in. to 3/8 in. (only for 24 type)

* Jumper cable is housed inside the electrical component box.

Table 1-5 (Outdoor Unit)


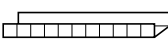

Part Name	Figure	Q'ty	Remarks
Hexagonal Wrench		1	To open and shut the Narrow Tube Service Valve
Grommet		1	For protecting refrigerant pipe by attaching to the edge of Tubing Outlet
Bushing		1	For protecting inter-unit control line by attaching to the edge of wiring outlet
Installation Instruction		1	
Owner's manual		1	

Table 1-6 (Accessories for the Wired Remote Controller)






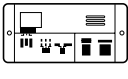



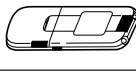

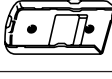



Part Name	Figure	Q'ty	Part Name	Figure	Q'ty
Wired remote controller (comes with 7-7/8 in. wire)		1	Spacers		2
Machine screws M4 × 1 in.		2	Wire joints		4
Wood screws		2			

Table 1-7 (Accessories for the Wireless Remote Controller)

<RCS-SH80UA.WL>

Part Name	Figure	Q'ty	Part Name	Figure	Q'ty
Operation controller		1	Spacers		2
Indicator section		1	Pan-head tapping screws 4 × 13/32 in.		4
Wireless remote controller		1	Truss-head tapping screws 4 × 5/8 in.		2
Wireless remote controller mounting cradle		1	Vinyl clampers L 5-29/32		3
Batteries		2	Wire joints		4

<RCS-BH80UA.WL>





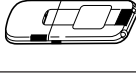

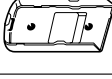





Part Name	Figure	Q'ty	Part Name	Figure	Q'ty
Separate type signal receiving unit (comes with 7-7/8 in. wire)		1	Small screws M4 × 1-9/16 in.		2
Carrier for ceiling installation		1	Wood screws		2
Wireless remote controller		1	Spacers		4
Wireless remote controller mounting cradle		1	Wire joints		4
Batteries		2	Clamper		1
Machine screws M4 × 1 in.		2	Ceiling installation paper pattern (3-3/4 × 2-1/32 in.)		1

Table 1-8 (Accessories for the Weekly Timer)












Part Name	Figure	Q'ty	Part Name	Figure	Q'ty
Weekly timer		1	Wood screws		2
Connecting wiring length 4 ft.		1	Spacers		2
Machine screws M4 x 1 in.		2	Clampers		2

Table 1-9 (Accessories for the System Controller)

Part Name	Figure	Q'ty	Part Name	Figure	Q'ty
System controller		1	Label (Identification label)		1
Rubber bushing (7/8 in.)		4	Label (Terminal base label)		1
Screws for fixture (1-3/16 in.)		2			

1-5. Tubing Length

- Refrigerant tubing between the indoor and outdoor units should be kept as short as possible.
- Select and decide the installation location so that the length of the refrigerant tubing will be within the limits given in Table 1-10.

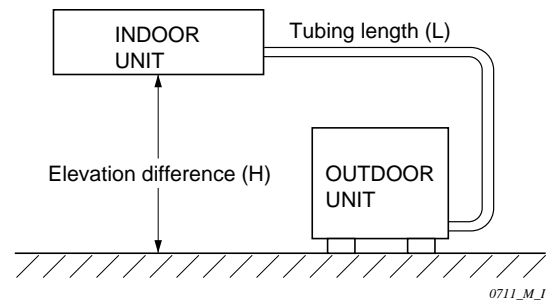


Fig. 1-1

Table 1-10

Tubing Data		Models	CH2442	CH3642, CH4242
Tubing size outer dia.	Narrow tube	in. (mm)	1/4 (6.35)	3/8 (9.52)
	Wide tube	in. (mm)	3/4 (19.05)	3/4 (19.05)
Limit of tubing length		(ft.)	165	165
Limit of elevation difference between the 2 units	Outdoor unit is higher than indoor unit (ft.)		165	165
	Outdoor unit is lower than indoor unit (ft.)		100	100
Max. allowable tubing length at shipment		(ft.)	100	100
Required additional refrigerant		(oz./ft.)	0.48 ^{*1}	0.53 ^{*2}

No additional charge of compressor oil is necessary.

*1 If total tubing length becomes 100 to 165 ft., charge additional refrigerant (R22) by 0.48 oz./ft..

*2 If total tubing length becomes 100 to 165 ft., charge additional refrigerant (R22) by 0.53 oz./ft..

2. SELECTING THE INSTALLATION SITE

Indoor Unit

AVOID:

- areas where leakage of flammable gas may be expected.
- places where large amounts of oil mist exist.
- direct sunlight.
- locations near inverter lamps which may affect performance of the unit.
- locations near heat sources which may affect performance of the unit.
- locations where external air may enter the room directly. This may cause "sweating" on the air discharge ports, causing them to spray or drip.
- locations where the remote control unit will be splashed with water or affected by dampness or humidity.
- installing the remote control unit behind curtains or furniture.
- locations where the receiver in the indoor unit is exposed to the inverter lamp light. Faulty operation of the unit occurs.

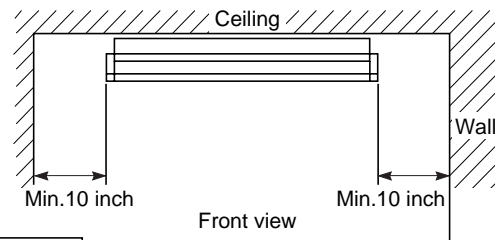
DO:

- select an appropriate position from which every corner of the room can be uniformly cooled.
- select a location where the ceiling is strong enough to support the weight of the unit.
- select a location where tubing and drain pipe have the shortest run to the outdoor unit.
- allow room for operation and maintenance as well as unrestricted air flow around the unit.
- install the unit within the maximum elevation difference above or below the outdoor unit and within a total tubing length from the outdoor unit as detailed in Table 1-10.
- allow room for mounting the remote control unit about 3 ft. off the floor, in an area that is not in direct sunlight nor in the flow of cool air from the indoor unit.

NOTE

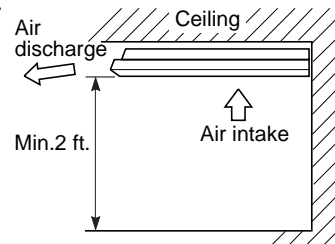
- Air delivery will be degraded if the distance from the floor to the ceiling is greater than 10 ft..

Ceiling-Mounted Type



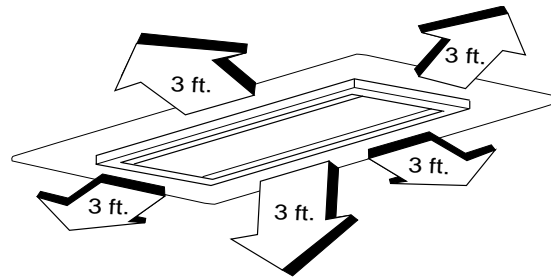
NOTE

The rear of the indoor unit can be installed flush against the wall.



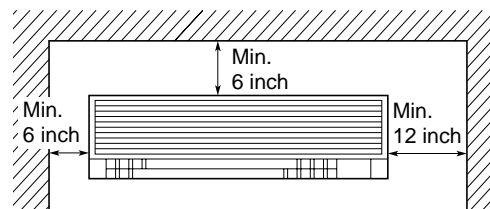
1091_T_1

4-Way Air Discharge Type Concealed-Duct Type



1960_X_1

Wall-Mounted Type



0930_K_1

Outdoor Unit

AVOID:

- heat sources, exhaust fans, etc. (Fig. 2-1)
- damp, humid or uneven locations.

DO:

- choose a place as cool as possible.
- choose a place that is well ventilated and outside air temperature does not exceed maximum 115°F constantly.
- allow enough room around the unit for air intake/exhaust and possible maintenance. (Fig. 2-2)
- provide a solid base; about 6 inch above ground level to reduce humidity and possible water damage in the unit and decreased service life. (Fig. 2-3)
- use lug bolts or equivalent to bolt down unit, reducing vibration and noise.

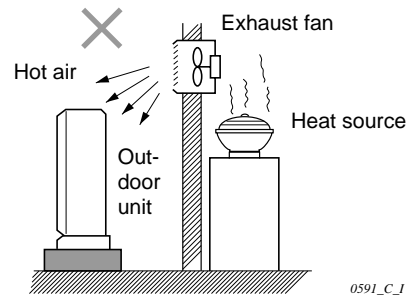


Fig. 2-1

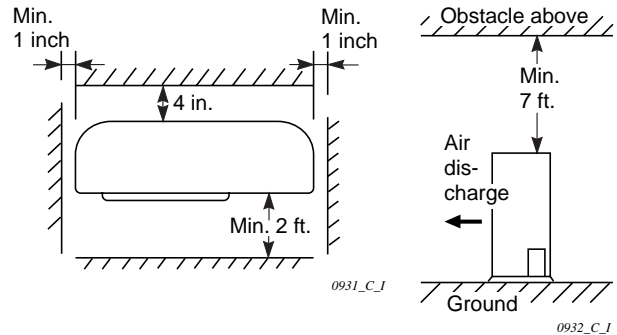


Fig. 2-2

In case of multiple installations

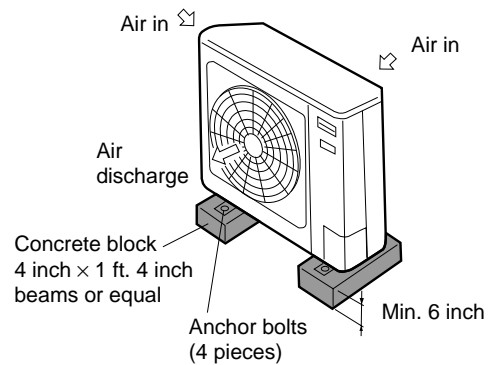
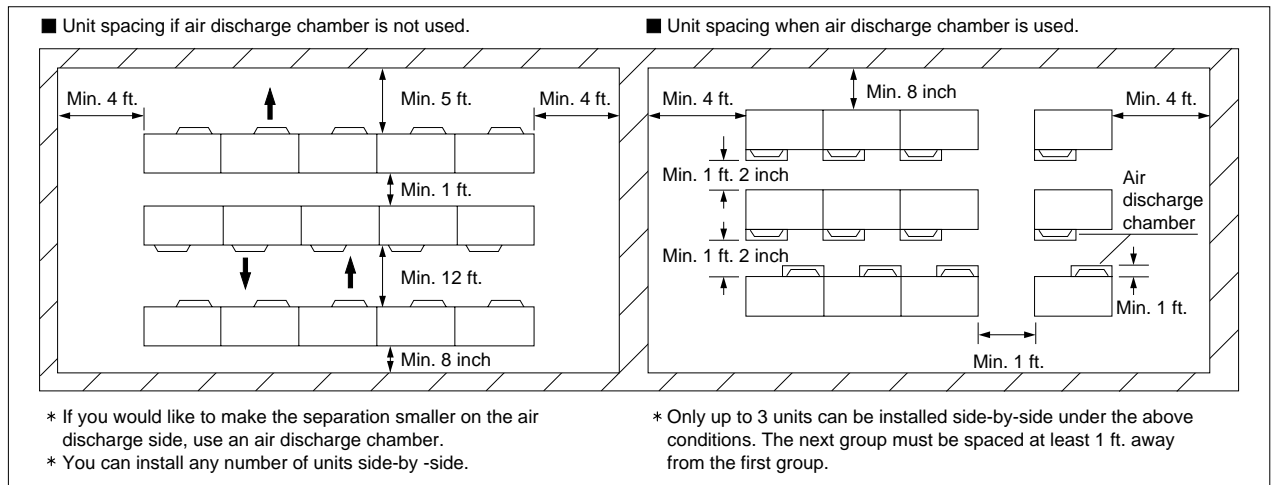


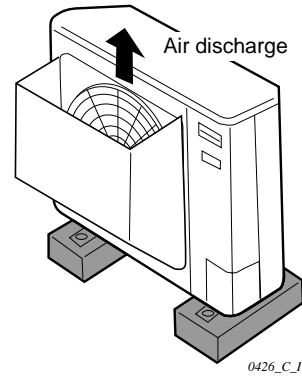
Fig. 2-3

2-1. Air Discharge Chamber for Top Discharge

Install the air-discharge chamber in the field when:

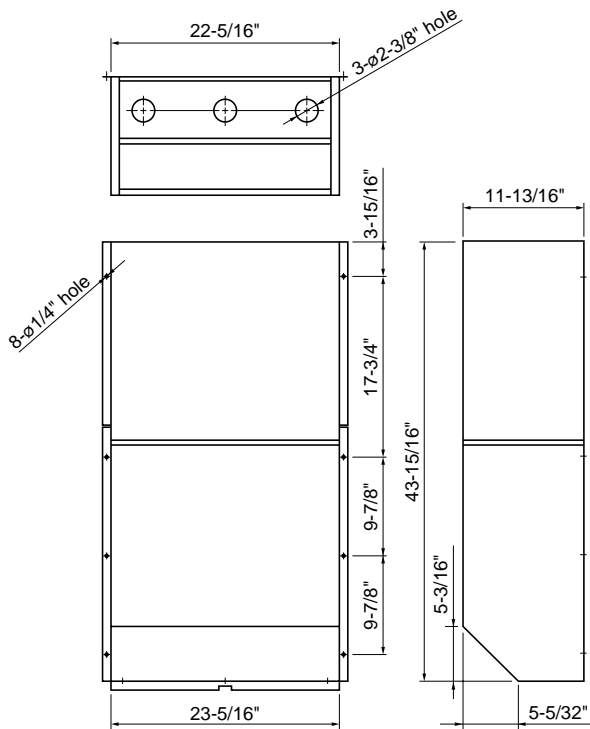
- it is difficult to keep a space of minimum 2 ft. between the air-discharge outlet and the obstacle.
- the air-discharge outlet is facing the sidewalk and discharge hot air can annoy the passers-by.

Refer to Fig. 2-4.



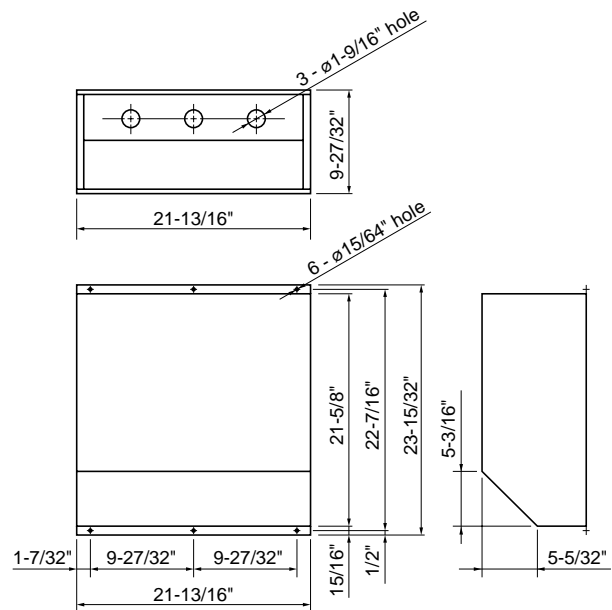
0426_C_1

Recommended outer dimensions of wind shield
(field supply)



1352_C_1

CH3642



0936_C_1

CH2442

Fig. 2-4

2-2. Installing the Outdoor Unit in Heavy Snow Areas

In locations subject to strong winds, snow-proof ducting should be fitted and direct exposure to the wind should be avoided as much as possible.

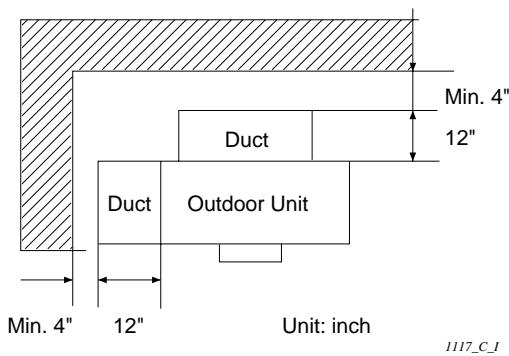
The following problems may occur when the outdoor unit is not provided with a platform and snow-proof ducting.

- The outdoor fan may not run and there may be damage to the unit
- There may be no air flow.
- The tubing may freeze and burst.
- The condenser pressure may drop because of strong wind, and the indoor unit may freeze.

2-3. Precautions When Installing in Heavy Snow Areas

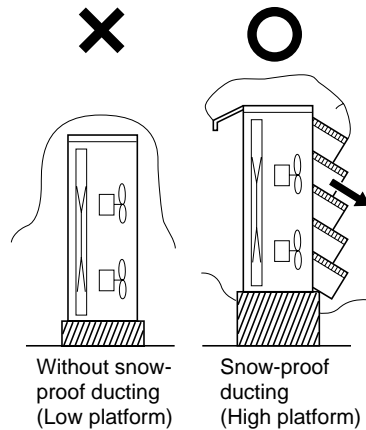
- (1) The platform should be higher than the maximum snow depth. (Fig. 2-5)
- (2) The two anchoring feet of the outdoor unit should be attached to the platform, and the platform should be installed beneath the air-intake side of the outdoor unit.
- (3) The platform foundation must be solid and the unit must be secured with anchor bolts.
- (4) When installing on a roof subject to strong wind, countermeasures must be taken to prevent the unit from being overturned.

2-4. Dimensions of Snow / Wind-proof Ducting and Refrigerant Tubing Space for Installation



1117_C_1

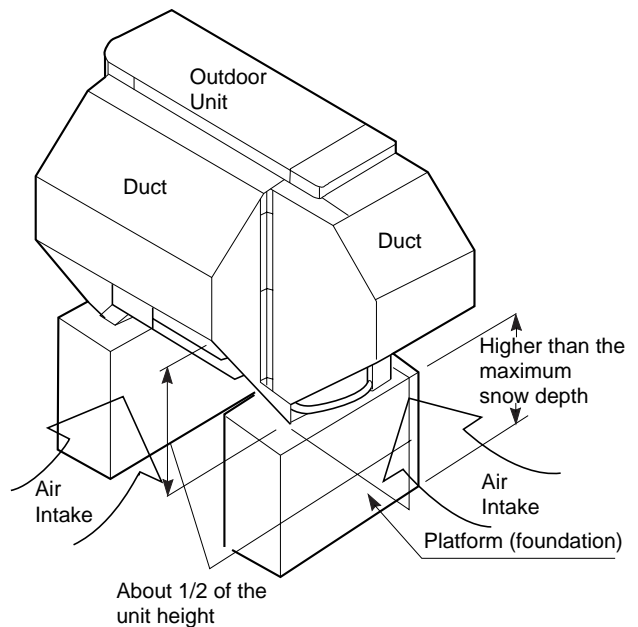
In regions with snow fall, the outdoor unit should be provided with a platform and snow-proof duct.



0937_C_1

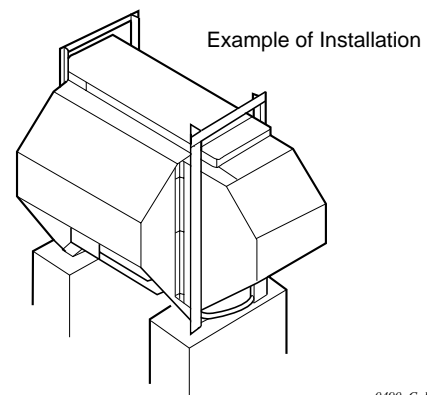
Fig. 2-5

Fig. 2-6



0488_C_1

Fig. 2-7



0490_C_1

Fig. 2-8

3. HOW TO INSTALL THE INDOOR UNIT

■ 4-Way Air Discharge Semi-Concealed Type (XH Type)

3-1. Suspending the Indoor Unit

This unit uses a drain pump. Use a carpenter's level to check that the unit is level.

3-2. Preparation for Suspending

- (1) Fix the suspension bolts securely in the ceiling using the method shown in the diagrams (Figs. 3-1 and 3-2), by attaching them to the ceiling support structure, or by any other method that ensures that the unit will be securely and safely suspended.
- (2) Follow Fig. 3-2 and Table 3-1 to make the holes in the ceiling.

Table 3-1 Unit: inch (mm)

Type	Length	A	B
XH1242, XH1842, XH2442 (PNR-XH2442)		32-9/32 (820)	22-9/32 (566)
XH3642, XH4242 (PNR-XH3642)		43-11/16 (1,110)	33-11/16 (856)

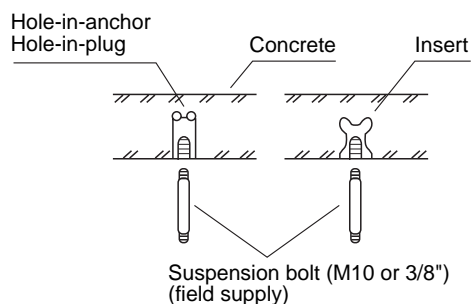


Fig. 3-1

0038_T_I

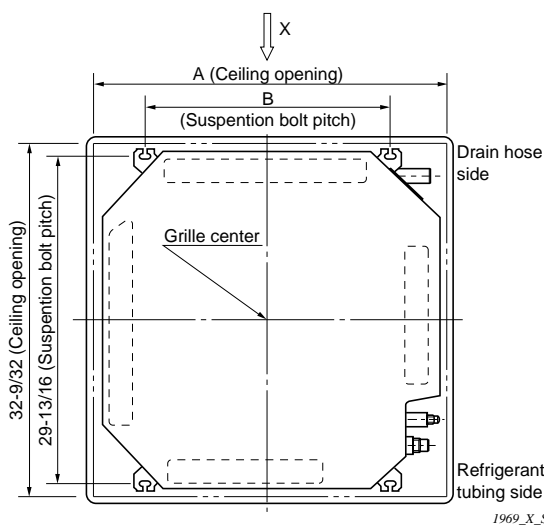


Fig. 3-2

1969_X_S

- (3) Determine the pitch of the suspension bolts using the supplied full-scale installation diagram. The diagram and table (Fig. 3-3 and Table 3-2) show the relationship between the positions of the suspension fitting, the unit, and the panel.

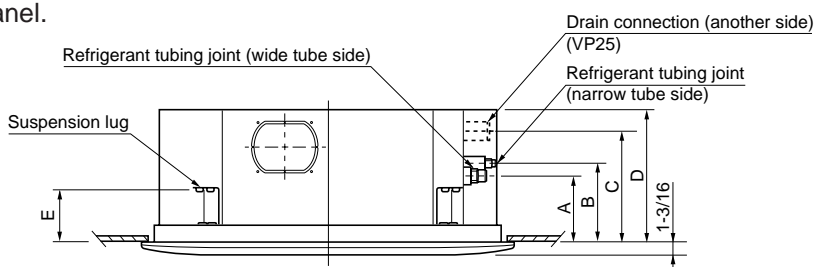


Fig. 3-3

1970_X_S

Table 3-2 Unit : inch (mm)

Type	Length	A	B	C	D	E
XH1242, XH1842, XH2442 (PNR-XH2442)		6-3/16 (157)	7-5/32 (182)	10-9/32 (261)	12-1/8 (308)	4-7/8 (124)
XH3642, XH4242 (PNR-XH3632)		6-3/16 (157)	7-5/32 (182)	11-15/32 (291)	13-1/16 (338)	4-7/8 (124)

3-3. Placing the Unit Inside the Ceiling

- (1) When placing the unit inside the ceiling, determine the pitch of the suspension bolts using the supplied full-scale installation diagram. (Fig. 3-4) The size of the opening for the indoor unit can be confirmed by attaching the full-scale installation diagram beneath the unit. (Fig. 3-4) Tubing and wiring must be laid inside the ceiling when suspending the unit. If the ceiling is already constructed, lay the tubing and wiring into position for connection to the unit before placing the unit inside the ceiling.
- (2) The length of suspension bolt must be appropriate for a distance between the bottom of the bolt and the bottom of the ceiling of 19/32 in. or more as shown in Fig. 3-4.
- (3) Thread the 2 hexagonal nuts (field supply) and washers onto the 4 suspension bolts as shown in Fig. 3-5.
Use 2 sets of nuts and washers (upper and lower), so that the unit will not fall off the suspension lugs.
- (4) Remove the protective cardboard used to protect the fan parts during transport.
- (5) Adjust the distance between the unit and surface of the ceiling. (1-7/8 in.) (Fig. 3-4)

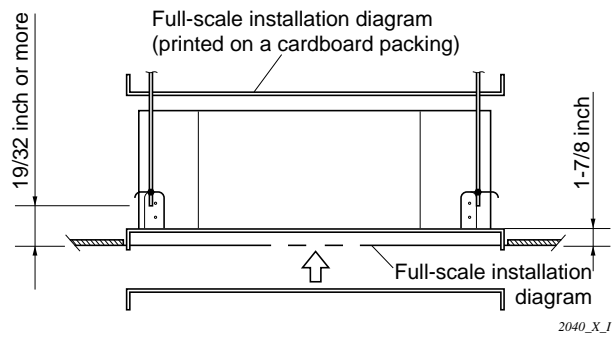


Fig. 3-4

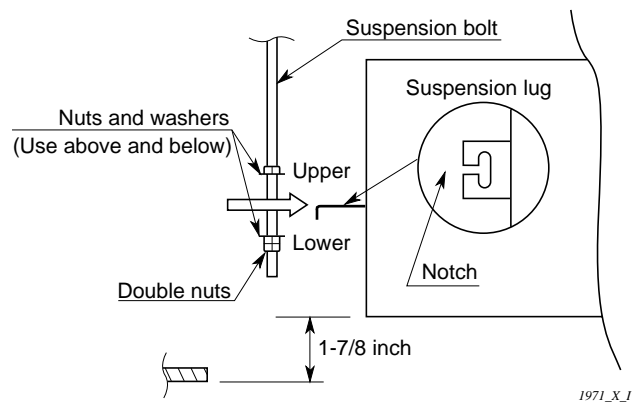


Fig. 3-5



3-4. Installing the Drain Piping

(1) Prepare standard hard PVC pipe for the drain and use the supplied drain hose and hose band to prevent water leaks.

The PVC pipe must be purchased separately.

The transparent part allows you to check drainage. (Fig. 3-6)

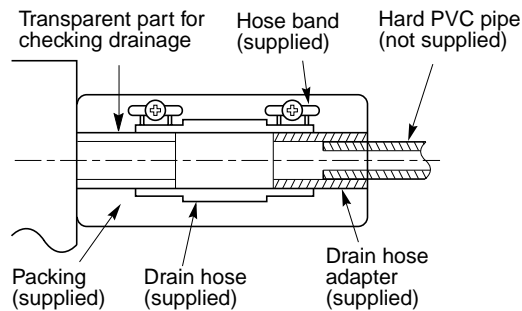


Fig. 3-6

0964_X_I



CAUTION

Tighten the hose clamps so their locking nuts face upward. (Fig. 3-6)

(2) After checking the drainage, wrap the supplied packing and drain pipe insulator around the pipe. (Fig. 3-7)

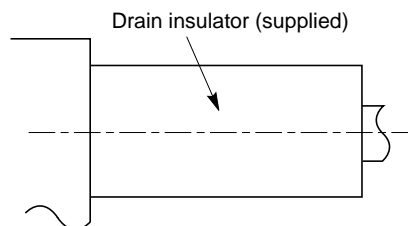


Fig. 3-7

0197_X_I

NOTE

Ensure the drain pipe has a downward gradient (1/100 or more) and that there are no water traps.



CAUTION

● **Do not install an air bleeder tubes, as this may cause water to spray from the drain tube outlet. (Fig. 3-8)**

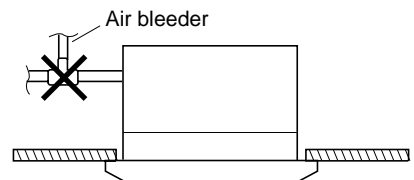


Fig. 3-8

0047_X_I

● **If it is necessary to increase the height of the drain pipe, the section directly after the connection port can be raised a maximum of 19-11/16 in. Do not raise it any higher than 19-11/16 in., as this could result in water leaks. (Fig. 3-9)**

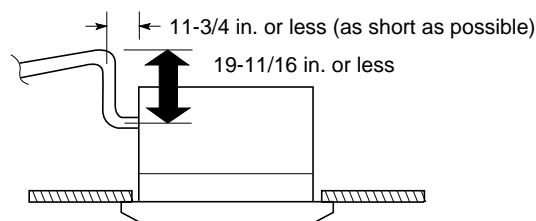


Fig. 3-9

1972_X_I

● **Do not install the pipe with an upward gradient from the connection port. It will cause the drain water to flow backwards and leak when the unit is stopped. (Fig. 3-10)**

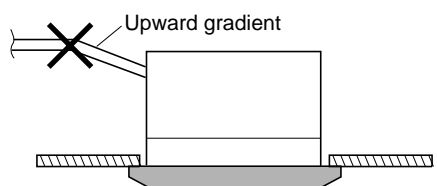


Fig. 3-10

0049_X_I

● **Do not apply force to the piping on the unit side when connecting the drain pipe. The pipe should not be allowed to hang unsupported from its connection to the unit. Fasten the pipe to a wall, frame, or other support as close to the unit as possible. (Fig. 3-11)**

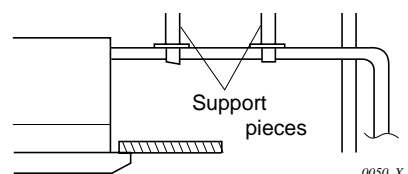


Fig. 3-11

0050_X_I

● **Provide insulation for any drain pipes that are installed indoors.**

3-5. Checking the Drainage

After wiring and piping are completed, use the following procedure to check that the water will drain smoothly. For this, prepare a bucket and wiping cloth ready to catch and wipe up spilled water.



WARNING

Do not supply power to the unit until the tubing and wiring to the outdoor unit are completed.

- (1) Take off the tube cover and through the opening, slowly pour about 43 oz. of water into the drain pan to check drainage.
- (2) Do Test Run to check the drainage after completing installation. When performing Test Run, be sure to observe the Test Run procedure. Refer to page 89.



CAUTION

Be careful since the fan will start turning when checking the drainage.

- (3) After drain checking is finished, return the Operation Selector switch to the RUN position (ON position) and remount the tube cover.



CAUTION

To mount the tube cover, use 5/16" (4 × 8 mm) tapping screws. Do not use long screws as they may puncture the drain pan and cause water leakage.

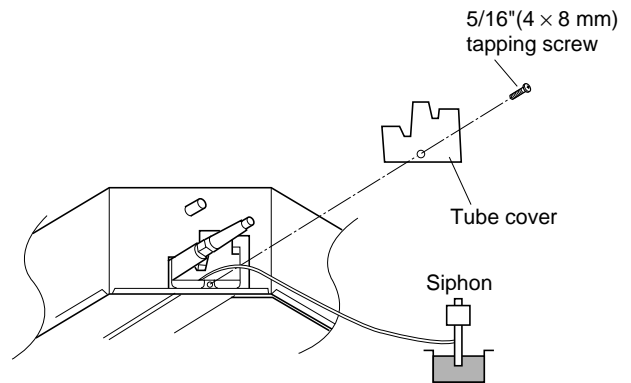


Fig. 3-12

0966_X_I

■ Ceiling Panel

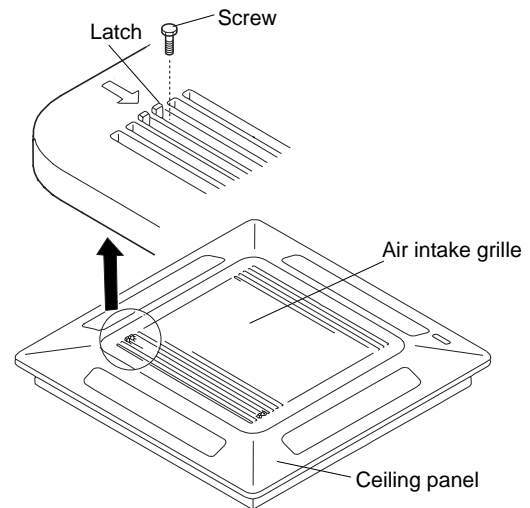


CAUTION

Never touch or attempt to move the air direction louver by hand or you may damage the unit. Instead, use the remote control unit if you want to change the direction or air flow.

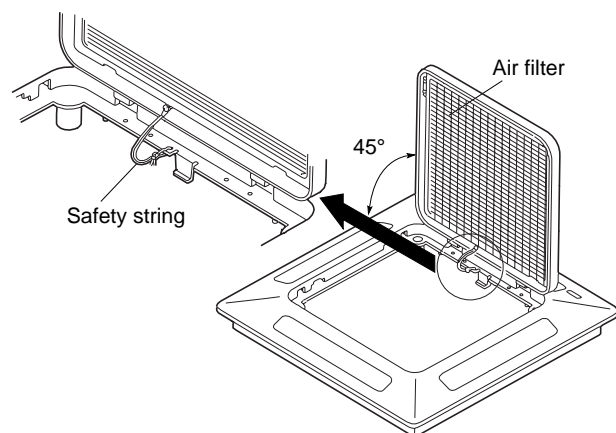
3-6. Before Installing the Ceiling Panel

- (1) Remove the air-intake grille and air filter from the ceiling panel. (Figs. 3-13 and 3-14)
 - (a) Remove the 2 screws on the latch of the air-intake grille. (Fig. 3-13)
 - (b) Press on the 2 latches of the air-intake grille with your thumb in the direction of the arrow to open the grille. (Fig. 3-13)
 - (c) With the air-intake grille open about 45°, remove the safety string (hook on the grille side). (Fig. 3-14)
 - (d) Pull the air-intake grille towards you to remove it from the ceiling panel.
- (2) Pull down the two panel catches on the body of the indoor unit body. (Fig. 3-15)



0149_X_I

Fig. 3-13



0150_X_I

Fig. 3-14

3-7. Installing the Ceiling Panel

- (1) Lift the ceiling panel and position it to align the panel hook with the panel catch of the indoor unit.

NOTE

The ceiling panel must be mounted in the correct direction. Note that the 2 catches of the panel differ in size.

Confirm that the catches are correctly matched between the ceiling panel and the indoor unit body.

- (2) Next, check to see that the ceiling panel is properly aligned with the seamline of the ceiling. If it is not, remove the ceiling panel and slightly readjust the indoor unit body to the proper suspension point.
- (3) When the ceiling panel has been properly aligned, use the supplied 4 mounting screws (M5) with washers to permanently fasten the ceiling panel.
- (4) Install the wiring connector from the ceiling panel to the connector in the electrical component box of the indoor unit. After installing the connector, use the clamp on the body of the indoor unit to secure the wiring.

- (5) Install the air filter and air-intake grille by performing the steps in section 3-6 in reverse.

NOTE

Rehook the safety string before closing the air-intake grille.

3-8. When Removing the Ceiling Panel for Servicing

When removing the ceiling panel for servicing, remove the air-intake grille and air filter, disconnect the wiring connector inside the electrical component box, and then remove the 4 mounting screws.

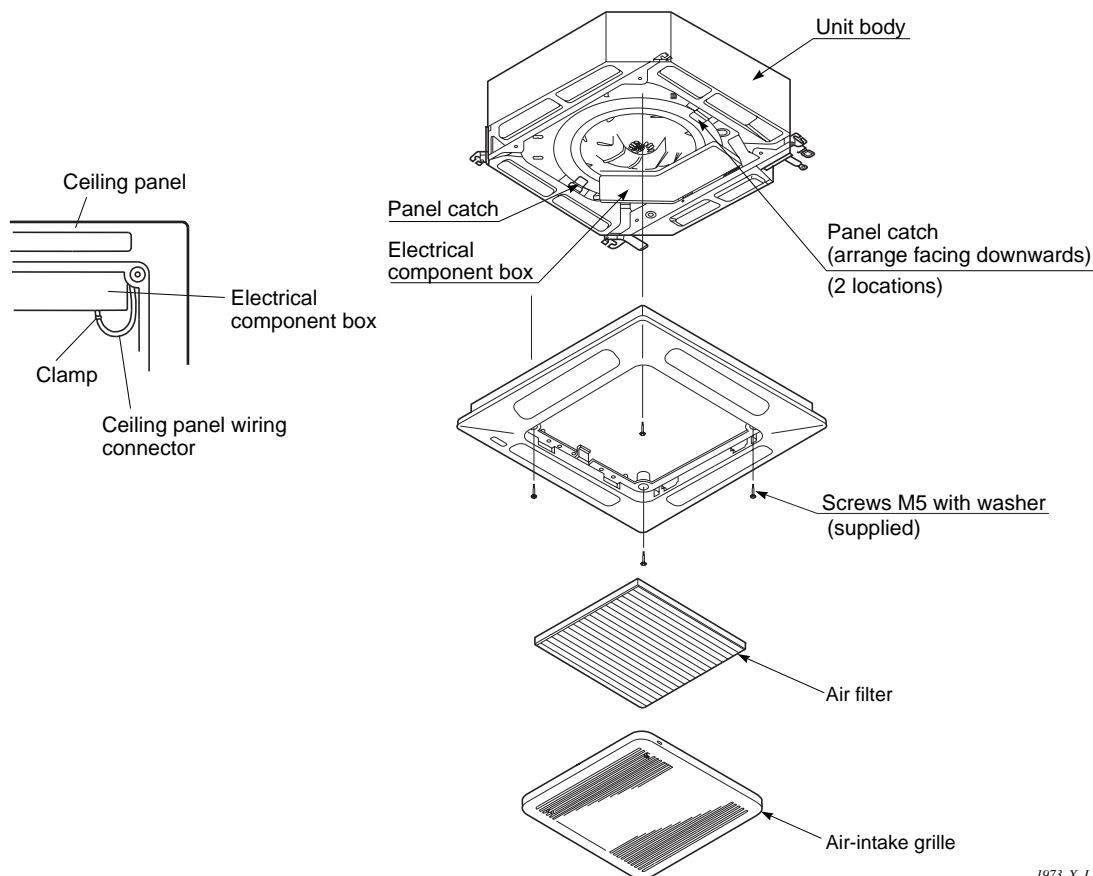


Fig. 3-15

1973_X_1

3-9. Duct for Fresh Air

- There is a duct connection part on sideface of the indoor unit. (Fig. 3-16)
- Optional air-intake plenum (including duct connection box and flange) can be attached to the indoor unit.

Air-intake plenum	Type
CMB-GSJ80U	PNR-XH2442 (XH1242, XH1842, XH2442)
CMB-GSJ140U	PNR-XH3642 (XH3642, XH4242)

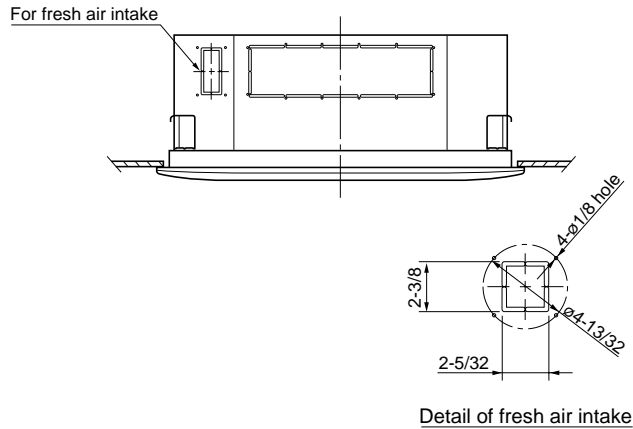


Fig. 3-16

(1) Accessories

- Check that the following parts are in the box when unpacking.

NAME	QTY	REMARKS
Cord with socket (9P)	1	Connecting line. Not necessary for intaking fresh air.
Screw (M5 × L5 in.)	4	Air-intake filter (for fastening)
Screw (M4 × L1/2 in.)	7	Duct connection flange/ box (for fastening)
Duct connection box	1	(for fresh air)
Duct connection flange	1	(for connecting fresh air duct)

(2) Installation

- Installation steps (a) to (e) are the same for both the CMB-GSJ80U and the GSJ140U. The drawing illustrates installation of air-intake plenum to the CMB-GSJ80U.

(a) Installing the air-intake plenum

- Set the air-intake plenum to the indoor unit taking care not to set the incorrect direction. (Fig. 3-17)
- Fasten the air-intake plenum with the accessory screws. (M5 × L5 in., 4pcs) (Fig. 3-17)

(b) Installing the duct connection box

- Fasten the duct connection flange to the duct connection box with the accessory screws. (M4 × L1/2 in., 4pcs) (Fig. 3-18)
- Put the duct connection box into the rectangular hole of the air-intake plenum and fasten it to the both sides of the indoor unit and plenum with the accessory screws. (M4 × L1/2 in., 3pcs) (Fig. 3-18)

(c) Installing the indoor unit

- Install the indoor unit to the ceiling.
(Install the indoor unit according to items 3-1 to 3-6.)

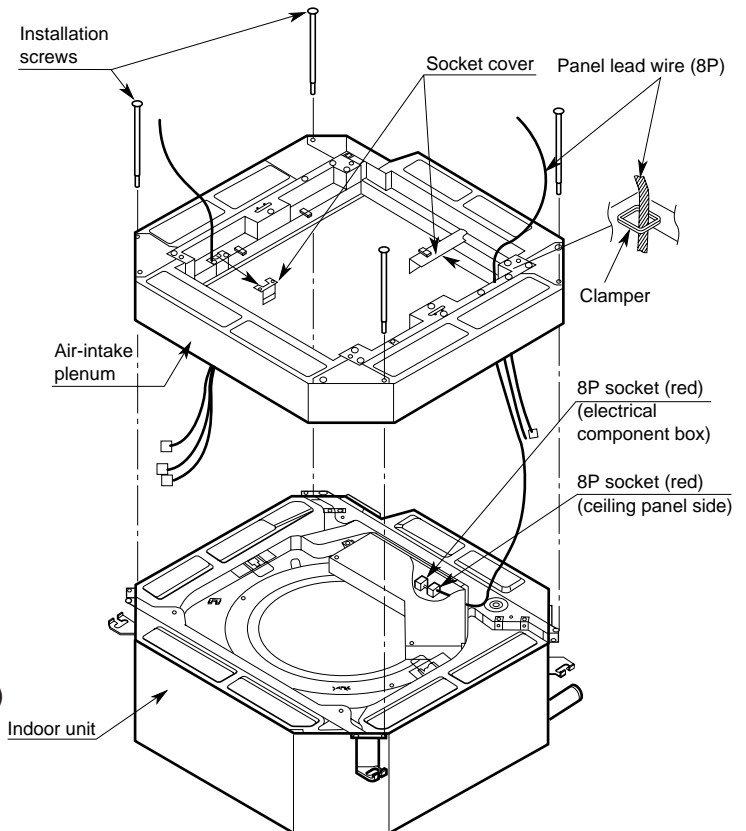


Fig. 3-17



CAUTION

When installing in a pre-existing location, install the indoor unit before installing the duct connection box.

(e) Installing the ceiling panel

- Attach the ceiling panel to the chamber.
Drawing the panel downwards sets the panel in position temporarily with the panel catch (at 2 locations).
- Remove the socket cover of the air-intake plenum and pass the 8P sockets through it. (Fix the panel lead wire to chamber side clamber.) (Fig. 3-17)
- Connect the 8P socket (electrical component box side) to the 8P socket (ceiling panel side) of the indoor unit electrical component box.
- Reattach the socket cover.

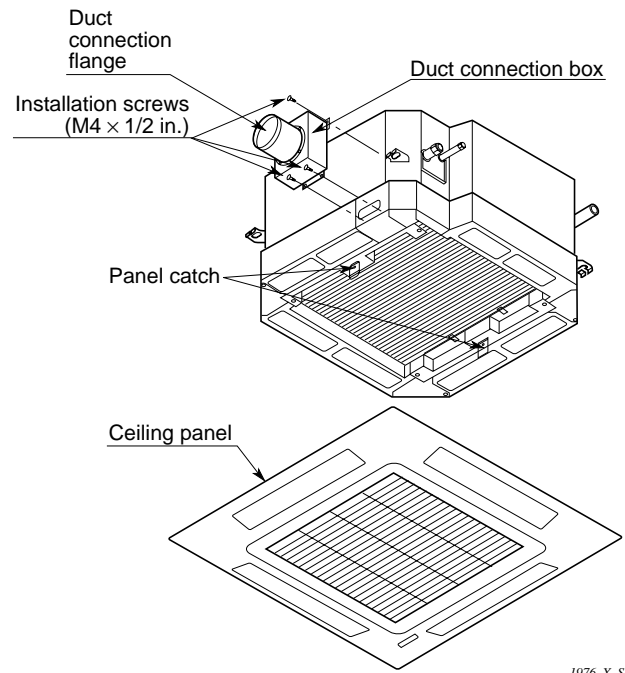


Fig. 3-18

1976_X_S



■ Wall-Mounted Type (KH Type)

3-10. Removing the Wall Fixture from the Unit

KH2442

Remove and discard the set screws and take off the wall fixture. (Fig. 3-19)

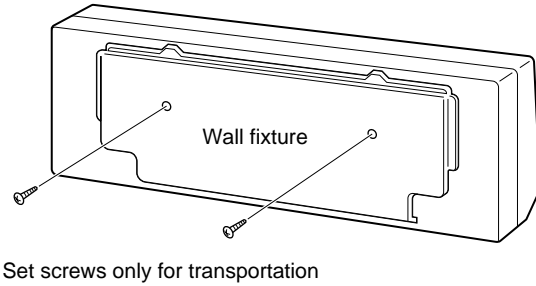


Fig. 3-19

3-11. Selecting and Making a Hole

KH2442

- (1) Tape the full-scale installation diagram on the wall at the location selected. Make sure the unit is horizontal, using a level or tape measure to measure down from the ceiling. (Fig. 3-20)
- (2) Before drilling a hole, check that there are no studs or pipes behind the determined location.

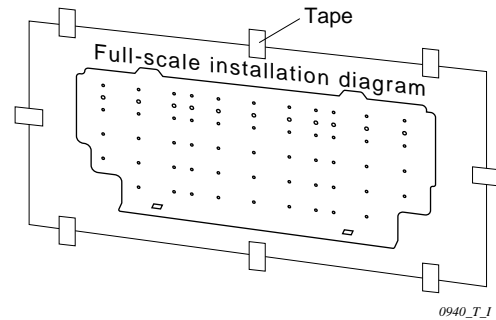


Fig. 3-20



CAUTION

Avoid area where electrical wiring or conduit is located. Also take this precaution if the tubing goes through a wall at any other location.

NOTE

- (3) Using a sabre saw, key hole saw or 3-5/32 in. hole-cutting drill attachment, make a hole in the wall. The required minimum hole diameter for these models is 3-3/16 in. (Fig. 3-21)
- (4) Measure the thickness of the wall from the inside edge to the outside edge and cut PVC pipe at a slight angle 1/4 in. shorter than the thickness of the wall. (Fig. 3-22)
- (5) Place the plastic cover over the end of the pipe, (for indoor side only) and insert in the wall. (Fig. 3-23)

Hole should be made at a slight downward slant to the outdoor side.

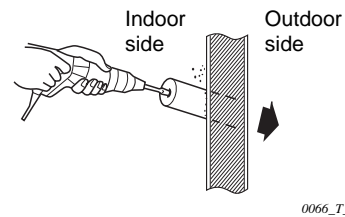
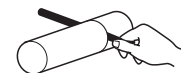


Fig. 3-21

PVC pipe (locally purchased)



Cut at slight angle

0941_T_I

Fig. 3-22

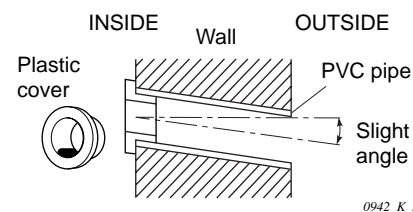


Fig. 3-23

KH3642

One hole is required for the air conditioner tubing, and may be either on the left or right side. (Also see section 3-14. Preparing the Indoor Side Tubing.)

- (1) Tape the full-scale installation diagram on the wall at the location selected. Make sure the unit is horizontal, using a level or tape measure to measure down from the ceiling. (Fig. 3-24)
- (2) Determine if the hole is to be drilled at the left or right hole location.
- (3) Before drilling a hole, check that there are no studs or pipes behind the determined location.



CAUTION

Avoid area where electrical wiring or conduit is located. Also take this precaution if the tubing goes through a wall at any other location.

- (4) Using a sabre saw, key hole saw or 3-5/32 in. hole-cutting drill attachment, make a hole in the wall. The required minimum hole diameter for these models is 3-3/16 in. (Fig. 3-25)
- (5) Measure the thickness of the wall from the inside edge to the outside edge and cut PVC pipe at a slight angle 1/4 in. shorter than the thickness of the wall. (Fig. 3-26)
- (6) Place the plastic cover over the end of the pipe, (for indoor side only) and insert in the wall. (Fig. 3-27)

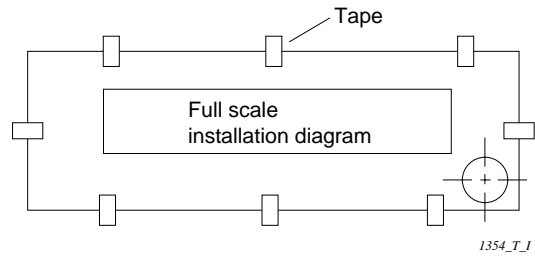


Fig. 3-24

NOTE

Hole should be made at a slight downward slant to the outdoor side.

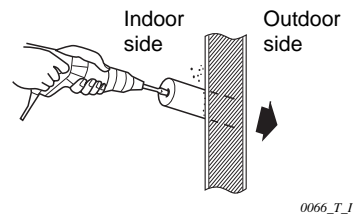
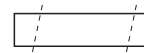
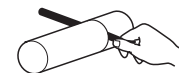


Fig. 3-25

PVC pipe (locally purchased)



Cut at slight angle

0941_T_I

Fig. 3-26

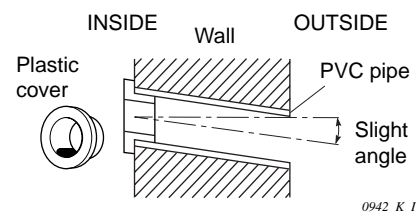


Fig. 3-27

3-12. Installing the Wall Fixture onto Wooden or Gypsum Wall

KH2442

Confirm that the wall is strong enough to support the unit.

a) If the Wall is Wooden

- (1) Attach the wall fixture to the wall with the 9 screws provided. (Fig. 3-28)
If you are not able to line up the holes in the wall fixture with the beam locations marked on the wall, use rawl plugs or toggle bolts to go through the holes on the panel or drill 3/16 in. dia. holes in the panel over the stud locations and then mount the wall fixture.
- (2) Check with a tape measure or carpenter's level. This is important so that the unit is correctly installed.
- (3) Make sure the wall fixture is flush against the wall. Any space between the wall and unit will cause noise and vibration.

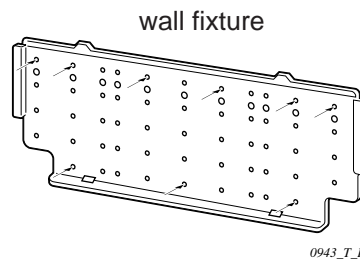


Fig. 3-28

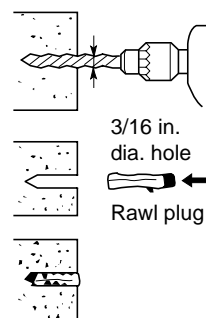


Fig. 3-29

b) If the Wall is Brick, Concrete or Similar

Drill 3/16 in. dia. holes in the wall. Insert rawl plugs for appropriate mounting screws. (Fig. 3-29)

KH3642

Confirm that the wall is strong enough to support the unit.

a) If the Wall is Wooden

- (1) Attach the wall fixture to the wall with the 12 screws provided. (Fig. 3-30) If you are not able to line up the holes in the wall fixture with the beam locations marked on the wall, use rawl plugs or toggle bolts to go through the holes on the panel or drill 3/16 in. dia. holes in the wall fixture over the stud locations.
- (2) Check with a tape measure or carpenter's level that the wall fixture is level. This is important so that the unit is correctly installed.
- (3) Make sure the wall fixture is flush against the wall. Any space between the wall and unit will cause noise and vibration.

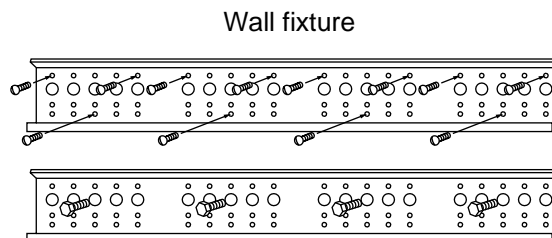


Fig. 3-30

b) If the Wall is Brick, Concrete or Similar

Drill 3/16 in. dia. holes in the wall. Insert rawl plugs for appropriate mounting screws. (Fig. 3-29)

3-13. Removing the Casing to Install the Indoor Unit

KH2442

How to Remove the Casing

- (1) Remove the plastic cover. (Fig. 3-31)
- (2) Remove the clamp for the wiring connector. (Fig. 3-32)
- (3) Disconnect the wiring connector. (Fig. 3-33)
- (4) Set the flap in the horizontal position. (Fig. 3-34)
- (5) Remove the 3 screws. (Fig. 3-34)
- (6) Remove the casing. (Fig. 3-34)

NOTE

When replacing the casing, be careful not to crush the lead wires between the casing and the frame. (Fig. 3-34)

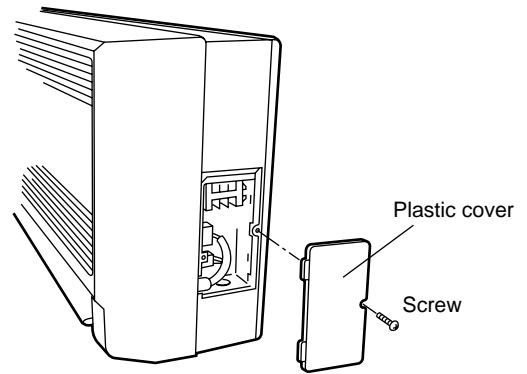


Fig. 3-31

0945_T_I

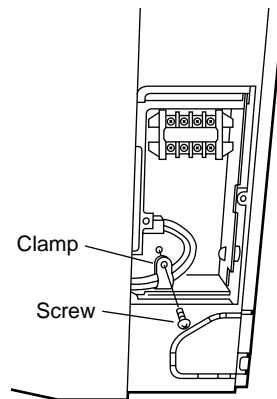


Fig. 3-32

2023_T_I

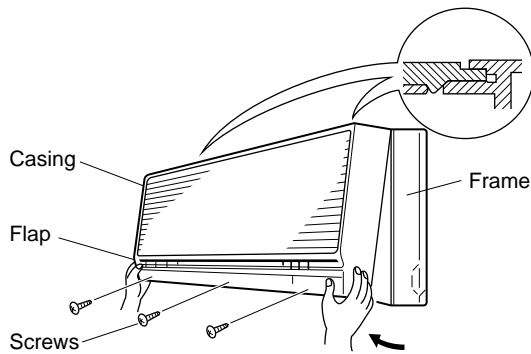


Fig. 3-34

0947_T_I

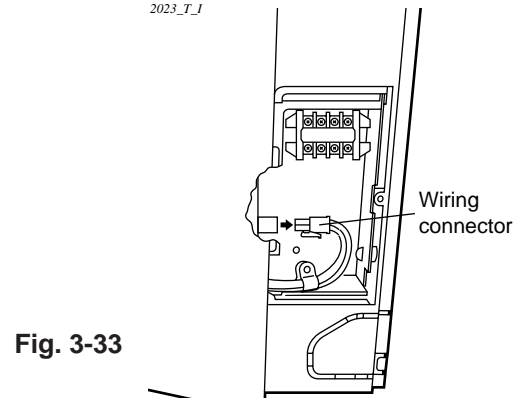


Fig. 3-33

2024_T_I

3-14. Preparing the Indoor Side Tubing

KH2442

Tubing can be extended in 4 directions as shown in Fig. 3-35.

Arrangement for Left Tubing

- (a) Cut out the left tubing outlet. (Fig. 3-36)

Arrangement for Right Tubing

- (a) Cut out the right tubing outlet using a hacksaw. (Fig. 3-37)

Arrangement for Left-rear and Right-rear Tubing.

- (a) It is not necessary to cut a hole.

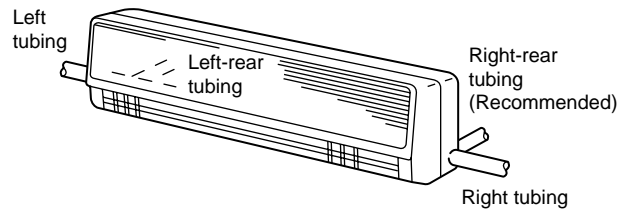


Fig. 3-35

0949_T_I

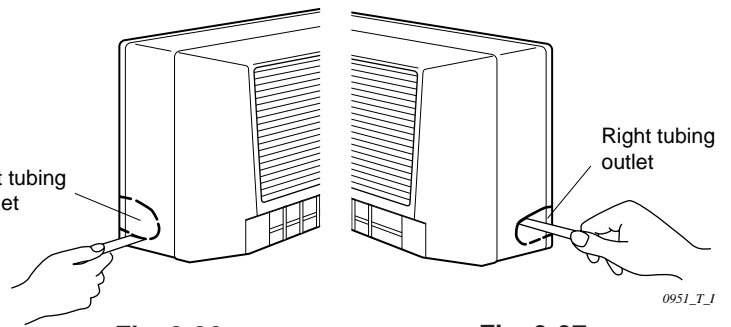


Fig. 3-36

0950_T_I

Fig. 3-37

0951_T_I

KH3642

Tubing can be extended in 4 directions as shown in Fig. 3-35.

Arrangement for Right-rear Tubing

- (a) Remove the 2 screws and slide out the side cover. (Fig. 3-38)
 (b) Extend the wide tube from the outdoor side and connect it directly to the mating tube inside the indoor unit. Use a flare nut. (Fig. 3-39)

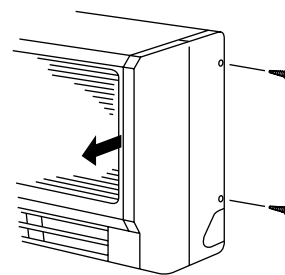


Fig. 3-38

1356_T_I

Arrangement for Right Tubing

- (a) Remove the 2 screws and take off the side cover. (Fig. 3-38)
 (b) Cut out the L-shaped tubing outlet using a hacksaw. (Fig. 3-40)
 (c) Using the L-shaped tube (field supply), connect tubing between the indoor and outdoor units. (Fig. 3-42)

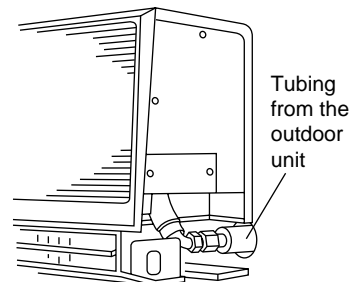


Fig. 3-39

1357_T_I

Arrangement for Left and Left-rear Tubing.

- (a) Remove the 4 screws (2 on each side) and take off both left and right side cover. (Fig. 3-41)
 (b) Remove 4 screws to remove the bottom cover.
 (c) Using the L-shaped tube (field supply), connect tubing as in Fig. 3-43.

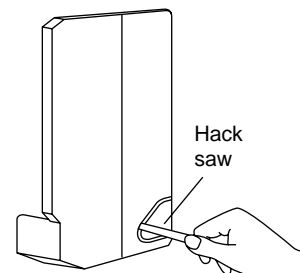


Fig. 3-40

1358_T_I

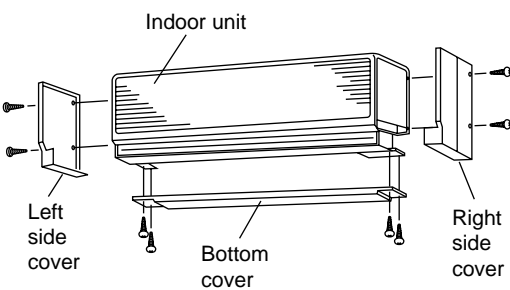


Fig. 3-41

1361_T_I

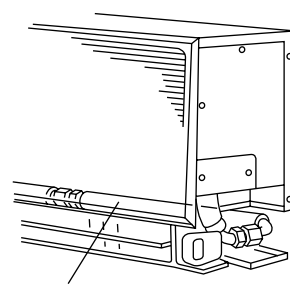


Fig. 3-42

1360_T_I

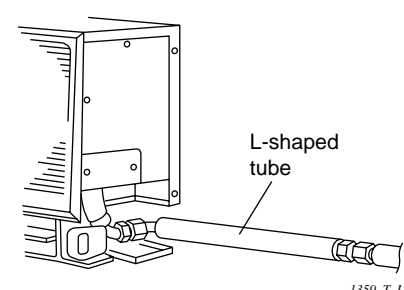


Fig. 3-43

1359_T_I

3-15. Wiring Instructions

General Precautions on Wiring

- (1) Before wiring, confirm the rated voltage of the unit as shown on its name plate, then carry out the wiring closely following the wiring diagram.
- (2) Provide a power outlet to be used exclusively for each unit a power supply disconnect and circuit breaker for overcurrent protection should be provided in the exclusive line.
- (3) To prevent possible hazards from insulation failure, the unit must be grounded.
- (4) All wiring must be connected tightly.
- (5) Do not allow wiring to touch refrigerant tubing, compressor, or any moving parts of the fan.



WARNING

Unauthorized changes in the internal wiring can be very dangerous. The manufacturer will accept no responsibility for any damage or misoperation that occurs as a result of such unauthorized changes.

3-16. Wiring Instructions for Inter-Unit Connections

- (a) Insert the inter-unit wiring (according to local codes) into the through-the-wall PVC pipe. Run the wiring toward the indoor side allowing approx. 5". to extend from the wall face. (Fig. 3-44)



Never fix the wiring by any means before the indoor unit is fully seated on the rear panel.

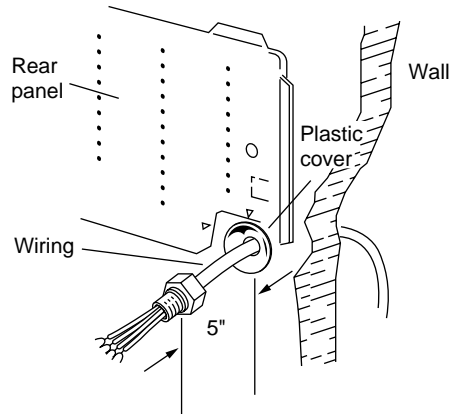
- (b) Remove the side cover and the metallic cover. (Fig. 3-45 or 3-46, depending on model.)
- (c) Secure the conduit connector to the chassis with a lock nut. (Fig. 3-45 or 3-46)
- (d) Give some play to the inter-unit wiring from the outdoor unit to the corresponding terminals on the terminal plate.



- **Be sure to refer to the wiring system diagram label inside the metallic cover and carry out the correct field wiring. Wrong wiring can cause the unit to malfunction.**
- **Check local electrical codes and any specified wiring instructions or limitations.**

- (e) Secure the metallic cover with its screw. Then replace the side cover.

KH2442



1362_T_I

KH3642

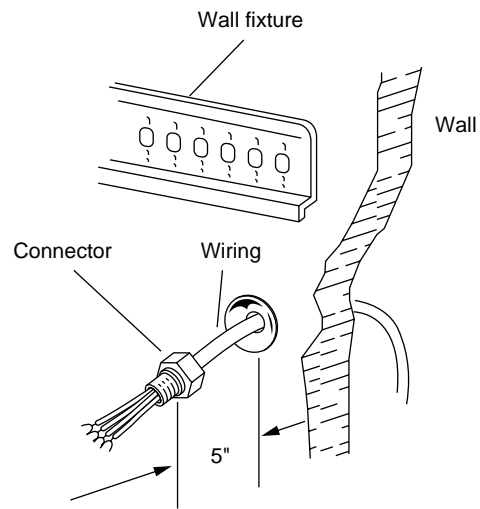


Fig. 3-44

1363_T_I

KH2442

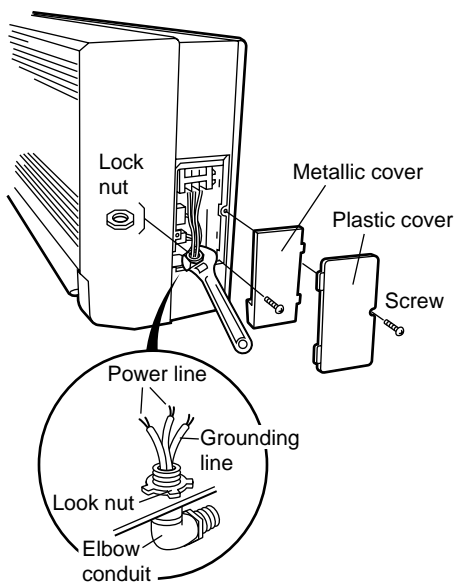


Fig. 3-45

0968_T_I

KH3642

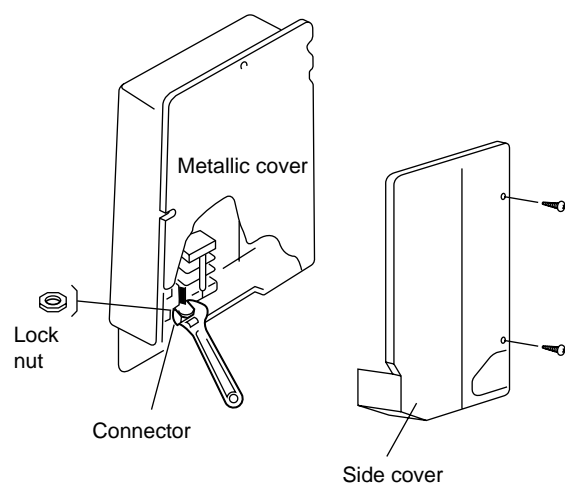


Fig. 3-46

1395_T_I

3-17. Shaping the Tubing

KH2442

- (1) Shape the refrigerant tubing so that it can easily go into the hole. (Fig. 3-47)
- (2) Push the wiring, refrigerant tubing and drain hose through the hole in the wall. Adjust the indoor unit so it is securely seated on the wall fixture.
- (3) Carefully bend the tubing (if necessary) to run along the wall in the direction of the outdoor unit and then insulate to the end of the fittings. The drain hose should come straight down the wall to a point where water runoff will not stain the wall.
- (4) Connect the refrigerant tubing to the outdoor unit. (After performing a leak test on the connection, insulate it with insulating tape. (Fig. 3-48)) Also, refer to Section 10-5. "Connecting Tubing between Indoor and Outdoor Units".
- (5) Assemble the refrigerant tubing, drain hose and inter-unit wiring as shown in Fig. 3-49.

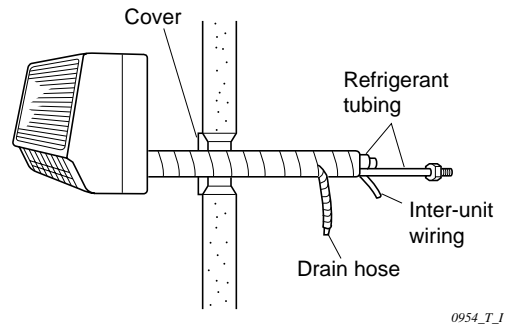


Fig. 3-47

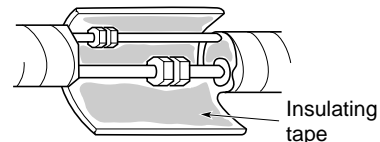


Fig. 3-48

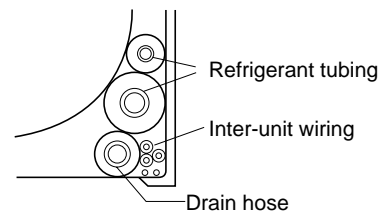


Fig. 3-49

KH3642

- (1) Shape the narrow refrigerant tube and the drain hose in the desired direction so that they can easily go into the wall hole. (Fig. 3-50)
- (2) Push the wiring, narrow tube, and drain hose through the hole in the wall.
- (3) Bend the tubing (if necessary) to run along the wall in the direction of the outdoor unit, then tape as far as the fittings. The drain hose should come straight down the wall to a point where runoff won't stain the wall.
- (4) Hang the indoor unit on the wall fixture. (Fig. 3-51)
- (5) Install the mounting plate to secure the indoor unit solidly to the wall. The plate can be positioned in either of the 2 ways shown. (Fig. 3-52)

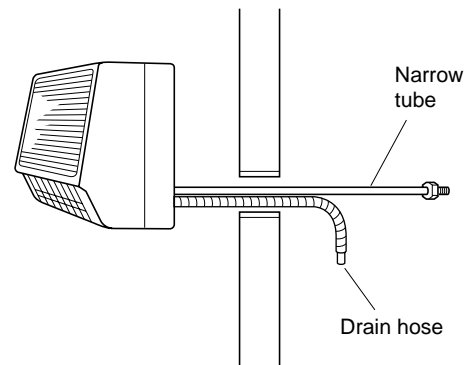


Fig. 3-50

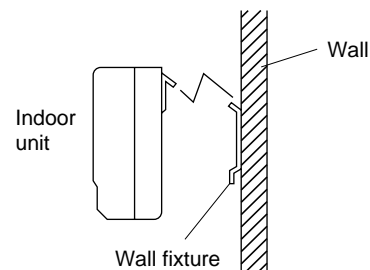


Fig. 3-51

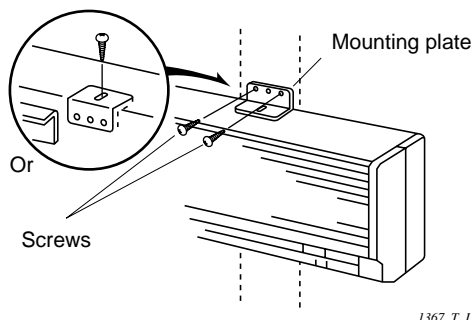


Fig. 3-52

3-18. Installing the Drain Hose

- (a) The drain hose should be slanted downward on the outdoor side. (Fig. 3-53)
- (b) Never form a trap in the course of the hose.
- (c) If the drain hose will run in the room, insulate* the hose so that chilled condensation will not damage furniture or floors. (Fig. 3-54)

* Foamed polyethylene or its equivalent is recommended.



WARNING

Do not supply power to the unit or operate it until all tubing and wiring to the outdoor unit are completed.

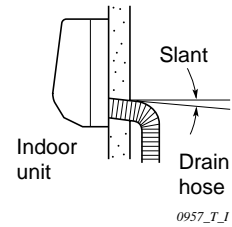


Fig. 3-53

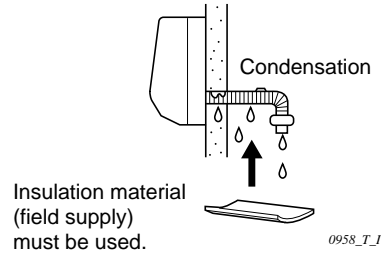


Fig. 3-54

■ Ceiling-Mounted Type (TH Type)

3-19. Suspending the Indoor Unit

- (1) Place the full-scale diagram (supplied) on the ceiling at the spot where you want to install the indoor unit. Use a pencil to mark the drill holes. (Fig. 3-55).

NOTE

Since the diagram is made of paper, it may shrink or stretch slightly because of high temperature or humidity. For this reason, before drilling the holes maintain the correct dimensions between the markings.

- (2) Drill holes at the 4 points indicated on the full-scale diagram.
- (3) Depending on the ceiling type:
 - a) Insert suspension bolts as shown in Fig. 3-56.
or
 - b) Use existing ceiling supports or construct a suitable support as shown in Fig. 3-57.



WARNING

It is important that you use extreme care in supporting the indoor unit from the ceiling. Ensure that the ceiling is sufficiently strong enough to support the weight of the unit. Before hanging the ceiling unit, test the strength of each attached suspension bolt.

- (4) Screw in the suspension bolts, allowing them to protrude from the ceiling as shown in Fig. 3-57. The distance of each exposed bolt must be of equal length within 2 inches. (Fig. 3-58)

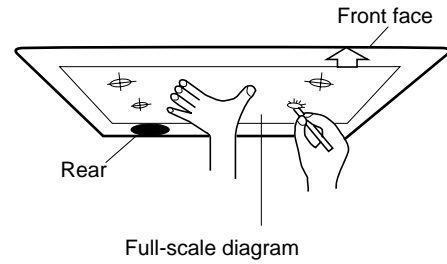


Fig. 3-55

0035_T_I

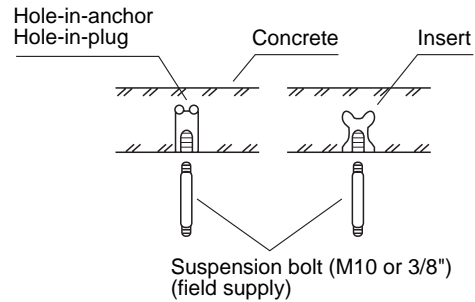


Fig. 3-56

0038_T_I

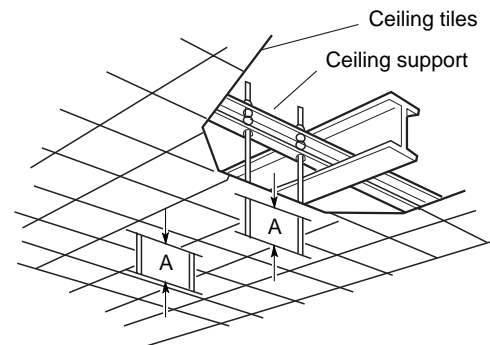


Fig. 3-57

0084_T_I

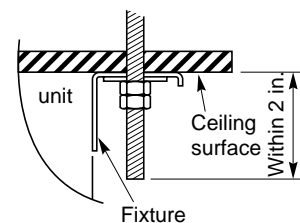


Fig. 3-58

0971_T_I

3

T

- (5) Before suspending the indoor unit, remove the 2 screws on the latch of the air-intake grilles, open the grilles, and remove them by pushing the claws of the hinges as shown in Fig. 3-59. Then remove both side panels sliding them along the unit toward the front after removing the two screws which fix them. (Fig. 3-60)
- (6) Preparation for suspending the indoor unit. The suspension method varies depending on whether the unit is next to the ceiling or not. (Fig. 3-61 and 3-62)
- (7) Suspend the indoor unit as follows.
 - (a) Mount a washer and two hexagonal nuts on each suspension bolt as shown in Fig. 3-63.

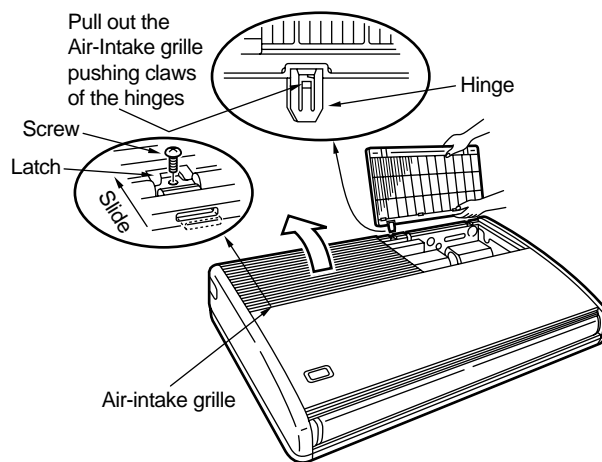


Fig. 3-59

0973_T_I

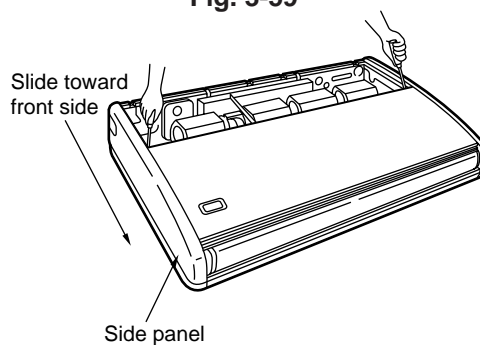


Fig. 3-60

0972_T_I

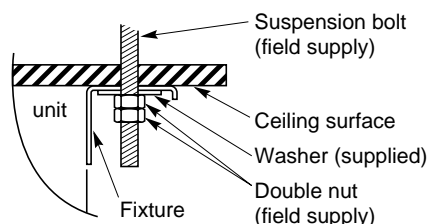


Fig. 3-61

0974_T_I

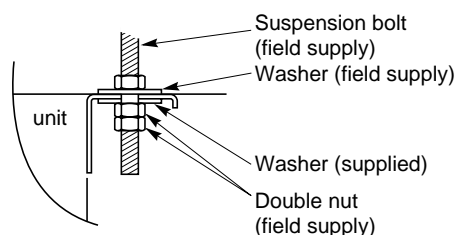


Fig. 3-62

0976_T_I

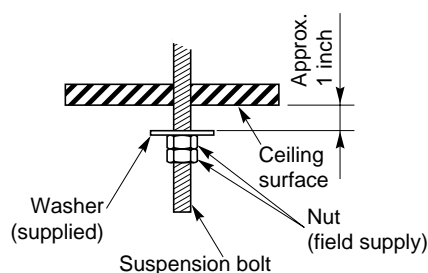


Fig. 3-63

1096_T_I

- (b) Lift the indoor unit, and place it on the washers through the notches, so as to fix it in place. (Fig. 3-64)
- (c) Tighten the two hexagonal nuts on each suspension bolt to suspend the indoor unit as shown in Fig. 3-65.

NOTE

A ceiling surface is not always level. Please confirm that the indoor unit is evenly suspended. For the installation to be correct, leave a clearance of about 3/8 in. between the ceiling panel and the ceiling surface and fill the gap with an appropriate insulation or filler material.

- (8) If the tubing and wiring are to go towards the rear of the unit, make holes in the wall. (Fig. 3-66)
- (9) Measure the thickness of the wall from the inside to the outside and cut PVC pipe at a slight angle to fit. Insert the PVC pipe in the wall. (Fig. 3-67)

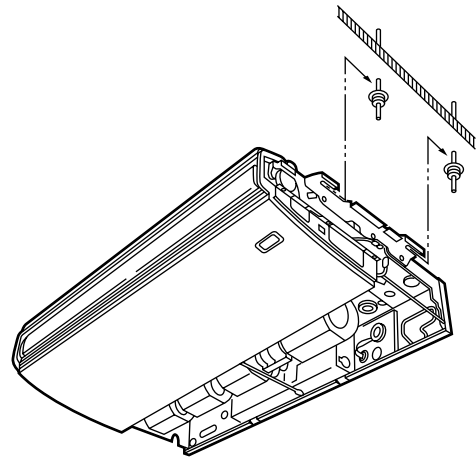


Fig. 3-64

0978_T_I

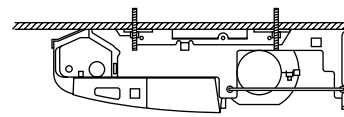


Fig. 3-65

0979_T_I

NOTE

The hole should be made at a slight downward slant to the outside.

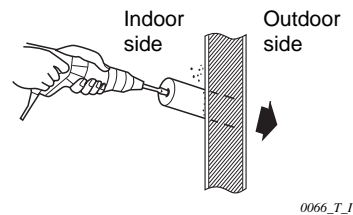


Fig. 3-66

0066_T_I

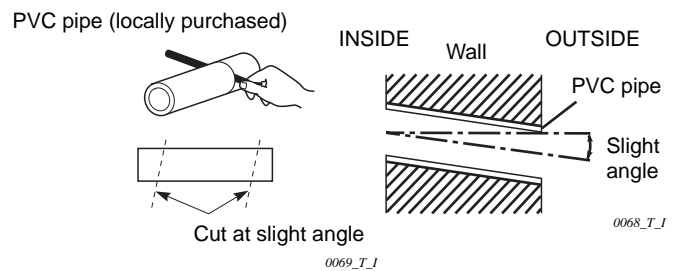


Fig. 3-67

0068_T_I



3-20. Duct for Fresh Air

There is a duct connection port (knock-out hole) at the right-rear on the Panel Top of the indoor unit for drawing in fresh air. If it is necessary to draw in fresh air, remove the cover by knocking out and connect the duct to the indoor unit through the connection port. (Fig. 3-68)

If connection at the right-rear on the Panel Top is not appropriate, another duct connection port can be made by cutting an opening on the left side of the Rear Panel of the indoor unit as shown in Fig. 3-69.

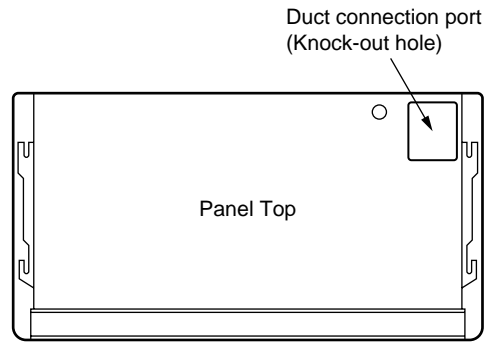


Fig. 3-68

1017_M_I

3-21. Installing the Drain Piping

- Prepare a standard PVC pipe for the drain and connect it to the indoor unit drain pipe with the supplied hose clamps to prevent water leaks.
- Connect the drain piping so that it slopes downward from the unit to the outside. (Fig. 3-70)
- Never allow traps to occur in the course of the piping.
- Insulate any piping inside the room to prevent dripping.
- Use the supplied drain pipe to connect the drain pipe with the drain outlet of the indoor unit.
- After connecting the drain pipe securely, wrap the supplied drain pipe insulator around the pipe, seal the gap at the drain socket with the supplied black insulation tape, then secure it with clamps. (Fig. 3-71)
- After the drain piping, pour water into the drain pan to check that the water drains smoothly.

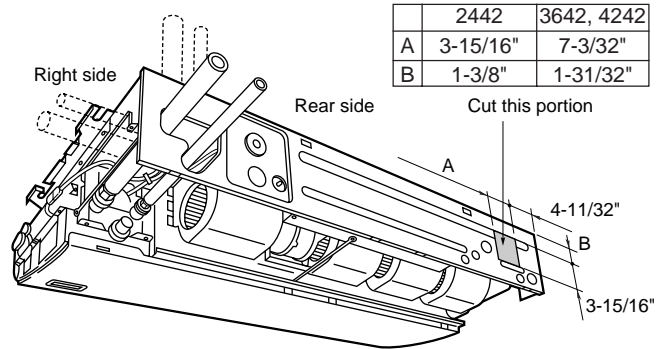


Fig. 3-69

1353_M_I

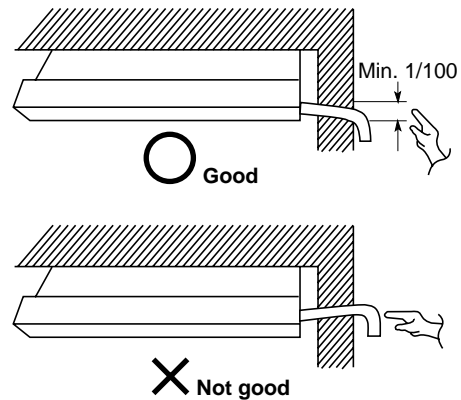


Fig. 3-70

0961_T_I



Check local electrical codes and regulations before obtaining wire. Also, check any specified instruction or limitations.

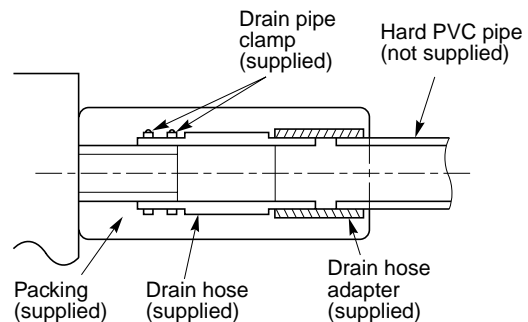


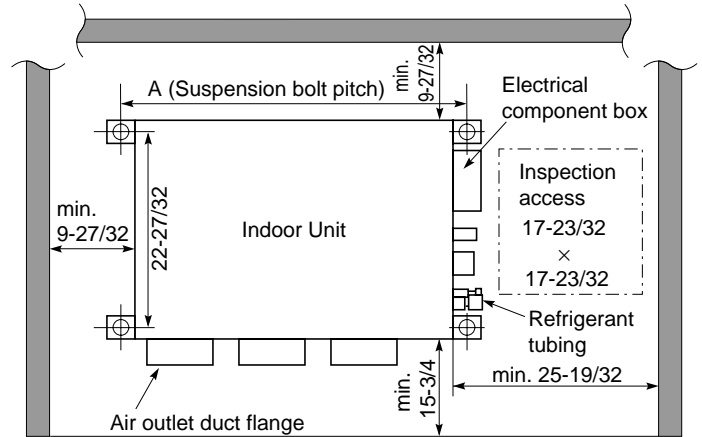
Fig. 3-71

1119_X_I

■ Concealed-Duct Type (UH Type)

3-22. Required Minimum Space for Installation and Service

- This air conditioner is usually installed above the ceiling so that the indoor unit and ducts are not visible. Only the air intake and air outlet ports are visible from below.
- The minimum space for installation and service is shown in Fig. 3-72 and Table 3-3.
- It is recommended that space is provided (17-23/32 × 17-23/32 in.) for checking and servicing the electrical system.
- Fig. 3-73 and Table 3-4 show the detailed dimensions of the indoor unit.



Unit: inch
1977_U_J

Table 3-3 Unit: inch (mm)

Type	12, 18	24	36
A (Length)	30-23/32 (780)	42-17/32 (1,080)	61-13/32 (1,560)
Number of duct flanges	2	3	4

Fig. 3-72

Table 3-4 Unit: inch

Dimension Type	A	B	C	D	E	F	G	H	I	J	K	No. of holes	
												L	M
UH1242, UH1842	26-1/16	23-5/8 (7-7/8×3)	27-9/16	30-23/32	11-13/32	10-5/16	26-25/32	28-5/32	7-3/32	—	13-3/8	8	12
UH2442	37-7/8	35-7/16 (7-3/32×5)	39-3/8	42-17/32	11-13/32	10-23/32	38-19/32	39-31/32	5-1/8	9-21/32 (9-21/32×1)	9-27/32	12	16
UH3642	56-25/32	54-11/32 (9-1/16×6)	58-9/32	61-13/32	13-3/16	12-7/32	57-15/32	58-27/32	5-1/8	19-9/32 (9-21/32×2)	9-7/16	16	18

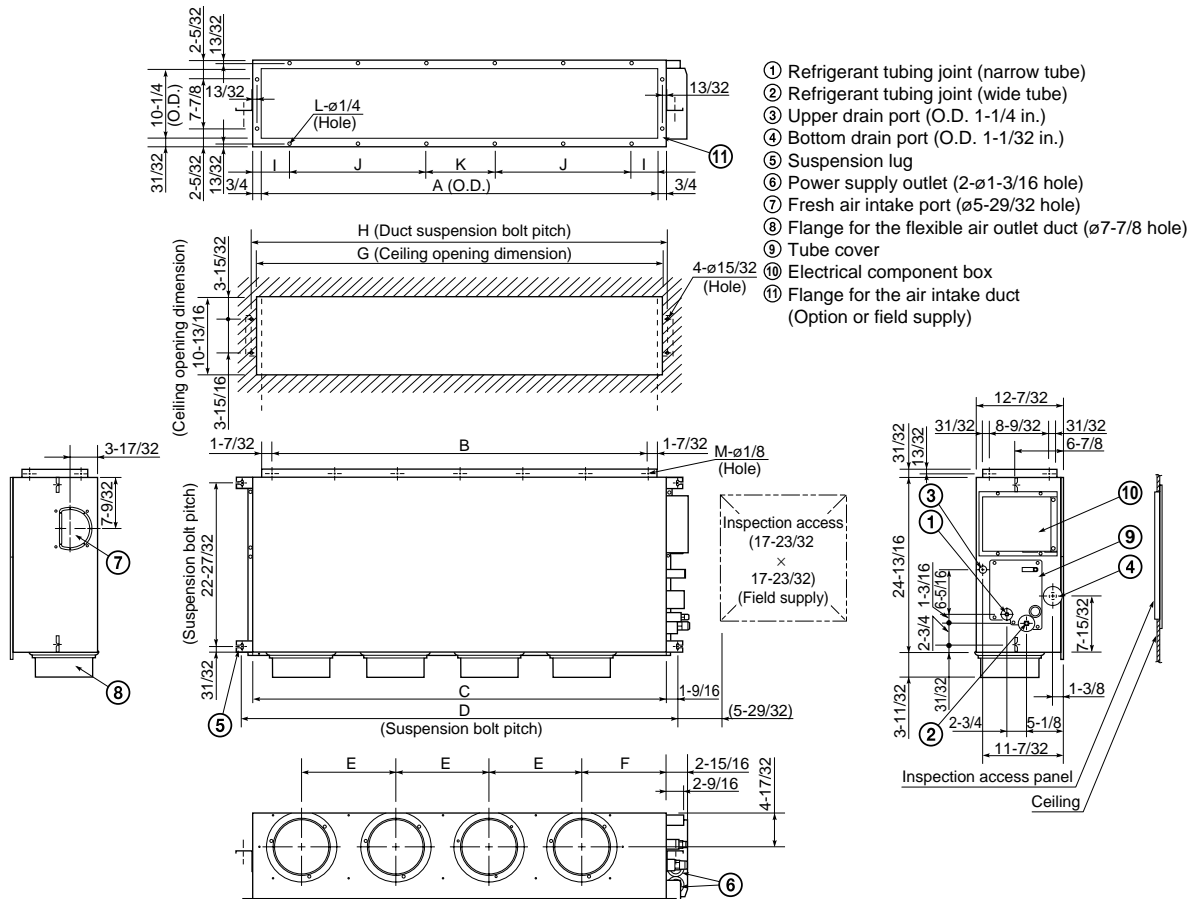


Fig. 3-73

1978_U_J

3-23. Suspending the Indoor Unit

Depending on the ceiling type:

- Insert suspension bolts as shown in Fig. 3-74 or
- Use existing ceiling supports or construct a suitable support as shown in Fig. 3-75.



WARNING

It is important that you use extreme care in supporting the indoor unit inside the ceiling. Ensure that the ceiling is strong enough to support the weight of the unit. Before hanging the unit, test the strength of each attached suspension bolt.

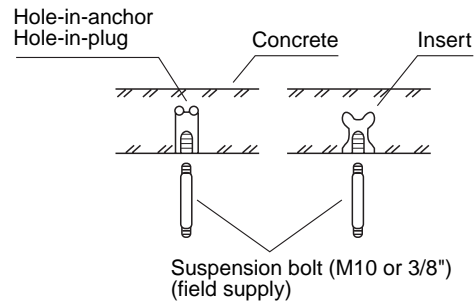


Fig. 3-74

0038_T_1

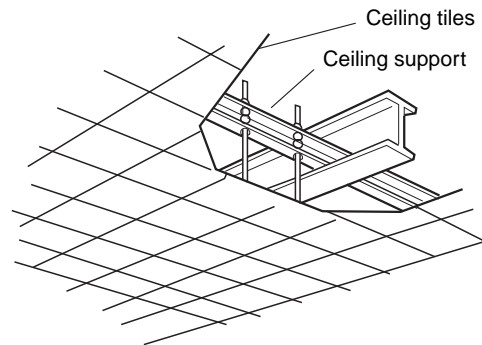


Fig. 3-75

0039_S_1

- (1) When placing the unit inside the ceiling, determine the pitch of the suspension bolts referring to the dimensional data on the previous page. (Fig. 3-73)

Tubing must be laid and connected inside the ceiling when suspending the unit. If the ceiling is already constructed, lay the tubing into position for connection to the unit before placing the unit inside the ceiling.

- (2) Screw in the suspension bolts allowing them to protrude from the ceiling as shown in Fig. 3-74. (Cut the ceiling material, if necessary.)
- (3) Thread the 2 hexagonal nuts and washers (field supply) onto the 4 suspension bolts as shown in Figs. 3-76 and 3-77. Use 2 sets of nuts and washers (upper and lower), so that the unit will not fall off the suspension lugs.

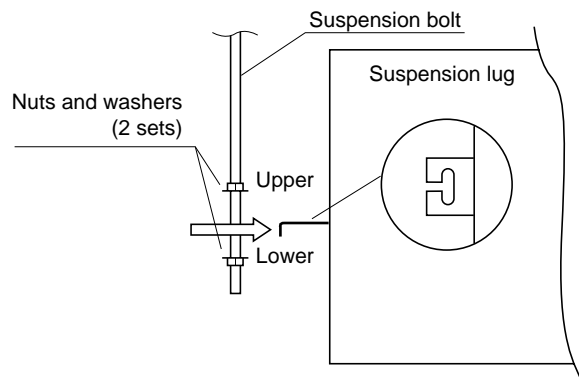


Fig. 3-76

0041_X_1

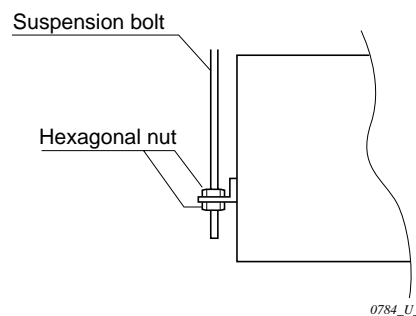


Fig. 3-77

0784_U_1

- Fig. 3-78 shows an example of installation.

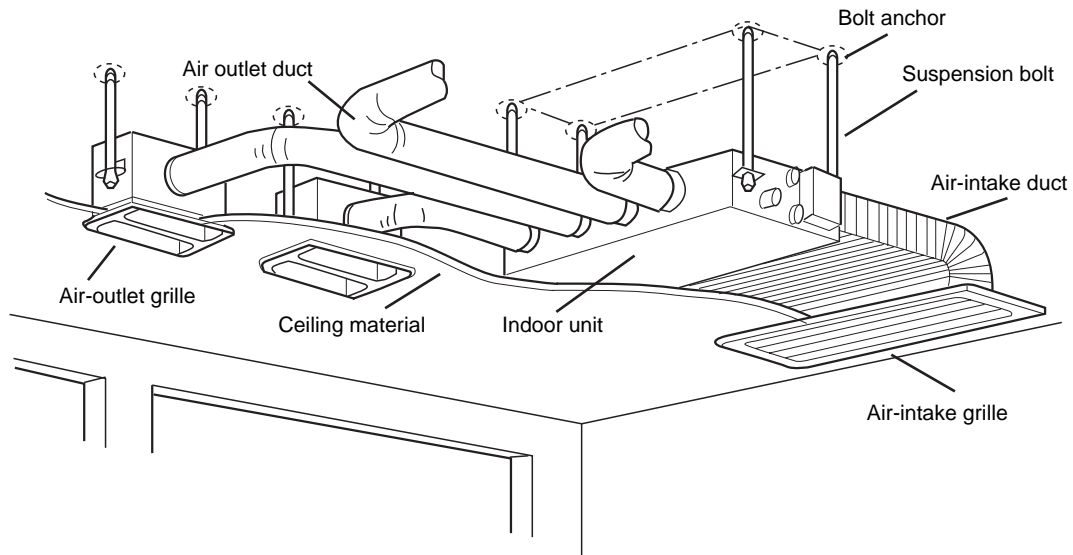


Fig. 3-78

0785_U_I



3-24. Installing the Drain Piping

- (1) Prepare a standard hard PVC pipe for the drain and use the supplied hose band to prevent water leaks. The PVC pipe must be purchased separately. When doing this, leave a gap between the drain socket of the unit and the PVC pipe to allow the drainage to be checked. The transparent drain pipe allows you to check drainage. (Fig. 3-79)

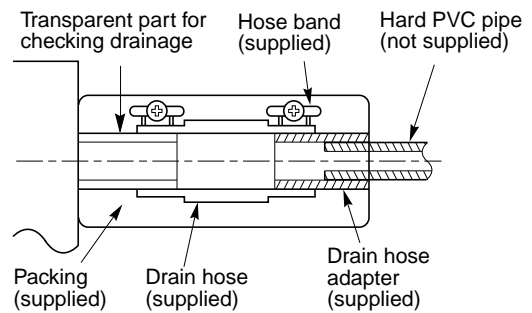


Fig. 3-79

0964_X_I



CAUTION

Tighten the hose clamps so their locking nuts face upward. (Fig. 3-79)

- (2) After connecting the drain piping securely, wrap the supplied packing and drain pipe insulator around the pipe, then secure it with the supplied clamps. (Fig. 3-80)

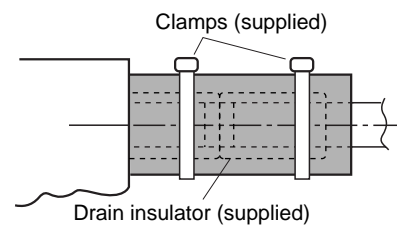


Fig. 3-80

0046_X_I

NOTE

Make sure the drain pipe has a downward gradient (1/100 or more) and that there are no water traps.



CAUTION

- Do not install an air bleeder as this may cause water to spray from the drain pipe outlet. (Fig. 3-81)

- If it is necessary to increase the height of the drain pipe, the section directly after the connection port can be raised a maximum of 19-11/16 in. Do not raise it any higher than 19-11/16 in., as this could result in water leaks. (Fig. 3-82)

- Do not install the pipe with an upward gradient from the connection port. This will cause the drain water to flow backward and leak when the unit is not operating. (Fig. 3-83)

- Do not apply force to the piping on the unit side when connecting the drain pipe. The pipe should not be allowed to hang unsupported from its connection to the unit. Fasten the pipe to a wall, frame, or other support as close to the unit as possible. (Fig. 3-84)

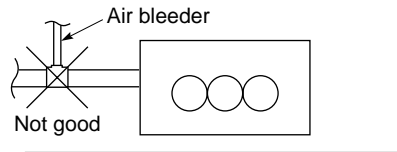


Fig. 3-81

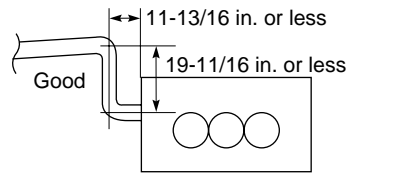


Fig. 3-82

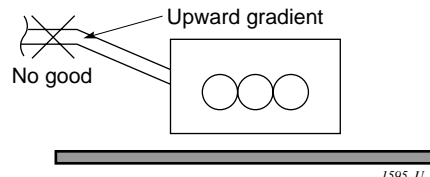


Fig. 3-83

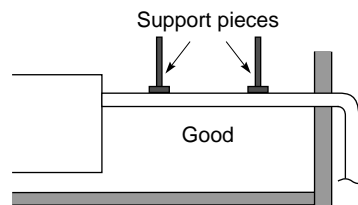


Fig. 3-84

3-25. Checking the Drainage

After wiring and drain piping are completed, use the following procedure to check that the water will drain smoothly. For this, prepare a bucket and wiping cloth to catch and wipe up spilled water.

- (1) Connect power to the power terminal board (L1, L2 terminal) inside the electrical component box.
- (2) Remove the tube cover and through the opening, slowly pour about 43 oz. of water into the drain pan to check drainage.
- (3) Short the check pin (CN5 white) on the indoor control board and operate the drain pump. Check the water flow and see if there is any leakage.



CAUTION

Be careful since the fan will start when you short the pin on the indoor control board.

- (4) When the check of drainage is complete, open the check pin (CN5 white) and remount the insulator and drain cap onto the drain inspection port.



CAUTION

To mount the tube cover, use 5/16" (4 × 8 mm) tapping screws. Do not use long screws as they may puncture the drain pan and cause water leakage.

3-26. Increasing the Fan Speed

If external static pressure is too great (due to long extension of ducts, for example), the air flow volume may drop too low at each air outlet. This problem may be solved by increasing the fan speed using the following procedure:

- (1) Remove 4 screws on the electrical component box and remove the cover plate.
- (2) Disconnect the fan motor sockets in the box.
- (3) Take out the booster cable (sockets at both ends) clamped in the box.
- (4) Securely connect the booster cable sockets between the disconnected fan motor sockets in step 2 as shown in the Fig. 3-85.
- (5) Place the cable neatly in the box and reinstall the cover plate.

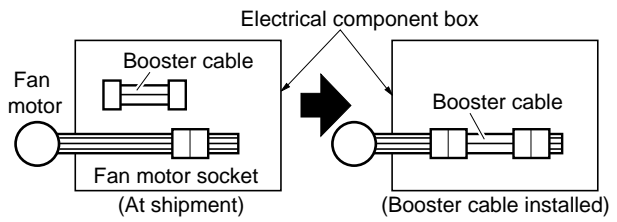
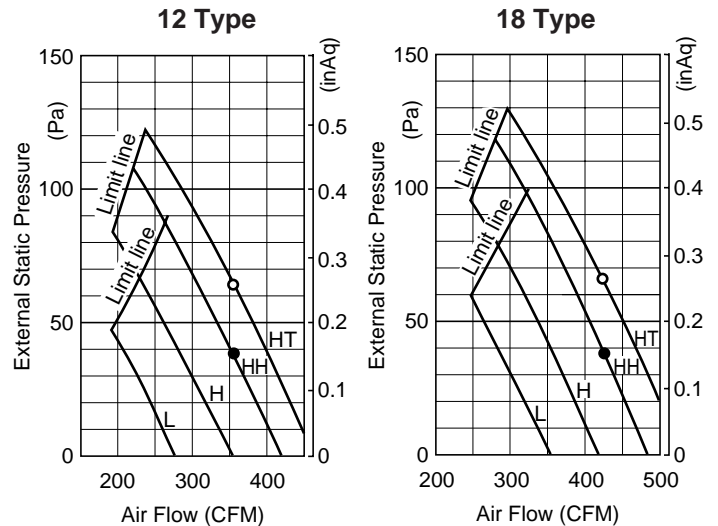


Fig. 3-85

0491_M_I

Indoor Fan Performance

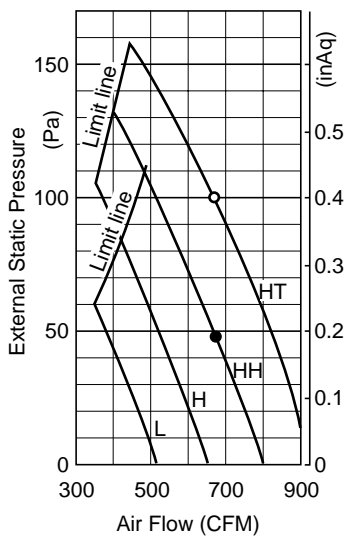


1980_U_I

1981_U_I

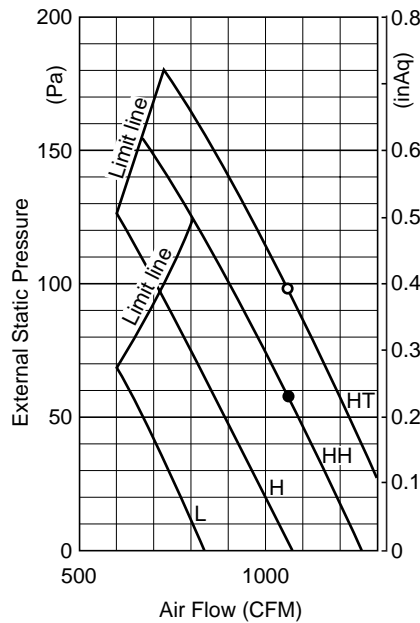


24 Type



1982_U_I

36 Type



1983_U_I

NOTE

HT : Using the booster cable
 H : At shipment



Fig. 3-86

How to read the diagram

The vertical axis is the external static pressure (Pa) while the horizontal axis represents the AIR FLOW (CFM). The characteristic curves for "HT", "H", "M" and "L" fan speed control are shown.

The nameplate values are shown based on the "H" air flow. For the 24 type, the air flow is 636 CFM, while the external static pressure is 49 Pa at "H" position. If external static pressure is too great (due to long extension of duct, for example), the air flow volume may drop too low at each air outlet.

This problem may be solved by increasing the fan speed as explained above.

4. HOW TO INSTALL THE OUTDOOR UNIT

4-1. Removing the Protective Spacer for Transportation

Remove the packing skid from the bottom of unit and then remove the plastic spacer used to secure the compressor during transportation. (Fig. 4-1)

Place the unit on a level concrete pad, block or equal and anchor.

Refer to Section 2. "Selecting the Installation Site".

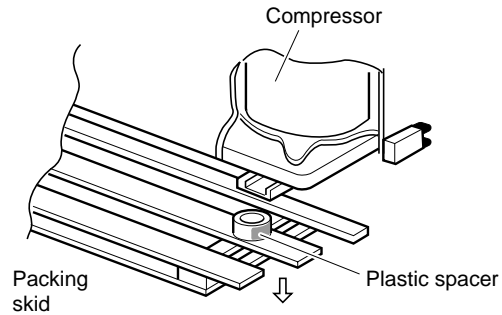


Fig. 4-1

0496_C_1

4-2. Installing the Outdoor Unit

- (1) Install blocks or a solid platform under the outdoor unit which provides a minimum height of 6 in. from ground level. (Fig. 4-2)
- (2) The outdoor unit must be bolted down tightly to the blocks or platform with 4 anchor bolts.

4-3. Tubing Direction

- Tubing can be extended in 4 different directions as shown in Fig. 4-3.
 - Service valves are housed inside the unit. To access them, remove the access panel by removing the 3 attaching screws, then slide the panel downward and pull it toward you.
- If either rear, right or front tubing is needed, punch out the knockout holes with a hammer or similar tool.
- After punching out the knockout holes, mount plastic protectors on the tubing outlets. These accessories are packed inside the unit and can be accessed through the access panel.
 - Use tube benders to extend refrigerant tubing to the outside.

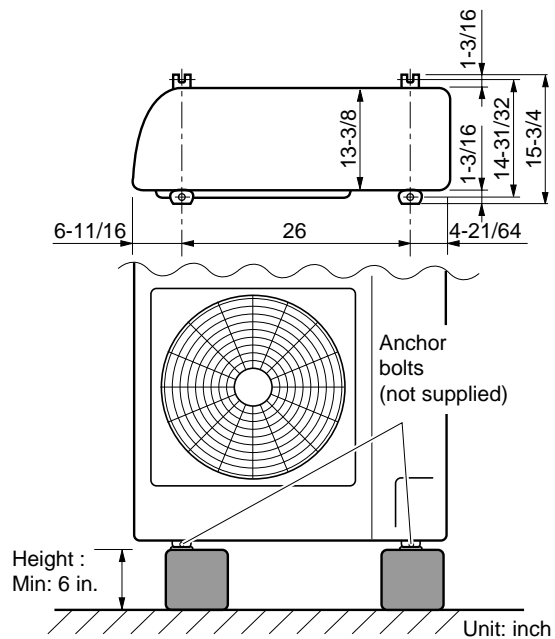


Fig. 4-2

1168_C_1

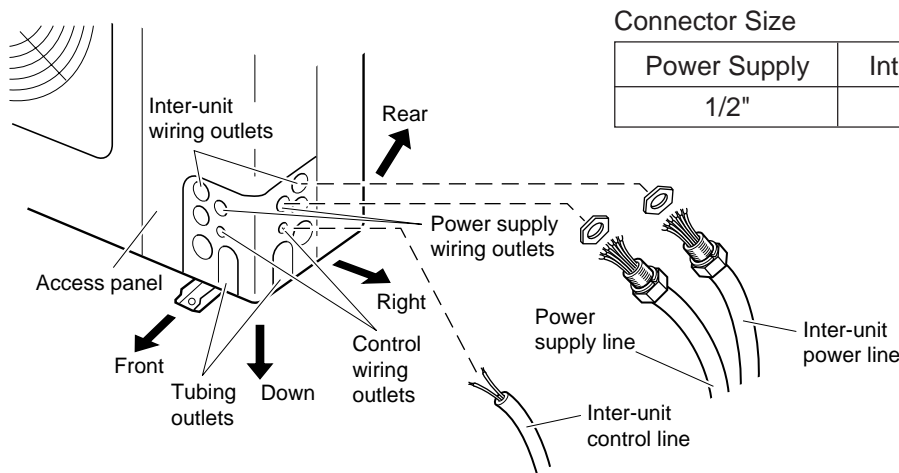


Fig. 4-3

1102_C_1

Connector Size

Power Supply	Inter-unit Power Line
1/2"	1/2"

5. ELECTRICAL WIRING

5-1. General Precautions on Wiring

- (1) Before wiring, confirm the rated voltage of the unit as shown on its nameplate, then carry out the wiring closely following the wiring diagram.
- (2) Provide a power outlet to be used exclusively for each unit, and a power supply disconnect and circuit breaker for overcurrent protection should be provided in the exclusive line.
- (3) To prevent possible hazards from insulation failure, the unit must be grounded.
- (4) Each wiring connection must be done in accordance with the wiring system diagram. Wrong wiring may cause the unit to misoperate or become damaged.
- (5) Do not allow wiring to touch the refrigerant tubing, compressor, or any moving parts of the fan.
- (6) Unauthorized changes in the internal wiring can be very dangerous. The manufacturer will accept no responsibility for any damage or misoperation that occurs as a result of such unauthorized changes.
- (7) Regulations on wire diameters differ from locality to locality. For field wiring rules, must follow your **LOCAL ELECTRICAL CODES** before beginning. You must ensure that installation complies with all relevant rules and regulations.
- (8) To prevent malfunction of the air conditioner caused by electrical noise, care must be taken when wiring as follows:
 - The remote control wiring and the inter-unit control wiring should be wired apart from the inter-unit power wiring.
 - Use shielded wires for inter-unit control wiring between units and ground the shield on both sides.
- (9) If the power supply cord of this appliance is damaged, it must be replaced by a repair shop appointed by the manufacture, because special purpose tools are required.
- (10) All wiring must be used class 1.

5-2. Recommended Wire Length and Wire Diameter for Power Supply System

Must follow LOCAL ELECTRICAL CODES for wiring.

Outdoor Unit

* AWG = American Wire Gauge

Model Name	(A) Power Supply	Trade size of Conduit	MOP (Fuse or HACR type circuit breaker)	Power Supply Terminal Base		Trade size of Conduit
				Capacity	Max. Wire Diameter	
CH2442	AWG #12 Max. length 69 ft.	3/4 in.	25 A	50 A	AWG #6	1-1/4 in.
CH3642	AWG #12 Max. length 69 ft.	3/4 in.	35 A/40 A (230/208 V)	50 A	AWG #6	1-1/4 in.
CH4242	AWG #10 Max. length 67 ft.	3/4 in.	45 A	50 A	AWG #6	1-1/4 in.

Indoor Unit

Type	(B) Power Supply	Trade size of Conduit	MOP (Fuse or HACR type circuit breaker)	Power Supply Terminal Base		Trade size of Conduit
				Capacity	Max. Wire Diameter	
X, K, T, U	Max. length 330 ft.	3/4 in.	15 A	25 A	AWG #10	3/4 in.

Control Wiring

(C) Inter-Unit Control Wiring	(D) Remote Control Wiring	(E) Control Wiring For Group Control
AWG #18 (0.75 mm ²) Use high voltage wire (300 V)^{*1}	AWG #18* (0.75 mm ²)	AWG #18* ² (0.75 mm ²)
Max. 3,300 ft.	Max. 1,650 ft.	Max. 1,650 ft. (Total)

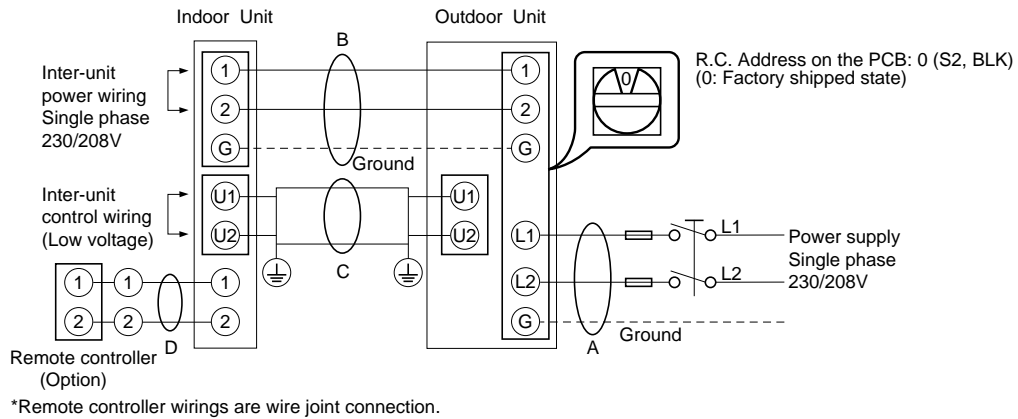
NOTE

*1 With ring type wire terminal.

*2 Wire joint connection.

5-3. Wiring System Diagrams

(1) Basic wiring diagram for standard control

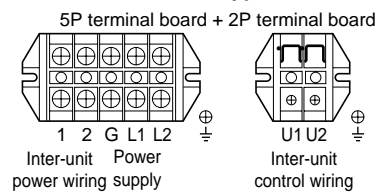


2085_M_1

NOTE

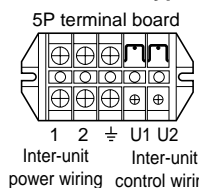
- (1) Refer to Section 5-2. "Recommended Wire Length and Wide Diameter for Power Supply System" for the explanation of "A", "B", "C", "D", and "E", in the above diagrams.
- (2) Inter-Unit Control Wiring (C) and remote controller wiring (D), (E) has no polarity. But for other wiring, respect polarity. Be sure to connect as shown in the Wiring System Diagram.
- (3) R.C. Address should be set before turning the power on.
- (4) Regarding the R.C. Address setting, refer to page 87. Auto. address setting can be executed by a remote controller automatically.

CH Type

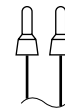


2086_M_1

XH, TH, UH Type

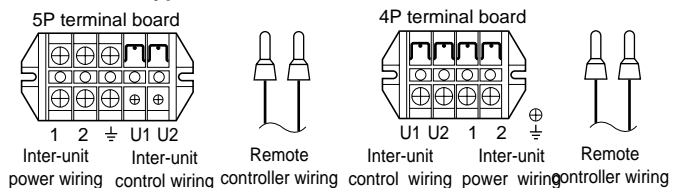


2087_M_1

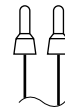


3003_M_1

KH Type



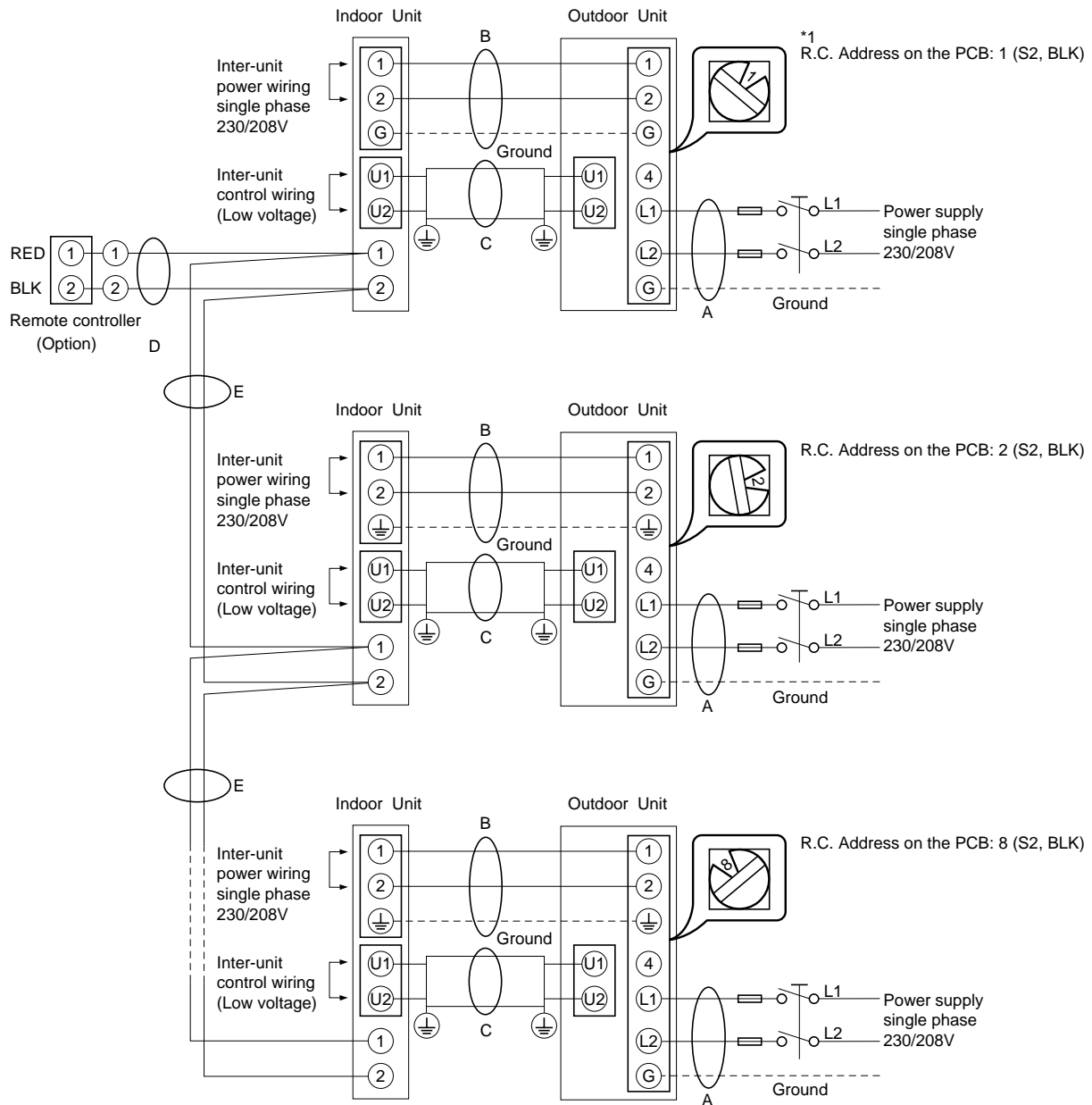
2088_M_1



3003_M_1

(2) Basic wiring diagram for group control

This diagram shows when several units (max. 8) are controlled by a remote controller. In this case, a remote controller can be connected at any indoor unit.



*Remote controller wirings are wire joint connection.

2089_M_I

NOTE

- R.C. Address should be set before turning the power on.
- Auto. address setting can be executed by a remote controller automatically. Please refer to 12-4 "Automatic Address Setting Method".
- Each successive unit will respond at one-second intervals following the order of the R.C. address when the remote controller is operated.

**WARNING**

Loose wiring may cause the terminal to overheat or result in unit malfunction. A fire hazard may also exist. Therefore, ensure that all wiring is tightly connected.

When connecting each power wire to the corresponding terminal, follow the instructions on "How to connect wiring to the terminal" and fasten the wire securely with the fixing screw of the terminal plate.

5-4. How to Connect Wiring to the Terminal

■ For stranded wiring

- (1) Cut the wire end with a wire cutter or wire-cutting pliers, then strip the insulation to expose the stranded wiring about 3/8 in.. (Fig. 5-1)
- (2) Using a Phillips head screwdriver, remove the terminal screw(s) on the terminal plate.
- (3) Using a ring connector fastener or pliers, securely clamp each stripped wire end with a ring pressure terminal. (Fig. 5-1)
- (4) Place the ring pressure terminal, and replace and tighten the removed terminal screw using a screwdriver. (Fig. 5-2)

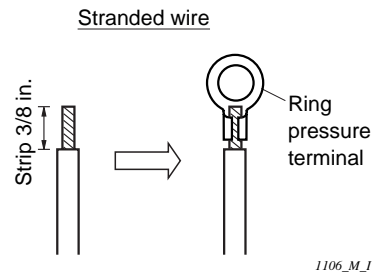


Fig. 5-1

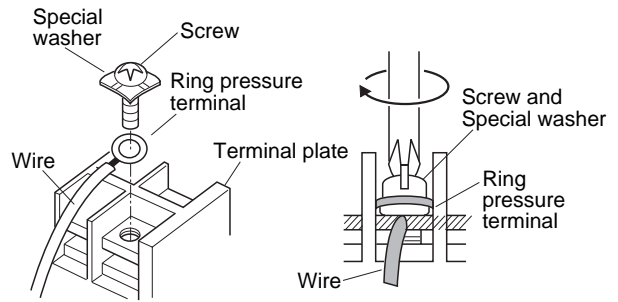


Fig. 5-2

6. HOW TO INSTALL THE WIRED REMOTE CONTROLLER (OPTIONAL PART)

6-1. Installation site selection

- Install the remote controller at a height of between 3–5 ft. above the floor.
- Do not install the remote controller in a place where it will be exposed to direct sunlight or near a window or other place where it will be exposed to the outside air.
- Be sure to install the remote controller vertically, such as on a wall.
- The mounting position for the remote controller should be located in an accessible place for control.
- Never cover the remote controller or recess it into the wall.

Mounting dimensions for continuous installation

- When mounting the remote controller on a wall, please see Fig. 6-1 and Fig.6-2.

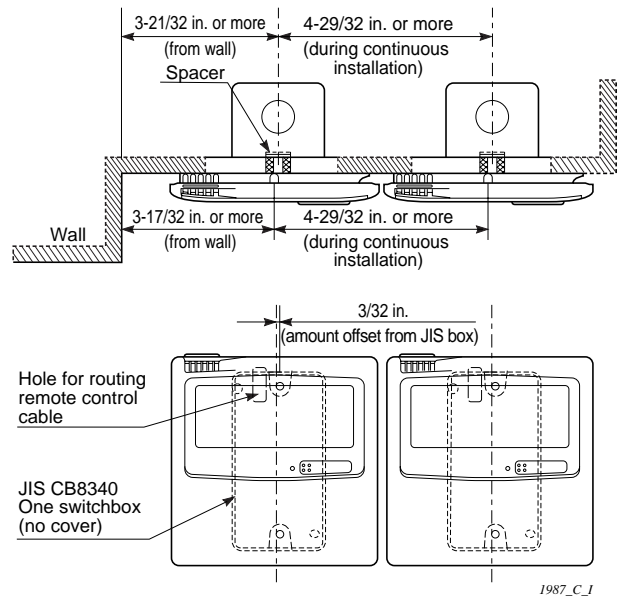


Fig. 6-1

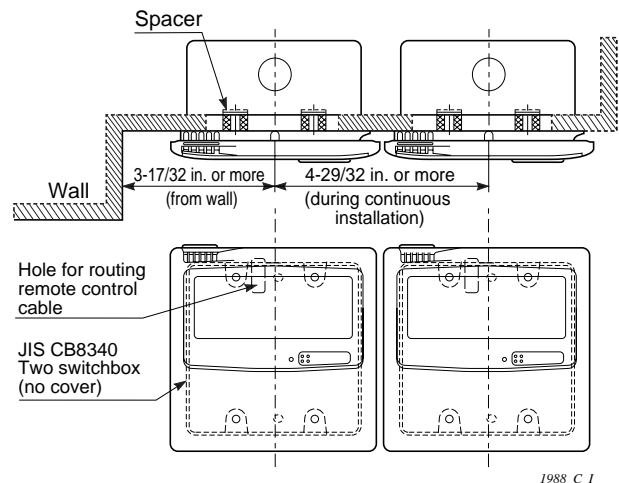


Fig. 6-2

⑥
RC
WD

6-2. Wired Remote Controller Installation



WARNING

- Do not supply power to the unit or try to operate it until the tubing and wiring to the outdoor unit is completed.



CAUTION

- Do not twist the control wiring with the power wiring or run it in the same metal conduit, because this may cause malfunction.
- Install the remote controller away from sources of electrical noise.
- Install a noise filter or take other appropriate action if electrical noise affects the power supply circuit of the unit.

- If local codes allow, this remote controller can be mounted using a conventional wall box for flush mounting.

- (1) When you open the decorative cover, you will see two gaps under the remote controller. Insert a coin into these gaps and pry off the back case. (Fig. 6-4)
- (2) Attach the back case with the 2 small screws provided. Using a screwdriver, push open the cut-outs on the back case. These holes are for screws. Use the spacers and take care not to tighten the screws excessively. If the back case will not seat well, cut the spacers to a suitable thickness. (Fig. 6-3)
- (3) Connect the remote controller wiring (2 wires) correctly to the corresponding terminals in the electrical component box of the indoor unit.



CAUTION

When wiring, do not connect the remote controller wires to the adjacent terminal block for the power wiring. Otherwise, the unit will break down.

- (4) To finish, fit the back tabs of the case into the remote controller and mount it.

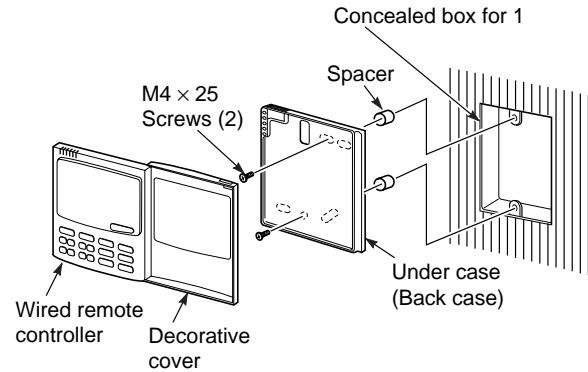


Fig. 6-3

1989_C_I

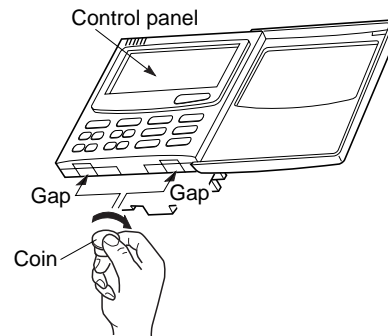


Fig. 6-4

1990_M_I

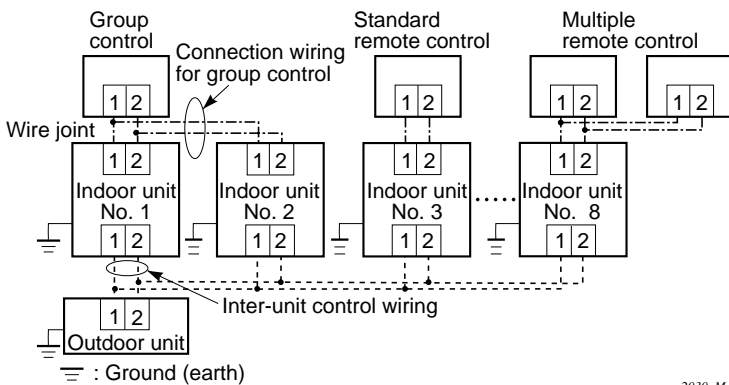
6-3. Basic Wiring Diagram



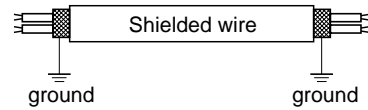
CAUTION

Install wiring correctly (incorrect wiring will damage the equipment).

- Use shielded wires for inter-unit control wiring and ground the shield on both sides. (Fig. 6-5) Otherwise misoperation because of noise may occur.

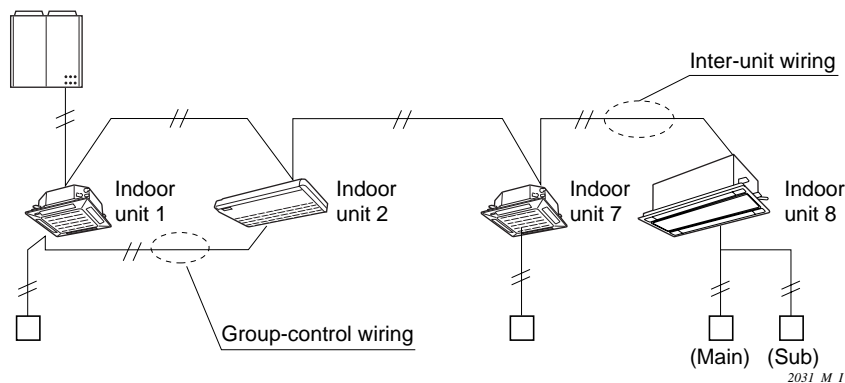


2030_M_I



0797_M_I

Fig. 6-5



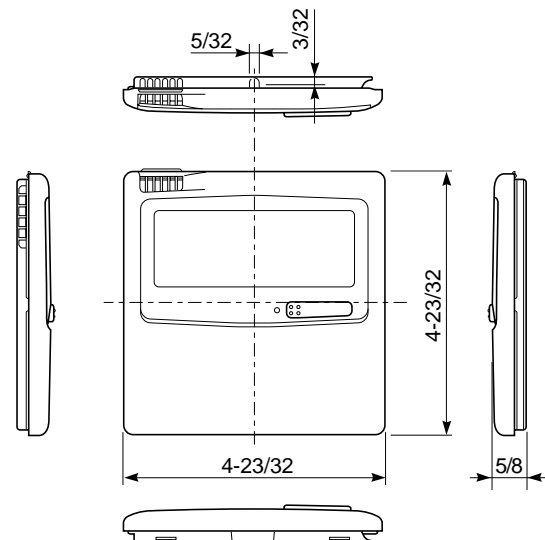
2031_M_I

● Wiring procedure

Install the wiring according to the above wiring diagram.

- The address setting is automatically executed after turning on the system. An indoor unit address is assigned to each indoor unit.
- Operation takes place successively at intervals of 1 second, by using combinations of the address setting of each unit.

● Diagram of outer dimensions

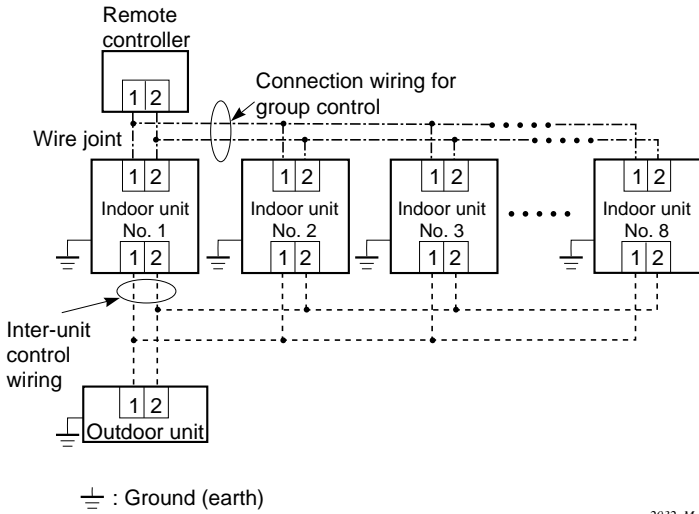


1991_M_I



6-4. Wiring System Diagram for Group Control

This diagram shows when several units (maximum of 8) are controlled by a remote controller (master unit). In this case, a remote controller can be connected at any indoor unit.



2032_M_I

Wiring procedure

Wire according to the left diagram:

- Address setting is executed automatically when the outdoor unit is turned on.
- Each successive unit will respond at one-second intervals following the order of the group address when the remote controller is operated.

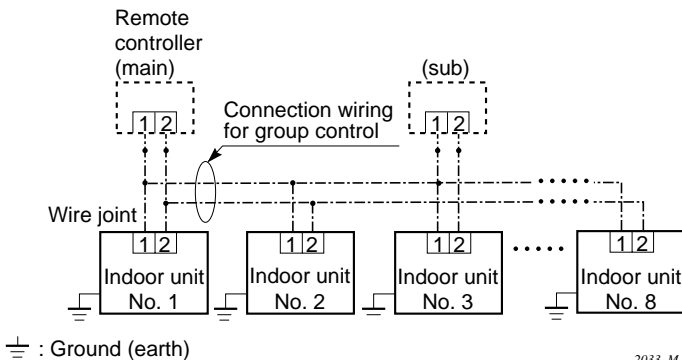
● Group control using 2 remote controllers.

It does not matter which of the 2 remote controllers you set as the main controller.

6
RC
WD

When using multiple remote controllers (up to 2 of them can be used), one is the main remote controller and the other is the sub-remote controller.

- To set up a sub-remote controller, change its remote control address connector (RCU. ADR) located on its PCB from main to sub position (main: when shipped from factory).



2033_M_I

6-5. Wiring System Diagram for Multiple Remote Control

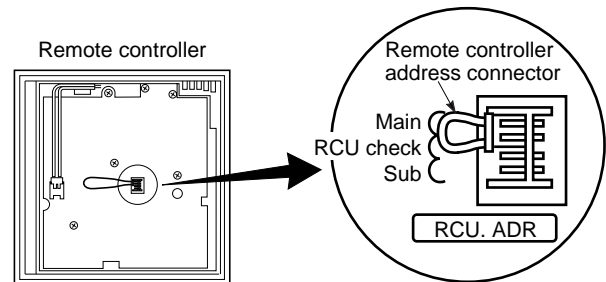
■ When Installing Multiple Remote Controllers

This multiple remote controller system is used for operating the unit(s) at different positions. (A maximum of 2 remote controllers can be installed.)

● Setting method

To execute this control, make the setting according to the following procedure.

- (1) Of the two installed remote controllers, make one the main remote controller (factory-shipped state).
- (2) On the other remote controller, change the address connector on the PCB from main to sub position.
In this state, it functions as a sub-remote controller.



1992_M_I

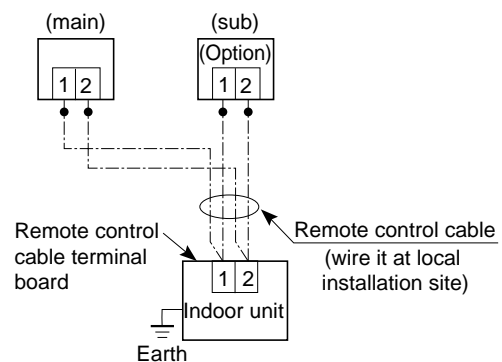
● Basic wiring diagram



CAUTION

Install wiring correctly (incorrect wiring will damage the equipment).

- To operate 1 indoor unit with 2 remote controllers set at different places.



1993_M_I

6-6. How to Switch the Indoor Temperature Sensor

The indoor unit and the remote controller both contain an indoor temperature sensor. The sensors on either unit can be used but normally only the sensor set on the indoor unit is used. However, use the following procedure if you must use the sensor on the remote controller.

- (1) Hold down the + + buttons for at least 4 seconds.
Note: The Unit No. first displayed is the main indoor unit address for group control.
Note: Do not press the button.
- (2) Select CODE NO. 32 with the Temp.setting (°F) / buttons.
- (3) Change the set data from 0000 to 0001 with the Timer (⊖) / button.
- (4) Press the button. (Setting is OK if the blinking display changes to a lit up display.)
- (5) Press the button.
This is the usual off condition. At this time, (remote controller) appears on the LCD display.

NOTE

- *1 If using 2 remote controllers, either one (main or sub-remote controller) can be used to make setting but only the main unit functions as the remote controller sensor.
- *2 The remote controller sensor will not function during group control unless the group address is set in the main remote controller indoor unit.
- *3 Do not use remote controller switch for the remote control sensor if the remote sensor is being used jointly with the remote controller switch.

6
RC
(WD)

6-7. Explanation of Alarm Messages

Possible Cause of Malfunction		Alarm message
<ul style="list-style-type: none"> • Serial communication errors • Mis-setting 	Remote controller is detecting error signal from indoor unit.	Error in receiving serial communications signal. E1
		Error in transmitting serial communications signal. E2
	• Indoor unit is detecting error signal from the remote controller. (No serial communications signal)	E3
	Indoor unit is detecting error signal from outdoor unit.	Error in receiving serial communications signal. E4
		Error in transmitting serial communications signal. E5
	Outdoor unit is detecting error signal from indoor unit.	Error in receiving serial communications signal. E6
	Indoor unit is not working correctly.	
	Outdoor unit is transmitting error signal.	Error in transmitting serial communications signal. E7
	Improper setting of indoor unit or remote controller.	Indoor unit address setting is duplicated. E8
		Remote controller address (RCU.ADR) switch is duplicated. E9
		Do not press Auto. address button S001: (A. ADD) of another R.C. line during Auto. address operation. E12
	When using group control, main indoor unit address setting is duplicated. (For single heat pump type.) E14	
	Error in Auto. address setting. (No. or capacity of judged indoor unit is small.) E15	
	Error in Auto. address setting. (No. or capacity of judged indoor unit is large.) E16	
Indoor unit is detecting error signal from another indoor unit. E18		
Activation of protective device	Protective device in indoor unit is activated.	<ul style="list-style-type: none"> • Thermal protector in indoor fan motor is activated. P1
	Protective device in outdoor unit is activated.	<ul style="list-style-type: none"> • Thermal protector in outdoor fan motor is activated. • Comp. thermal protector is activated. P2
		Incorrect discharge gas temp. of comp. P3
		High-pressure switch is activated. P4
		Incorrect power supply voltage . Negative phase, defective phase or voltage drop. P5
		Incorrect discharge gas temp. of comp. P17
	Protective device in indoor unit is activated.	Improper wiring connections of ceiling panel. P9
		Float switch is activated. P10

6
RC
(WD)

NOTE

- RCU : Remote Control Unit (remote controller)
- R.C. : Refrigerant Circuit
- comp. : Compressor
- temp. : Temperature
- PCB : Printed Circuit Board

Possible Cause of Malfunction			Alarm message
Thermistor failure	Indoor thermistor is either open or damaged.	Indoor coil temp. (E1 = TH1) cannot be detected.	F1
		Indoor coil temp. (E2 = TH2) cannot be detected.	F2
		Indoor coil temp. (E3 = TH3) cannot be detected.	F3
		Indoor room (air-intake) temp. can not be detected.	F10
	Outdoor thermistor is either open or damaged.	Discharge gas temp. (comp. = TH0A) cannot be detected.	F4
		Outdoor coil gas temp. (C2 = TH0C) cannot be detected.	F25
		Outdoor coil liquid temp. (C1 = TH0D) cannot be detected.	F7
EEPROM (ICB of PCB) failure			F29
Fault with comp. and its circuit	Protective device for comp. is activated.	Comp. motor is overloaded.	H1
		Comp. motor is locked.	H2
		Current of comp. cannot be detected when it is turned on.	H3
		Current of comp. is detected when it is not operated.	F27
		Comp. contactor (Mg SW) is chattering.	H18

Possible cause of Malfunction	Alarm message
Model setting of indoor unit is not matching the outdoor unit.	L2
When using group control, main indoor unit address setting is duplicated. (Judging by indoor unit.)	L3
Outdoor unit address (R.C. No.) is duplicated.	L4
Priority setting of indoor unit is duplicated.	L5
—	L6
Improper wiring between indoor units. (There is group connection wiring in case of individual control.)	L7
Capacity code of indoor unit is not set.	L9
Improper wiring of group control wiring.	L11

Possible Cause of Malfunction (The following messages are displayed only for the system controller.)			Alarm message
• Serial communication errors • Mis-setting	System controller is transmitting incorrect signal.	• Indoor or outdoor unit is not working correctly. • Control lines between indoor unit, outdoor unit, and system controller are not wired correctly.	C05
	System controller is detecting incorrect signal.	• Same as for C05, above. • Connector CN1 is not connected correctly.	C06
Activation of protective device	Protective device of the sub-indoor unit is activated in group control.	When using wireless remote controller or system controller, connect wired remote controller with the indoor unit temporarily to check the alarm message in detail.	P30

NOTE




- R.C. : Refrigerant Circuit
- comp. : Compressor
- temp. : Temperature
- PCB : Printed Circuit Board



7. HOW TO INSTALL THE WIRELESS REMOTE CONTROLLER (OPTIONAL PART)

Important

When using this air conditioner (ECO multi system air conditioner) with the wireless remote controller it may sometimes be impossible to change the operation modes while other indoor unit is running.

- When this happens, a double beep tone sounds, the  (operation lamp) lights up, and the  (Timer lamp) and  (Standby lamp) blink alternately. Operation is the same even during (AUTO mode) automatic cooling or heating.
- A beep tone sounds 5 times and no changes can be made when any of the ON/OFF, MODE, Temperature setting buttons were pressed while set under central control by the system controller.

7-1. Wireless Remote Controller Installation

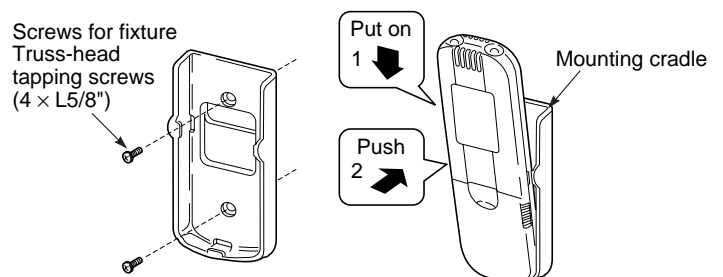
The remote controller can be operated from either a non-fixed position or a wall-mounted position.

To ensure that the air conditioner operates correctly, do not install the remote controller in the following places:

- In direct sunlight.
- Behind a curtain or other place where it is covered.
- More than 26 ft. away from the air conditioner.
- In the path of the air conditioner's airstream.
- Where it may become extremely hot or cold.
- Where it may be subject to electrical or magnetic interference.

(1) If Wall-mounted Fixed Position

Install the remote controller at a convenient location on a nearby wall. However, before attaching the remote controller mounting cradle, check that the remote controller can operate from the desired wall position. (Fig. 7-1)

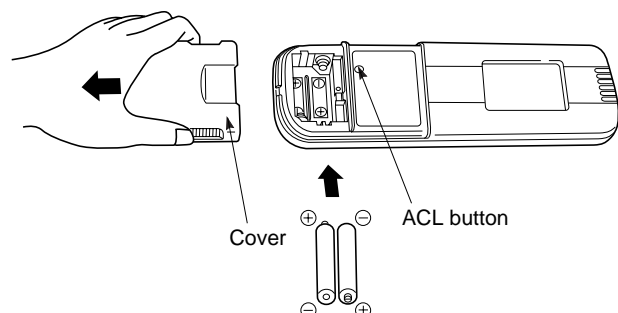


1994_M_1

■ How to Install Batteries

See Fig. 7-2.

- (1) Press and slide the lid on the back of the remote controller in the direction of the arrow.
- (2) Install two AAA alkaline batteries. Make sure the batteries point in the direction marked in the battery compartment.
- (3) Press the ACL button, then replace the lid. If you press it, the current time, ON time, and OFF time are all reset to 0:00.



1995_M_1

Fig. 7-1

Fig. 7-2

7-2. Room Temperature Sensor Setting

The room temperature sensors are built into the indoor unit and the wireless remote controller. Either of these room temperature sensors can operate.

The system is shipped from the factory set to the indoor unit sensor. To switch to the remote controller sensor, press the sensor switching button located inside the remote controller cover and check that A/C SENSOR on the LCD display panel goes out.

NOTE

If the sensor switch is set to the remote controller side, but no room temperature data is sent to the main unit for 10 minutes, the sensor is automatically switched to the indoor unit side. As much as possible, install the remote controller facing the unit.

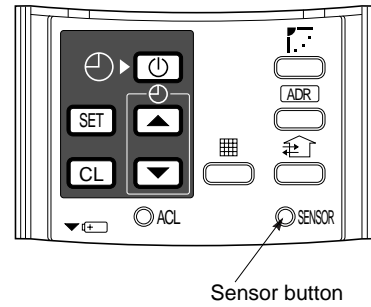


Fig. 7-3

7-3. Address Switches

If you are installing more than 1 indoor unit (up to 6) in the same room, it is necessary for you to assign each unit its own address so they each can be operated by their remote controller.

Up to 6 indoor units can be controlled separately through the address switches. The operating control has the reception address switch and the remote controller has transmission address switch. This function is utilized by matching the transmission and reception address switches.

Remote controller address display	ADR ALL	ADR 1	ADR 2	...	ADR 6
Address switch positions	* Any address switch position available			...	

7-4. Setting the Model Code

① Flap display selector switch

Make the slide switch settings in the battery compartment box of the remote controller depending on the type of indoor unit in which the wireless receiving unit is used.

② Operation mode switch

In this Split System Air Conditioner set the switch to "A".

* The switch is factory set to "S" / "A".

* Always press the reset button after switching the setting.

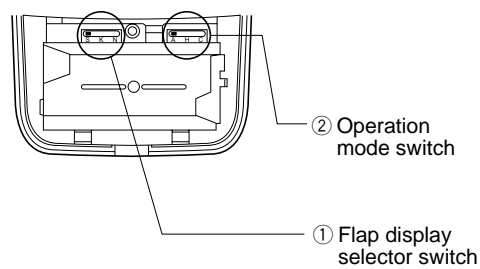


Fig. 7-4

①			
	XH, TH type	KH type	UH type
②			
	Heat pump with Auto mode (CH type)	Heat pump without Auto mode	Cooling only

■ 4-Way Air Discharge Semi-concealed Type
(XH Type)

1
X

7-5. Indicator section Installation

● Remove the ceiling panel and indicator cover and install the indicator section.

- (1) Remove the ceiling panel.
- (2) Remove the corner cover behind the mark section. (3 screws)
- (3) Remove the mark section inside the ceiling panel. (2 screws)
- (4) Install the indicator section in the location where the mark section was attached. (2 screws)
- (5) Form the wire to match the panel ribs as in the Fig. 7-6.
- (6) Install the corner cover. (Restrain the wire with the corner cover.)

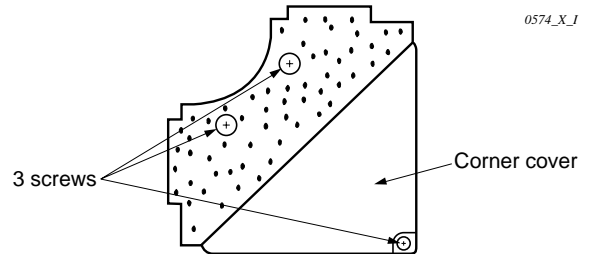
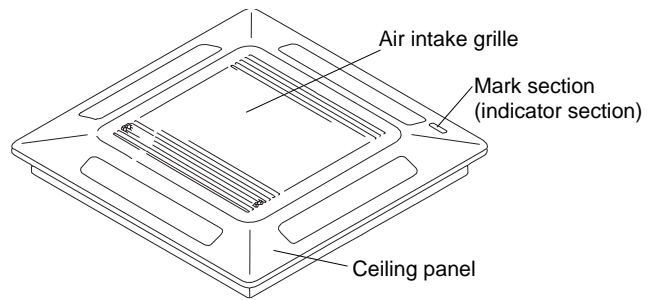


Fig. 7-5

7-6. Operating Controller Installation



CAUTION

- Do not twist the operating controller wires together with the power supply wires. Doing so can result in malfunction.
- If noise is induced in the unit power supply, take appropriate measures, for example installing a noise filter.

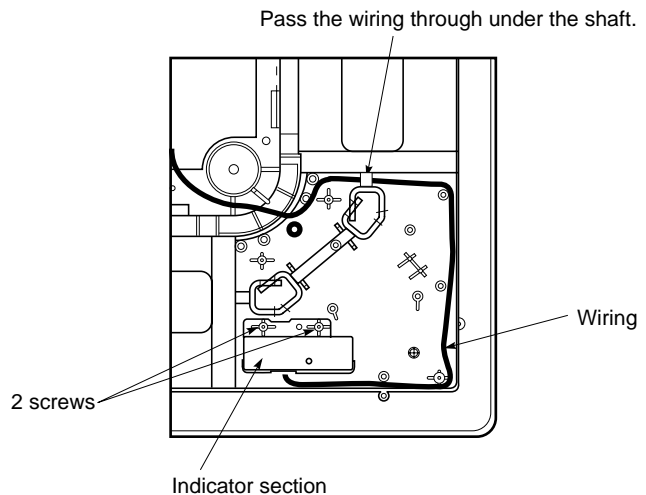


Fig. 7-6

Install the operating controller at the indoor unit intake port section.

- (1) Fasten the operating controller to the indoor unit intake port section (electrical component box opposite side) with the 2 accessory screws (4 × L13/32 in.).
- (2) Connect the operating controller 2 wires (WHT, BLK) to the remote control wire (WHT) in the electrical component box. (For details on the wiring, see "7-9. Electrical wiring" P56.)
- (3) Install the ceiling panel.
- (4) Connect the indicator section and the operating controller by 6P connector (white).
- (5) Form the wires with vinyl claspers and fasten.
- (6) Connect the ceiling panel wiring connector (2P, 3P) to the body connector in the electrical component box.
- (7) For details on test operation, see "Test Run".

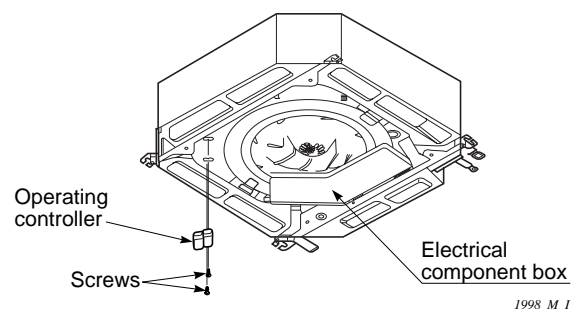


Fig. 7-7

■ Ceiling Mounted Type (TH Type)

7-7. Indicator Section Installation

Remove the side panel to install the indicator section.
(Fig. 7-8)

- (1) Remove the side panel.
Open the air intake grille, remove the screw at one place and then remove the side panel by sliding it toward the front (arrow direction).
- (2) Remove cover A and cover B.
Put the minus-screwdriver into the recess of cover A to remove cover A and cover B.
(When removing the cover, take care not to scratch the panel.)
- (3) Remove cover B from cover A.
- (4) Install the indicator section at cover A.
- (5) After passing through the lead wires, install cover A and the indicator section at the panel hole.
(The protrusion part of cover A is fixed with the panel hole.)
- (6) Bundle the lead wires along with the wiring of the louver motor.
- (7) Install the side panel.

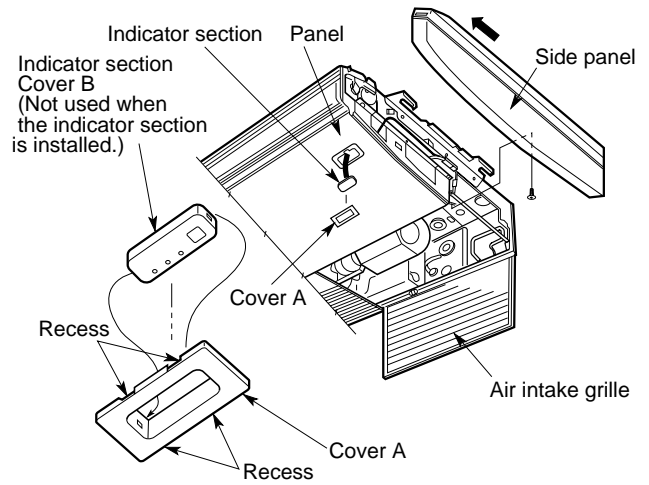


Fig. 7-8

1536_T_I

7-8. Operating Controller Installation



CAUTION

- **Do not twist the operating controller wires together with the power supply wires. Doing so can result in malfunction.**
- **If noise is induced in the unit power supply, take appropriate measures, for example installing a noise filter.**

Install the operating controller on the top face of the air intake section (space between the fan motor and the electrical component box). (Fig. 7-9)

- (1) Fasten the operating controller to the ceiling panel of the air intake section with the 2 accessory screws ($4 \times L13/32$ in.).
- (2) Draw the lead wires into the electrical component box and connect the operating controller 2 wires (WHT, BLK) to the remote control wires in the electrical component box.
- (3) Connect the indicator section and the operating controller by 6P connector in the electrical component box.

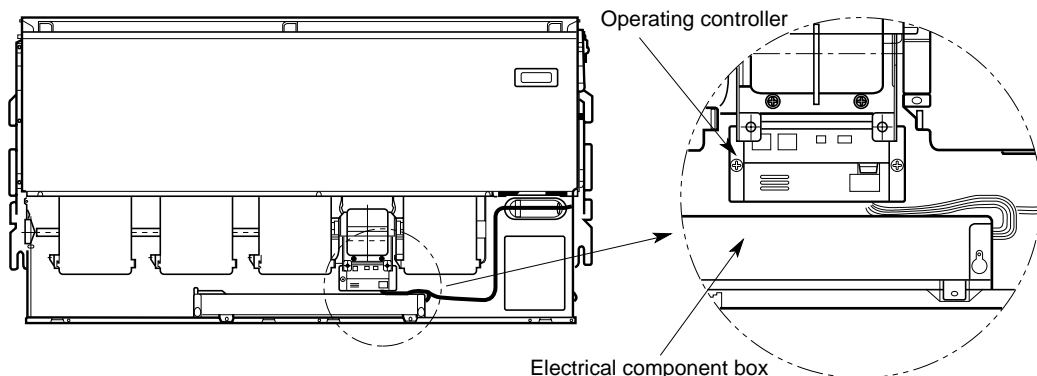


Fig. 7-9

1537_T_I

7-9. Electrical Wiring

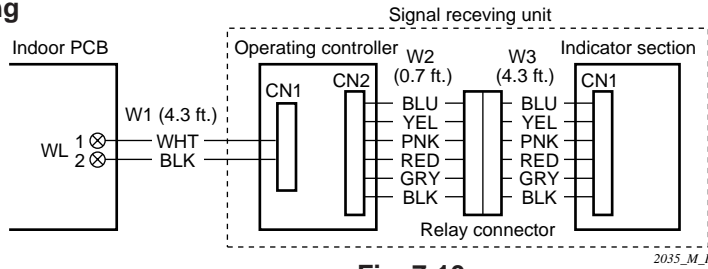


Fig. 7-10

Connection method

- (1) Connect W1 to the indoor PCB WL connector.
- (2) Connect W3 from the indicator section with W2 from the operating controller using the relay connector.

7-10. Test Run Switch

Test run switch is located at operating control unit. Regarding the test run, please refer to section 12. Test Run.

NOTE

- In case of 4-way air discharge type, test run operation is not possible without the ceiling panel installation.
- During the test run, all of the 3 indicator lamps on the indoor unit will flash.
- During the test run, the air conditioner runs continuously and the thermostat does not control the system.
- To protect the air conditioner from overloading, the outdoor unit will not start running for 3 minutes after power is applied or the air conditioner is turned off and then back on.
- When the air conditioner fails to start the test run, 1 or more of the 3 alarm indicator lamps on the indoor unit will flash (See next section).

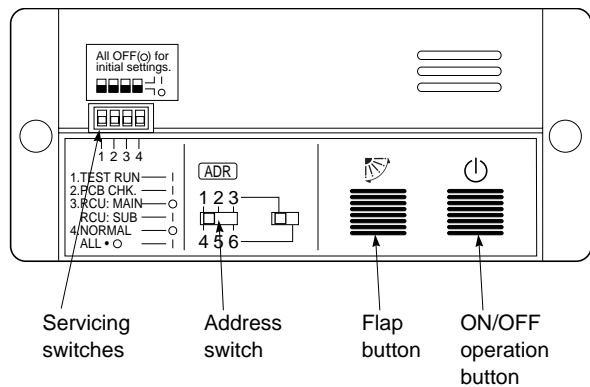


Fig. 7-11

7-11. Misoperation Alarm Indicators

Alarm indicator lamps on the indoor unit indicate the error cause when the air conditioner fails to operate upon being switched on. The possible alarm indications are given in Table 7-1. Fig.7-12 shows the location of the alarm lamps on the indoor unit. (See Table 7-1, Fig. 7-12)

Table 7-1

Alarm			Cause of Trouble
⏻ (OPERATION lamp)	⌚ (TIMER lamp)	⊗ (STANDBY lamp)	
☼	●	●	S.C. errors* between the indoor unit's controller (PCB) and the remote controller.
●	☼	●	Compressor protector is working.
●	●	☼	S.C. errors between indoor and outdoor units.
☼	☼	●	Indoor or outdoor thermistor is malfunctioning.
☼	●	☼	Outdoor unit protector is working.
●	☼	☼	Indoor unit protector is working.
☼	☼	☼	TEST RUN switch on the operation controller is in ON state.

* S.C. : Serial communications

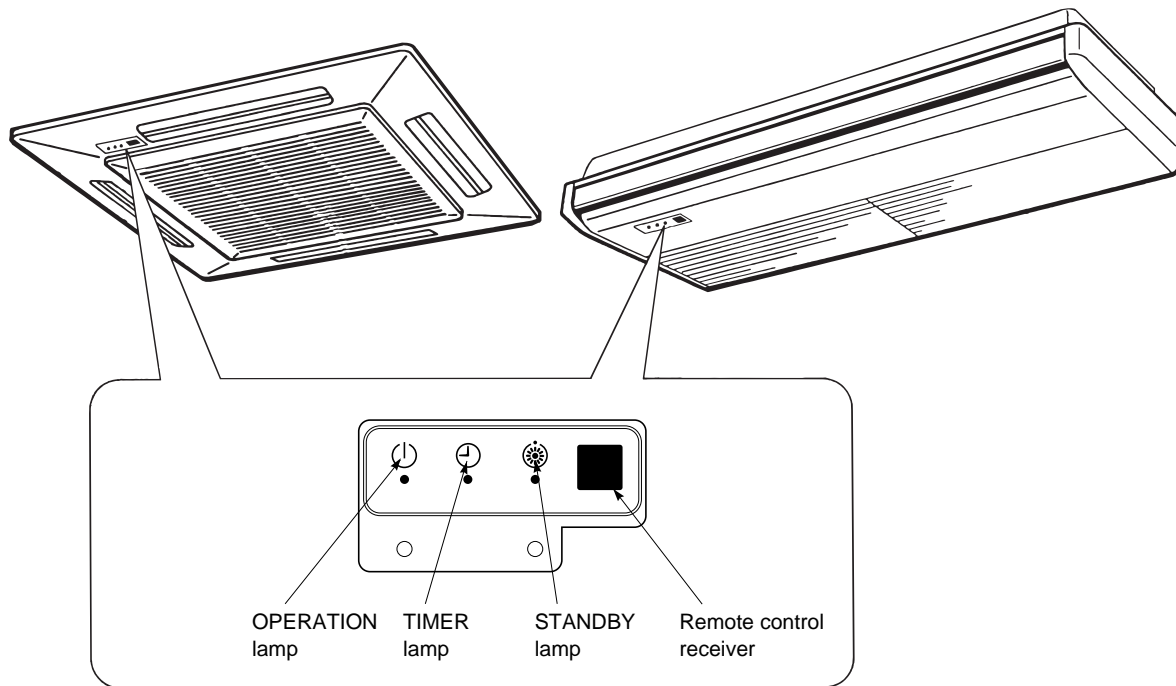


Fig. 7-12

2000_M_1

NOTE

Stick the alarm message label accompanying with the wireless remote controller on the electrical component box to find the cause of trouble in case of need.

7
RC
(WL)



CAUTION

- If the signal receiving unit is installed near rapid-start type or inverter type fluorescent lamp (neither one having glow lamps), it may be impossible to receive signals from the wireless remote controller. To avoid signal interference from fluorescent lamps, install the receiving unit at least 6.6 ft. away from the lamps and install at a location where wireless remote controller signals can be received when the fluorescent lamps are on.

7-12. Separate type Signal Receiving Unit Installation



CAUTION

- Do not twist the operating controller wires together with the power supply wires. Doing so can result in malfunction.
- If noise is induced in the unit power supply, take appropriate measures, for example installing a noise filter.

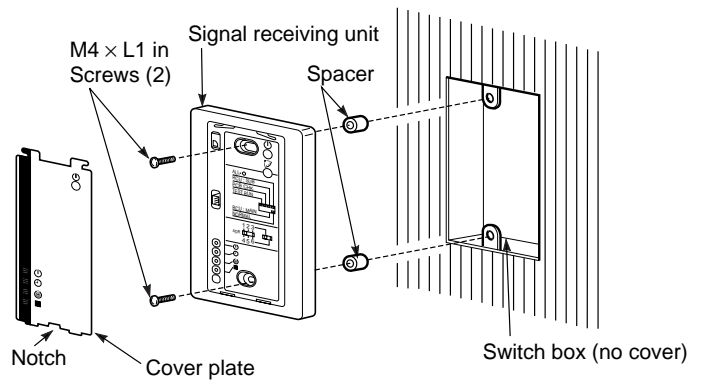


Fig. 7-13

2001_M_I

- If local codes allow, this signal receiving unit can be mounted using a conventional wall box for flush mounting.

- (1) Insert a minus driver into the gap under the signal receiving unit and pry off the cover (Fig. 7-14)
- (2) Attach the signal receiving unit with the 2 small screws provided. Use the spacers and take care not to tighten the screws excessively. If the signal receiving unit will not seat well, cut the spacers to a suitable thickness. (Fig. 7-13)
- (3) Connect the signal receiving unit wiring (2 wires) correctly to the corresponding terminals in the electrical component box of the indoor unit.

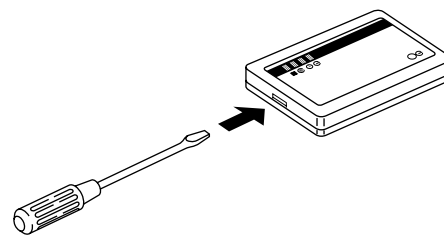


Fig. 7-14

2002_M_I



CAUTION

When wiring, do not connect the signal receiving unit wires to the adjacent terminal block for the power wiring. Otherwise, the unit will break down.

- When using the signal receiving unit on a wall with the front exposed, choose a wall surface that the signal receiving unit can be mounted on.

- (1) Insert a flat tip (minus) screwdriver into the slot on the lower side of the signal receiving unit and pry off the back case as shown in Fig. 7-14.
- (2) The wire routing at the signal receiving unit comes out of the upper case (thin portion at upper center) so use nippers or a similar tool to cut out a notch beforehand large enough for the remote control cable (option) to pass through as shown in Fig. 7-15.
- (3) Remove the wire which is connected prior shipping from the connector.
- (4) Connect the remote control cable (option) to the signal receiving unit connector shown in Fig. 7-16 after the clamper (supplied) with the unit is installed.
- (5) After arranging the wiring on the printed circuit board as shown in Fig. 7-17 so that it is contained within the signal receiving unit, attach the back case. At this time, arrange so that the head of the clamper faces the side.
- (6) Remove the cover plate and install the signal receiving unit using the 2 wood screws.
- (7) Fasten to the wall using the cord clip (supplied).
- (8) Reinstall the cover plate.

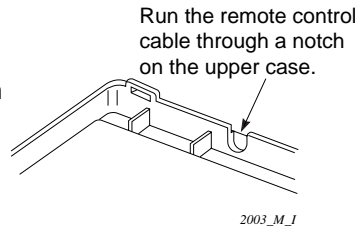


Fig. 7-15

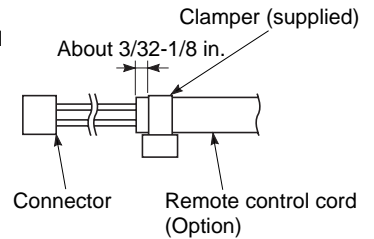


Fig. 7-16

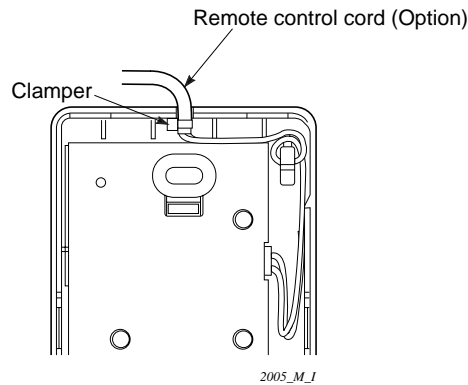


Fig. 7-17

- To use the signal receiving unit while mounted on a ceiling, install by using the carrier for ceiling installation supplied with the unit.

- (1) Remove the cover plate by inserting a flat tip (minus) screwdriver or similar tool into the notch in the lower section and prying it off.
- (2) Cut out a section (3-3/4 x 2-1/32 in.) on the ceiling using the paper pattern (supplied) as a guide.
- (3) Run the wire through the mounting carrier and insert into the installation hole as shown in Fig. 7-19.
- (4) Fit securely into the ceiling material at sections (A) and (B) as shown in Fig. 7-20.
- (5) Connect the wire (2-wire core) from the signal receiving unit with the wire from the indoor unit. (See section on how to wire the receiving unit.) as shown in Fig. 7-20.
- (6) Use the supplied spacers to adjust for a thickness several inches more than the ceiling material and lightly fasten the receiving unit in place with the small screws (M4 x 1-9/16 in., 2 pcs.) supplied with the unit.
- (7) Tighten the machine screws after fitting sections (A) and (B) into the openings, in the gap between the signal receiving unit and ceiling surface as in Fig. 7-21. Do not apply strong force when tightening the screws. Excessive force might warp or damage the cover. When finished the signal receiving unit should still be able to move slightly when pressed as shown in Fig. 7-21.
- (8) Reinstall the cover plate.

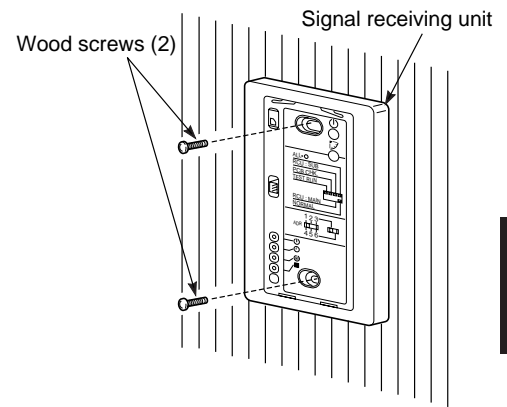


Fig. 7-18

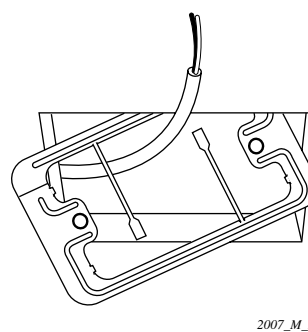


Fig. 7-19

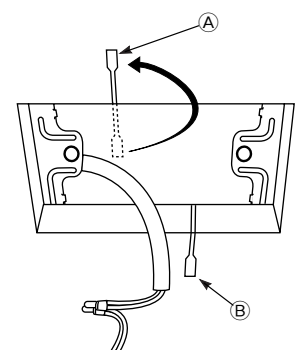


Fig. 7-20

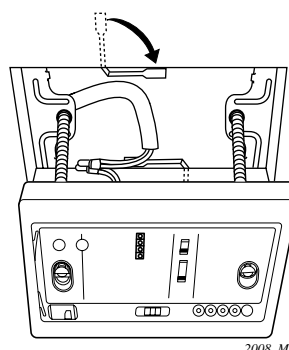


Fig. 7-21



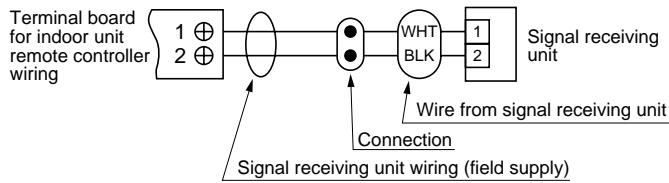
7-13. Electrical Wiring



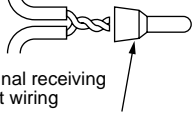
CAUTION

Make correct wiring without any mistakes (incorrect wiring will damage the equipment).

- Recommended wire diameter and allowable length for signal receiving unit wiring and its branch wiring: AWG #18, MAX 1,300 ft.



2010_M_I

<p>Wire joint (2 pcs. white, supplied)</p>	<p>Signal receiving unit wiring</p>  <p>Signal receiving unit wiring</p> <p>Wire joint CE-1 (supplied)</p> <p>3004_M_I</p>	<ol style="list-style-type: none"> 1. Peel away 9/16 in. of shield from the wire for the connection. 2. Join the 2 wires as shown and crimp-connect them with the wire joint (supplied). 3. When no crimp tool is available or if a solder connection was made then cover with insulating tape.
--	---	--

7-14. Test Run Switch

- (1) Remove the cover plate of the signal receiving unit. Set the "TEST RUN" switch of the dipswitches to the ON position.
 - (2) Press the ON/OFF operation button on the wireless remote controller.
- During the test run, all of the 3 indicator lamps on the indoor unit will flash.



CAUTION

The TEST RUN switch is used only for servicing the air conditioner. DO NOT use this switch for normal operation. Otherwise, it may put stress on the system.

- (3) Make a test run using the air conditioner in COOL, HEAT or FAN modes.
- To protect the air conditioner from overloading, the outdoor unit will not start running for 3 minutes after power is applied or the air conditioner is turned off and then back on.
- (4) After the test run, press the ON/OFF operation button on the wireless remote controller. Then, set the TEST RUN switch back to the OFF position to cancel the test run mode.

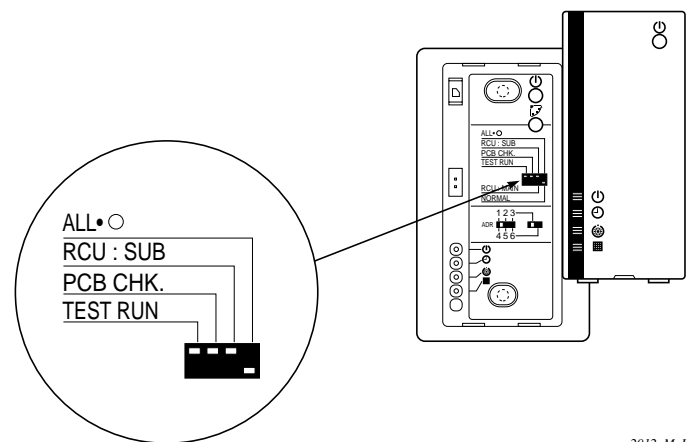


Fig. 7-22

2012_M_I

7-15. Misoperation Alarm Indicators

A blinking lamp for other than the signal receiving unit filter shows that a problem has occurred in the unit so make an inspection. (Refer to servicing information in the service manual, etc.) Also, if wired remote controller and dedicated service check lines (854-9-9536-044-97: service use) are available, then detailed error information can be obtained by connecting to the service connector as shown in the drawing. For information on how to connect to the signal receiving unit, refer to instruction manual that comes with the dedicated service check lines.

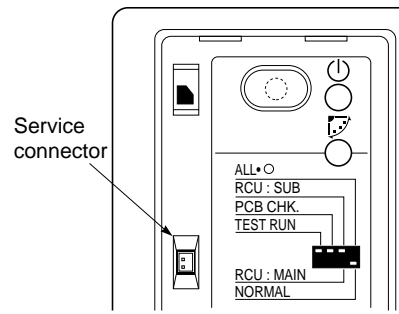


Fig. 7-23 2013_M_1

Table 7-2

OPERATION lamp	Lamp		Bright	Cause of Trouble
	TIMER lamp	STANDBY lamp		
●	●	●		No power supply or mis-wiring of signal receiving unit.
☼	●	●		S.C.* errors between the indoor unit's controller (PCB) and signal receiving unit.
●	●	☼		S.C. errors between indoor and outdoor units.
●	☼	☼	Alternately	Indoor unit protector is activated.
☼	●	☼	Alternately	Outdoor unit protector is activated.
●	☼	●		Compressor protector is activated.
☼	●	☼	Concurrent	Mis-setting of indoor unit.
☼	○	☼	Concurrent	Mis-setting of outdoor unit.

* S.C. : Serial communications

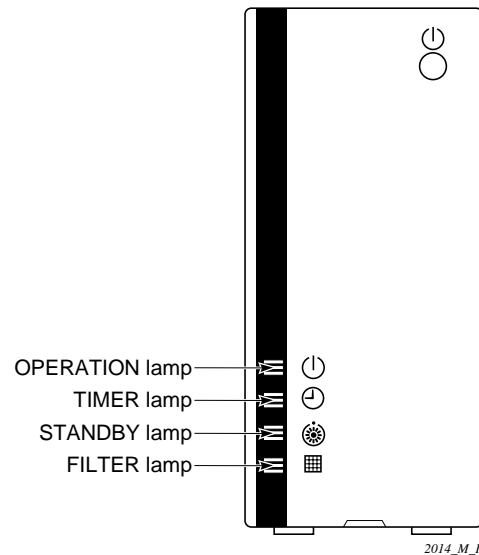


Fig. 7-24 2014_M_1

7
RC
(WL)

7-16. Basic Wiring Diagram



CAUTION

Install wiring correctly (incorrect wiring will damage the equipment).

- Use shielded wires for inter-unit control wiring and ground the shield on both sides. (Fig. 7-25) Otherwise misoperation because of noise may occur.

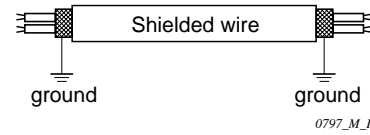
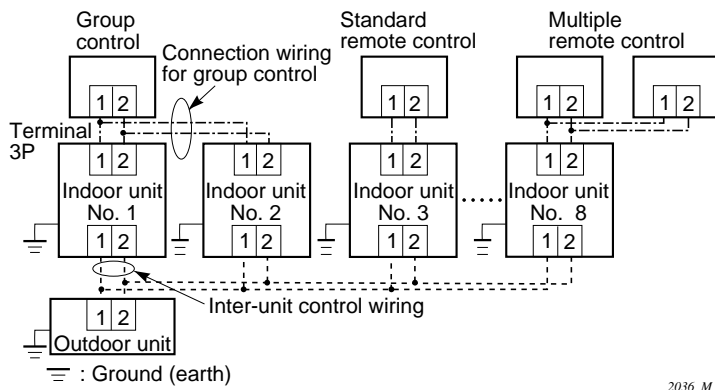
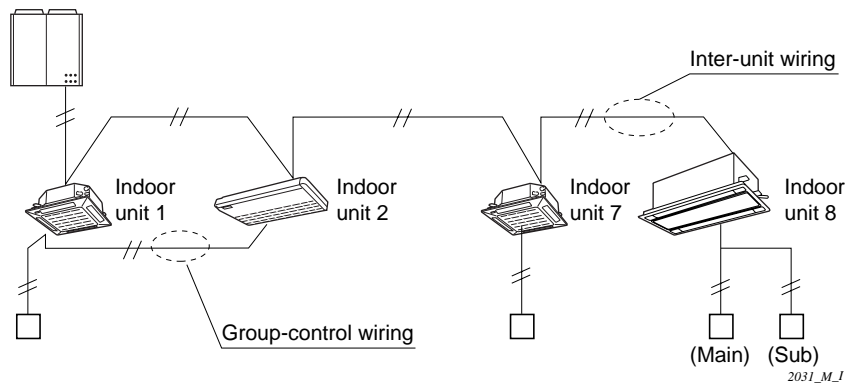


Fig. 7-25



2036_M_I



2031_M_I

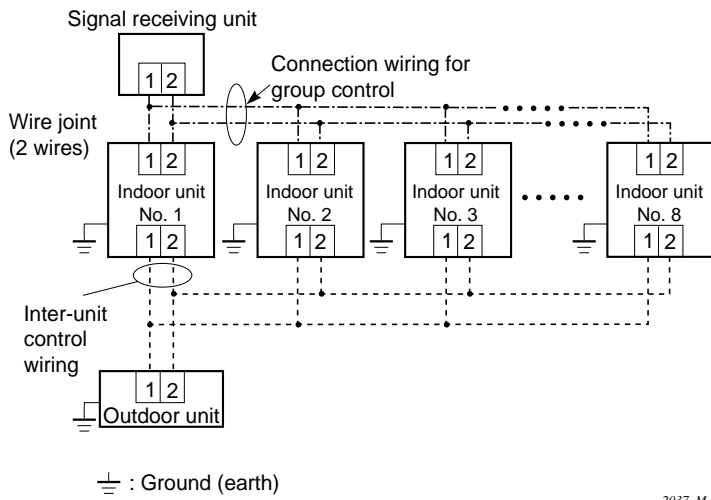
● Wiring procedure

Install the wiring according to the above wiring diagram.

- The address setting is automatically executed after turning on the system. An indoor unit address is assigned to each indoor unit.
- Operation takes place successively at intervals of 1 second, by using combinations of the address setting of each unit.

7-17. Wiring System Diagram for Group Control

This diagram shows when several units (maximum of 8) are controlled by a signal receiving unit (master unit). In this case, a signal receiving unit can be connected at any indoor unit.



Wiring procedure

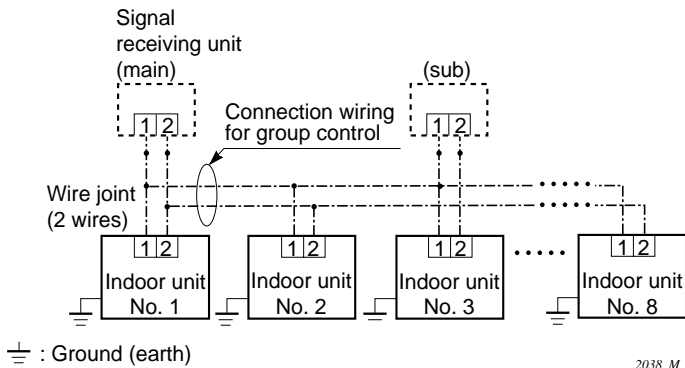
Wire according to the left diagram:

- Address setting is executed automatically when the outdoor unit is turned on.
- Each successive unit will respond at one-second intervals following the order of the group address when the remote controller is operated.

● Group control using 2 signal receiving unit.

It does not matter which of the 2 signal receiving unit you set as the main controller.

When using multiple signal receiving unit (up to 2 of them can be used), one is the main signal receiving unit and the other is the sub-signal receiving unit.



- To set up a sub-signal receiving unit, change its remote control address connector (RCU. ADR) located on its PCB from main to sub position (main: when shipped from factory).

7
RC
(WL)

7-18. Wiring System Diagram for Multiple

■ When Installing Multiple

This multiple system is used for operating the unit(s) at different positions. (A maximum of 2 signal receiving unit can be installed.)

● Setting method

To execute this control, make the setting according to the following procedure.

- (1) Of the two installed signal receiving unit, make one the main signal receiving unit (factory-shipped state).
- (2) On the other signal receiving unit, change the address connector on the PCB from main to sub position.
In this state, it functions as a sub-signal receiving unit.

● Basic wiring diagram

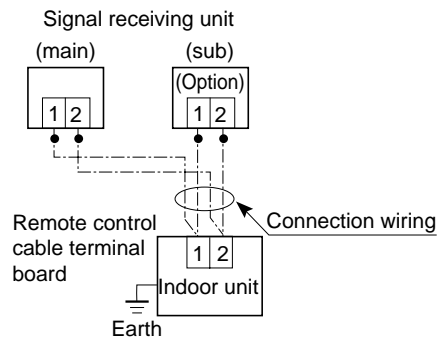


CAUTION

**Install wiring correctly
(incorrect wiring will damage
the equipment).**

7
RC
(WL)

- To operate 1 indoor unit with 2 signal receiving unit set at different places.



2015_M_1

8. HOW TO INSTALL THE WEEKLY TIMER (OPTIONAL PART)



WARNING

Do not supply power to the unit or try to operate it until the tubing and wiring to the outdoor unit is completed.

8-1. Mounting Dimensions for Continuous Installation

- For vertical continuous installation, the space between the weekly timer and the remote controller must be 1 in. or more.



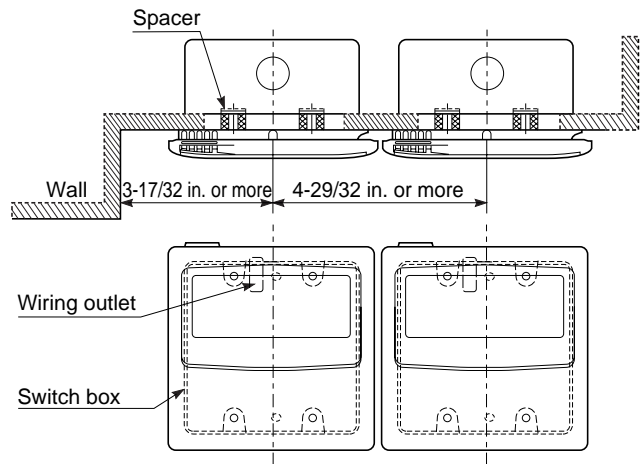
CAUTION

- Do not twist the control wiring with the power wiring or run it in the same metal conduit, because this may cause malfunction.
- Install the weekly timer away from sources of electrical noise.
- Install a noise filter or take other appropriate action if electrical noise affects the power supply circuit of the unit.

The mounting position for the weekly timer should be located in an accessible place for control. Never cover the weekly timer or recess it into the wall.

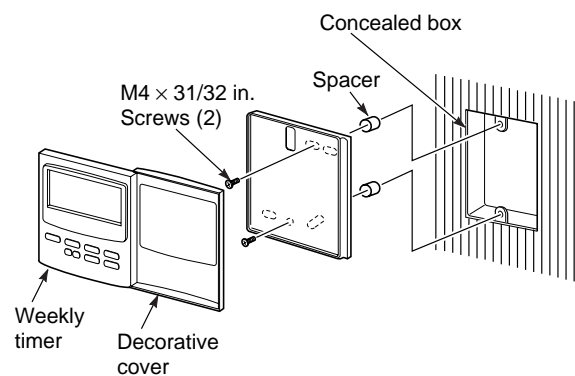
8-2. When Using a Wall Box for Flush Mounting

- If local codes allow, this weekly timer can be mounted using a conventional wall box for flush mounting.
- (1) Remove the flat-top screw on the bottom of the back case. When you open up the decorative cover, you will see two gaps under the weekly timer. Insert a coin into these gaps and remove the back case. (Figs. 8-2, 8-3)
 - (2) Attach the back case with the 2 small screws provided. Using a screwdriver, push open the cut-outs on the back case. These holes are for screws. Use the spacers and take care not to tighten the screws excessively. If the back case does not sit well, cut the spacers to a suitable thickness. (Fig. 8-2)
 - (3) Connect the 4 wires to the weekly timer 4P terminal base (see next page).
 - (4) To finish, fit the back tabs of the back case into the weekly timer and mount it using the flat-top screw.



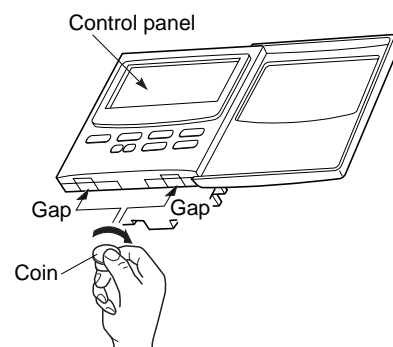
2016_C_I

Fig. 8-1



2017_C_I

Fig. 8-2



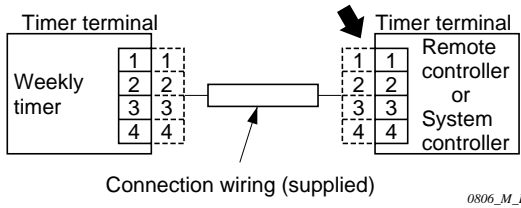
2018_M_I

Fig. 8-3

8

WT

8-3. Wiring Diagram (For wiring, always use the supplied wires)



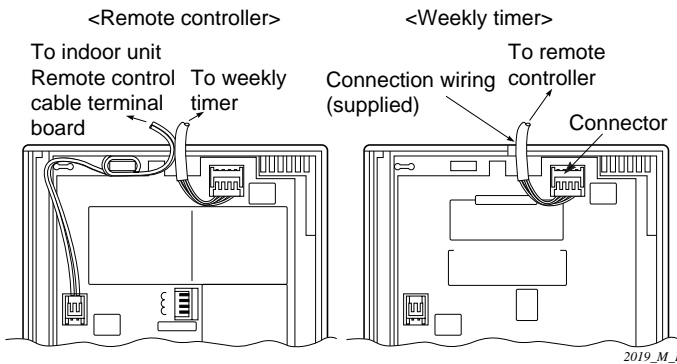
● Layout

The weekly timer and remote controller may be located, either one on the left or right sides.

● Wiring procedure

Do the wiring according to the following procedure.

- Loosen the retaining screw of the lead wire of the weekly timer, remove the collar, and connect the supplied connection wiring to the timer terminal (4P connector) of the weekly timer. Place the supplied connection wiring into the groove neatly, and then refasten the collar.



- Pass the supplied connection wiring through the lead-wire drawing-out port on the bottom case of the weekly timer, then run it behind the wall and connect it to the timer terminal (4P terminal) of the remote controller. (Fig. 8-4)
(Use the supplied collar for fastening the wire of the remote controller.)

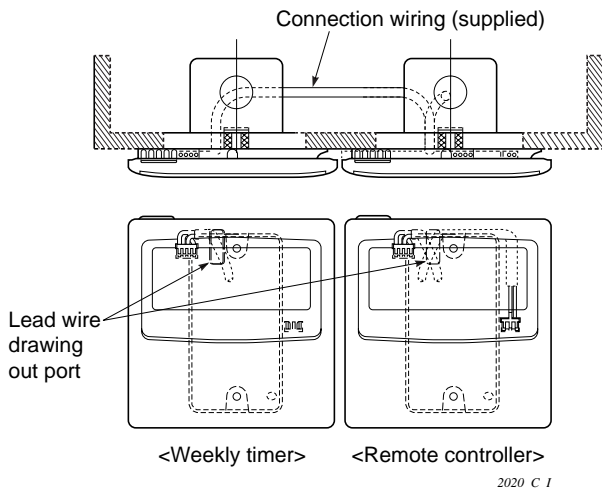


Fig. 8-4

8-4. Test Run Setting

- After installation, check the output state of the weekly timer with the "FORCED OPR." switch (OFF to ON) located on the rear side of its PCB. After confirming normal operation, turn the "FORCED OPR." switch back to OFF without fail.

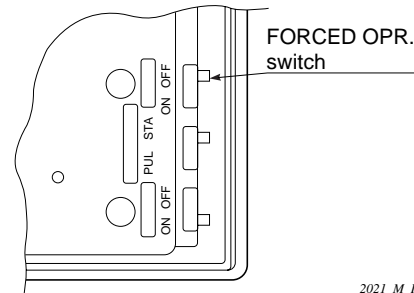


Fig. 8-5

8-5. Memory Back Up Function for Power Failure Compensation

- This weekly timer keeps the settings of operating buttons memorized; so that after a power failure the operation can be restarted in the same set state by pressing the PROGRAM button.
- Using the "Back Up"
After installation, confirm that the BAT.BKUP switch on the rear side of the weekly timer's PCB is ON.

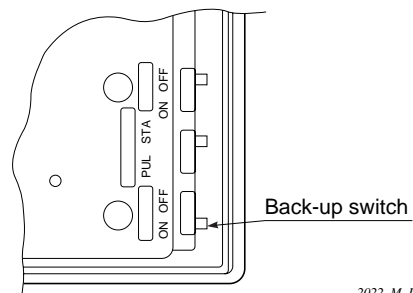


Fig. 8-6

9. HOW TO INSTALL THE SYSTEM CONTROLLER (OPTIONAL PART)



WARNING

Do not supply power to the unit or try to operate it until the tubing and wiring to the outdoor unit is completed.

9-1. System Controller Installation



CAUTION

- Do not twist the control wiring with the power wiring or run it in the same metal conduit, because this may cause malfunction.
- Install the system controller away from sources of electrical noise.
- Install a noise filter or take other appropriate action if electrical noise affects the power supply circuit of the unit.

- If local codes allow, this system controller can be mounted using a conventional wall box for flush mounting.

- (1) Remove the flat-top screw on the bottom of the back case. When you open up the decorative cover, you will see two gaps under the system controller. Insert a coin into these gaps and remove the back case. (Figs. 9-1, 9-2)
- (2) Connect the wires to terminal base of the system controller (see next page).
- (3) Attach the back case with the 2 M4 screws provided.
- (4) To finish, fit the back tabs of the back case into the system controller and mount it using the flat-top screw.

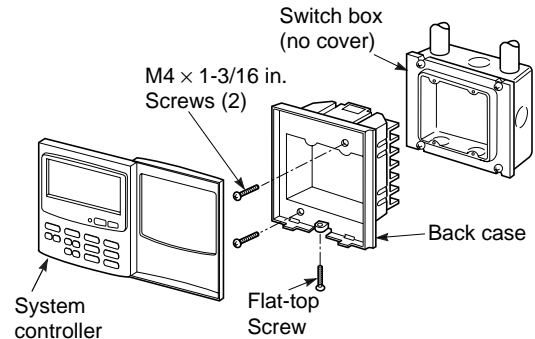


Fig. 9-1

2041_C_I

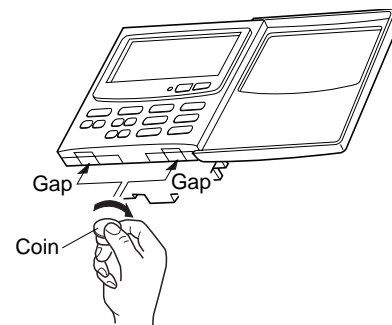


Fig. 9-2

2042_M_I

9

SC

9-2. Electrical Wiring

How to connect electrical wiring

- (1) Connect B1, B2 to indoor PCB CRV connector using accessory 2P connector. (*No polarity)
Total wire length is less than 985 ft. and size is AWG#18.
- (2) Connect B5, B6 to indoor unit 2P terminal base. (*No polarity). Wire size is AWG#18.

● Basic wiring

B1: Power supply: DC12V *No polarity
B2: To CRV connector (CN91) on indoor PCB

B3: Not be used

B4: Auxiliary of inter-unit control wiring

B5: Inter-unit control wiring. (Low voltage)
To indoor unit 2P terminal base (U1, U2)
B6: *No polarity

● Terminals for remote monitoring

- A1: Input for turning on air conditioners concurrently.
A2: Input for turning off air conditioners concurrently.
A3: Common input for turning air conditioners on or off.
A4: On operation state indicator output.
A5: Alarm indicator output.
A6: Common indicator output.

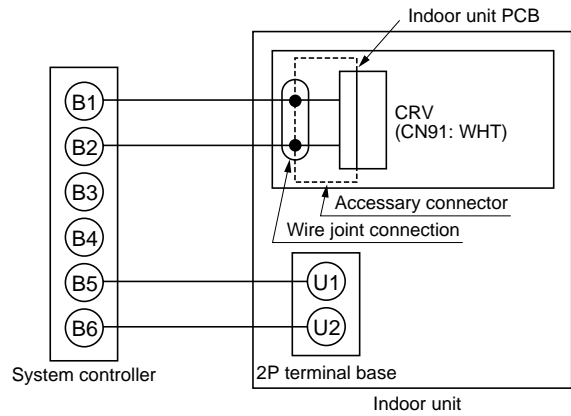


Fig. 9-3

<Back side of system controller>

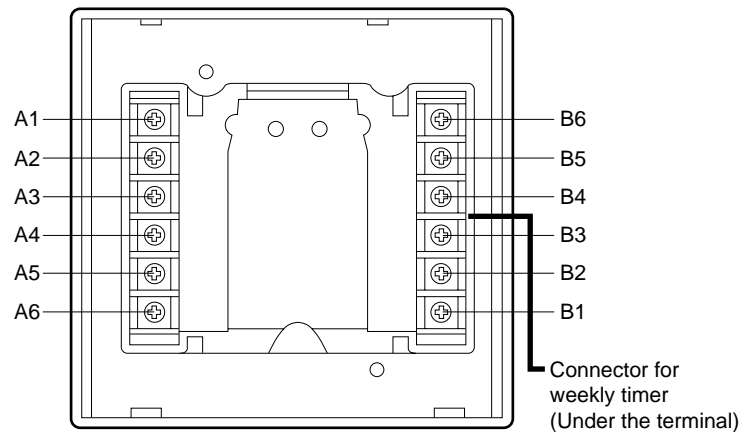
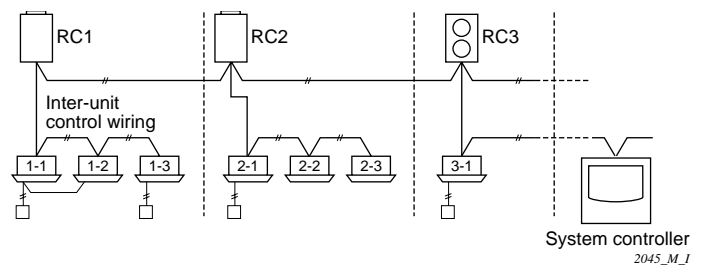


Fig. 9-4

Basic wiring diagram of control wiring

- Max. 64 indoor units and 30 outdoor units can be connected in 1 system.
- Up to 10 system controller can be connected in 1 system.



9-3. Address Switch Setting

SW1

Main/sub selection switch

OFF: System controller operates as main controller.
ON: System controller operates as sub-controller.

ALL/ZONE mode selection switch

ALL mode:
All indoor units can be controlled by system controller
ZONE 1, 2, 3, 4 mode:
Indoor units in one of zone 1, 2, 3, or 4 can be controlled by system controller. All indoor units cannot be set.

	2	3	4	5
ALL mode	OFF	OFF		OFF
ZONE 1 mode	OFF	OFF		ON
ZONE 2 mode	ON	OFF	OFF	ON
ZONE 3 mode	OFF	ON		ON
ZONE 4 mode	ON	ON		ON

Central control/Remote control mode selection switch.

OFF: Central control mode.
Individual setting by remote controller can be inhibited by system controller.



ON: Remote control mode.
Setting by system controller is inhibited by other central control equipments.

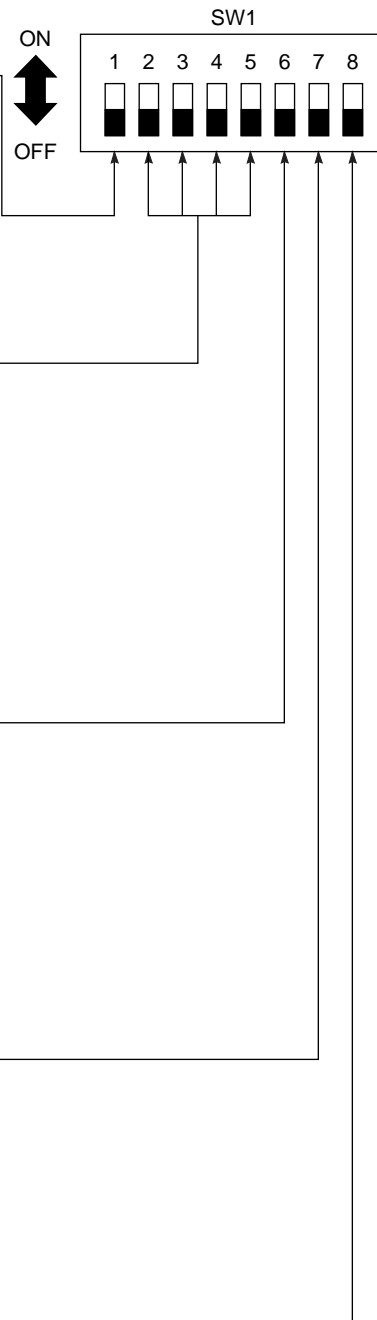
Central control Main/Sub selection switch

(OFF: Main, ON: Sub)

- ① When AMY adaptor etc. is used with system controller, set the switch to ON position.
- ② When only one system controller is used, set the switch to OFF position.
- ③ Except ①, when multiple system controllers are used, set only one system controller to OFF position others to ON position.
ALL mode system controller to be OFF position.
(recommended)

(Central control) button operation switch

OFF:  (Central control) button operation is permitted.
ON :  button operation is inhibited.



*All switches are OFF position at shipment.

2046_M_I



SW2

Weekly timer input switches.

System controller operation can be set when weekly timer activates (ON/OFF).

System controller operation	Switch No.				
	Timer OFF→ON	Timer ON→OFF	1	2	3
① All ON	All OFF		OFF	OFF	OFF
② No change		All OFF	ON	OFF	OFF
③ Individual control of all indoor units to be permitted	All indoor units to be 1*1		OFF	ON	OFF
④ Ditto	All OFF and all indoor units to be 1*1		ON	ON	OFF
⑤ Ditto	All indoor units to be 2*2		OFF	OFF	ON
⑥ Ditto	All OFF and all indoor units to be 2*2		ON	OFF	ON

Incase of Remote control mode, use ① or ②.

In case of ZONE 1, 2, 3, 4 mode, ALL, all indoor units means one of ZONE 1, 2, 3, 4.

*1: 1 (Central control 1) means ON/OFF operation cannot execute by remote controller.

*2: 2 (Central control 2) means ON/OFF, MODE change. Temp. setting cannot be executed by remote controller.

Auxiliary switch

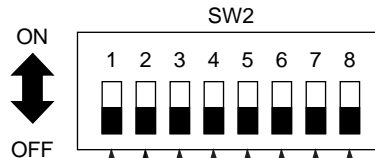
Must be set to OFF position.

Beep tone switch

OFF: Beep tone when each button is pushed.
ON: No tone when each button is pushed.

Indication switch

Normally set to OFF position.
When set to ON position, indication is not displayed on LCD of system controller.



*All switches are OFF position at shipment.

2047_M_I



9-4. Mode Setting

According to function of each system controller, set SW1 as Fig. 9-5.

(1) Central control/Remote control mode

● Central control mode

System controller is used as central control equipment.

Individual setting by remote controller can be inhibited by system controller

● Remote control mode

System controller is used as remote controller.

Setting by system controller is inhibited by other central control equipments.

(2) ALL/ZONE mode

● ALL mode

All indoor units can be controlled by system controller.

● ZONE mode

Indoor units in one of ZONE 1, 2, 3 or 4 can be controlled by system controller

(3) Function of system controller is 10 types according to combination of central control/remote control mode and ALL/ZONE mode setting as the table 9-1.

(4) Stick the system controller unit label in a conspicuous position.

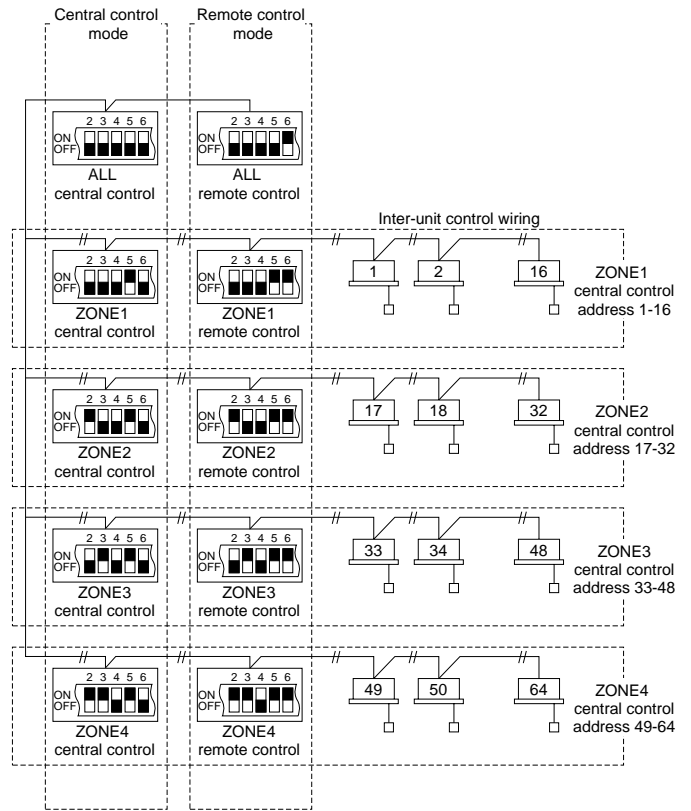


Fig. 9-5

Table 9-1

	Central control	Remote control
ALL	1. ALL/Central	6. ALL/Remote
ZONE1	2. ZONE1/Central	7. ZONE1/Remote
ZONE2	3. ZONE2/Central	8. ZONE2/Remote
ZONE3	4. ZONE3/Central	9. ZONE3/Remote
ZONE4	5. ZONE4/Central	10. ZONE4/Remote

9-5. How to Perform Zone Registration

To operate the system controller properly, zone registration is required after finishing the test run (and after setting all indoor unit addresses) using one of the following methods.

- (a) Zone registration using the remote controller (RCS-SH80UG)
Refer to page 73
- (b) Zone registration using the system controller (SHA-KC64UG)
Refer to page 74
- (c) Automatic zone registration using the system controller (SHA-KC64UG)
Refer to page 75

For methods (a) and (b), you should make a zone registration table manually before performing the registration as shown on the next page.

For method (c), zone registration is executed automatically, proceeding from small indoor unit address and small central addresses to larger numbers in numerical order. For example:

Central address	1	2	3	4	5	6	
ZONE-group	1-1	1-2	1-3	1-4	1-5	1-6	
Indoor unit address	1-1	1-2	2-1	2-2	2-3	3-1	

NOTE

1. An indoor unit address is assigned to each indoor unit during automatic address operation. Each indoor unit address combines an R.C. address and indoor unit number as follows:

1 - 1 : Indoor unit address (UNIT No.)
 ↑ ↑
 Indoor unit No.
 Refrigerant circuit No. (R.C. address)

2084_M_I

This address is displayed on remote controller for UNIT No. when the UNIT button is pressed.

2. The central address represents the zone and group number. These addresses are assigned in ascending numerical order.

(a) Zone registration using the remote controller (RCS-SH80UG)

(Determination of central address)

- In this case, after confirming which indoor unit is connected to the remote controller and that the air conditioner in the OFF state, you set the central addresses one at a time.
- If the system has no remote controller, connect a remote controller to the system temporarily. Then follow this procedure.

NOTE

The indoor unit address must already have been set before performing zone registration. If necessary, refer to the Installation Manual supplied with the outdoor unit.

- (1) Press the and buttons at the same time of the remote controller for more than 4 seconds.
- (2) Do not press **UNIT** button.
- (3) Once in this mode, the UNIT No., CODE No., No. of SET DATA and **SETTING** indications will flash on the display as shown Fig. 9-6.

NOTE

In case of group control "ALL" instead of "UNIT No." will flash on the display. Select the main indoor unit address by pressing the **UNIT** button once.

- (4) Set CODE No. to 03 using the and () buttons.

NOTE

The CODE No. 03 must be selected to perform zone registration using the remote controller.

- (5) Set the Central address which you want to assign to the indoor unit address using the and () buttons according to the zone registration table.
- (6) Press the **SET** button. The CODE No. and Central address changes from flashing to ON state. If you make mistake, then press the **CL** button and reset the central address.
- (7) Press the button to finish zone registration.

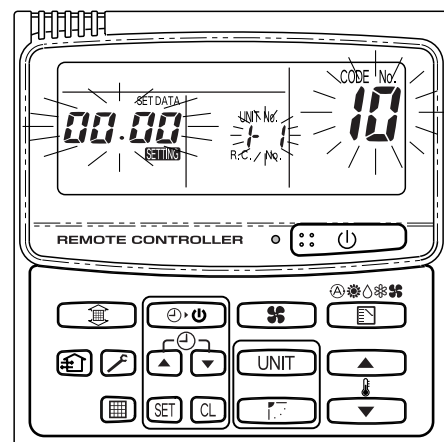


Fig. 9-6

2049_M_I

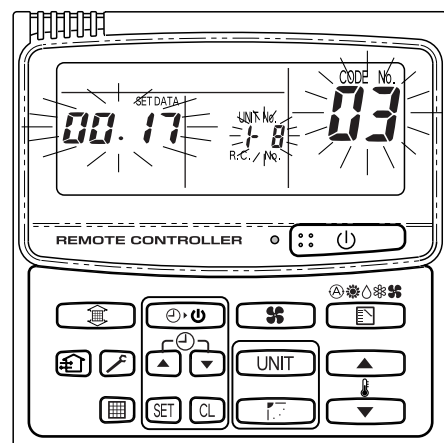


Fig. 9-7

For example, in this case
 Indoor unit address: 1-8
 Central address : 17 (ZONE 2, GROUP 1)



(b) Zone registration using the system controller (SHA-KC640G)

● In this case, you set all central addresses by system controller at once manually.

- (1) Press the and **ZONE** buttons at the same time for more than 4 seconds. **SETTING** and CODE No. C1 will flash.
- (2) After confirming that CODE No. C1 is displayed, press the **SET** button. Once in this mode, a change takes place as Fig. 9-8.
- (3) Select the zone and group No. which you want to set with **ZONE** and (GROUP) buttons.
If already set, press the **CL** buttons.

- (4) Set the unit No. (Indoor unit address) with and buttons, according to the zone registration table.
R.C. No. button
Indoor unit No. button

- (5) Press the **SET** button.
GROUP No. turns ON and UNIT No. (Indoor unit address) changes from flashing to ON state.
UNIT No. is registered to selected ZONE No. and GROUP No..
If you make mistake, then press the **CL** button and reselect the ZONE, GROUP and UNIT No.

- (6) Register the other UNIT No. in the same way by following the steps (3) to (5).
- (7) Finally, complete the registration by pressing the button.
SETTING flashes for a few minutes, then OFF.

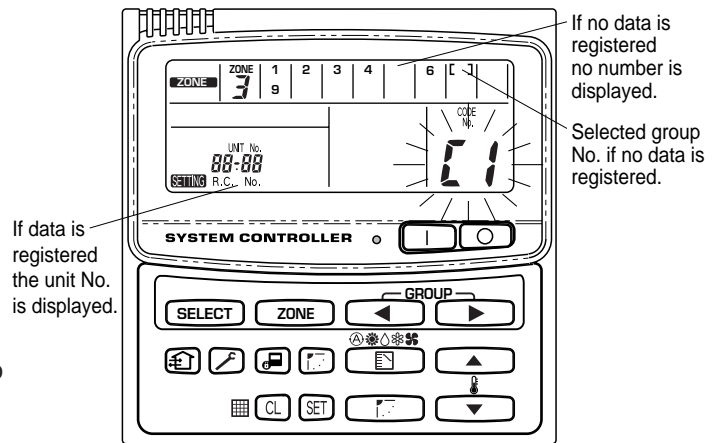
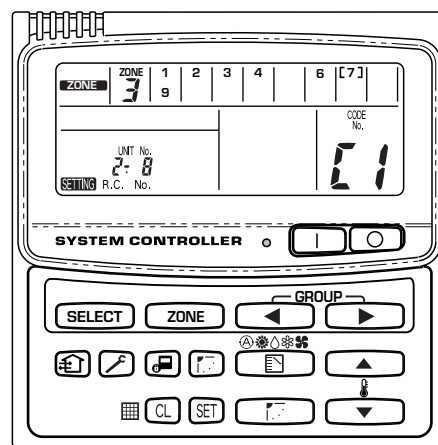







Fig. 9-8

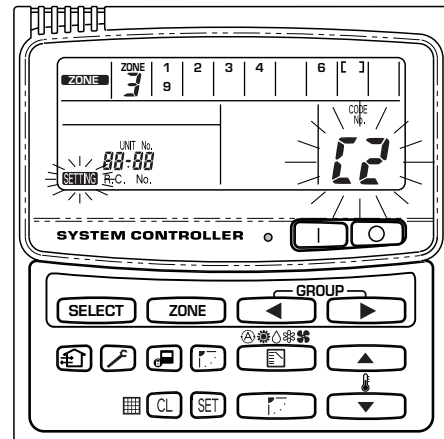


For example, in this case
Zone 3, group No. 7
Unit No. (indoor unit address) 2-8
Unit No. 2-8 is registered to zone 3-group 7.

Fig. 9-9

(c) **Automatic zone registration using the system controller (SHA-KC64UG)**








- (1) Press the  and **ZONE** buttons at the same time for more than 4 seconds. **SETTING** and CODE No. C1 will flash.
- (2) Select CODE. No. C2 by pressing  and  () button and press the **SET** button. C2 changes from flashing to ON state and automatic zone registration will start.
- (3) Registered GROUP No. will be disappeared all.
- (4) Central address will be assigned from small indoor unit address to large one in numerical order automatically. Finishing automatic zone registration, **SETTING** changes from flashing to OFF.
- (5) If the error is happened, the “CHECK” starts flashing and zone registration finishes at this time. Press the **CL** button.
- (6) Finally, complete automatic zone registration mode by pressing the  button. **SETTING** flashes for a few minutes, then OFF.



2053_M_I

Fig. 9-10

■ **How to check overlapping of central address No.**

- (1) Press the  and **ZONE** buttons at the same time for more than 4 seconds.
SETTING and CODE No. C1 will flash.
- (2) Select CODE No. C3 by pressing ,  (🔒) button and press the **SET** button.
 C3 changes from flashing to ON state and **SETTING** will flash. Then auto. overlap checking will start .
- (3) If C3 changes from ON to flashing and **SETTING** stops flashing and disappears, there is no overlapping.
 Then finally, complete the auto overlap checking mode by pressing the  button.
- (4) If some of GROUP No., ZONE No. and UNIT No. flash, you should try again the zone registration.
 - ① Select CODE No. C1 by pressing ,  (🔒) button and press the **SET** button.
 - ② Select the flashing GROUP No. with ZONE and GROUP button.
 Then press the **CL** button and reselect the ZONE, GROUP and UNIT No.
 - ③ Then finally, complete the auto. overlap checking mode by pressing the  button.

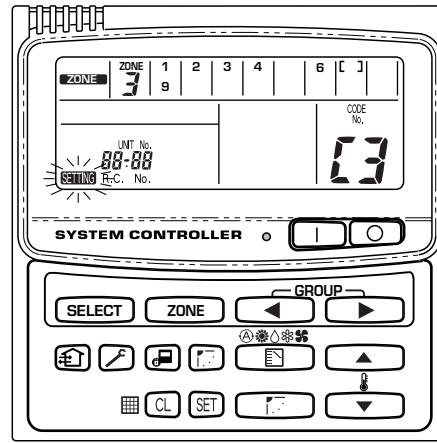


Fig. 9-11

■ ZONE registration table

ZONE	GROUP	Central address	Indoor unit address (UNIT No.)	Unit location	ZONE	GROUP	Central address	Indoor unit address (UNIT No.)	Unit location
1	1	1			3	1	33		
	2	2				2	34		
	3	3				3	35		
	4	4				4	36		
	5	5				5	37		
	6	6				6	38		
	7	7				7	39		
	8	8				8	40		
	9	9				9	41		
	10	10				10	42		
	11	11				11	43		
	12	12				12	44		
	13	13				13	45		
	14	14				14	46		
	15	15				15	47		
	16	16				16	48		
2	1	17			4	1	49		
	2	18				2	50		
	3	19				3	51		
	4	20				4	52		
	5	21				5	53		
	6	22				6	54		
	7	23				7	55		
	8	24				8	56		
	9	25				9	57		
	10	26				10	58		
	11	27				11	59		
	12	28				12	60		
	13	29				13	61		
	14	30				14	62		
	15	31				15	63		
	16	32				16	64		

NOTE 1. Assign indoor unit addresses to the desired positions (central addresses) manually.

2. For group control, only the main indoor unit should be assigned. Sub indoor units cannot be assigned.



9-6. Connection with Other Equipments

Name	System controller		Equipment		
	Input/output	Terminal	Terminal	Example	Input/output
Digital input/output terminals	Status output		CPEV AWG#16		Wire length: less than 330 ft.
	Control input		CPEV AWG#16		Pulse width: more than 984 ft./sec. Wire length: less than 330 ft.

2055_M_I

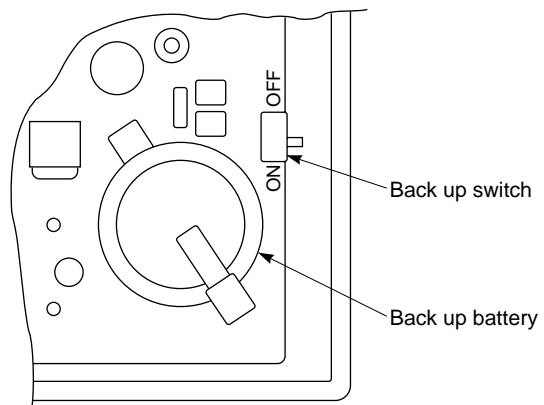
9-7. Memory Back Up Switch

Check the back up switch is ON for back side of PCB by system controller.

9-8. Test Run

- Power on for all indoor units. Next, power on for system controller.
SETTING will flash, checking the indoor unit address automatically.
- If group No. displayed on system controller is not same as indoor unit No.* which is connected, see Fig. 9-5 and setting again.

*In case of group control, main unit No. only.



2056_M_I

9

SC

10. HOW TO PROCESS TUBING

The narrow tubing side is connected by flare nut, and the wide tubing side is connected by brazing.

10-1. Use of the Flaring Method

Many of the conventional split system air conditioners employ the flaring method to connect refrigerant tubes which run between indoor and outdoor units. In this method, the copper tubes are flared at each end and connected with flare nuts.

10-2. Flaring Procedure with a Flare Tool

- (1) Cut the copper tube to the required length with a tube cutter. It is recommended to cut about 12 – 20 in. longer than the estimated tubing length.
- (2) Remove burrs at the end of the copper tube with a tube reamer or file. This process is important and should be done carefully to make a good flare. (Fig. 10-1)

NOTE

When reaming, hold the tube end downward and be sure that no copper scraps fall into the tube. (Fig. 10-2)

- (3) Remove the flare nut from the unit and mount it on the copper tube.
- (4) Make a flare at the end of copper tube with a flare tool.* (Fig. 10-3)
*Use "RIGID®" or equivalent.

NOTE

A good flare should have the following characteristics:

- inside surface is glossy and smooth.
- edge is smooth.
- tapered sides are of uniform length.

10-3. Precaution before Connecting Tubes Tightly

- (1) Apply a sealing cap or water-proof tape to prevent dust or water from entering the tubes before they are used.
 - (2) Apply refrigerant lubricant to the matching surfaces of the flare and union before connecting them together. This helps to reduce gas leaks. (Fig. 10-4)
 - (3) For proper connection, align the union tube and flare tube with each other, then screw in the flare nut lightly at first to obtain a smooth match. (Fig. 10-5)
- Adjust the shape of the narrow and wide tubes using a tube bender at the installation site and connect them to the each tubing side valve using a flare nut.

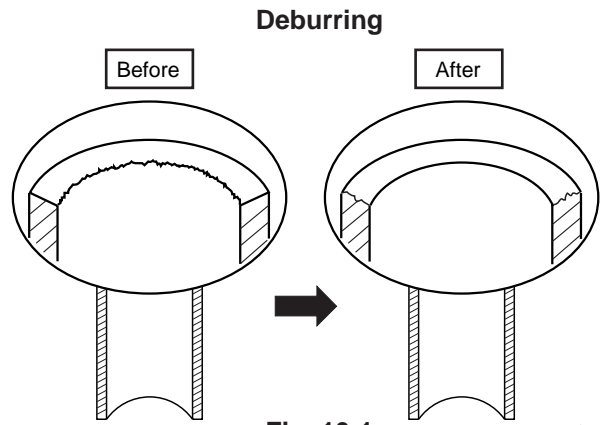


Fig. 10-1

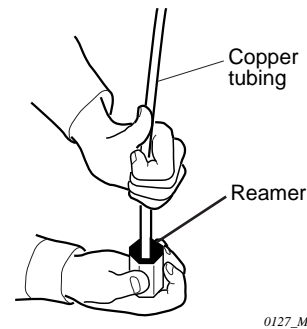


Fig. 10-2

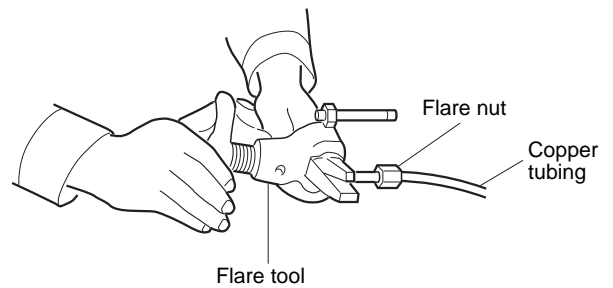


Fig. 10-3

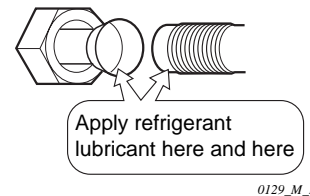


Fig. 10-4

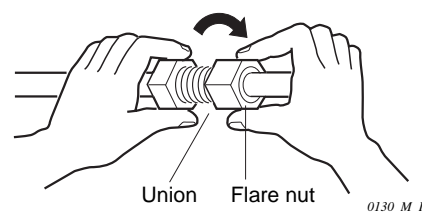


Fig. 10-5

10-4. Precautions during Brazing

- Replace air inside the tube with nitrogen gas to prevent copper oxide film from forming during the brazing process.
- Do not allow the tubing to get too hot during the brazing process.
The nitrogen gas inside the tubing may overheat, causing refrigerant system valves to become damaged. Therefore allow the tubing to cool between brazings.

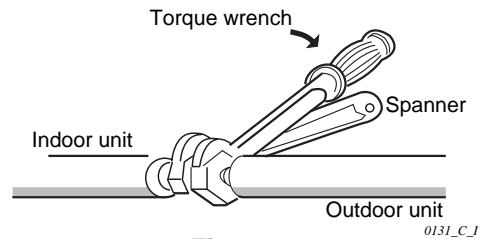


Fig. 10-6

10-5. Connecting Tubing between Indoor and Outdoor Units

- (1) Tightly connect the indoor side refrigerant tubing with the outdoor side tubing. (Fig. 10-6)
- (2) To fasten the flare nuts, apply specified torque as:

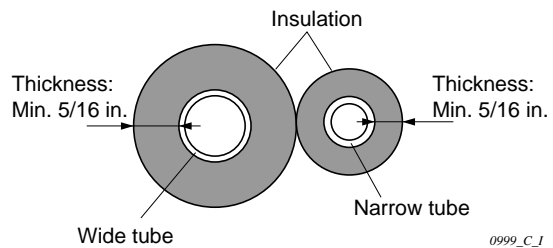


Fig. 10-7

Table 10-1

Tube Dia.	Tightening Torque
1/4" (6.35 mm)	Approx. 120 — 160 lbs-in. (140 — 180 kg-cm)
3/8" (9.52 mm)	Approx. 300 — 360 lbs-in. (340 — 420 kg-cm)
3/4" (19.05 mm)	Approx. 870 — 1040 lbs-in. (1000 — 1200 kg-cm)

10-6. Insulating the Refrigerant Tubing



CAUTION

Always insulate tubes after draining water and completing leak tests on all connection points.

Important

To avoid condensation and water leaks, the wide tube (gas line) must be insulated with the supplied insulation materials.

Taping the flare nuts

Wind white insulation tape around the flare nuts at the wide tube connections. Place the seal (supplied) on the unit. Then cover up the tubing connections with the flare nut insulator, and cover the gap at the union with the supplied black insulation tape. Finally, fix the insulator at both ends with vinyl clamps. (Fig. 10-8)

Insulation material

The material used for insulation must have good insulation characteristics, be easy to use, be age resistant, and must not easily absorb moisture.



CAUTION

After a tube has been insulated, never try to bend it into a narrow curve because it can cause the tube to break or crack.

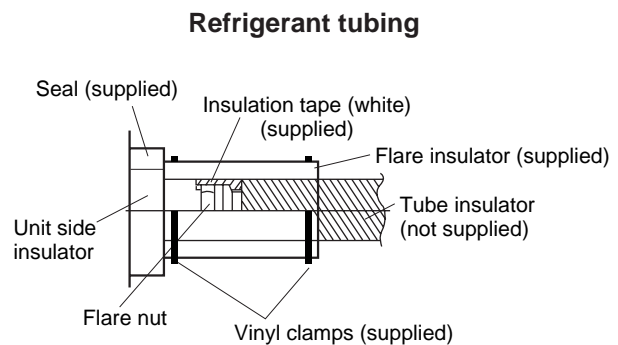
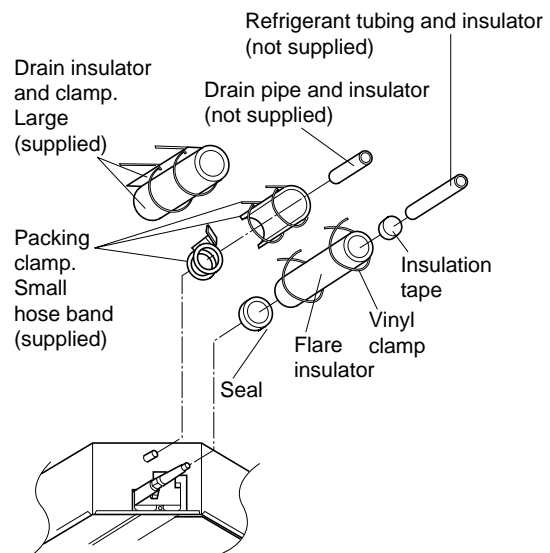


Fig. 10-8



Never grasp the drain or refrigerant connecting outlets when moving the unit.

Fig. 10-9

10-7. Taping the Tubes

- (1) At this time, the refrigerant tubes (and electrical wiring if local codes permit) should be taped with armoring tape in 1 bundle. To prevent the condensation from overflowing the drain pan, keep the drain hose separate from the refrigerant tubing.
- (2) Wrap the armoring tape from the bottom of the outdoor unit to the top of the tubing where it enters the wall. As you wrap the tubing, overlap half of each previous tape turn. (Fig. 10-10)
- (3) Clamp the tubing bundle to the wall, using 1 clamp about every 3 feet.

NOTE

Do not wind the armoring tape too tightly since this will decrease the heat insulation effect. Also ensure that the condensation drain hose splits away from the bundle and drips clear of the unit and the tubing.

10-8. Finishing the Installation

After finishing insulating and taping over the tubing, use sealing putty to seal off the hole in the wall to prevent rain and draft from entering. (Fig. 10-11)

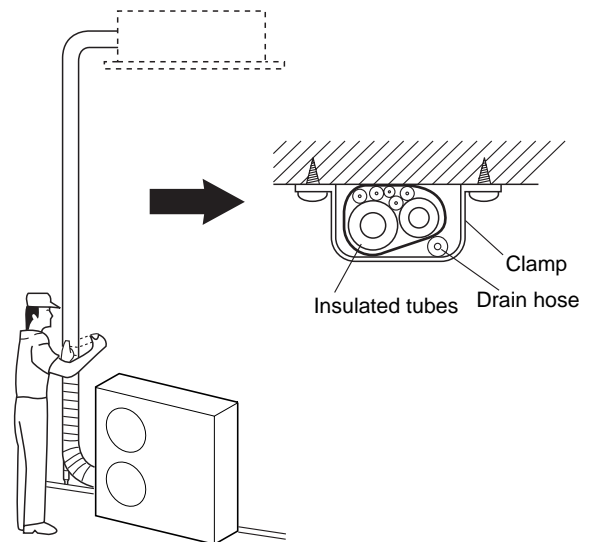


Fig. 10-10

1124_M_I

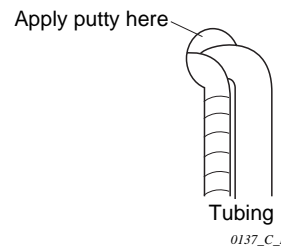


Fig. 10-11

0137_C_I

11. AIR PURGING

Air and moisture in the refrigerant system may have undesirable effects as indicated below.

- pressure in the system rises
- operating current rises
- cooling (or heating) efficiency drops
- moisture in the refrigerant circuit may freeze and block capillary tubing
- water may lead to corrosion of parts in the refrigerant system

Therefore, the indoor unit and the tubing between the indoor and outdoor units must be checked for leaks and evacuated to remove air and moisture.

■ Air Purging with a Vacuum Pump (for Test Run)

Preparation

Check that each tube (both narrow and wide) between the indoor and outdoor units has been properly connected and all wiring for the test run has been completed. Remove the valve caps from both the wide and narrow service valves on the outdoor unit. Note that both narrow and wide tube service valves on the outdoor unit are kept closed at this stage.

Leak test

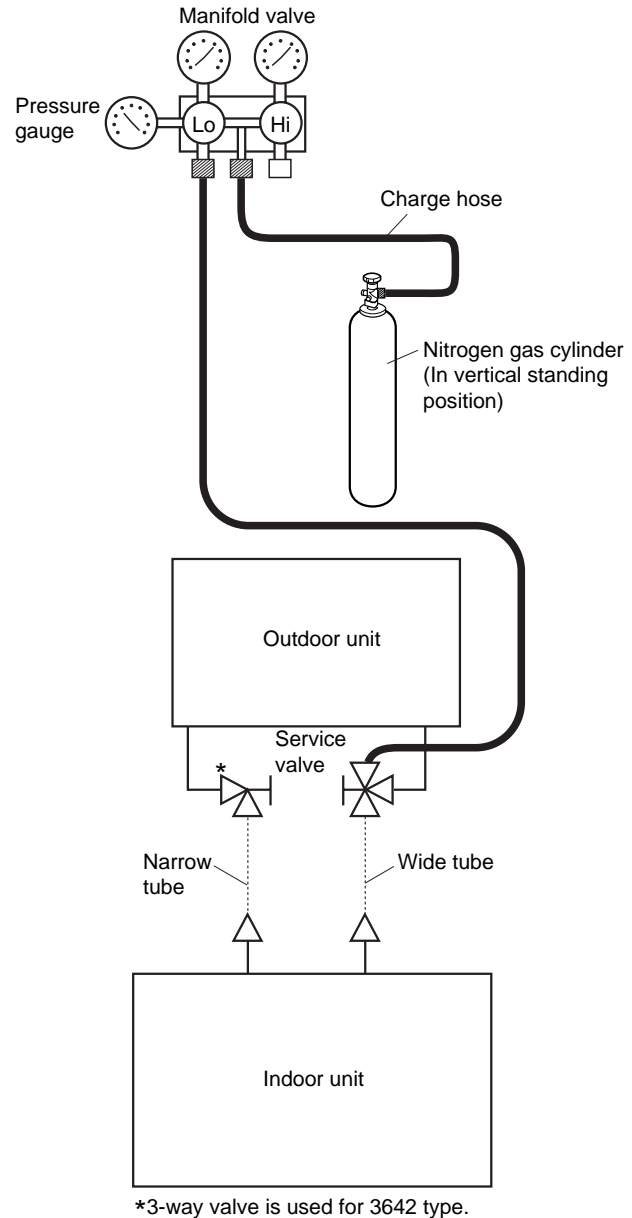
- (1) With the service valves on the outdoor unit closed, remove the 1/4 in. flare nut and its bonnet on the wide tube service valve. (Save the flare nut and its bonnet for reuse.)
- (2) Attach the nitrogen gas cylinder to the service port of the wide tube via a manifold valve with pressure gauges. (See Fig. 11-2)



CAUTION

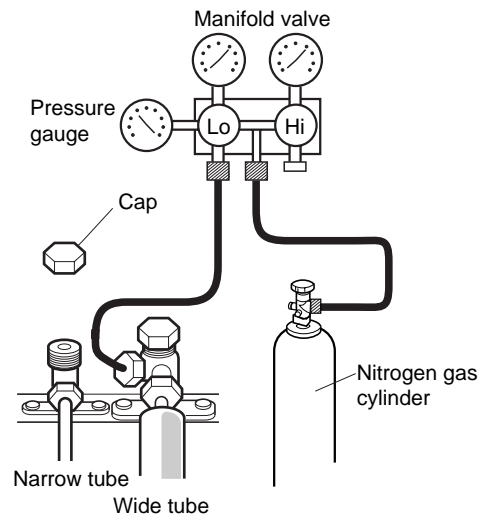
Use a manifold valve for air purging. If it is not available, use a stop valve for this purpose. The "Hi" knob of the manifold valve must always be kept closed.

- (3) Pressurize the system to about 150 P.S.I.G. with dry nitrogen gas and close the cylinder valve when the gauge reading reaches about 150 P.S.I.G. Then, test for leaks with liquid soap.



2090_C_1

Fig. 11-1



1370_C_1

Fig. 11-2

**CAUTION**

To avoid nitrogen entering the refrigerant system in a liquid state, do not use the nitrogen cylinder up side down. Use the cylinder in a vertical standing position. (Refer to the previous page.)

- (4) Do a leak test of all joints of the tubing (both indoor and outdoor) and both wide and narrow service valves. Bubbles indicate a leak. Wipe off the soap with a clean cloth after the leak tests.
- (5) After the system is found to be free of leaks, relieve the nitrogen pressure by loosening the charge hose connector at the nitrogen cylinder. When the system pressure is reduced to normal, disconnect the hose from the cylinder.

Evacuation

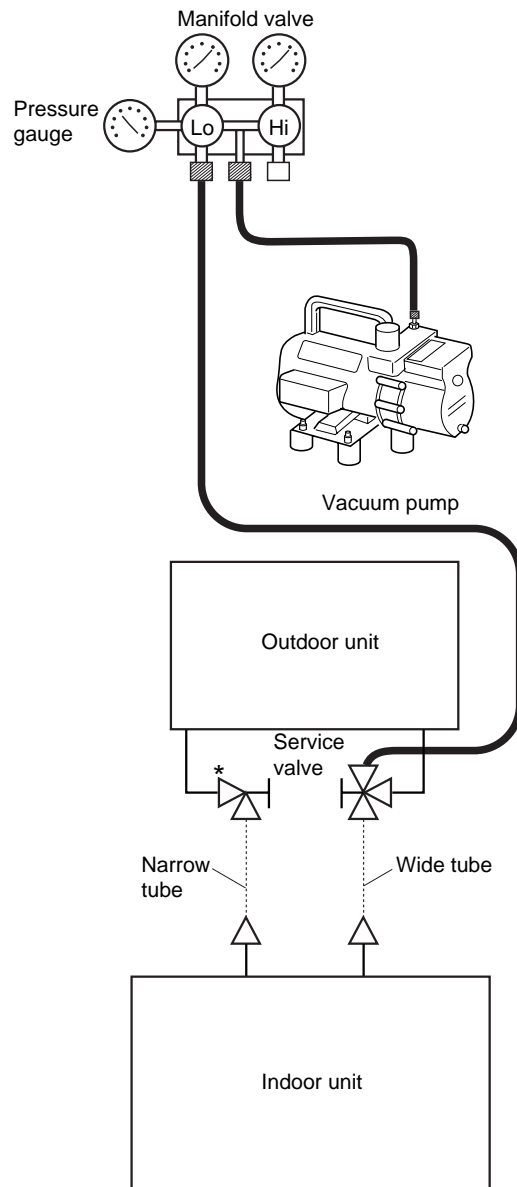
- (1) Attach the charge hose end (described in the preceding steps) to the vacuum pump to evacuate the tubing and indoor unit. Confirm that the "Lo" knob of the manifold valve is open. Then, run the vacuum pump. The operation time for evacuation varies with the tubing length and capacity of the pump. The following table shows the required time for evacuation:

Required time for evacuation when 30 gal/h vacuum pump is used	
If tubing length is less than 50 ft.	If tubing length is longer than 50 ft.
45 minutes or more	90 minutes or more

NOTE

The required time in the above table is calculated on the assumption that the ideal (or target) vacuum condition is around 10 mmHg abs.

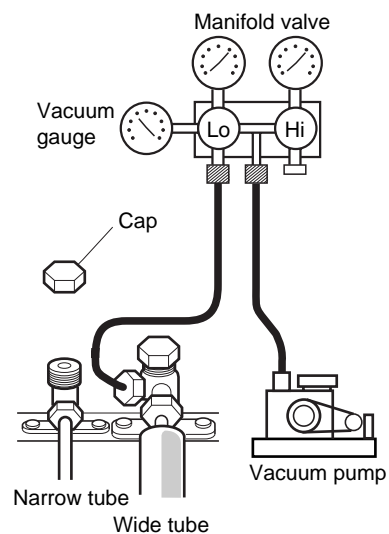
- (2) When the desired vacuum is reached, close the "Lo" knob of the manifold valve and turn off the vacuum pump.



*3-way valve is used for 3642 type.

Fig. 11-3

2091_C_1

**Fig. 11-4**

0540_C_1



Charging additional refrigerant

- Charge additional refrigerant (calculated from the narrow tube length as shown in Sec. 1-5) using the wide tube service valve with the system in cooling operating mode. (Fig. 11-5)
- Use a balance to measure the refrigerant accurately.

Finishing the job

- (1) With a hex wrench, turn the narrow tube service valve stem counterclockwise to fully open the valve. (Fig. 11-6)
- (2) With a screwdriver, turn the wide tube service valve stem counterclockwise to fully open the valve. (Fig. 11-6)



CAUTION

To avoid gas from leaking when removing the charge hose, make sure the stem of the wide tube is turned all the way out ("BACK SEAT" position).

- (3) Loosen the charge hose connected to the wide tube service port (1/4 in.) slightly to release the pressure, then remove the hose.
- (4) Replace the 1/4 in. flare nut and its bonnet on the wide tube service port and fasten the flare nut securely with an adjustable wrench or box wrench. This process is very important to prevent gas from leaking from the system.
- (5) Replace the valve caps on both the wide and narrow service valves and fasten them securely.

This completes air purging with the vacuum pump. The air conditioner is now ready for a test run.

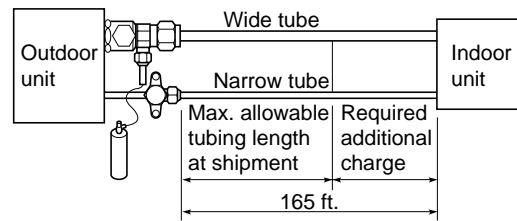


Fig. 11-5

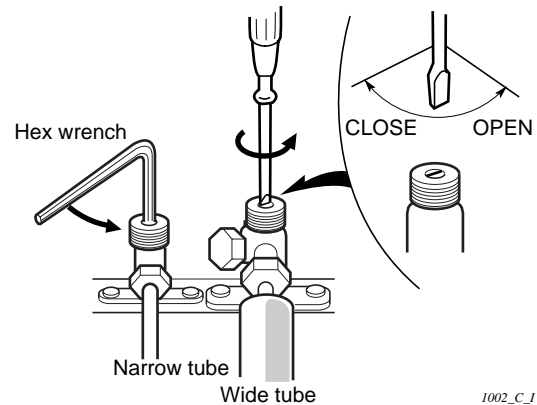


Fig. 11-6

12. TEST RUN

12-1. Preparing for Test Run

● **Before attempting to start the air conditioner, check the following:**

- (1) All loose matter is removed from the cabinet especially steel filings, bits of wire, and clips.
- (2) The control wiring is correctly connected and all electrical connections are tight.
- (3) The protective spacers for the compressor used for transportation have been removed. If not, remove them now.
- (4) The transportation pads for the indoor fan have been removed. If not, remove them now.
- (5) The power has been connected to the unit for at least 5 hours before starting the compressor. The bottom of the compressor should be warm to the touch and the crankcase heater around the feet of the compressor should be hot to the touch. (Fig. 12-1)
- (6) Both the wide and narrow tube service valves are open. If not, open them now. (Fig. 12-2)

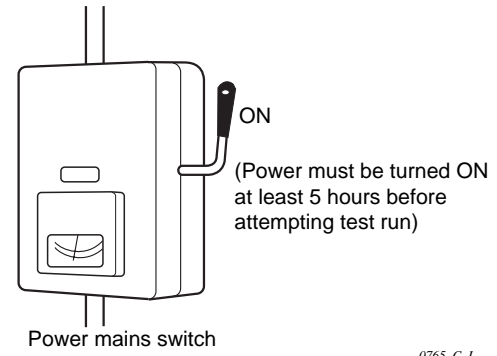


Fig. 12-1

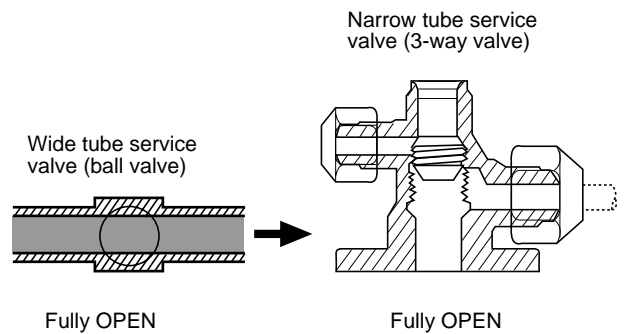

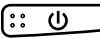




Fig. 12-2

● **Test run procedure**

- ❑ The purpose of the test run function is to let you control the operation of the unit directly without the thermostat turning the unit on or off. As indicated in the following procedure, switch out of TEST RUN when you are finished, or the air conditioner can be damaged because it will not cycle on and off normally.
 - ❑ To protect the air conditioner from overloading, the outdoor unit will not start running for 3 minutes after power is applied or the unit is turned OFF.
- a Press the  (TEST RUN) button on the remote controller. (Fig. 12-3)
 - b Press the  (ON / OFF operation) button to start the test run.
 - c Press the  (MODE) button to select either COOL or HEAT mode.
 - d When the test run has started, "TEST" shows on display of the remote controller.
 - e During the test run, the air conditioner runs continuously and the thermostat does not control the system.
 - f After the test run, press the  button once again to cancel this mode and check that "TEST" is not shown on the display.

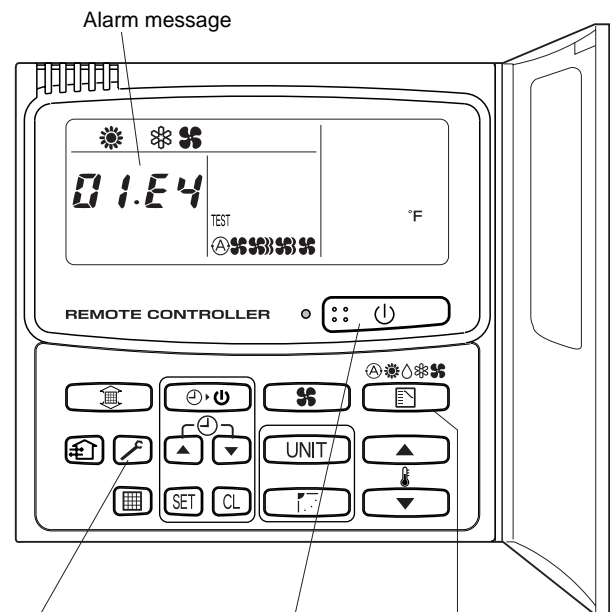


Fig. 12-3



CAUTION

The TEST RUN button is used only for servicing the air conditioner. Do not press this button for normal operation, or the system may be damaged.

12-2. PCB Setting

● Setting of outdoor control PCB

(A) Standard control (single outdoor unit)

In case of single outdoor unit installation, even if in case of twin, triple or quartet type (2, 3 or 4 indoor units), no setting necessary.

Keep factory shipment state (R.C. address is set in "0").

In this case, auto. address operation takes place automatically for the first time when the power is switched on. This takes about a few minutes.

(B) Group control (Multiple outdoor units)

In case of group control (up to 8 indoor units can be connected with one remote controller), before turning the power supply on set the R.C. address with S2, S3 on the outdoor control PCB.

R.C. address: Refrigerant circuit address 1 ~ 30.

Regarding the example of R.C. address for group control, please refer to page 43 and sec. 12-3 (page 87).

(C) Central control (when using the system controller)

In case of central control (when using the system controller, that is, when linking outdoor units in a network),

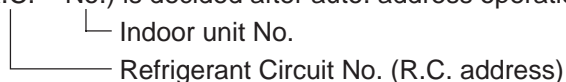
- (a) Before turning the power supply on, set the R.C. address with S2, S3 on the outdoor control PCB.
- (b) Remove the short plug (CN006, 2P Black) from all outdoor units except any one of outdoor unit.

Regarding the example of R.C. address for central control and the position of CN006, please refer to sec. 12-3. (page 87).

● Setting of indoor control PCB

No setting necessary.

Each indoor unit address (UNIT No.: R.C. – No.) is decided after auto. address operation.

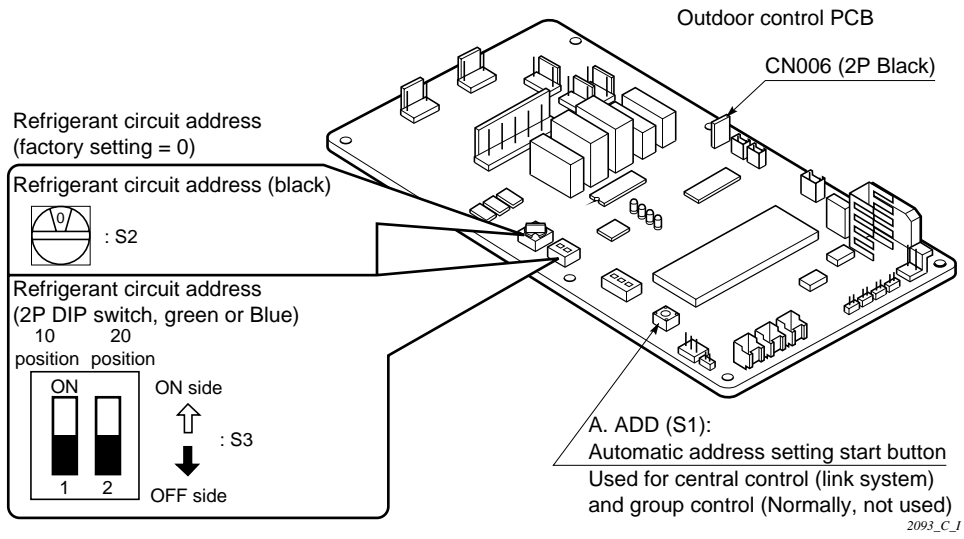


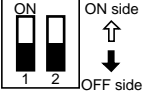

Manual setting for indoor unit address can be performed also by remote controller.

12-3. R.C. Address Setting Method

Outdoor unit R.C. address setting method

In case of group control or central control, set the R.C. address to 1, 2, 3, ... according to the No. of outdoor units.


















R.C. address	R.C. address (S3 2P dip switch, green or blue)	R.C. address (S2 Rotary switch, Black)
00 auto address ("0" when shipped from factory)	Both OFF 	 Set to 0

12-4. Automatic Address Setting Method

— For group control and central control with multiple outdoor units —

Carry out automatic address setting with the remote controller.

- (1) All auto. address operation
 - ① Press the  and  () buttons at the same time for more than 4 seconds.
 - ② Press the  button after confirming the CODE No. AA (CODE No. AA: All Auto. address operation).

After addresses are automatically set in order for the outdoor units from No. 1 to No. 30, the system returns to the normal stopped state.
- (2) Individual auto. address operation for each refrigerant circuit
 - ① To select each refrigerant circuit individually and set addresses automatically, press the  and  () buttons at the same time for more than 4 seconds, then press the ,  () button once to set CODE No. A1. (CODE No. A1: Auto. address operation)
 - ② Select R.C. No. which you want to execute the auto. address operation with  button.
 - ③ Press the  button. The auto. address operation will start. CODE No. changes from flashing to ON state.
 - ④ If the error is happened during the operation, the alarm message will display. Check and remove the cause. If you want to interrupt the operation, press the  button then the unit stands in waiting mode (Press the  button).
 - ⑤ If the auto. address operation finishes, the display will disappear.
 - ⑥ Execute the operation of the other R.C. line in the same way by following the above steps ② to ③.
 - ⑦ Complete the auto. address operation by pressing the  button.

NOTE

Required time for auto. address operation:

In case of group control : a few minutes for each R.C.

In case of central control : max. about 20 min. for each R.C.

12-5. Displaying Indoor / Outdoor Unit Combination Numbers

Display the indoor / outdoor unit address after automatic address setting.




- (1) When installing multiple units, match the indoor unit address numbers and the outdoor R.C. address numbers and display them at an easy-to-check location (near the nameplate) with an oil-based magic marker or other indelible marker so that the individual indoor and outdoor unit combinations can be checked.


Example:

Outdoor Unit 1 – Indoor Units 1-1, 1-2, 1-3,

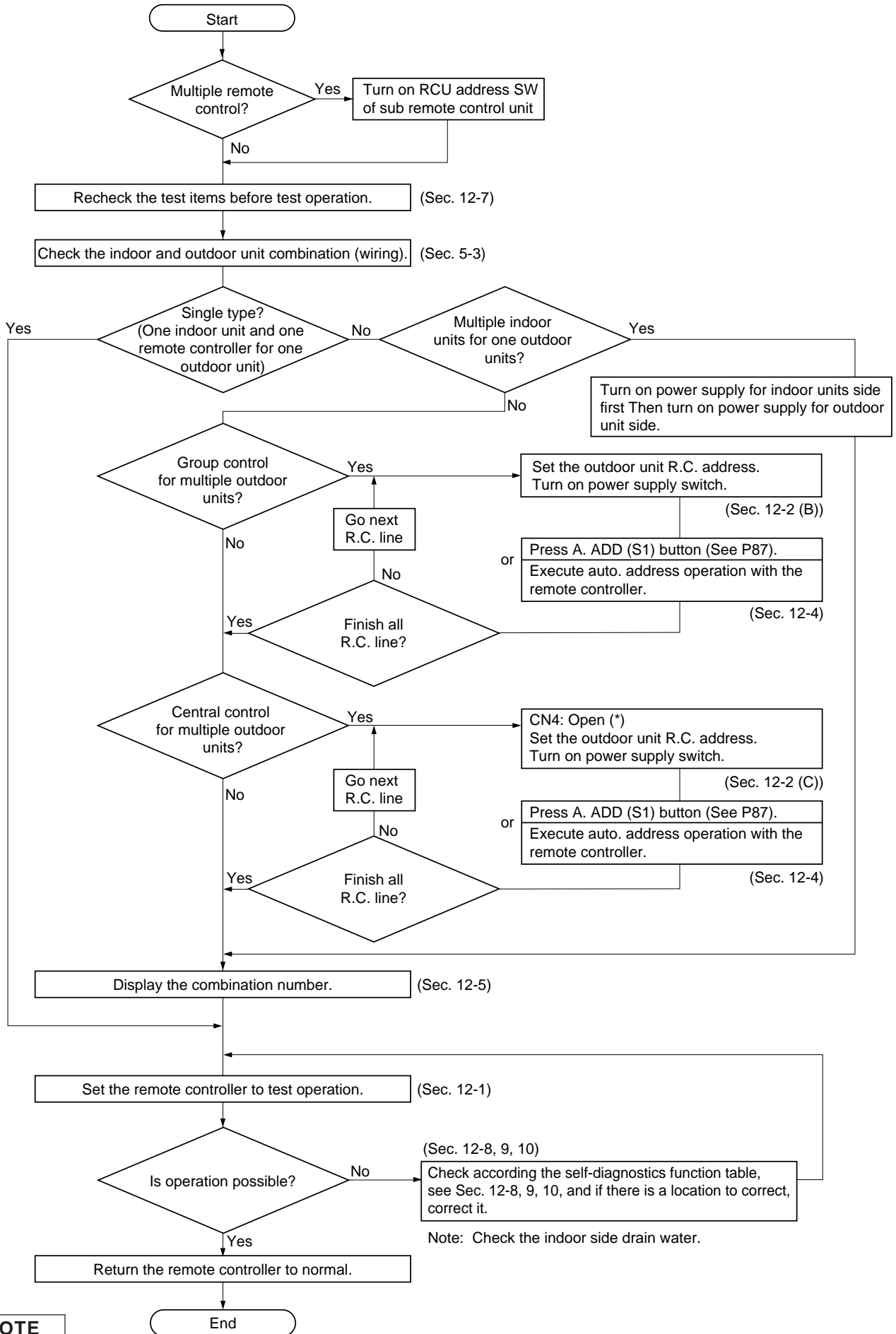
Outdoor Unit 2 – Indoor Units 2-1, 2-2, 2-3,

- (2) This is necessary for maintenance. Always label these.

*Check indoor unit address with the remote controller. Press the  button for at least 4 seconds and check the indoor unit address with the  button. (Each time you press the  button, the address changes 1-1, 1-2, ... 2-1, 2-2, ...) The fan for only the selected indoor unit turns on at high speed, so check which indoor unit runs and label the indoor unit address. (If there is 1 outdoor unit, the addresses are 1-1, 1-2, ...)

When you press the  button again, the system returns to normal remote control mode.

12-6. Test Run Procedure



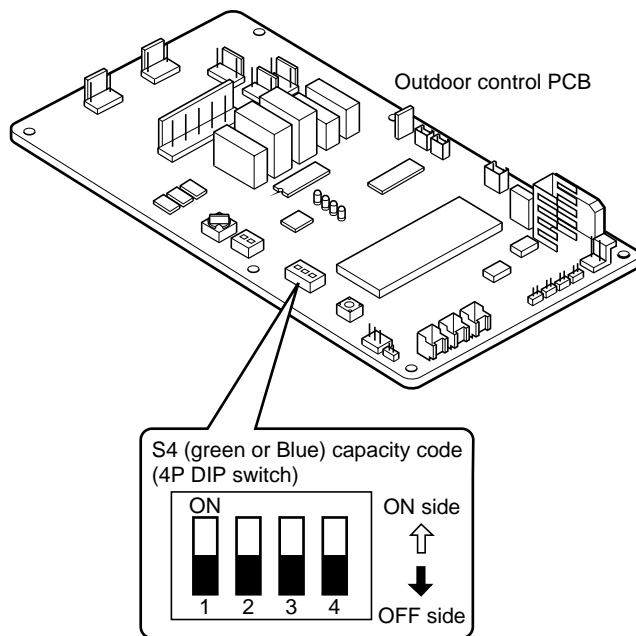
NOTE

- 1) One of CN006 of all linked outdoor units should be short.
- 2) In case of using system controller, zone registration is required after finishing Test run. Regarding the zone registration, please refer to page 74 and 75.

0509_M_I

12-7. Items to Check Prior to Test Run

- (1) Turn on the power supply switch more than 5 hours before in order to charge the crank case heater.
- (2) Fully open the outdoor service valve after making the leak inspection of field connected tubing, vacuuming, and gas charging if necessary.
- (3) Check the capacity code setting.
 - * The factory setting is as shown in the table. Double check it.
 - * The capacity code is set by S4 (green or blue, 4P DIP switch) on outdoor control PCB.



2094_C_1

S4. Capacity code

Model No.	No.	Outdoor PCB			
		1	2	3	4
24 type		ON	ON	ON	OFF
36 type		OFF	ON	OFF	ON
48 type		ON	ON	OFF	ON

12-8. The Main Alarms of Mis-wiring & Mis-setting

Remote controller display	Cause		
	In case of individual remote control	In case of group control	In case of multiple remote control
Nothing displayed	<ul style="list-style-type: none"> Remote controller not properly connected. Power supply not ON. 		
E1	<ul style="list-style-type: none"> Remote controller not properly connected. 		
E4	<ul style="list-style-type: none"> Wiring connection fault of indoor/outdoor units 	<ul style="list-style-type: none"> Wiring connection fault of some indoor/outdoor units inside the group 	
	<ul style="list-style-type: none"> Power supply of outdoor unit not ON. 		
E6	<ul style="list-style-type: none"> Combination of indoor/outdoor units is wrong. * Power supply of some indoor unit is not ON. 		
E9	—	—	<ul style="list-style-type: none"> 2 main remote controllers set.
P9 (*)	<ul style="list-style-type: none"> Improper wiring connections of ceiling panel 		

* Ref: Alarm "P9" is not generated if the remote controller is set at test run.

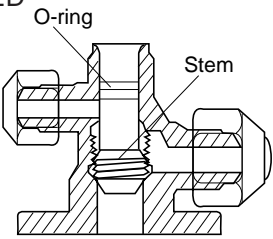
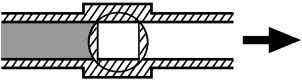
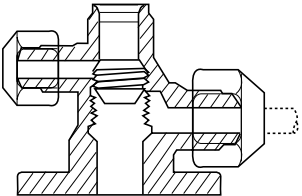
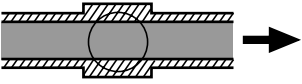
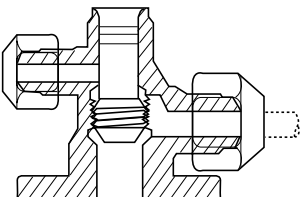
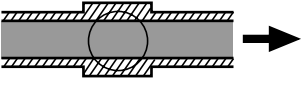
12-9. The Main Alarms of Unit Troubles

Trouble detected		Remote controller display
Indoor protection	Fan motor protection thermostat	P1
Outdoor protection	Fan motor protection thermostat Compressor protection thermostat	P2
	Abnormal discharge temp.	P3
	High pressure switch	P4
Indoor protection	Float switch	P10
Indoor sensor	Open/or damaged	F1-F3
Outdoor sensor	Open/or damaged	F4-F9
Compressor protection	Compressor motor is overloaded.	H1
	Compressor motor is locked.	H2
	Compressor current detection circuit is abnormal.	H3
	Low pressure protector is activated.	H6

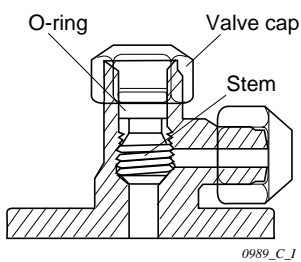
12-10. The Main Alarms of Power Supply Troubles

Cause		Remote controller display
Outdoor protection	Power supply voltage is abnormal. (More than 260 V or less than 160 V between L and N phase)	P2
	Negative phase or defective phase	P5
	Compressor contactor (Mg SW) is chattering.	H18

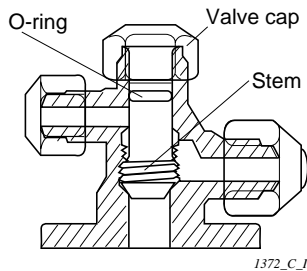
■ Basic Functions of the Service Valves

Action	Narrow Tube Service Valve (3-Way)	Wide Tube Service Valve (Ball Valve)
Shipping and air purging	<p>CLOSED</p>  <p>0546_C_1</p>	<p>CLOSED</p>  <p>0549_C_1</p>
Operating and test running the air conditioner	<p>Fully OPEN</p>  <p>0547_C_1</p>	<p>Fully OPEN</p>  <p>0550_C_1</p>
Measuring pressure and gas charging	<p>Half OPEN</p>  <p>0548_C_1</p>	<p>Fully OPEN</p>  <p>0550_C_1</p>

Narrow tube service valve

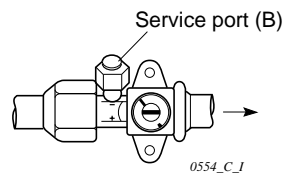


2-Way Valve
CH2442



3-Way Valve
CH3642, CH4242

Wide tube service valve



0554_C_1

13. PUMP DOWN

Pump down means collecting all refrigerant gas in the system back into the outdoor unit without losing any of the gas. Pump down is used when the unit is to be moved or before servicing the refrigerant circuit.

Pump down procedure



CAUTION

Be sure to carry out pump down with the unit in cooling mode.

- (1) Connect the low pressure side (wide tube valve service port) charging hose of the manifold valve to the service port (B) on the wide tube service valve.
- (2) Using a hex wrench, turn the narrow tube service valve clockwise all the way to close the service valve.
- (3) Press the operation button and start cooling operation.
- (4) When the low pressure gauge reading falls to 14.2 to 7.1 psi (1 to 0.5 kg/cm²), fully close the wide tube valve stem with a standard screwdriver. Then quickly stop the unit.
- (5) Disconnect all gauges and hoses, and replace the bonnets and the valve caps as they were previously.
- (6) Purge all air remaining inside the tubing before operating the air conditioner.

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