System Air Conditioner

PAW-PAIRC-HS
PAW-PAIRC-LS

Air Curtain System for R32 Use

Installation Manual

Commercial System Air Conditioner

20191101-1

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Installation Manual

Origin Installation Manual (English)

State of the documentation: 11/2019

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Contents

■ **U-71PZH2E5, U-100PZH2E5, U-125PZH2E5, U-140PZH2E5**
U-71PZH2E8, U-100PZH2E8, U-125PZH2E8, U-140PZH2E8

Introduction

Important Notice!

Please read before starting

Preparation for operation

Before operating the Air Curtain unit, it is absolutely mandatory to carefully read and to strictly execute the instructions and settings in Chapter 10.

Failure to follow instructions

The manufacturer shall in no way be responsible for improper installation, problems in operation, malfunction of the unit or safety hazards resulting from failure to follow the instructions in this manual.

Target groups

This manual is intended for specialist planners and installers, as well as service companies.

Installation, commissioning and maintenance of the products may only be carried out by qualified specialist personnel.

The operation of the products can also be carried out by private persons.

Treated products

This manual covers the following products:

R32 products

- Indoor Units, and connectable outdoor units combinations

	Outdoor unit types (kW)				
Indoor Unit Type	2,5	5	6	8	10
Standard Air Curtain LS*	PAW-10PAIRC-LS	PAW-15PAIRC-LS	PAW-20PAIRC-LS	PAW-10/25PAIRC-LS	
Standard Air Curtain HS*		PAW-10PAIRC-HS	PAW-15PAIRC-HS	PAW-20PAIRC-HS	PAW-25PAIRC-HS

* PAIRC-LS up to installation high 2,70 m.
PAIRC-HS up to installation high 3 m.

- Outdoor Units*

Outdoor unit types	
PACi Standard	U-60PZ2E5, U-100PZ2E5/8, U-125PZ2E5/8
PACi Elite	U-50PZH2E5, U-100PZH2E5/8, U-125PZH2E5/8, U-140PZH2E5/8, U-200PZH2E8, U-250PZH2E8

* Refrigerant R32 is used in the outdoor units.

Used symbols

The text in this manual uses various notices, symbols and textual representations, which are briefly explained below.

Safety-related cautions

Safety-related information alerts users to hazards and provides instructions for the safe, designated use of the product. This guide uses the following warnings and signs:

DANGER

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

► Follow the warnings provided to avoid this.

CAUTION

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

► Follow the warnings provided to avoid this.

WARNING

This signal word warns of a situation that can result in property damage.

► Follow the warnings provided to avoid this.

Further used symbols

Warning against Electrical Shock

Further notes

Important

Important notes that must be followed to ensure that the units work as intended.

Note

Hints for more useful information.

Text displays

►	indicates instructions in a warning.
1., 2., 3. ... or a, b, c ...	indicate steps to be performed in the specified order.
⇨	indicates the result of a work step.
✔	indicates the result of a sequence of work steps.
●	indicates an enumeration.
[Key]	indicates the name of a key.
Option	indicates an option of the panel.
Menu » Option	indicates a sequence of several options that must be selected one after the other.
Accent	indicates important terms or passages.
(**1**)	indicates references to legends in the text.
→ *cross-reference*	indicates a cross-reference.
www.example.com	indicates web addresses (without Hyperlink function).

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.

Safety Instructions

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.

DANGER

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CAUTION

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In Case of Improper Installation

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Special Precautions

DANGER

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 accidental 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.
- Provide a power outlet to be used exclusively for each unit, and a power supply disconnect, circuit breaker and earth leakage breaker for overcurrent protection should be provided in the exclusive line.
- Provide a power outlet exclusively for each unit, and full disconnection means contact separation in all poles must be incorporated in the fixed wiring in accordance with the wiring rules.
- To prevent possible hazards from insulation failure, the unit must be grounded.

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…

Select an installation location which is rigid and strong enough to support or hold the unit, and select a location for easy maintenance.

…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.

DANGER

► Keep the fire alarm and the air outlet at least 1.5 m away from the unit.

When Connecting Refrigerant Tubing

Pay particular attention to refrigerant leakages.

WARNING

- When performing piping work do not mix air except for specified refrigerant (R32) in refrigeration cycle. It causes capacity down, and risk of explosion and injury due to high tension inside the refrigerant cycle
- If the refrigerant comes in contact with a flame, it produces a toxic gas.
- Do not add or replace refrigerant other than specified type. It may cause product damage, burst and injury, etc.
- Ventilate the room immediately, in the event that is 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 toxic gas.
- Keep all tubing runs as short as possible.
- 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.
- Do not leak refrigerant while piping work for an installation or re-installation, and while repairing refrigeration parts. Handle liquid refrigerant carefully as it may cause frostbite.

When servicing

- Turn the power OFF at the main power box (mains), wait at least 10 minutes until it is discharged, then open the unit to check or repair electrical parts and wiring.
- Keep your fingers and clothing away from any moving parts.
- Clean up the site after you finish, remembering to check that no metal scraps or bits of wiring have been left inside the unit.

WARNING

- This product must not be modified or disassembled under any circumstances. Modified or disassembled unit may cause fire, electric shock or injury.
- Do not clean inside the indoor and outdoor units by users. Engage authorized dealer or specialist for cleaning.
- In case of malfunction of this appliance, do not repair by yourself. Contact the sales dealer or service dealer for repair.

CAUTION

- Ventilate any enclosed areas when installing or testing the refrigeration system. Leaked refrigerant gas, on contact with fire or heat, can produce dangerously toxic 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.

Others

- Do not touch the air inlet or the sharp aluminum fins of the outdoor unit. You may get injured.
- Do not sit or step on the unit,you may fall down accidentally.
- Do not stick any object into the FAN CASE. You may be injured and the unit may be damaged.

Note

The English text is the original instructions. Other languages are translations of the original instructions.

Check of Density Limit

The room in which the air conditioner is to be installed requires a design that in the event of refrigerant gas leaking out, its density will not exceed a set limit.

The refrigerant (R32), which is used in the air conditioner, is safe, without the toxicity or combustibility of ammonia, and is not restricted by laws imposed to protect the ozone layer.

However, since it contains more than air, the risk posed from a leakage of refrigerant is almost non-existent. With the recent increase in the number of high density buildings, however, the installation of multi air conditioner systems is on the increase because of the need for effective use of floor space, individual control, energy conservation by curtailing heat and carrying power, etc.

Most importantly, the multi air conditioner system contains a large amount of refrigerant compared to conventional individual air conditioners. If a single unit of the multi air conditioner system is to be installed in a small room, select a suitable model and installation procedure so that if the refrigerant accidentally leaks out, its density does not reach the set limit (and in the event of an emergency, measures can be made before injury can occur).

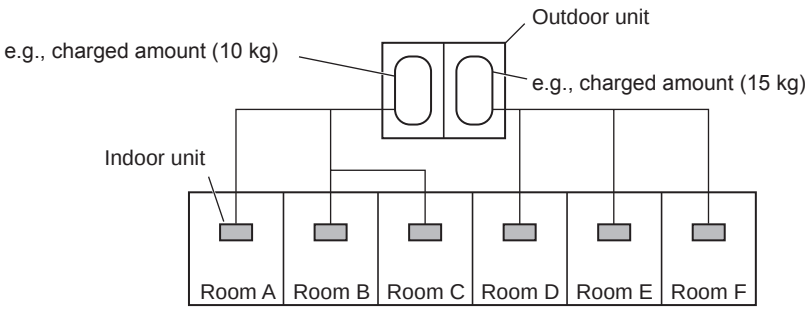
In a room where the density may exceed the set limit, create an opening with adjacent rooms, or install mechanical ventilation combined with a gas leak detection device. The density is as given below.

$$\frac{\text{Total amount of refrigerant (kg)}}{\text{Min. volume of the indoor unit installed room (m}^3\text{)}} < \text{Density limit (kg/m}^3\text{)}$$

The density limit of refrigerant which is used in multi air conditioners is 0.3 kg/m³ (ISO 5149).

Please observe the following points:

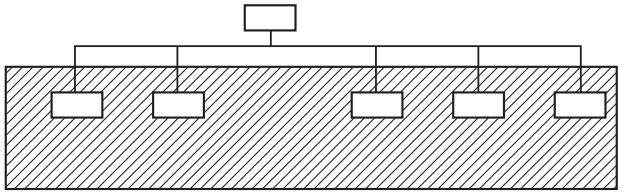
1. If there are 2 or more refrigerating systems in a single refrigerating device, the amount of refrigerant should be as charged in each independent device.
   For the amount of charge in this example:



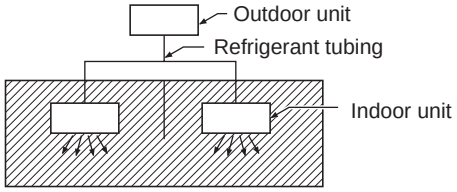
   The possible amount of leaked refrigerant gas in rooms A, B and C is 10 kg.

   The possible amount of leaked refrigerant gas in rooms D, E and F is 15 kg.

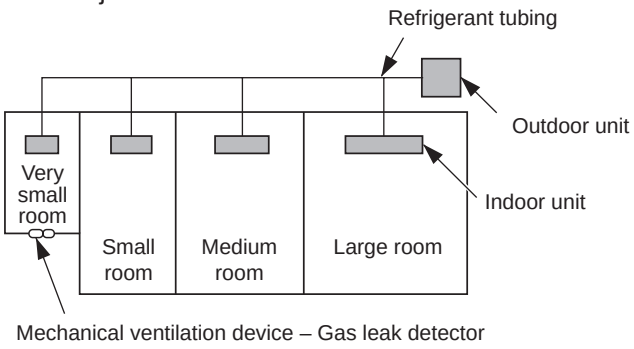
2. The standards for minimum room volume are as follows.
   (1) No partition (shaded portion)



(2) When there is an effective opening with the adjacent room for ventilation of leaking refrigerant gas (opening without a door, or an opening 0.15% or larger than the respective floor spaces at the top or the bottom of the door).

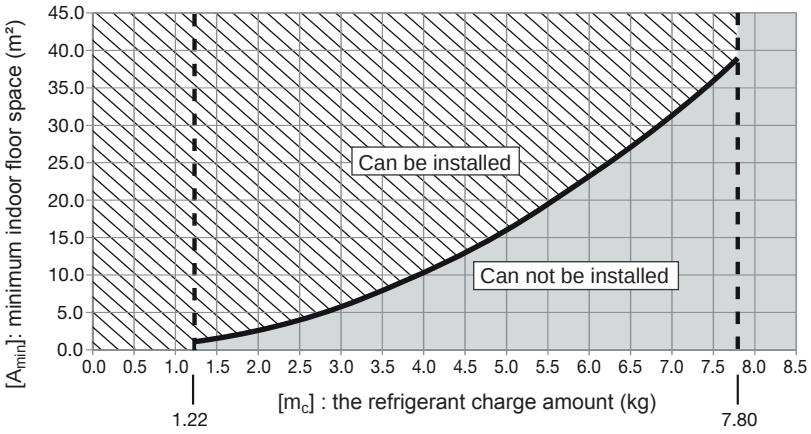


(3) If an indoor unit is installed in each partitioned room and the refrigerant tubing is interconnected, the smallest room of course becomes the object. But when mechanical ventilation is installed interlocked with a gas leakage detector in the smallest room where the density limit is exceeded, the volume of the next smallest room becomes the object.



3. The minimum indoor floor space compared with the amount of refrigerant is roughly as follows:

[ex.: Panasonic outdoor models U-200PZH2E8, U-250PZH2E8]



* •7.80 indicates m_{max} digit of the model U-200PZH2E8, U-250PZH2E8.

$[m_c]$: The refrigerant charge amount (Total of refrigerant at shipment and refrigerant charge amount in the field).

$[m_{max}]$: Maximum refrigerant charge amount

	U-200PZH2E8 U-250PZH2E8
m_{max}	7.80 kg

Judgement:
$[m_c] < 1.22$: Can be installed
$1.22 < [m_c] < [m_{max}]$: Installation possible with in the range of slanted line part
$[m_c] > [m_{max}]$: Can not be installed

1 Before installation

1.1 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.

1.2 Tools Required for Installation (not supplied)

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

1.3 Type of Copper Tube and Insulation Material

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 8 mm.
3. Use insulated copper wire for field wiring. Wire size varies with the total length of wiring. Refer to chap. 4. ELECTRICAL WIRING for details.

CAUTION

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

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

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 heat sources wich may affect the performance of the unit.
- Locations where external air may enter the room directly.
  This may cause “condensation” on the air discharge ports, causing them to spray or drip water.
- Locations where the remote controller will be splashed with water or affected by dampness or humidity.
- Installing the remote controller behind curtains or furniture.
- Locations where high-frequency emissions are generated.
- Locations on the outside or in humid areas like swimming pools.
- Locations in areas with danger of explosion, with aggressive air or with extreme high dust exposure.

Do:

- Select a location in frost-free indoor areas only.
- Select a location where the ceiling is strong enough to support the weight of the unit.
- Select a location where the unit can be installed as close as possible to the wall and as flush as possible to the top of the door.
- 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 (L) from the outdoor unit as detailed in the installation manual packed with the outdoor unit.
- Allow room for mounting the remote controller about 1 m off the floor, in an area that is not in direct sunlight or in the flow of cool air from the indoor unit.

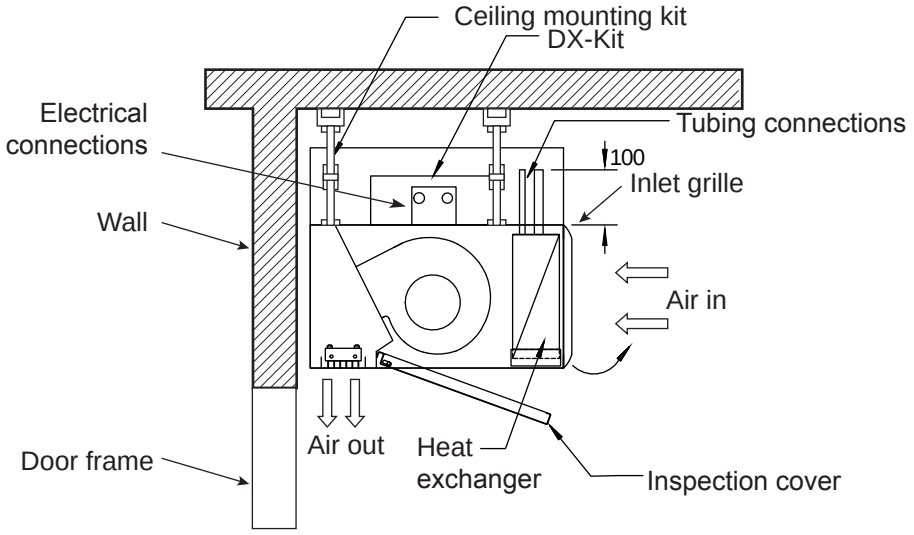


Fig. 2-1

3 How to Install the Indoor Unit

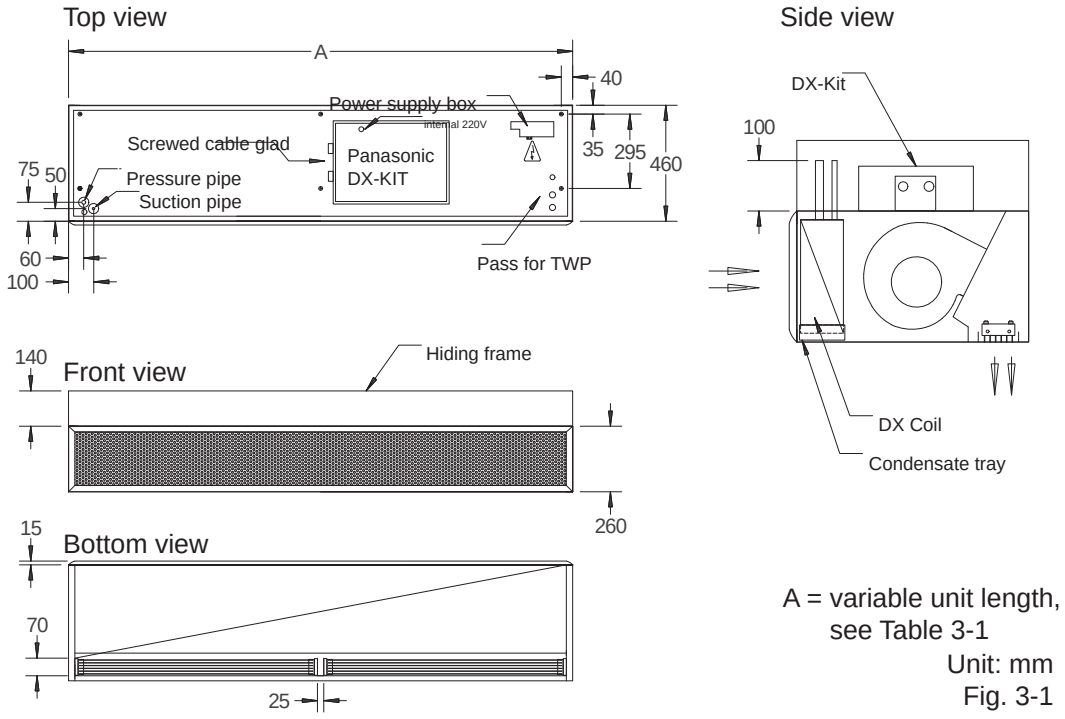
■ **Air Curtain (PAW-PAIRC-HS, PAW-PAIRC-LS Types)**

3.1 Dimensions and Required Minimum Space for Installation and Service

3.1.1 Tubing connection from the top (Standard)

- This air conditioner (air curtain) is usually installed freely suspended from the ceiling.
- The ceiling must be strong enough to support the weight of the unit.
- The recommended installation height for this Air Curtain type is 2.4 m for worst conditions or 2.7 m for medium conditions or 3.0 m for optimum conditions and depending on the site conditions should not be exceeded.
- The unit should be installed as close as possible to the wall and as flush as possible to the top of the door.
- The air flow outlet should be free and not obstructed in anyway.
- The unit should be accessible over the whole length of the unit at any time.
- The inspection cover should be accessible over the whole length of the unit at any time.
- It is recommended that space be provided (600 × 600 mm) for checking and servicing the electrical system.

Fig. 3-1: Detailed dimensions of the indoor unit type for tubing from the top.



A = variable unit length, see Table 3-1

Unit: mm

Fig. 3-1

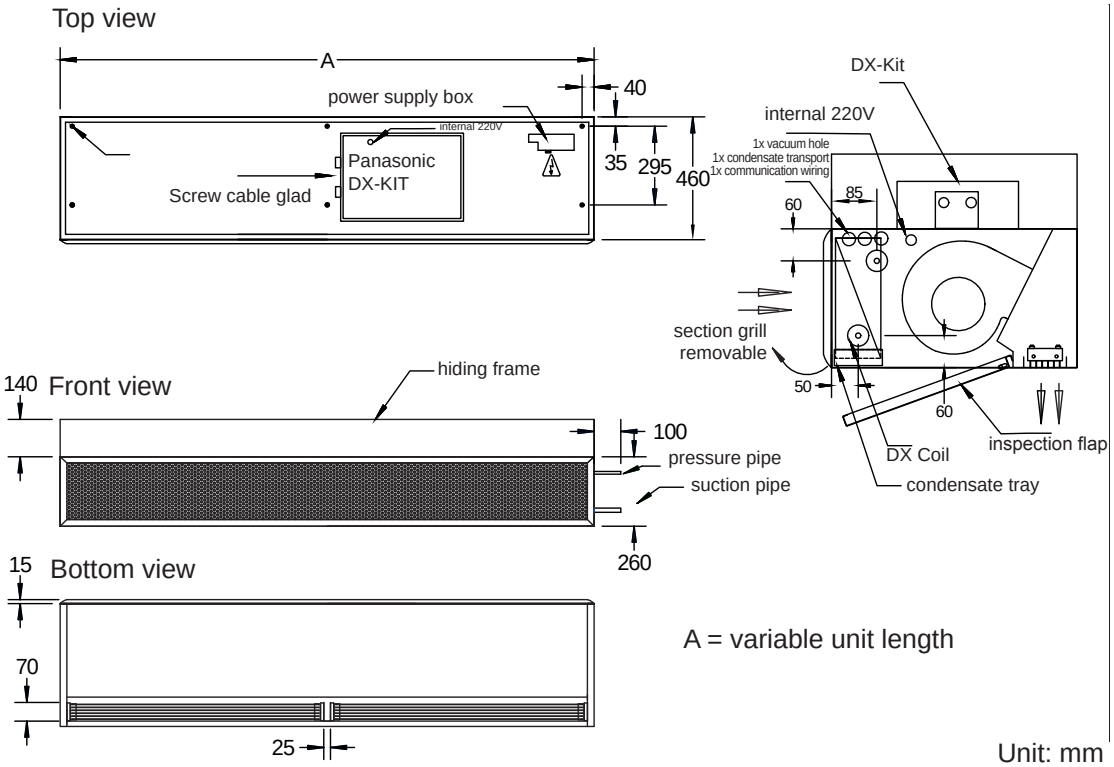
Table 3-1: Variable unit length A[mm]

Type	PAW-10…-LS/HS	PAW-15…-LS/HS	PAW-20…-LS/HS	PAW-25…-LS/HS
A [mm]	1000	1500	2000	2500

3.1.2 Tubing connection from left or right side

- This air conditioner (air curtain) is usually installed freely suspended from the ceiling.
- The ceiling must be strong enough to support the weight of the unit.
- The recommended installation height for this Air Curtain type is 2.7 m for worst conditions or 3.1 m for medium conditions or 3.5 m for optimum conditions and depending on the site conditions should not be exceeded.
- The unit should be installed as close as possible to the wall and as flush as possible to the top of the door.
- The air flow outlet should be free and not obstructed in any way.
- The unit should be accessible over the whole length of the unit at any time.
- The inspection cover should be accessible over the whole length of the unit at any time.
- It is recommended that space be provided (600 × 600 mm) for checking and servicing the electrical system.

Fig. 3-2: Detailed dimensions of the indoor unit type for tubing from left or right side.



Unit: mm

Fig. 3-2

3.2 Suspending the Indoor Unit

Depending on the ceiling type:

- Insert suspension bolts as shown in Fig. 3-3

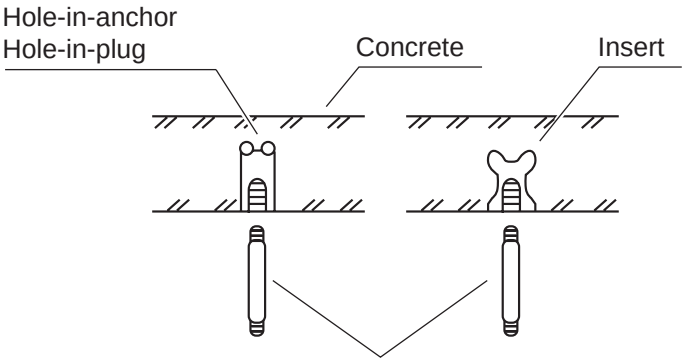


Fig. 3-3

or

- Use existing ceiling supports or construct a suitable support as shown in Fig. 3-4.

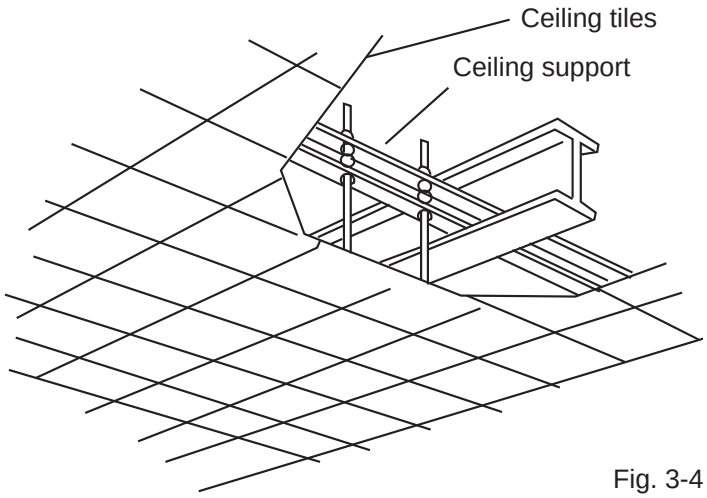


Fig. 3-4

CAUTION

► It is important that you use extreme care in supporting the indoor unit from 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.

1. Before suspending the unit from the ceiling, determine the pitch of the suspension bolts referring to the dimensional data given previously. (Figs. 3-1 and 3-2)
2. Screw in the suspension bolts allowing them to protrude from the ceiling as shown in Fig. 3-3. (Cut the ceiling material, if necessary.)
3. Suspend and fix the indoor unit as shown in Fig. 3-6 using vibration absorbers, sound insulation brackets and the material shown in Fig. 3-5. Note that all fixing material must be field-supplied.

Lock nut M8

Hanging rod M8
length: approx.1 m

Lock nut M8

Spannernenut M8
Setting range: 30 mm

Set screw M8
with left-hand andright-hand thread

Lock nut M8

Fig. 3-5

Fixing points

Use the existing fixing points on the top side of the unit. The number of fixing points depends on the length of the air curtain.

Table 3-2: Number of fixing points

Type	PAW-10PAIRC	PAW-15PAIRC	PAW-20PAIRC	PAW-25PAIRC
Unit length	1.0 m	1.5 m	2.0 m	2.5 m
No. of fixing points	4	4	6	6

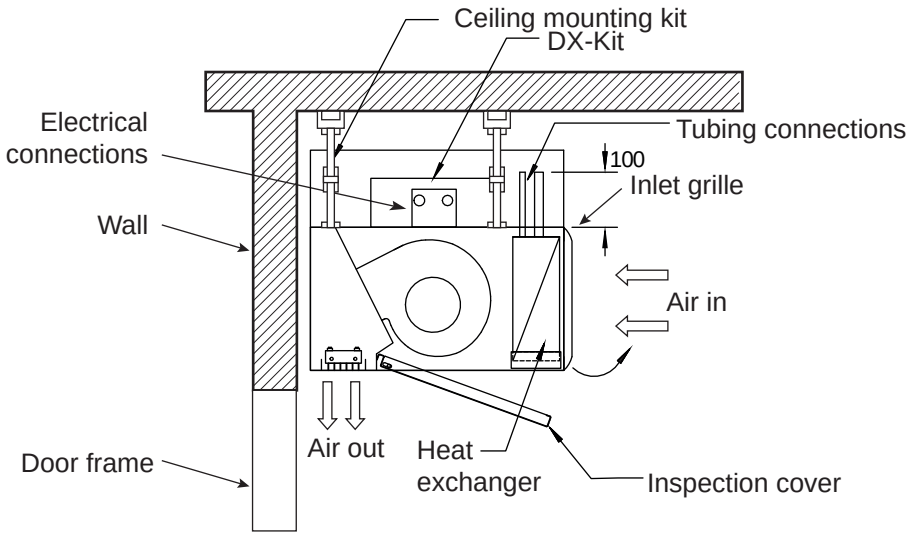
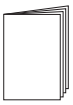
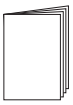


Fig. 3-6

4 How to install the outdoor unit

■ **U-50PZH2E5, U-60PZ2E5, U-100PZH2E5, U-100PZ2E5/8, U-100PZH2E5/8, U-125PZ2E5/8, U-125PZH2E5/8, U-140PZH2E5/8, U-200PZH2E8**

4.1 Accessories supplied with outdoor unit

Part name	Figure	Q'ty	Remarks	Part name	Figure	Q'ty	Remarks
Operating instructions		1	A5-size	Operating instructions		1	Included this instructions

4.2 Selecting the installation site

AVOID:

- Heat sources and exhaust fans, etc.
- 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 45 °C constantly.
- Allow enough room around the unit for air intake/exhaust and possible maintenance.
- Use lug bolts or equal to bolt down unit, reducing vibration and noise.
- If cooling operation is to be used when the outdoor air temperature is -5 °C or below, install a duct on the outdoor unit.

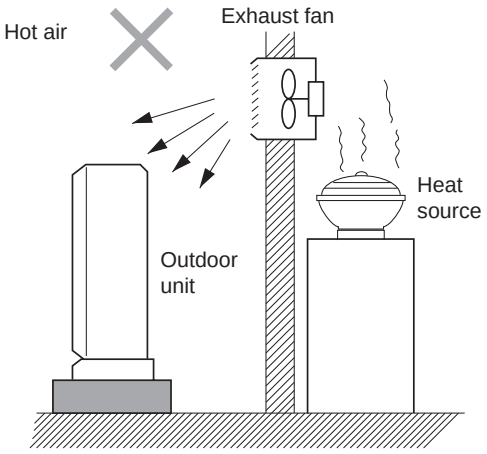


Fig. 4-3

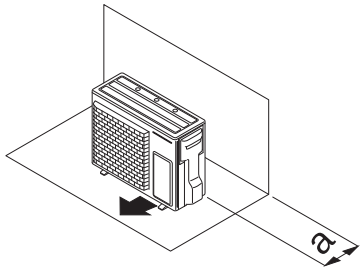
4.2.1 Installation space for outdoor unit

Install the outdoor unit with a sufficient space around the outdoor unit for operation and maintenance.

4.2.1.1 When an obstruction is present on the air inlet side

- When the upward area is open

1. One outdoor unit installed individually
   • Obstruction only on air inlet side.



a	b	c
50 mm or more	50 mm or more	5 cm or more

Fig. 4-4

   • Obstruction on both sides

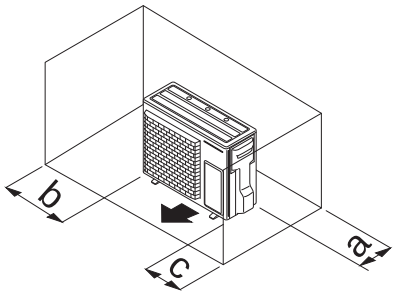
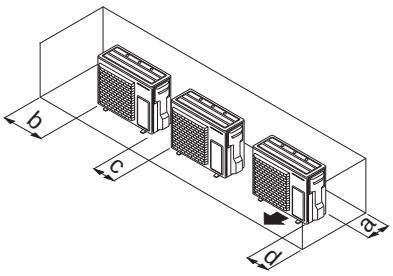


Fig. 4-5

2. Two or more outdoor units installed side by side.
   • Obstructions on both sides



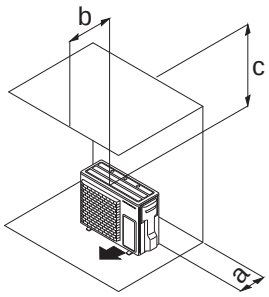
a	b	c	d
200 mm or more	150 mm or more	250 mm or more	250 mm or more

Fig. 4-6

4.2.1.2 When an obstruction is present also in the upward area

(Do not use the air-discharge chamber.)

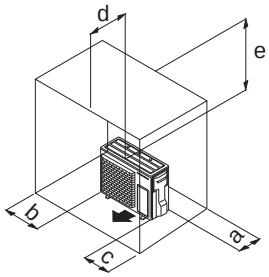
1. One outdoor unit installed individually
   • Obstruction only on air inlet side.



a	b	c
50 mm or more	500 mm or more	300 mm or more

Fig. 4-7

   • Obstruction also on the air inlet side and both sides

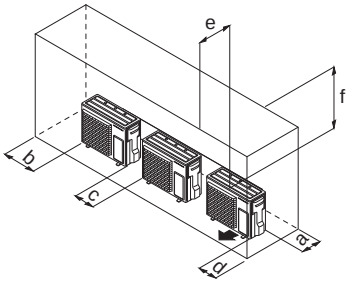


a	b	c	d	e
50 mm or more	50 mm or more	250 mm or more	500 mm or less	1000 mm or more

* When using the air-discharge chamber, provide a space of 300 mm or more.

Fig. 4-8

2. Two or more outdoor units installed side by side
   • Obstruction also on the air inlet side and both sides



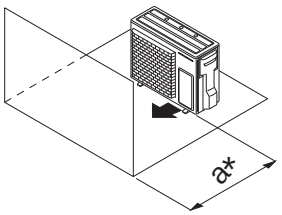
a	b	c	d	e	f
400 mm or more	1000 mm or more	250 mm or more	250 mm or more	500 mm or less	1000 mm or more

Fig. 4-9

4.2.1.3 When an obstruction is present on the air outlet side

- When the upward area is open

1. One outdoor unit installed individually.

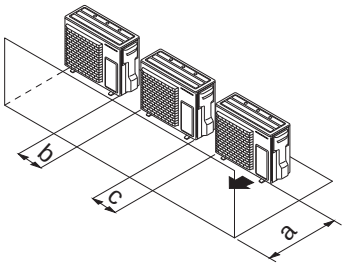


a
500 mm or more

* When also using the air-discharge chamber, provide a space of 500 mm or more.

Fig. 4-10

2. Two or more units installed side by side

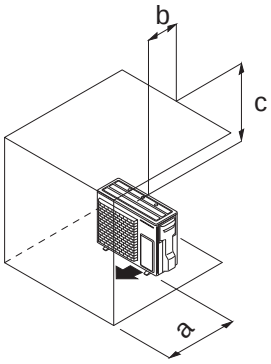


a	b	c
1.000 mm or more	250 mm or more	250 mm or more

Fig. 4-11

- When an obstruction is present also in the upward area

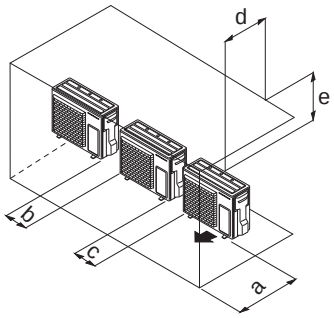
1. One outdoor unit installed individually



a	b	c
500 mm or more	500 mm or less	300 mm or more

Fig. 4-12

2. Two or more units installed side by side



a	b	c	d	e
500 mm or more	250 mm or more	250 mm or more	500 mm or less	1.000 mm or more

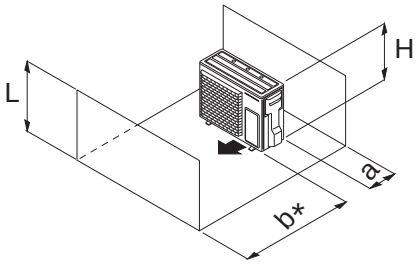
Fig. 4-13

4.2.1.4 When an obstruction is present on both the air inlet and air outlet sides

Case 1: When an obstruction on the air outlet side is higher than the outdoor unit (L > H)
(There is no height restriction on the air inlet side.)

- When the upward area is open

1. One outdoor unit installed individually.

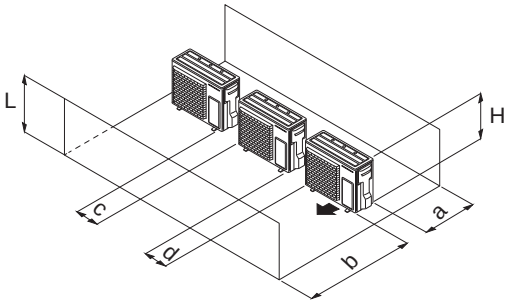


a	b
100 mm or more	500 mm or more

* When using the air-discharge chamber, provide a space of 300 mm or more.

Fig. 4-14

2. Two or more units installed side by side

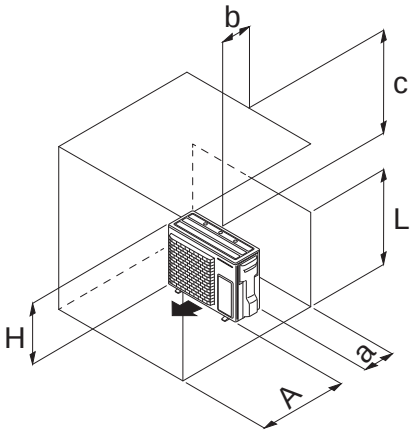


a	b	c	d
200 mm or more	1.000 mm or more	250 mm or more	250 mm or more

Fig. 4-15

- When an obstruction is present also in the upward area
(Do not use the air-discharge chamber.)

1. One outdoor unit installed individually



a	b	c
100 mm or more	500 mm or less	1.000 mm or more

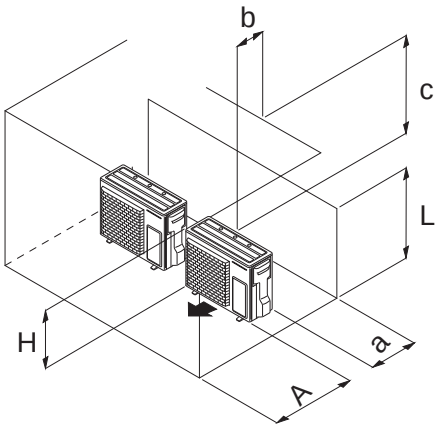
The dimensional relationship between H, A, and L is as shown in the following table.

	L	A
L ≤ H	0 < L ≤ 1/2 H	300 mm
	1/2H < L ≤ H	500 mm
H < L	Install the frame to achieve L ≤ H	

Close the area under the frame so that the outlet air does not bypass there.

Fig. 4-16

2. Only two outdoor units installed side by side



a	b	c
200 mm or more	500 mm or less	1000 mm or more

The dimensional relationship between H, A, and L is as shown in the following table.

	L	A
L ≤ H	0 < L ≤ 1/2 H	500 mm
	1/2H < L ≤ H	700 mm
H < L	Install the frame to achieve L ≤ H	

- Close the area under the frame so that the outlet air does not bypass there.
- Only two outdoor units can be installed side by side.

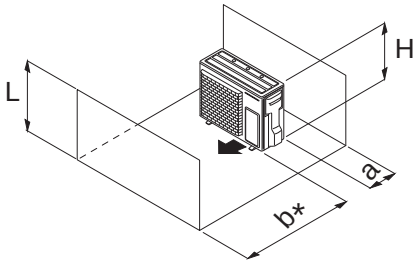
Fig. 4-17

4

Case 2: When an obstruction on the air outlet side is lower than the outdoor unit (L ≤ H)
(There is no height restriction on the air inlet side.)

- When the upward area is open

1. One outdoor unit installed individually.

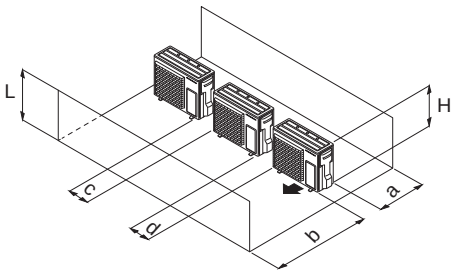


a	b
100 mm or more	500 mm or more

When using the air-discharge chamber, provide a space of 300 mm or more.

Fig. 4-18

2. Two or more units installed side by side

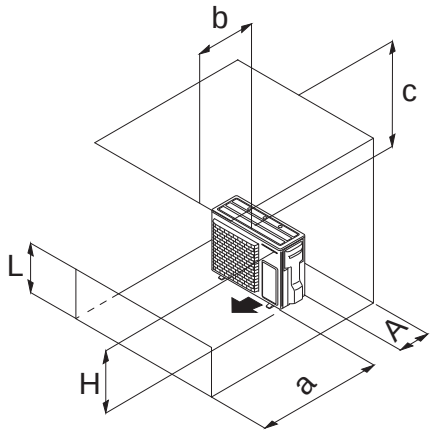


a	b	c	d
100 mm or more	1.000 mm or more	250 mm or more	250 mm or more

Fig. 4-19

- When an obstruction is present also in the upward area (Do not use the air-discharge chamber.)

1. One outdoor unit installed individually



a	b	c
500 mm or more	500 mm or less	1000 mm or more

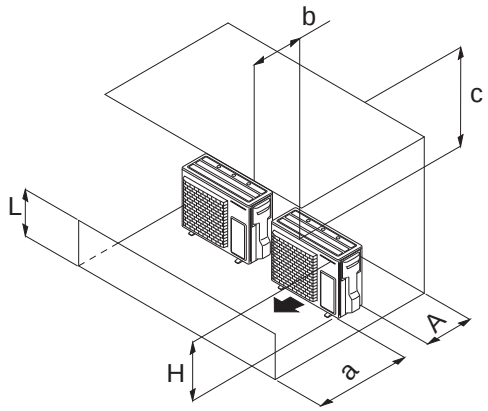
• The dimensional relationship between H, A, and L is as shown in the following table.

	A
L ≤ H	200 mm
H < L	Install the frame to achieve L ≤ H

Close the area under the frame so that the outlet air does not bypass there.

Fig. 4-20

2. Only two outdoor units installed side by side



a	b	c
1000 mm or more	500 mm or less	1000 mm or more

The dimensional relationship between H, A, and L is as shown in the following table.

	A
L ≤ H	200 mm
H < L	Install the frame to achieve L ≤ H

• Close the area under the frame so that the outlet air does not bypass there.
• Only two outdoor units can be installed side by side.

Fig. 4-21

4.2.1.5 When outdoor units are stacked

- Only two outdoor units can be stacked.
- For drain treatment, a space of at least 400 mm is required between the upper and lower outdoor units.
- Close the area A (gap between the upper outdoor unit and lower outdoor unit) so that the outlet air does not bypass there.

1. Obstruction on the air outlet side

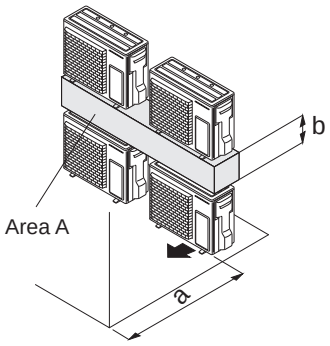


Fig. 4-22

a	b
500 mm or more	400 mm

2. Obstruction on the air inlet side

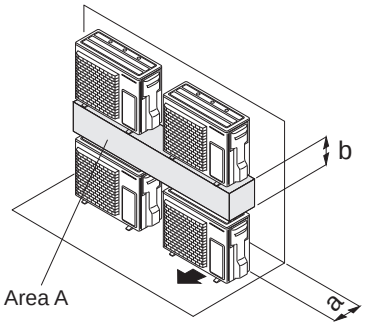
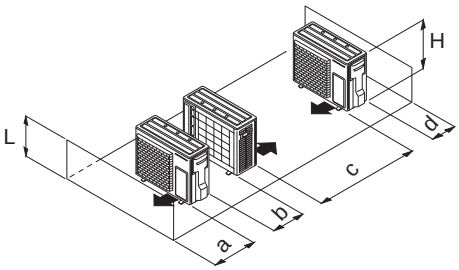


Fig. 4-23

a	b
200 mm or more	400 mm

4.2.1.6 When outdoor units are installed in rows, such as on a rooftop (L < H)

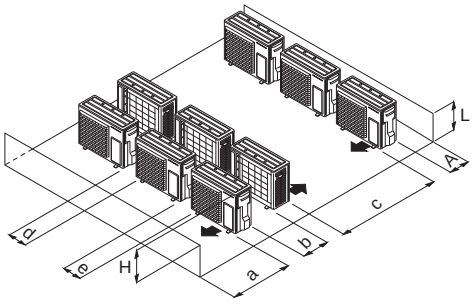
1. One outdoor unit installed in each row



a	b	c	d
500 mm or more	300 mm or more	1000 mm or more	50 mm or more

Fig. 4-24

2. Obstruction on the air inlet side



a	b	c	d	e
1000 mm or more	400 mm or more	2000 mm or more	250 mm or more	250 mm or more

The dimensional relationship between H, A, and L is as shown in the following table.

	A
L ≤ H	150 mm
H < L	Installation is not allowed.

- The values described above are the least space to optimise application performance.
- If any service area is needed for service according to field circumstance, obtain enough service space.

Fig. 4-25

4.2.1.7 In case of multiple installations

- Concrete block foundation should be used and well drained. Be sure that the foundation height is kept at least more than 50 mm from the ground.
- Base leg should be fixed by inserting the flat washer (field supply) and single nut (field supply) onto the anchor bolt (M10, field supply). Protrusion length of anchor bolt should be 13 mm or less and fastening height of nut should be 12 mm or less.
- Use lug bolts or equal to bolt down unit, reducing vibration and noise.

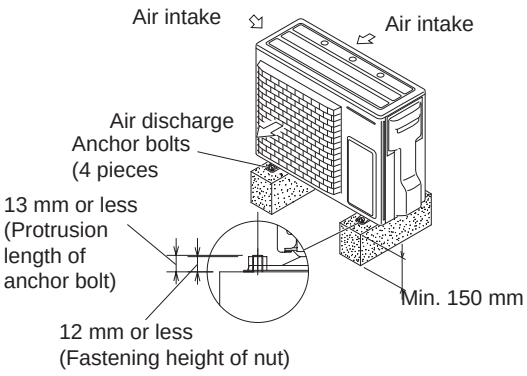


Fig. 4-26

NOTE

If the anchor bolt is longer and the fastening height of nut is higher, the front panel may be damaged when installing or removing it.

4

4.2.1.8 Optional: Air discharge chamber for top discharge

Be sure to install the air discharge chamber in the field when:

- It is difficult to keep a space of min. 50 cm between the air discharge outlet and an obstacle.
- The air discharge outlet is facing a sidewalk and discharged hot air annoys passers-by.

Note: In regions with significant snowfall, the outdoor unit should be provided with a platform and snow-proof duct.

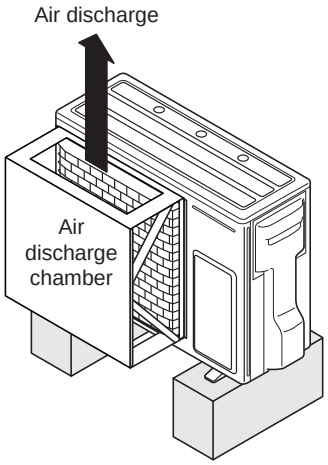


Fig. 4-27

4.2.1.9 Tubing size

Single type outdoor model

- Refrigerant tubing between the indoor and outdoor units should be kept as short as possible.
- The lengths of the refrigerant tubes between the indoor and outdoor units are limited by the elevation difference between the 2 units. During tubing work, try to make both the tubing length (L) and the difference in elevation (H1) as short as possible.

Table 4-1: Tubing and refrigerant data

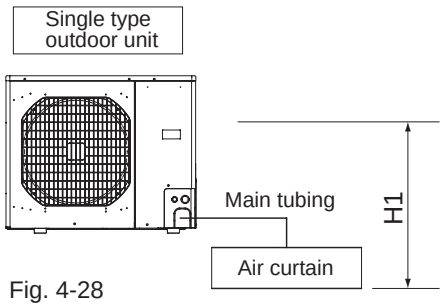


Fig. 4-28

Outdoor unit type	U-50PZH2E5	U-60PZH2E5 U-60PZ2E5 U-71PZ2E5
Maximum allowable tubing length	40 m	40 m
Charge-less tubing length (actual length)	3–30 m	3–30 m
Additional charge per 1 m	20 g	35 g

Table 4-2: Maximum tubing length and heights

Tubing data \ Models		Contents	Symbol	Actual length (m)	
				50	60–71 single
Allowable tubing lengths	Maximum allowable tubing length	One-way length of tubing from outdoor unit to the indoor unit	L	≤40	≤50
Maximum allowable height difference	Maximum indoor-outdoor height difference	If outdoor unit is higher	—	≤30	≤30
		If outdoor unit is lower	—	≤15	≤15

* For connection tubing sizes, refer to Table 4-3.

Table 4-3: Tubing data for models (Single)

Tubing data \ Models			U-50PZH2E5	U-60PZH2E5 U-60PZ2E5 U-71PZ2E5
Tubing size outer diameter	Liquid tube	mm (in.)	6.35 (1/4)	9.52 (3/8)
	Gas tube	mm (in.)	12.7 (1/2)	15.88 (5/8)
Limit of tubing length		(m)	40	40
Limit of elevation difference **between the 2 units**	Outdoor unit is placed higher	(m)	30	30
	Outdoor unit is placed lower	(m)	15	15
Max. allowable tubing length at shipment		(m)	3–30	3–30
Required additional refrigerant		(g/m)	20	35
Refrigerant charged at shipment		(kg)	1.15	1.45
Total refrigerant amount		(kg)	1.35	1.80

Tab. 4.1: Connection tube sizes

	Main tubing (L)	Indoor unit connection tube (ℓ1, ℓ2)
Type capacity of indoor unit	71	71
Gas tube	ø15.88	ø15.88
Liquid tube	ø9.52	ø9.52
Amount of additional charge per 1 m	40 g	40 g

Charge with the amount of additional refrigerant calculated using the formula below, based on the values in table 4.3 and the size and length of the liquid tubing.

Amount of additional refrigerant charge (g)

Do not remove refrigerant from the system, even if the result of the calculation is negative.

Additional refrigerant amount (g) = Additional refrigerant for main tubing (g) + Additional refrigerant for distribution tubing (g)
– Outdoor unit charge-less refrigerant amount (g)
= 40 × (a) + 20 × (b) – 400*1 (60–71 types)
*1 50 type of outdoor unit is 600 g.

(Use with the current refrigerant charge.)

1) Actual length (m) of main tubing (ø9.52) — Refrigerant charge per 1 m of actual length = 40 g/m (60–71 types)

2) Total length of distribution tubing (ø6.35) — Refrigerant charge per 1 m of actual length = 20 g/m

Example

- Sample tubing length
  L = 35 m
- Find the liquid tube size from Table 4-3.
  L : ø9.52 (71 type)
- The amount of additional on-site refrigerant charge is found by subtracting the outdoor unit charge-less refrigerant amount from the total charge amount for all tube sizes.

ø9.52 → L : 35 m × 40 g/m	= 1400
Outdoor unit charge-less refrigerant amount	-400
Total	+1000

- The amount of additional on-site refrigerant charge is 1000 g.

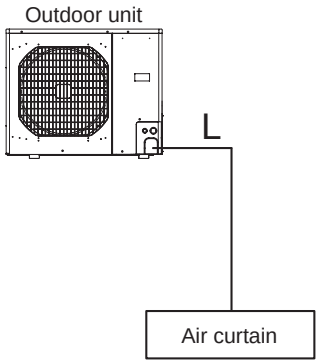


Fig. 4-29

NOTE

For type 50, the additional refrigerant charge for tubing length (c) of 30 to 40 m is the following:
Additional refrigerant amount (g) = 20 × (c) – 600

CAUTION

1. This unit requires no additional refrigerant charge up to tubing length 20 m (50 type: 30 m). In case of multiple type installation, more than 20 m, additional refrigerant charge is required.
2. In case of multi type installation, indoor units should be installed within the same room. If multi type indoor units are installed in different rooms, temperature control may develop problems because thermostat operation must follow the thermostat condition of 1 indoor unit only (the main unit).

DANGER

Always check the gas density for the room in which the unit is installed.

4.3 Check of density limit

When installing an air conditioner in a room, it is necessary to ensure that even if the refrigerant gas accidentally escapes, its density does not exceed the limit level.

If the density might exceed the limit level, it is necessary to set up an opening between it and the adjacent room, or to install mechanical ventilation which is interlocked with the leak detector.

$$\frac{\text{(Total refrigerant charged amount: kg)}}{\text{(Min. indoor volume where indoor unit is installed: m}^3\text{)}} \leq \text{Limit density 0.3 (kg/m}^3\text{)}$$

The limit density of refrigerant which is used in this unit is 0.3 kg/m^3 (ISO 5149).

The shipped outdoor unit comes charged with the amount of refrigerant fixed for each type, so add it to the amount that is charged at the field. (Refer to the unit's nameplate for the amount of charged refrigerant at shipment.)

■ **U-50PZH2E5, U-60PZH2E5, U-60PZ2E5, U-71PZ2E5**

The refrigerant (R32), which is used in the air conditioner, is a flammable refrigerant. So the requirements for installation space of appliance are determined according to the refrigerant charge amount [m_c] used in the appliance.

The minimum indoor floor space compared with the amount of refrigerant is roughly as follows:

[Type LS/HS]

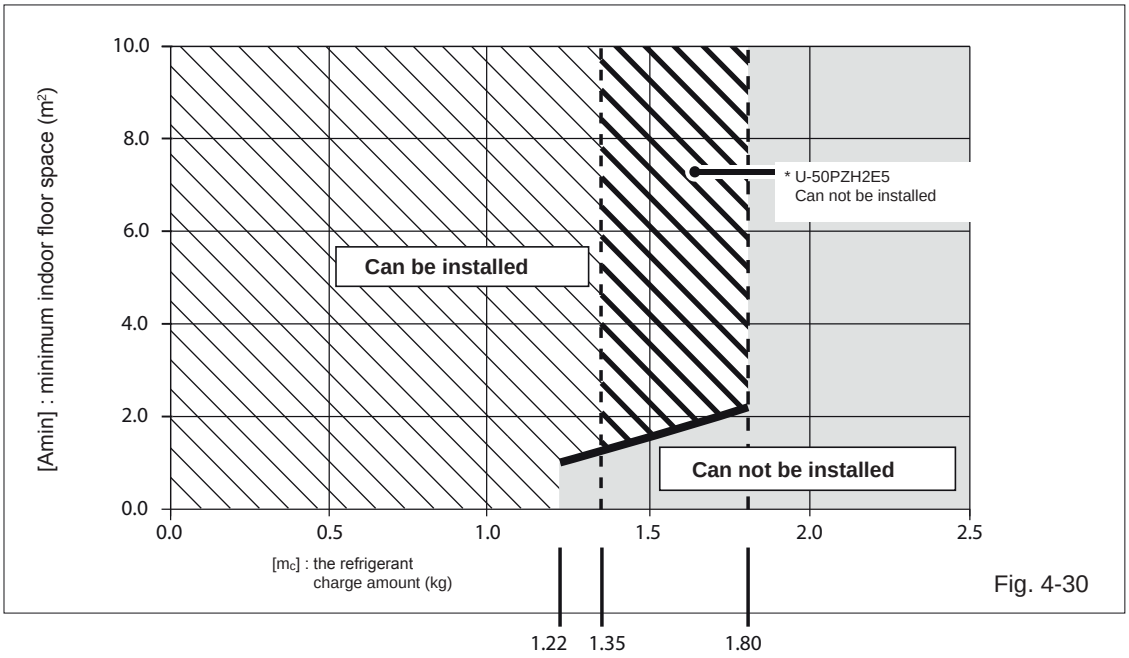


Fig. 4-30

* Definition of terms [mc], [mmax] and table of max. refrigerant charge amount of units, refer to page 37 onwards

■ **U-71PZH2E5, U-100PZH2E5, U-125PZH2E5, U-140PZH2E5, U-71PZH2E8, U-100PZH2E8, U-125PZH2E8, U-140PZH2E8**

[Type LS/HS]

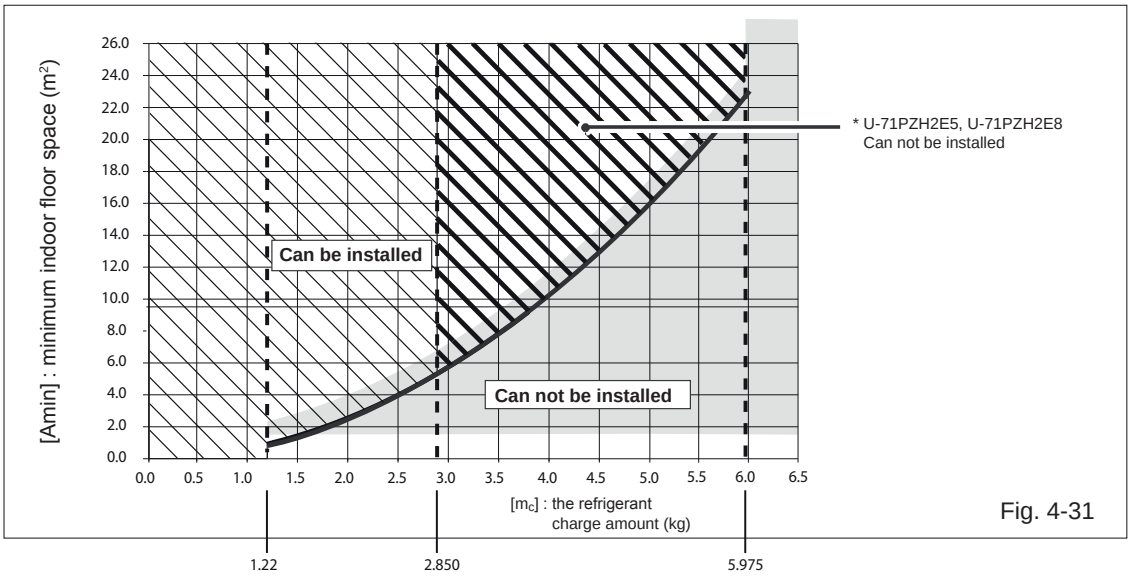


Fig. 4-31

* Definition of terms [mc], [mmax] and table of max. refrigerant charge amount of units, refer to page 37 onwards

Definition of terms used on pages before

[m_c] : Refrigerant charge amount (Total of refrigerant at shipment and refrigerant charge amount in the field).

[m_{max}] : Maximum refrigerant charge amount

	[m_{max}]
U-50PZH2E5	1.35
U-60PZH2E5 U-60PZ2E5 U-71PZ2E5	1.80
U-71PZH2E5 U-71PZH2E8	2.850
U-100PZH2E5 U-100PZH2E8	5.975
U-125PZH2E5 U-125PZH2E8	5.975

	[m_{max}]
U-140PZH2E5 U-140PZH2E8	5.975
U-100PZ2E5 U-100PZ2E8	3.50
U-125PZ2E5 U-125PZ2E8	3.88
U-140PZ2E5 U-140PZ2E8	3.88

Judgement

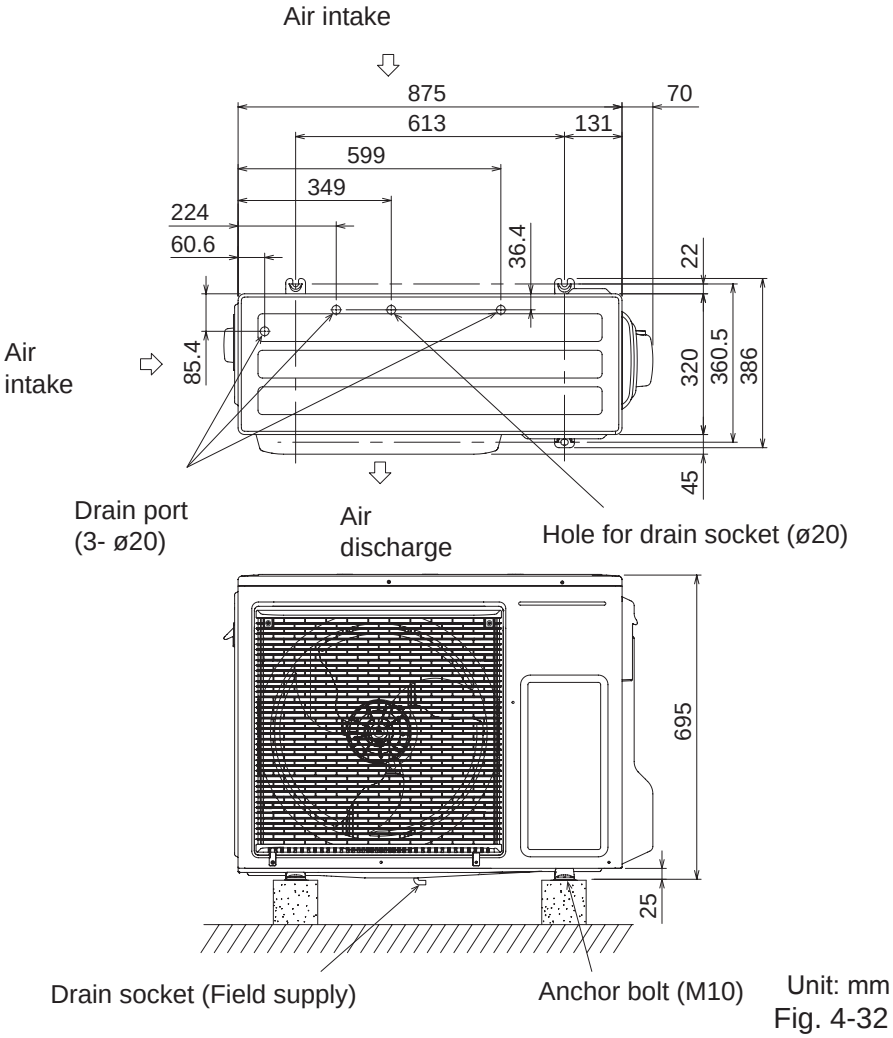
[m_c] ≤ 1.22 : Can be installed
1.22 < [m_c] ≤ [m_{max}] : Installation possible with in the range of slanted line part
[m_c] > [m_{max}] : Can not be installed

CAUTION

Pay special attention to any location, such as a basement or recessed area, etc. where leaked refrigerant can collect, since refrigerant gas is heavier than air.

Installing the outdoor unit

- Use concrete or a similar material to make the base, and ensure good drainage.
- Ordinarily, ensure a base height of 5 cm or more.
  If a drain pipe is used, or for use in cold-weather regions, ensure a height of 15 cm or more at the feet on both sides of the unit.
  (In this case, leave clearance below the unit for the drain pipe, and to prevent freezing of drainage water in cold-weather regions.)
- See the figure shown below for the anchor bolt dimensions.
- Be sure to anchor the feet with anchor bolts (M8). In addition, use anchoring washers on the top side. (Use large square 32 × 32 SUS washers with JIS nominal diameter of 8.) (Field supply)



Unit: mm

Fig. 4-32

Drainage work

Follow the procedure below to ensure adequate draining for the outdoor unit.

- For the drain port dimensions
- Ensure a base height of 15 cm or more at the feet on both sides of the unit.
- When using a drain pipe, install the drain socket (optional part) onto the drain port. Seal the other drain port with the rubber cap supplied with the drain socket.

4.4 Routing the tubing and wiring

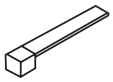
CAUTION

- ► Route the tubing so that it does not contact the compressor, panel, or other parts inside the unit. Increased noise will result if the tubing contacts these parts.
- ► When routing the tubing, use a tube bender to bend the tubes.
- ► In cold-weather regions, in order to prevent drainage water from freezing, do not install the drain socket cap. Also take steps to prevent water from accumulating around the unit.

■ U-50PZH2E5, U-60PZ2E5, U-100PZH2E5, U-100PZ2E5/8, U-100PZH2E5/8, U-125PZ2E5/8, U-125PZH2E5/8, U-140PZH2E5/8, U-200PZH2E8

Accessories supplied with outdoor unit

The following parts are supplied as accessories with each outdoor unit.
Check that all accessory parts are present before installing the outdoor unit.

Part name	Q'ty	Diagram	Application	Part name	Q'ty	Diagram	Application
Protective bushing	2		For protecting electrical wires	Installation instructions		—	This manual
Banding strap	4		For tying electrical wires together				

4.4.1 Select the outdoor unit installation location

CAUTION

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.

1. Install the unit once you have checked that the installation location matches the following conditions.
   - A location with sufficient ventilation.
   - Possibly a location that is sheltered from rain or direct sunlight and is well-ventilated so that hot and cool air does not build up.
   - A location where the area around the discharge is not exposed to animals or plants which could adversely affect the release of hot or cool air from the unit.
   - A location where the discharge and operation noise will not be a nuisance to the neighbours.
   - A location that can support the product's weight or vibrations and secured for horizontal installation wherever possible.
   - A location that does not obstruct the air discharge or intake.
   - A location where there is no danger of flammable or corrosive gas leaks.
   - A location that provides space for installation and service.
   - A location that allows the pipe and cable length fixture for internal and external connections.
   - It may need two or more people to carry out the installation work.
2. Refer to the diagram below for the installation location which is exposed to strong wind.
   - If a strong wind of more than 5 m/s blows to the area directly in front of the discharge, the outdoor unit's air flow is reduced and the outflow may re-enter (short circuit) causing the following outcome: "Reduced capacity", "Increased frost formation during heating" or "Operation stopped due to increased pressure". Should an exceptionally strong wind blow to the area directly in front of the discharge of the outdoor unit; there is the risk of damage due to the fan's high-speed reverse rotation.
   - If the direction of the prevailing wind is known when operating the unit, place the unit at an appropriate angle to the wind's direction so that the discharge faces towards a building or a wall.

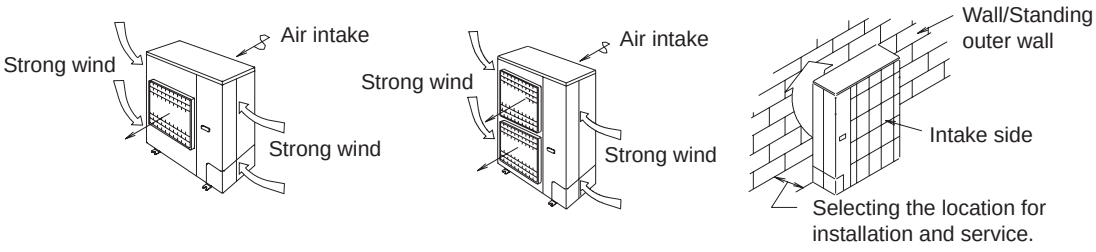


Fig. 4-33

3. If installing at locations prone to snowfall, install the unit as high as possible with suitable roofing which shelters the unit from snow.

4. Avoid installing the unit in locations where there are petroleum products (such as machine oil), saline content (such as coastal areas), sulphurous gas and where high frequency noise is generated.
5. Place the indoor and outdoor unit, power cords and indoor/outdoor unit connection cables at a minimum distance of 1 meter or more away from televisions and radios. This is to avoid interference to picture and/or sound. (However, depending on the electromagnetic waves, noise interference may still occur even with the 1 meter separation.)
6. For restaurants and kitchens, avoid installing at locations which draws oil and steam. Plastic parts can deteriorate from droplets of oil and steam or it can cause falling parts or water leakage.
7. Avoid installing at the location where cutting oil mist or iron powder is present.
8. If there is an immense voltage fluctuation due to the location's problem, ensure to split the power supply.
9. When installing the product in a place where it will be affected by typhoon or strong wind such as wind blowing between buildings, including the rooftop of a building and a place where there is no building in surroundings, fix the product with an overturn prevention wire, etc.

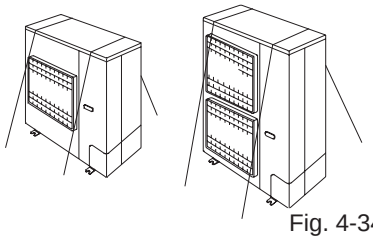


Fig. 4-34

10. Ensure to assign several people or use a mechanical lift, etc. to transport the unit.

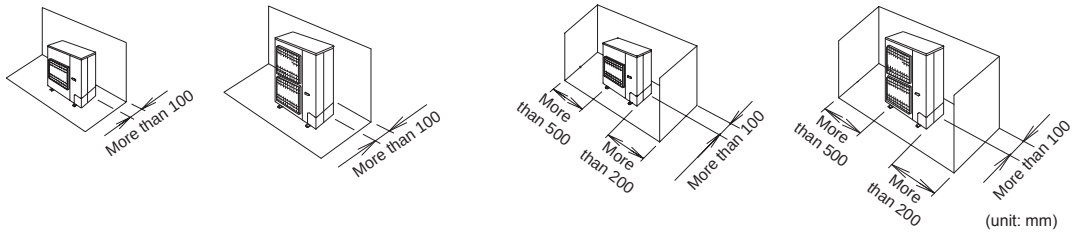
4.4.2 Selecting the location for installation service

When installing multiple units, allow enough space in between the units and the side of the building.

4.4.2.1 If there are obstacles at the intake

- If the upper part is open

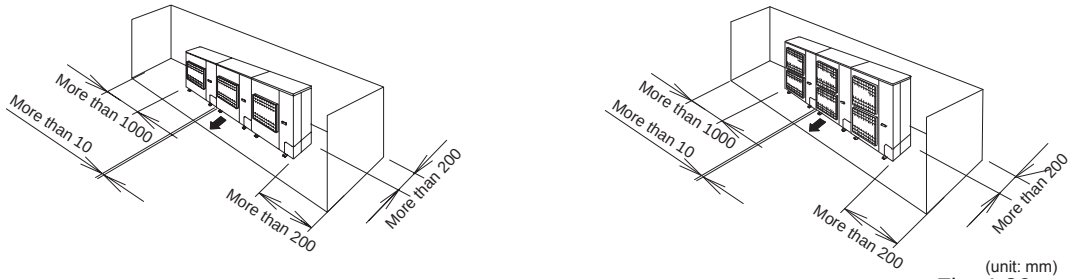
1. For separate installation location
   - Only if there are obstacles at the intake
   - If there are obstacles on both sides



(unit: mm)

Fig. 4-35

2. For multiple units (more than 2 units)
   - If there are obstacles on both sides

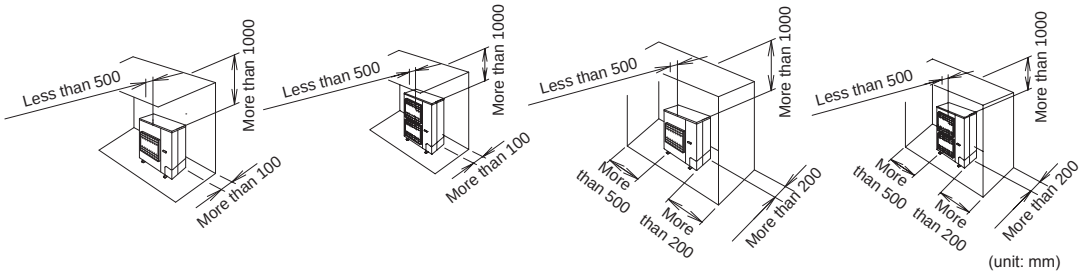


(unit: mm)

Fig. 4-36

- If there are obstacles above the unit

1. For separate installation location
   - Only if there are obstacles at the intake
   - If there are obstacles on the intake and the other side



(unit: mm)

Fig. 4-37

2. For multiple units (more than 2 units)
   - If there are obstacles on both sides

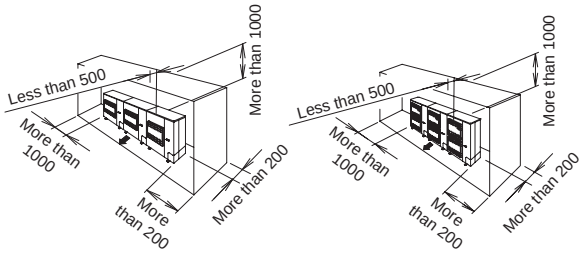


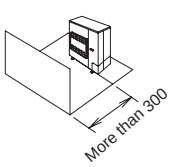
Fig. 4-38

(unit: mm)

4.4.3 If there are obstacles at the discharge

- If the upper part is open

1. For separate installation location



2. For multiple units (more than 2 units)

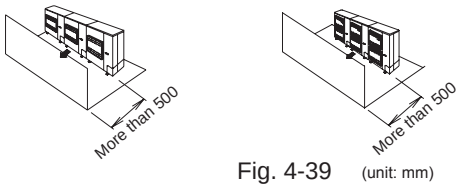
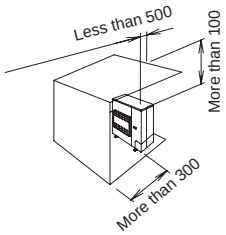


Fig. 4-39 (unit: mm)

- If there are obstacles above the unit

1. For separate installation location



2. For multiple units (more than 2 units)

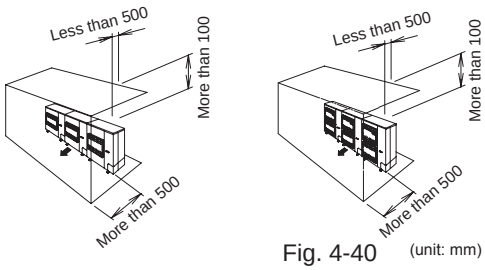


Fig. 4-40 (unit: mm)

4

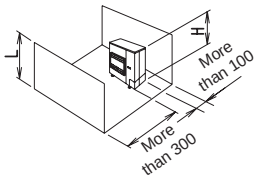
4.4.4 If there are obstacles on both the intake and discharge

Pattern 1

If there is an obstacle that is higher than the unit on the intake side. (There is no limit to the height of the obstacle above the discharge.)

- If the upper part is open

1. For separate installation location



2. For multiple units (more than 2 units)

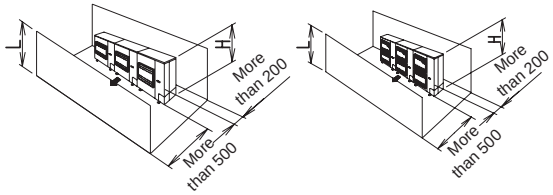


Fig. 4-41 (unit: mm)

- If there are obstacles above the unit

1. For separate installation location

• The dimensions for H, A and L are shown in the following table.

	L	A
L ≤ H	0 < L ≤ 1/2 H	300
	1/2H < L ≤ H	500
H < L	Install a pedestal or mount so that L ≤ H	

• Cover the bottom part of the pedestal or mount so that air does not go through it.

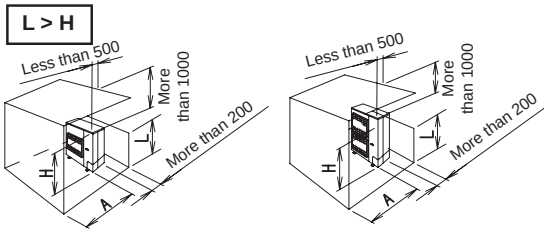


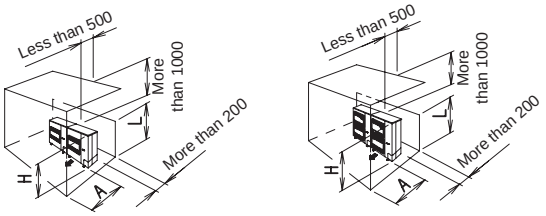
Fig. 4-42 (unit: mm)

2. For multiple units (up to 2 units)

• The dimensions for H, A and L are shown in the following table.

	L	A
L ≤ H	0 < L ≤ 1/2 H	500
	1/2H < L ≤ H	750
H < L	Install a pedestal or mount so that L ≤ H	

• Cover the bottom part of the pedestal or mount so that air does not bypass it.
• A limit of only 2 units can be installed.



(unit: mm)

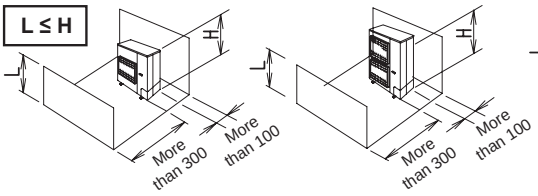
Fig. 4-43

Pattern 2

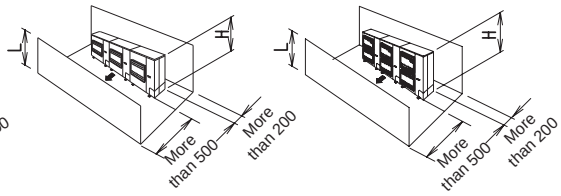
If there is an obstacle that is higher than the unit on the discharge side. (There is no limit to the height of theobstacle above the discharge.)

- If the upper part is open

1. For separate installation location



2. For multiple units (more than 2 units)



(unit: mm)

Fig. 4-44

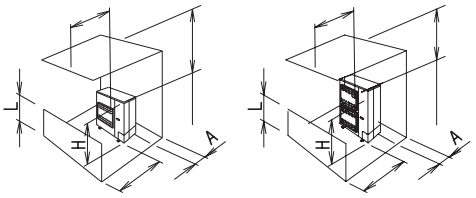
- If there are obstacles above the unit

1. For separate installation location

• The dimensions for H, A and L are shown in the following table.

	A
L ≤ H	100
H < L	Install a pedestal or mount so that L ≤ H

• Cover the bottom part of the pedestal or mount so that air does not go through it.



(unit: mm)

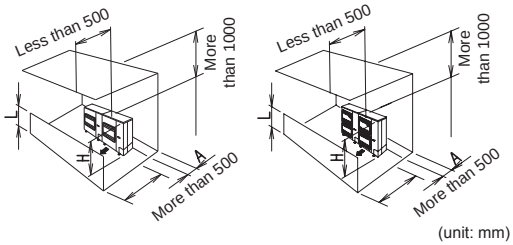
Fig. 4-45

2. For multiple units (up to 2 units)

• The dimensions for H, A and L are shown in the following table.

	A
L ≤ H	200
H < L	Install a pedestal or mount so that L ≤ H

• Cover the bottom part of the pedestal or mount so that air does not bypass it.
• A limit of only 2 units can be installed.



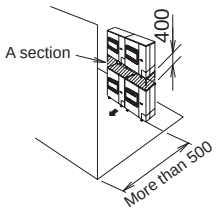
(unit: mm)

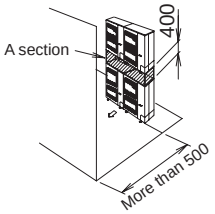
Fig. 4-46

4.4.5 Stacking installation setup

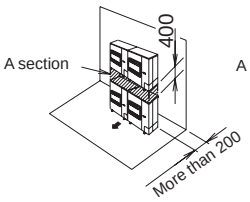
- Stack up to 2 tiers.
- A dimension of approximately 400 mm is required for the second tier outdoor unit's drain pipe and space for maintenance of the first tier outdoor unit.
- Close A section (the space between the upper and lower level outdoor units) so the outtake air does not bypass it.

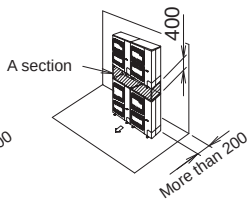
1. If there are obstacles at the discharge





2. If there are obstacles at the intake



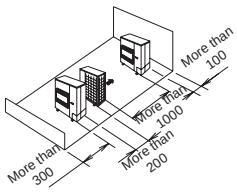


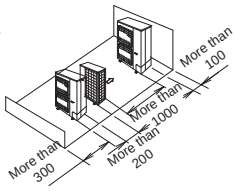
(unit: mm)

Fig. 4-47

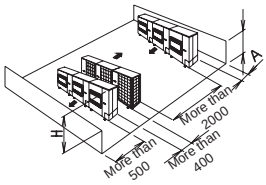
4.4.6 For multiple row installation (on the roof, etc.)

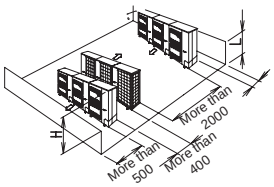
1. For one row installation setup





2. For multiple units (more than 2 units)





(unit: mm)

Fig. 4-48

• The dimensions for H, A and L are shown in the following table.

	A
L ≤ H	200
H < L	Installation not possible

• The above mentioned distance is required for optimal unit performance.
Allow as much space as possible in order to obtain the best performance from the units.

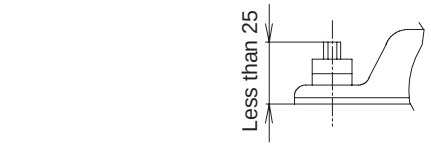
4.5 Transport and install the outdoor unit

- Transporting

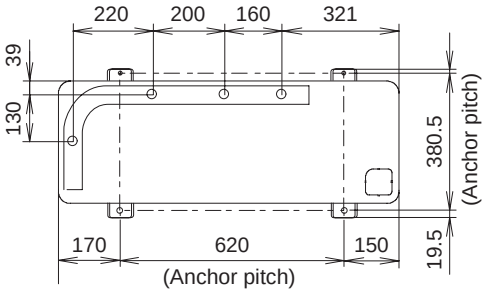
1. Transport the outdoor unit in its original packaging as close as possible to the installation location.
2. In the event that the unit needs to be lifted or suspended, use a rope or belt and use cloth or wood as padding to avoid damaging the unit.
3. Use the side handles to carry the unit and be careful not to touch the fan with your hand or any objects.

- Installation

1. Read the “Select the outdoor unit installation location” thoroughly before installing the outdoor unit.
2. When installing to a concrete or solid surface, use M10 or a W3/8 bolts and nuts to secure the unit. Ensure that it installed upright on a horizontal plane. (Use an anchor bolt for the installation as shown in the diagram at right.)
3. Avoid installing on the slanted roof.
4. In the even where the roof is at risk of receiving oscillations or vibrations, secure the unit with a seismic isolating mount or vibration absorbing rubber.



Anchor bolt length



Anchor bolt position

(unit: mm)

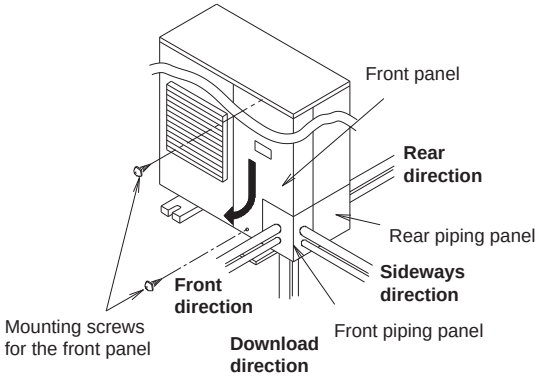
Fig. 4-49

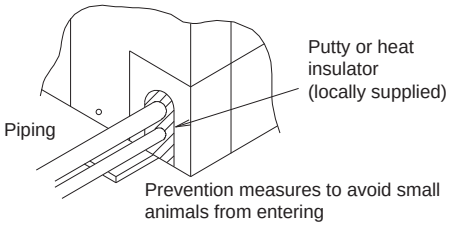
5. The drain water will be discharged from the unit during heating or defrosting operation mode. Select an appropriate location with good drainage system. (In the winter, there is risk of slipping due to freezing, and depending on the installation set up there is risk of drain water running overhead.)
   - Please consult us if installing drain elbows.
   - In cold regions (where the outdoor temperature can drop to below 0° for 2 to 3 consecutive days), the drain water may freeze and may prevent the fan from operating. For this case, do not use the drain elbow.

4.6 Refrigerant installation

For indoor unit refrigerant piping installation, refer to the Installation Instruction manual that comes with that indoor unit. Do not reuse existing piping, install new piping.

1. Precautions during refrigerant installation.
   - Use clean pipes with no dust inside.
     The pipe may corrode with the presence of fluorine dust which will adversely affect the refrigerant piping system due to deterioration of the refrigerant oil, etc.
   - This unit is specifi cally for R32.
     Ensure to adhere to the following items and install accordingly:
     - Use pipe cutters and flaring tools which are specially designed for use with R32.
     - When connecting with flaring tools, coat the flare section with ether-based oil.
     - Ensure to use flare nuts supplied with the unit when connecting this unit.
     - Only for storing or for open pipes.
     - Set the lower limit of the allowable pipe length to 5 m. If the pipe is shorter than 5 m, the refrigerant may become overfilled and a problem such as abnormal high pressure could occur.
     - Carefully handle the liquid refrigerant, as it may cause a frostbite.
     - Do not release refrigerants during the piping works for installing, re-installing and repairing refrigeration parts





2. The local pipes can protrude from any four directions.
   - Make holes in the pipe panel for the pipes to penetrate it and lay the pipes accordingly.
   - It is recommended to apply additional substance to the cut area for anti-rust protection.
   - Ensure to install pipe panels to prevent rain water from getting into the unit.
   - Close the gap at the pipe connected area with putty or heat insulator (locally supplied).
     - If an insect or small animal enters the outdoor unit, there is the risk of shorting in the product electronic casing.
     - **Remove the front panel**
       1) Remove the 2 mounting screws.
       2) Slide the front panel using your hands downwards to release the pawls. Then remove by pulling the panel towards you.

Specification for pipe connecting indoor unit to outdoor unit.

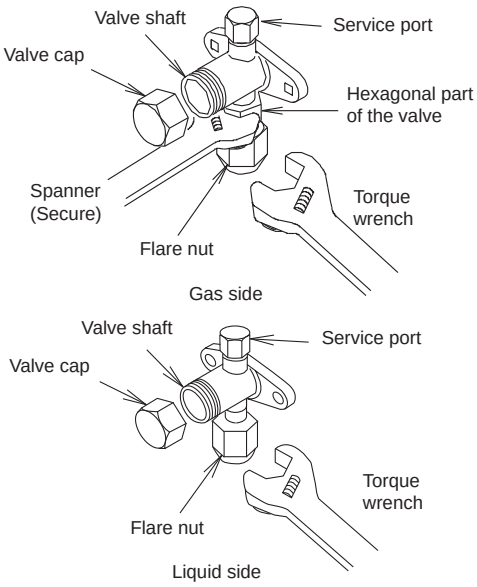
• The dimensions for H, A and L are shown in the following table.

		U-71	**U-100/125/140**
Maximum pipe length		50 m	85 m
Height difference	Outdoor located higher installation	30 m	
	Outdoor located lower installation	15 m	
Charge-less pipe length		5–30 m	
Additional charge per 1 m		45 g/m	
Refrigerant charged at shipment		1.95 kg	3.05 kg
Total refrigerant amount		2.850 kg	5.975 kg

• The above mentioned distance is required for optimal unit performance.
Allow as much space as possible in order to obtain the best performance from the units.

4.6.1 Precautions when operating the 3-way valve for piping installation

- Do not open the 3-way valve until the piping installation is completed.
  - It is closed during shipment.
  - During installation the side panel may warp if only the flare nut is loosened and tightened with a torque wrench. As a result, always be sure to secure to the hexagonal part of the 3-way valve with a spanner, or other tool.
- Refer to the following table for the tightening torque of the 3-way valve flare nuts.
  - If the nuts are over tightened, they may cause the flares to break or leak.
- Do not add additional force to the valve's cover.
  - Using spanners on the cover or valve itself (other than the hexagonal parts) may cause gas leakage.
    Avoid using spanners on the cover or parts other than the hexagonal part of the valve.



(Please use a single, open-end spanner to loosen and tighten the liquid side 3-way valve fl are nut.)

Fig. 4-50

4.6.2 Precautions for handling the valve cap

- Ensure not to scratch the inner surface of the valve or the end of the valve shaft.
  - Once adjustments to the valve are completed, ensure to tighten the valve cap according to the prescribed torque.

Valve size	Tightening torque
ø9.52	20.6 Nm–28.4 Nm {2.1 kgfm–2.8 kgfm}
ø15.88	48.0 Nm–59.8 Nm {4.8 kgfm–6.0 kgfm}

4.6.3 Precautions for handling the service ports

- Use a push-rod with a charge hose.
  - Once adjustments to the valve are completed, ensure to tighten the valve cap according to the prescribed torque.

Tightening torque
20.6 Nm–28.4 Nm {2.1 kgfm–2.8 kgfm}
48.0 Nm–59.8 Nm {4.8 kgfm–6.0 kgfm}

4.6.4 Precautions for connecting the pipes

- Ensure that the pipes do not come into contact with the compressor's bolts or exterior panel.
- There is a risk of condensation from the 3-way valve coming out between the insulation material and the indoor unit's piping when you install the outdoor unit above then the indoor unit. Ensure to caulk the connection parts.

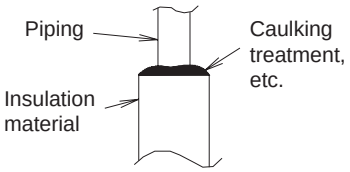


Fig. 4-51

4.6.5 Precautions for insulation installation

Maximum temperature limit of gas or liquid piping exceeds 120 °C

- In high humidity environment, reinforce the insulation material for the refrigerant piping. Failure to do so may result in condensation on the surface of the insulation material.
- Use materials with good heat-resistant properties as the heat insulator for the pipes. Ensure to insulate both the gas side and liquid side pipes. If the pipes are not adequately insulated, condensation and water leakages may occur.
- Ensure that the current insulation covers the pipes up to the unit's connecting part. If the piping is exposed, it may cause condensation or burn (when touch the pipe).

4.6.6 Precautions for flare nut installation

- Dimensions when adding flare nuts and the tightening torque

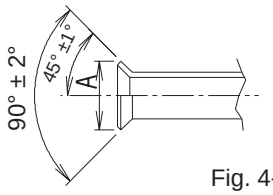
Piping size	Tightening torque	Flare section dimensions A	Flare configuration
ø 6.35	14.2 Nm–17.2 Nm {1.4 kgfm–1.7 kgfm}	8.7–9.1	
ø 9.52	32.7 Nm–39.9 Nm {3.3 kgfm–4.0 kgfm}	12.8–13.2	
ø 12.7	49.5 Nm–60.3 Nm {5.0 kgfm–6.0 kgfm}	16.2–16.6	
ø 15.88	68.0 Nm–75.5 Nm {6.8 kgfm–7.6 kgfm}	19.3–19.7	

Fig. 4-52

(unit: mm)

After piping connection has completed, ensure there is no gas leakage.

- When tightening the flare nut, coat the flares (inner surface only) with refrigerant oil on the flares
  Firstly, screw in 3-4 turns by hand.
  Ensure not to get oil on the screw part. Refrigerant oil used is ether-based.
  Refrigerant oil used is ether-based.

Application for ether-based oil

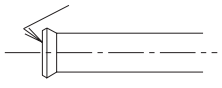


Fig. 4-53

- Once the piping connections are completed, perform leakage inspection using nitrogen gas.

4.6.7 Vacuum purging

- Once the piping connections are completed, perform leakage inspection using nitrogen gas (leak tightness test) using the 3-way valve for the outdoor unit and then close it.

  Test pressure: 4.15 MPa

- Ensure to use a vacuum pump (with a back-flow prevention device) for inside the refrigerant system.
- Vacuuming process will take place after the leak test.

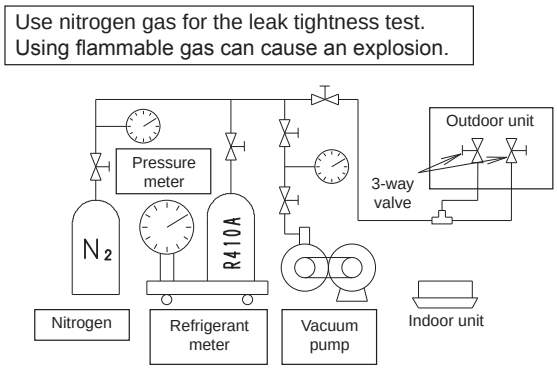
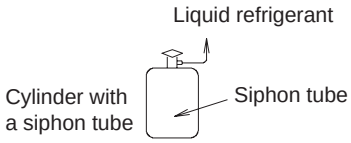


Fig. 4-54

4.6.8 Regarding refrigerant filling

Precautions during refrigerant filling

- Ensure to fill only with liquid refrigerant when refilling. If gas refrigerant is filled, the refrigerant composition will not be balanced and will cause abnormal operation.



- If using cylinders as shown in the bottom left diagram; without a siphon tube inside, turn it upside down and use it. (It is recommended to use the manifold with the side glass.)

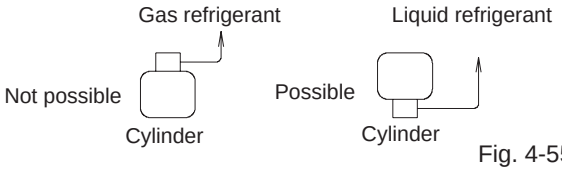


Fig. 4-55

- Use tools that are designed specifically for R410A, for pressure resistance and to prevent mixing impurities.
- Fill the refrigerant from the 3-way valve's service port on the liquid-side.

For filling and replacing all refrigerant (For refilling due to a leak)

- For refilling refrigerant, first collect all residual refrigerant and after vacuum dehydration using the vacuum pump. Refill the refrigerant according to the prescribed amount stated on the placard affixed to this unit.

Precautions after the pipes' connection have completed

- Ensure to open the 3-way valve after completing the piping installation, leak test and vacuuming. If it is closed during operation, it can lead to compressor failure.

4.6.9 Charging with refrigerant (for single combination)

- At the time of shipment from the factory, this unit is charged with enough refrigerant for an equivalent pipe length of 30 m. If the equivalent pipe length used will be 30 m or less, no additional charging will be necessary.
- If the equivalent pipe length will be between 30 and 90 m, charge with additional refrigerant according to the equivalent length given in the table below.

	Additional charging amount	Maximum equivalent length	Minimum length
U-71P	45 g/m	50 m	5 m
U-100/125/140P	45 g/m	85 m	5 m
U-200PZH2E8	60 g/m	90 m	5 m
U-250PZH2E8	80 g/m	60 m	5 m

- Pump down operation
  - Pump down means refrigerant gas in the system is returned to the outdoor unit. Pump down is used when the unit is to be moved, or before servicing the refrigerant circuit.
  - Operate the pump down according to the following procedures.

4

DANGER

Pump down operation must not be left operate alone without checking the system state.

► Remaining refrigerant due to Pump down failure can leak uncontrolled when servicing. This can lead to hazardous situations as choking, frostbites or with contact to big heat or open flames the building of toxic gases, fire and explosions.

	Procedure	Remarks
1	Stop operation both outdoor and indoor units.	
2	Remove the cap and hood (bonnet) on the service port of the gas (wide tube) side from the outdoor unit. Then connect the pressure gauge (local supply) to the service port of the gas (wide tube) side.	• Be sure to use the pressure gauge (local supply) which is specific to low pressure measurable.
3	Short-circuit the pump down pin (PUMP DOWN) on the control PCB of the outdoor unit for 1 second or longer. Use a flathead screwdriver and short-circuit the pin.	• If the pump down pin (PUMP DOWN) on the control PCB of the outdoor unit is short circuit, refrigerant recovery control is started in the cooling operation. • The indoor fan is operated in High mode during pump down operation and the compressor drives in 60Hz.
4	When 2 or 3 minutes have passed after the start of outdoor unit operation, fully close the liquid (narrow tube) side valve of the outdoor unit.	• Refrigerant recovery will start • The LED 1 on the control PCB of the outdoor unit blinks and LED 2 illuminates. • Maintenance function indication ( ) will blink on the LCD display of the wired remote controller (CZ-RTC2).
5	When the pressure gauge installed at the service port reaches the desired pressure of 0.2 MPa – 0.1 MPa, fully close the gas (wide tube) side valve of the outdoor unit. Then again short-circuit the pump down pin (PUMP DOWN) on the control PCB of the outdoor unit for 1 second or longer.	• If the pump down operation has continued for over 10 minutes or the pump down pin (PUMP DOWN) on the control PCB of the outdoor unit is short circuit for 1 second or longer, the outdoor and indoor units will stop even though the pump down has not completed yet. • Do not operate the outdoor unit until the pressure value reaches negative pressure. Otherwise, this will cause the compressor trouble.
6	Remove the pressure gauge installed at the gas (wide tube) side of the outdoor unit. Then reinstall the cap and hood (bonnet) in the original position once removed in the Step 2 described above.	• The pump down operation is completed.

NOTE

If you normally operate the refrigerant recovery unit, fully open both the liquid and gas valves of the outdoor unit.

4.6.10 Precautions regarding test run

Check before test run

	Content check
Power supply cable Indoor/outdoor connection wire **Earth wire**	• Is the wire set up and connected as described in the instructions? Check for any phase sequence. • Are the wire connection's screws loose? • Is the open and close device/leakage breaker installed? • Is the power supply cable's thickness and length appropriately measured as described in the instructions? • Is it earthed (grounded)? • Check that the insulation resistant value is more than 1 M. Use the 500 V mega-testers to measure the insulation. Do not use the mega-tester for any other circuit except for voltage of 220 V to 240 V or 380–415 V. • Are the wire connections for the indoor/outdoor units connected as described in the instructions? Are there any looped wires? • Was the "N-phase" surely connected when connecting the power supply wire on the three-phase model? If N-phase is not connected, only the fan may repeat turning ON/OFF without the compressor operating. In that case, check if there is any problem with N-phase connection.
Refrigerant pipe	• Is the piping installed as described in the instructions? • Are the pipes sizes appropriate? • Does the pipe's length adhere to the specifications? • Is the branch pipe slant being appropriately done as described in the instructions? • Was vacuum removal sufficiently carried out? • Was the leak tightness test carried out with nitrogen gas? Use the testing pressure of 3.8 MPa (PEY1 type: 4.15 MPa). • Is the piping insulation material appropriately installed? (Insulation material is necessary for both gas and liquid piping.) • Is the 3-way valve for the liquid side and gas side open?

- Always be sure to use a properly insulated tool to operate the short-circuit pin on the circuit board. (Do not use your finger.)
- Never switch the power supply ON until the installation has completed.
- Supply electrical current through all indoor units and check the voltage.
- Supply electrical current through all the outdoor units and check each inter-phase voltage.
- Before the test run, ensure to check that the 3-way valve is open. Operating while the valve is closed causes the compressor to fail.

4.6.11 Test run procedure

- If there are duplicated system addresses, or if the settings for the Nos. of the indoor units are not consistent, an alarm will occur and the system will not start.
- Switch the power supply ON both indoor and outdoor units.
- Short-circuit CHK pin on the outdoor main PCB.
  Do not remove CHK pin until test run is completed.
  Removing CHK pin stops test run.
- Short-circuit RUN pin on the outdoor main PCB for one second or longer.
  Factory setting is cooling operation mode and cooling operation test run starts.
  If heating operation starts, short-circuit both right side and centre of the MODE pin (centre and COOL) continuously.
- Ensure to conduct a test run. In addition, be sure to run the cooling operation test run for at least 20 minutes before starting the heating operation test run.
- To conduct heating operation test run, short-circuit left side and centre of the MODE pin (centre and HEAT) continuously.
- Removing CHK pin's and MODE pin's short-circuit stops test run.
- For the test run using remote control unit, please see installation manual included with the remote control unit.

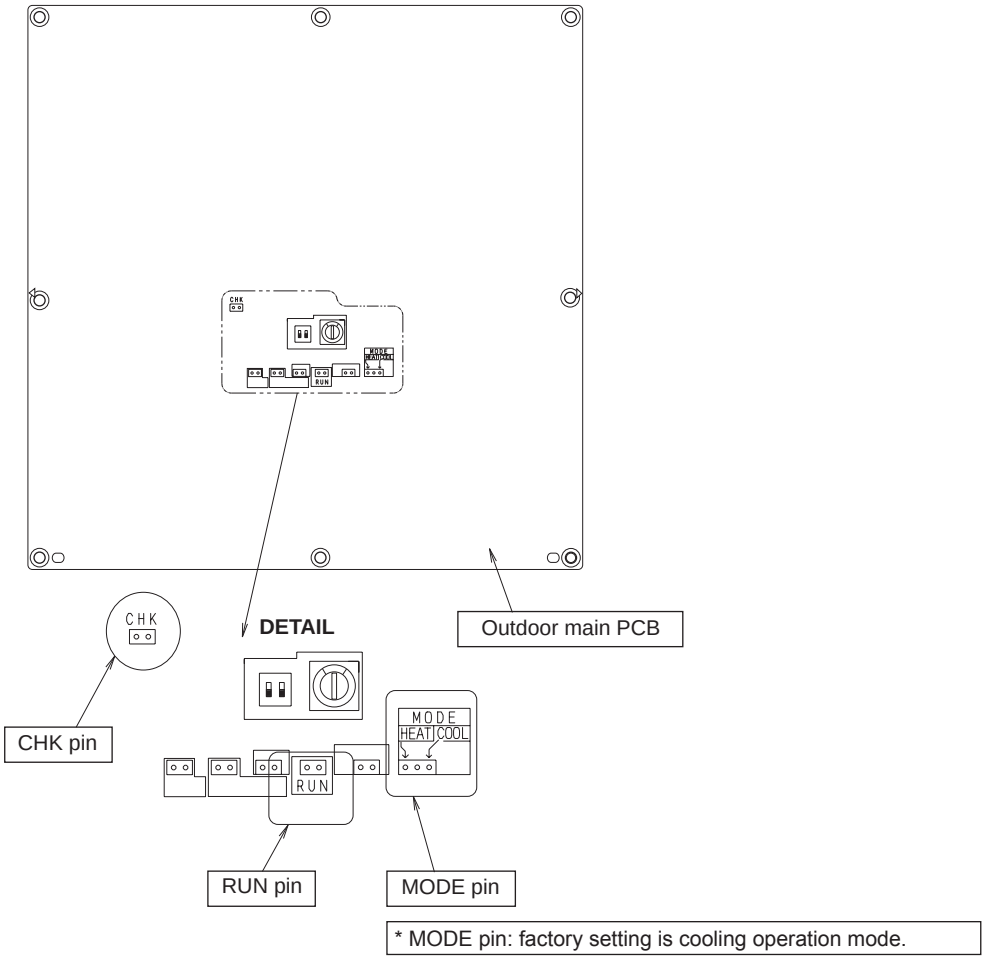


Fig. 4-56

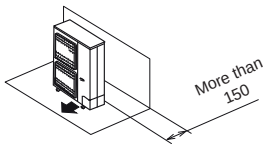
4.6.12 Selecting the location for installation service

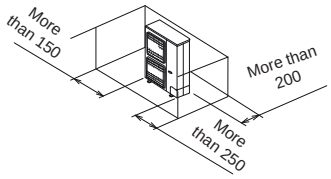
Please secure necessary space to guarantee performance and service & maintenance.
For multiple installations, please secure enough space to enable removal of side face screws between units. (unit:mm)
The below mentioned distance is required for optimal unit performance.
Allow as much space as possible in order to obtain the best performance from the units.

4.6.12.1If there are obstacles at the intake

- If the upper part is open

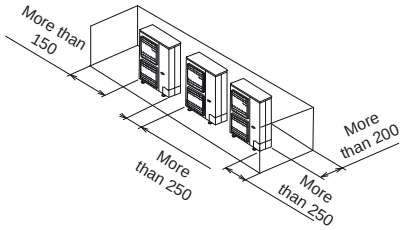
1. For separate installation location
   - Only if there are obstacles at the intake
   - If there are obstacles on both sides





(unit: mm)
Fig. 4-57

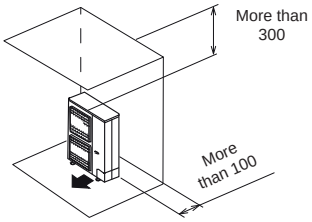
2. For multiple units (more than 2 units)
   - If there are obstacles on both sides



(unit: mm)
Fig. 4-58

- If there are obstacles above the unit

1. For separate installation location
   - Only if there are obstacles at the intake

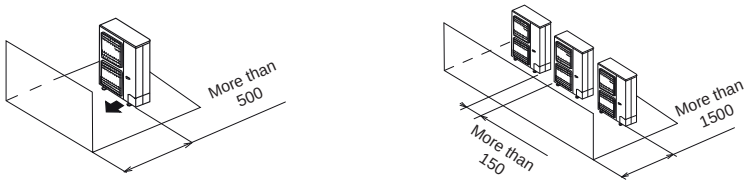


(unit: mm)
Fig. 4-59

4.6.12.2If there are obstacles at the discharge

- If the upper part is open

1. For separate installation location
2. For multiple units (more than 2 units)



(unit: mm)

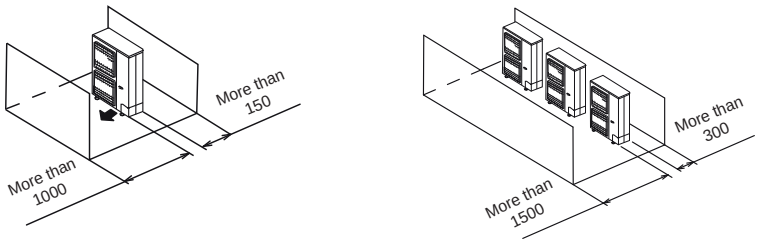
Fig. 4-60

4.6.12.3If there are obstacles on both the intake and discharge

If there is an obstacle that is higher than the unit on the intake side.
(There is no limit to the height of the obstacle above the discharge.)

- If the upper part is open

1. For separate installation location
2. For multiple units (more than 2 units)

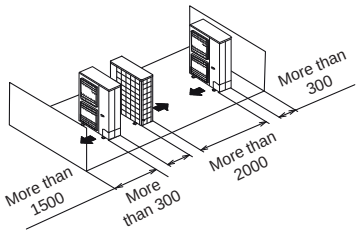


(unit: mm)

Fig. 4-61

4.6.12.4For multiple row installation (on the roof, etc.)

1. For one row installation setup



(unit: mm)

Fig. 4-62

4.6.13 Checks after installation have completed

- Check the following items after completing installation.
  - > Is there a short circuit with the intake air flow?
  - > Is the insulation secure? (Refrigerant piping)
  - > Are there any errors with the wiring?
  - > Are the terminal screws loose? Tightening torque (Unit: Nm {kgfm}) M4… 1.57–1.96 {0.16–0.2}, M5... 1.96–2.45 {0.2–0.25}.
  - > Is the drain water flowing smoothly?
  - > Is the insulation material properly installed?
  - > Is the earth wire securely connected?
  - > Is the front panel and the indoor unit air conditioner firmly fixed and was the installation completed without any leakage from the refrigerant?
  - > Are the indoor and outdoor units secured firmly installed with bolts at secured locations?

4.6.14 Regarding delivery to the customer

- Request the customer to review the instruction manual and explain the operating method for the product.
- In addition, it is also recommended that regular inspection checks are agreed upon for maintenance.

User inspection places	• Filter and grille cleaning
	• Exterior cleaning
Serviceman inspection places	• Check the operating status
	• Clean the drain pan or things related to the water discharge
	• Heat exchanger cleaning

Refer to the installation instruction manual provided with the indoor unit for the specifications on the indoor unit installation.

CAUTION

For safety reasons, an oil pan should be placed under every outdoor unit

In case of multiple installations

- Provide a solid base (concrete block, 10×40 cm beams or equal), a minimum of 15 cm above ground level to reduce humidity and protect the unit against possible water damage and decreased service life. (Fig. 4-61)
- Use lug bolts or equal to bolt down unit, reducing vibration and noise.

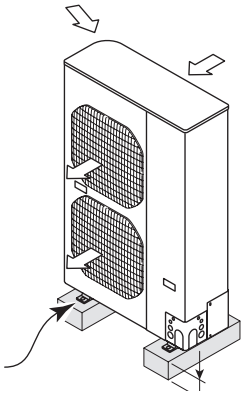


Fig. 4-63

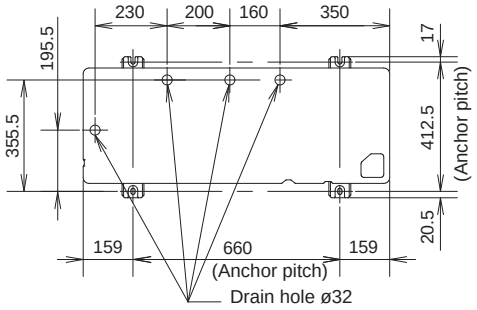
4.7 Transport and install the outdoor unit

- Transporting

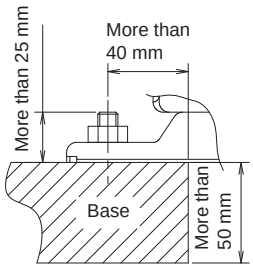
1. Transport the outdoor unit in its original packaging as close as possible to the installation location.
2. In the event that the unit needs to be lifted or suspended, use a rope or belt and use cloth or wood as padding to avoid damaging the unit.
3. Use the side handles to carry the unit and be careful not to touch the fan with your hand or any objects.

- Installation

1. Read the “Select the outdoor unit installation location” thoroughly before installing the outdoor unit.
2. When installing to a concrete or solid surface, use M10 or a W 3/8 bolts and nuts to secure the unit. Ensure that it installed upright on a horizontal plane. (Use an anchor bolt for the installation as shown in the diagram below.)
3. Avoid installing on the slanted roof.
4. In the even where the roof is at risk of receiving oscillations or vibrations, secure the unit with a seismic isolating mount or vibration absorbing rubber.
5. The drain water will be discharged from the unit during heating or defrosting operation mode. Select an appropriate location with good drainage system. (In winter, there is a risk of slipping caused by freezing depending on the installation location.)



Anchor bolt position



Anchor bolt length

(unit: mm)

Fig. 4-64

   - Ensure a height of 15 cm or more at the feet on both sides of the unit.
   - Precautions for Installation in Heavy Snow Areas. The platform should be higher than the maximum snow depth + 50 cm. (In this case, leave clearance below the unit for the drain tube, and to prevent freezing of drainage water in cold-weather regions.)
   - Please consult us if installing the drain socket (Field supply).
   - When using a drain tube, install the drain socket (Field supply) onto the drain hole. Seal the other drain hole with the rubber cap (Field supply). For details, refer to the instruction manual of the drain socket (Field supply). After completing the installation work of the drain socket, make sure that the water does not leak from any part of connection
   - In cold regions (where the outdoor temperature can drop to below 0° for 2 to 3 consecutive days), the drain water may freeze and may prevent the fan from operating. For this case, do not use the drain socket (Field supply).

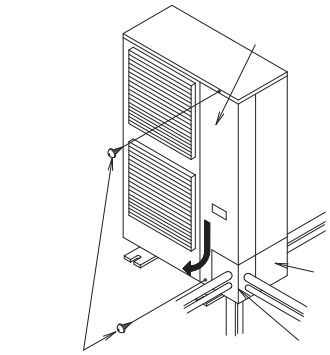
CAUTION

- ► Route the tubing so that it does not contact the compressor, panel, or other parts inside the unit. Increased noise will result if the tubing contacts these parts.
- ► When routing the tubing, use a tube bender to bend the tubes.
- ► In cold-weather regions, in order to prevent drainage water from freezing, do not install the drain socket cap. Also take steps to prevent water from accumulating around the unit.

4.7.1 Refrigerant installation

For indoor unit refrigerant tubing installation, refer to the installation instruction manual that comes with that indoor unit. Do not reuse existing tubing, install new tubing.

1. Precautions during refrigerant installation.
   - Use clean pipes with no dust inside.
     The tube may corrode with the presence of fluorine dust which will adversely affect the refrigerant tubing system due to deterioration of the refrigerant oil, etc..
   - This unit is specifically for R32. Ensure to adhere to the following items and install accordingly:
     - Use tube cutters and flaring tools which are specially designed for use with R32.
     - When connecting with flaring tools, coat the flare section with ether-based oil.
     - Ensure to use flare nuts supplied with the unit when connecting this unit.
     - Only for storing or for open tubes.
     - Set the lower limit of the allowable tube length to 5 m.
       If the tube is shorter than 5 m, the refrigerant may become overfilled and a problem such as abnormal high pressure could occur.
     - Carefully handle the liquid refrigerant, as it may cause a frostbite.
     - Do not release refrigerants during the tubing works for installing, re-installing and repairing refrigeration parts.



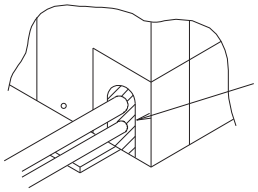


Fig. 4-65

2. The local tubes can protrude from any four directions.
   - Make holes in the tube panel for the tubes to penetrate it and lay the tubes accordingly.
     - It is recommended to apply additional substance to the cut area for anti-rust protection.
   - Ensure to install tube panels to prevent rain water from getting into the unit.
   - Close the gap at the tube connected area with putty or heat insulator (field supply).
     - If an insect or small animal enters the outdoor unit, there is the risk of shorting in the product electronic casing.
     - **Remove the front panel**
       3) Remove the 2 mounting screws.
       4) Slide the front panel using your hands downwards to release the pawls.Then remove by pulling the panel towards you.

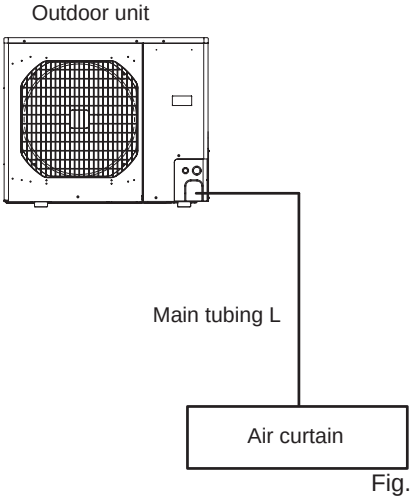


Fig. 4-66

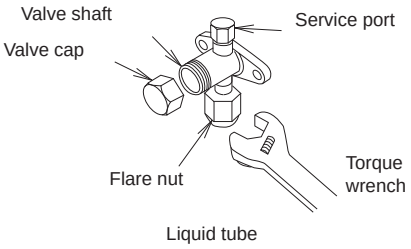
Table 4-4: Specification for tube connecting indoor unit to outdoor unit

			U-200PZH2E8	U-250PZH2E8
Total tube length			100 m	80 m
Height difference	Outdoor located higher installation		30 m	
	Outdoor located lower installation		30 m	
Charge-less tube length			5–30 m	
Additional charge per 1 m			60 g/m	80 g/m
Refrigerant charged at shipment			4.2 kg	5.2 kg
Total refrigerant amount			7.80 kg	
Valve size (Outdoor unit)		Liquid	ø9.52	ø12.7
		Gas	ø19.05 [1)]	ø19.05 [1)]
Main tube (Outdoor unit to Indoor unit)		Liquid	ø9.52	ø12.7
		Gas	ø25.4	ø25.4

[1)] (Gas tubing connection) While the main gas tube is ø25.4, since connecting the outdoor unit's 3-way valve requires a ø19.05 flare, please be sure to use standard accessories joint tubing A for connection (brazing).

4.7.2 Precautions when operating the 3-way valve for piping installation

- Do not open the 3-way valve until the tubing installation is completed.
  - It is closed during shipment.
  - During installation the side panel may warp if only the flare nut is loosened and tightened with a torque wrench. As a result, always be sure to secure to the hexagonal part of the 3-way valve with a spanner, or other tool



(Please use a single, open-end spanner to loosen and tighten the liquid tube 3-way valve flare nut.)

- Refer to the following table for the tightening torque of the 3-way valve flare nuts.
  - If the nuts are over tightened, they may cause the flares to break or leak.
- Do not add additional force to the valve's cover.
  - Using spanners on the cover or valve itself (other than the hexagonal parts) may cause gas leakage.
    Avoid using spanners on the cover or parts other than the hexagonal part of the valve.

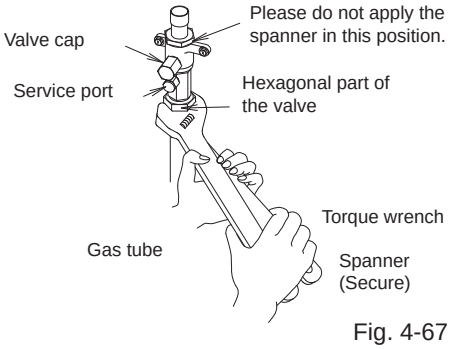
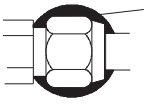


Fig. 4-67

- When cooling in the low outdoor air, the low-pressure side pressure may decrease. Seal sufficiently the flare nut in the service valve (both gas and liquid tubes) with silicone sealant to avoid the gas leak caused by freezing.
- Silicone Sealant must be neutral cure and ammonia free. Use of silicon containing ammonia can lead to stress corrosion on the joint and cause leakage.



Silicone sealant. Please ensure there are no gaps where moisture can enter the joint.

Fig. 4-68

- Gas tube

  Opening : Open the valve cap, pull out the knob and use pliers etc. to turn the knob 90° counter-clockwise

  Closing : Open the valve cap, pull out the knob and use pliers etc. to turn the knob 90° clockwise..

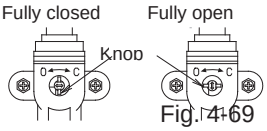


Fig. 4-69

- Liquid tube

  Opening : Open the valve cap and turn the Allen wrench counter-clockwise until it stops

  Closing : Open the valve cap and turn the Allen wrench clockwise until it stops.

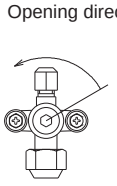


Fig. 4-70

4.7.3 Precautions for outdoor and indoor unit PCB (CR)

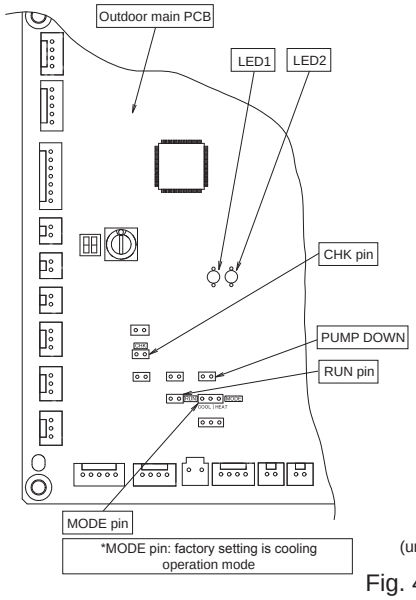
Precautions

- Request that the customer be present when the test run is performed. At this time, explain the operation manual and have the customer perform the actual steps.

4.7.3.1 Outdoor unit main PCB (CR)

- Be sure to pass the manuals and warranty certificate to the customer.
- Check that the 220–240 V AC power is not connected to the inter-unit control wiring connector terminal.

  * If 220–240 V AC is accidentally applied, the indoor or outdoor unit control PCB fuse will blow in order to protect the PCB. Correct the wiring connections, then disconnect the 2P connectors that are connected to the PCB, and replace them with 2P connectors. If operation is still not possible after changing the brown connectors, try cutting the varistor. (Be sure to turn the power OFF before performing this work.)



(unit: mm)

Fig. 4-71

4.7.3.2 Indoor unit main PCB (CR)

- Check that the 220–240 V AC power is not connected to the inter-unit control wiring connector terminal.

  * If 220–240 V AC is accidentally applied, the indoor unit control PCB fuse will blow in order to protect the PCB. In this case, make the wiring correctly. Then disconnect the 2P connectors (OC) that are connected to the indoor unit PCB, and replace them with 2P connectors (EMG). If operation is still not possible after changing the brown connectors, cut the jumper on the indoor unit PCB. (Be sure to turn the power OFF before performing this work.)

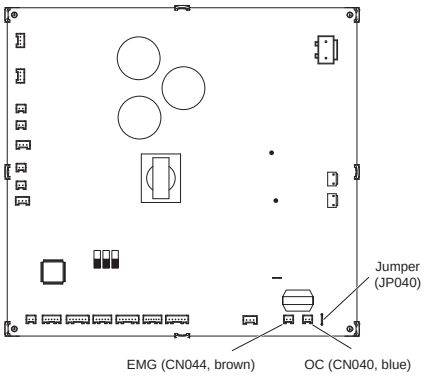


Fig. 4-72

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 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 differs from locality to locality. For field wiring rules, please refer to 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 designated by the manufacturer, because special-purpose tools are required.

5.2 Recommended Wire Length and Wire Diameter for Power Supply System

5.2.1 Outdoor units

■ U-50PZH2E5, U-60PZH2E5, U-60PZ2E5, U71PZ2E5

	(A) Power supply		Time delay fuse or circuit capacity	(A) Power supply		Time delay fuse or circuit capacity
	Wire size	Max. length		Wire size	Max. length	
U-50PZH2E5	2.5 mm²	21 m	20 A	4 mm²	34 m	20 A
U-60PZH2E5	2.5 mm²	15 m	25 A	4 mm²	25 m	25 A
U-60PZ2E5	2.5 mm²	15 m	25 A	4 mm²	25 m	25 A
U-71PZ2E5	2.5 mm²	15 m	25 A	4 mm²	25 m	25 A

■ U-71PZH2E5, U-100PZH2E5, U-1250PZH2 E5, U-140PZH2E5 U-71PZH2E8, U-100PZH2E8, U-1250PZH2E8, U-140PZH2E8

Model name	Power supply	Time delay fuse or circuit capacity	Control cable (*1)	Short circuit power Ssc
U-71PZH2E5	220-230-240V~	25 A	0.75 mm²	3200 kVA
U-100PZH2E5	220-230-240V~	30 A	0.75 mm²	4050 kVA
U-125PZH2E5	220-230-240V~	35 A	0.75 mm²	4550 kVA
U-140PZH2E5	220-230-240V~	35 A	0.75 mm²	4700 kVA
U-71PZH2E8	380-400-415V 3N~	15 A	0.75 mm²	(*2)
U-100PZH2E8	380-400-415V 3N~	15 A	0.75 mm²	(*2)
U-125PZH2E8	380-400-415V 3N~	20 A	0.75 mm²	(*2)
U-140PZH2E8	380-400-415V 3N~	20 A	0.75 mm²	(*2)

*1 Use a shielded cable for the control cable. Overall extension less than 1000 m.

*2 Intended for professional use. Permission from the power supplier is required when installing the U-71PZH2E8, U-100PZH2E8, U-125PZH2E8, U-140PZH2E8 outdoor units that are connected to a 16 A distribution network.

■ U-100PZ2E5, U-125PZ2E5, U-140PZ2E5 U-100PZ2E8, U-125PZ2E8, U-140PZ2E8

Model name	Power supply	Time delay fuse or circuit capacity	Control cable (*1)	Short circuit power Ssc
U-100PZ2E5	220-230-240V~	30 A	0.75 mm²	4750 kVA
U-125PZ2E5	220-230-240V~	35 A	0.75 mm²	5500 kVA
U-140PZ2E5	220-230-240V~	40 A	0.75 mm²	5650 kVA
U-100PZ2E8	380-400-415V 3N~	15 A	0.75 mm²	(*2)
U-125PZ2E8	380-400-415V 3N~	15 A	0.75 mm²	(*2)
U-140PZ2E8	380-400-415V 3N~	15 A	0.75 mm²	(*2)

*1 Use a shielded cable for the control cable. Overall extension less than 500 m.

*2 Intended for professional use. Permission from the power supplier is required when installing the U-71PZH2E8, U-100PZH2E8, U-125PZH2E8, U-140PZH2E8 outdoor units that are connected to a 16 A distribution network.

■ **U-200PZH2E8, U-250PZH2E8**

Model name	Power supply	Time delay fuse or circuit capacity	Control cable (*1)	Short circuit power Ssc
U-200PZH2E8	380-400-415V 3N~	30 A	0.75 mm²	(*2)
U-250PZH2E8	380-400-415V 3N~	30 A	0.75 mm²	1850 kVA

*1 Use a shielded cable for the control cable. Overall extension less than 1000 m.

*2 Intended for professional use. Permission from the power supplier is required when installing the U-200PZH2E8 outdoor units that are connected to a 16 A distribution network.

5.2.2 Indoor unit

Type	(B) Power supply	Time delay fuse or circuit capacity
	2.5 mm²	
PAIRC-HS PAIRC-LS	Max. 130 m* Max. 50 / 30 m**	10-16 A

* For U-50PE1E5, U-60/71PEY1E5
** For U-200/250PE1E8

5.2.3 Control wiring

(C) Inter-unit (between outdoor and indoor units) control wiring	(D) Remote control wiring	(E) Control wiring for group control
0.75 mm² (AWG #18) Use shielded wiring*	0.75 mm² (AWG #18)	0.75 mm² (AWG #18)
Max. 1,000 m	Max. 500 m**	Max. 200 m (Total)

Note

* With ring-type wire terminal.

** When the “PAIRC” type and (D) and (E) are used together with maximum length of 500 m for group control, and if the remote controller for the group control is wireless, the maximum length will be 400 m.

5.2.4 Example

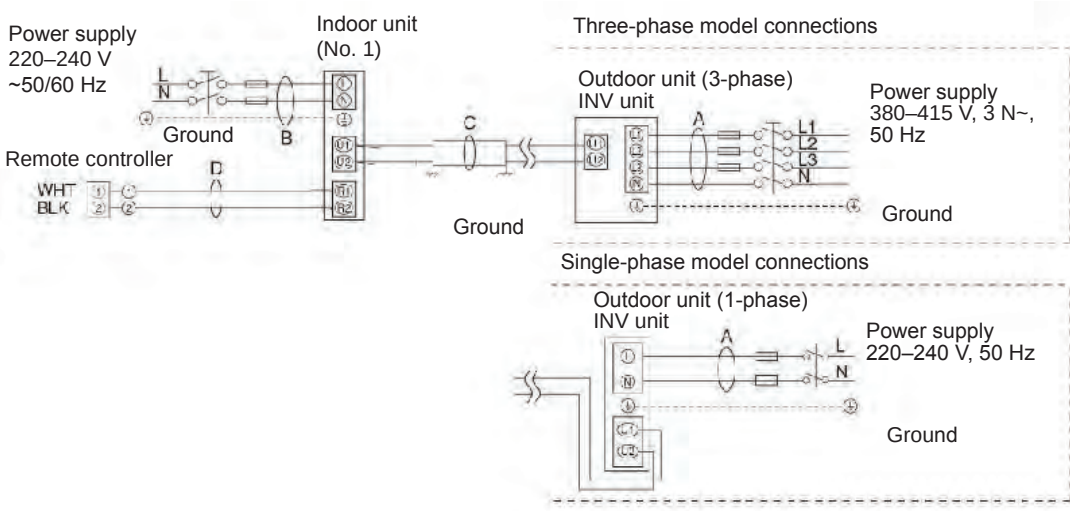
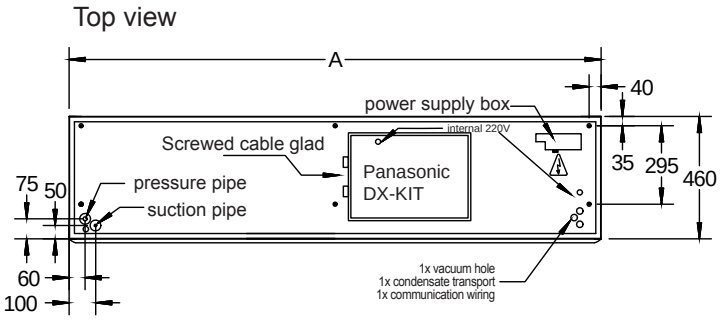


Fig. 5-1

NOTE

1. Refer to Section 5-2. “Recommended Wire Length and Wire Diameter for Power Supply System” for the explanation of “A”, “B”, “C”, “D” and “E” in the above diagram.
2. The basic connection diagram of the indoor unit shows the terminal boards, so the terminal boards in your equipment may differ from the diagram. (Fig. 5-2)
3. Refrigerant Circuit (R.C.) address should be set before turning the power on.
4. Regarding R.C. address setting, refer to the installation instructions supplied with the remote controller unit (Optional). Auto address setting can be executed by remote controller automatically. Refer to the installation instructions supplied with the remote controller unit (optional).
5. Fig. 5-2 shows the electrical connections in detail.



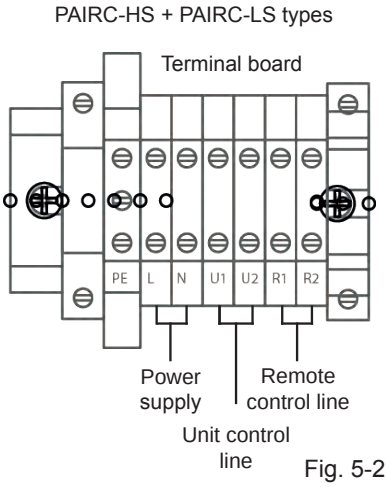


Fig. 5-2

5.2.5 How to connect wiring to the terminal

- For stranded wiring

1. Cut the wire end with cutting pliers, then strip the insulation to expose the stranded wiring about 10 mm and tightly twist the wire ends. (Fig. 5-3)
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.
4. Place the ring pressure terminal, and replace and tighten the removed terminal screw using a screwdriver. (Fig. 5-4)

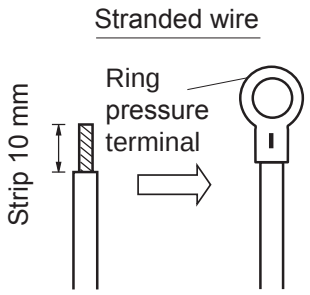


Fig. 5-3

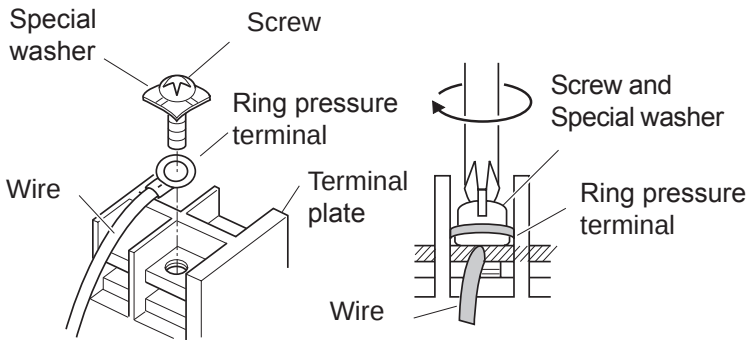


Fig. 5-4

- Examples of shield wires

1. Remove cable coat not to scratch braided shield. (Fig. 5-5)
2. Unbraid the braided shield carefully and twist the unbraided shield wires tightly together. Insulate the shield wires by covering them with an insulation tube or wrapping insulation tape around them. (Fig. 5-6)
3. Remove coat of signal wire. (Fig. 5-7)
4. Attach ring pressure terminals to the signal wires and the shield wires insulated in Step (2). (Fig. 5-8)

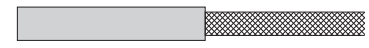


Fig. 5-5

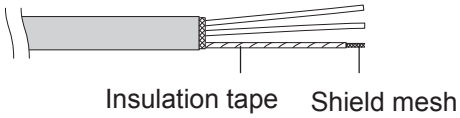


Fig. 5-6

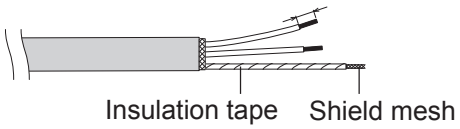


Fig. 5-7

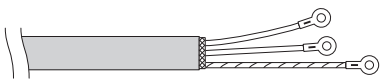


Fig. 5-8

5.3 Electrical Wiring diagrams

PAW-10EAIRC-LS and PAW-10EAIRC-HS

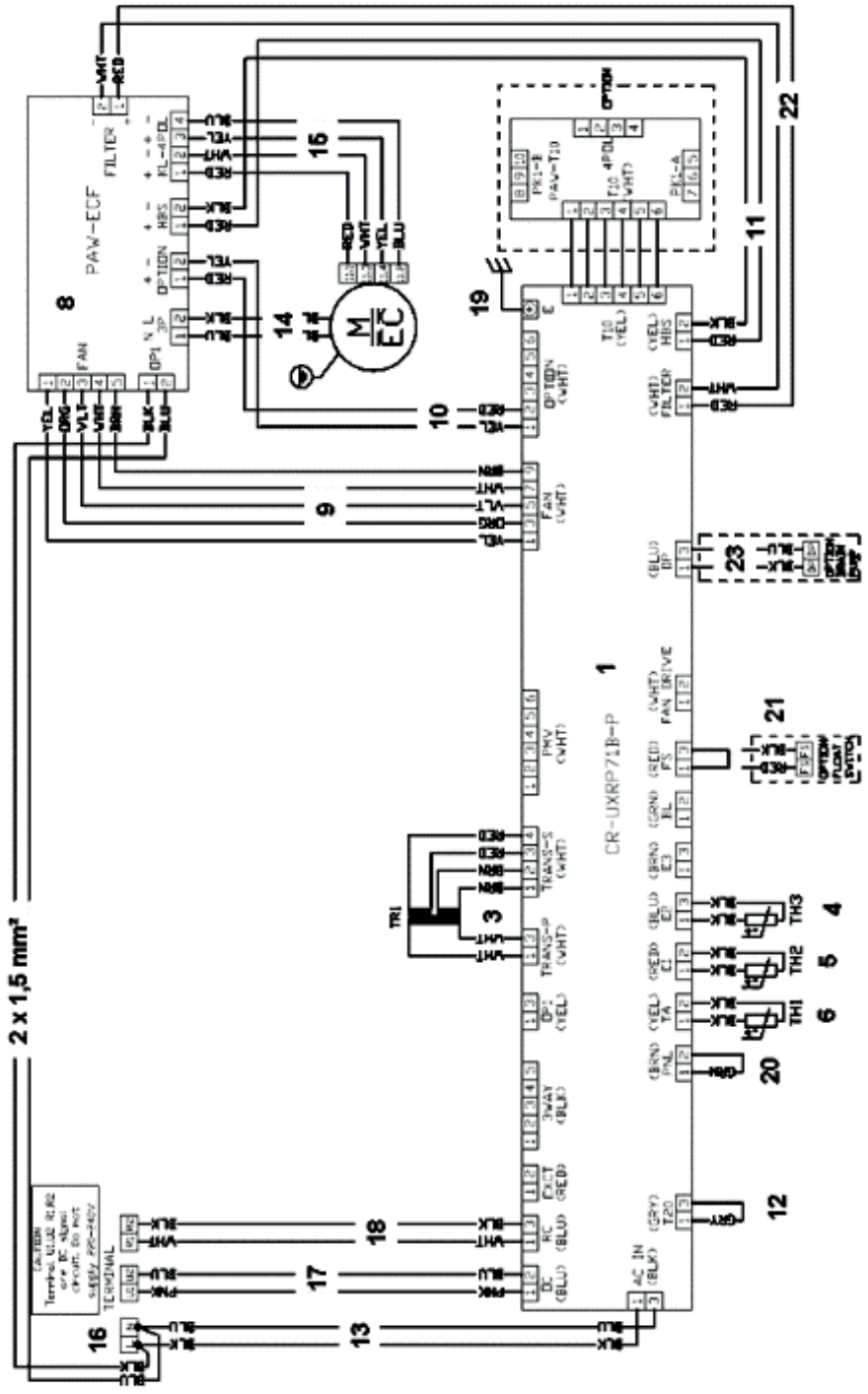


Fig. 5-9

Item	Description	Symbol	Colour
TH1	Air intake sensor (Room temperature)	TA	yellow
TH2	Gas tubing sensor	E1	red
	Evaporation temperature sensor		
TH3	Refrigerant gas temperatur sensor	E2	black

PAW-20EAIRC-LS and PAW-15/20/25EAIRC-HS

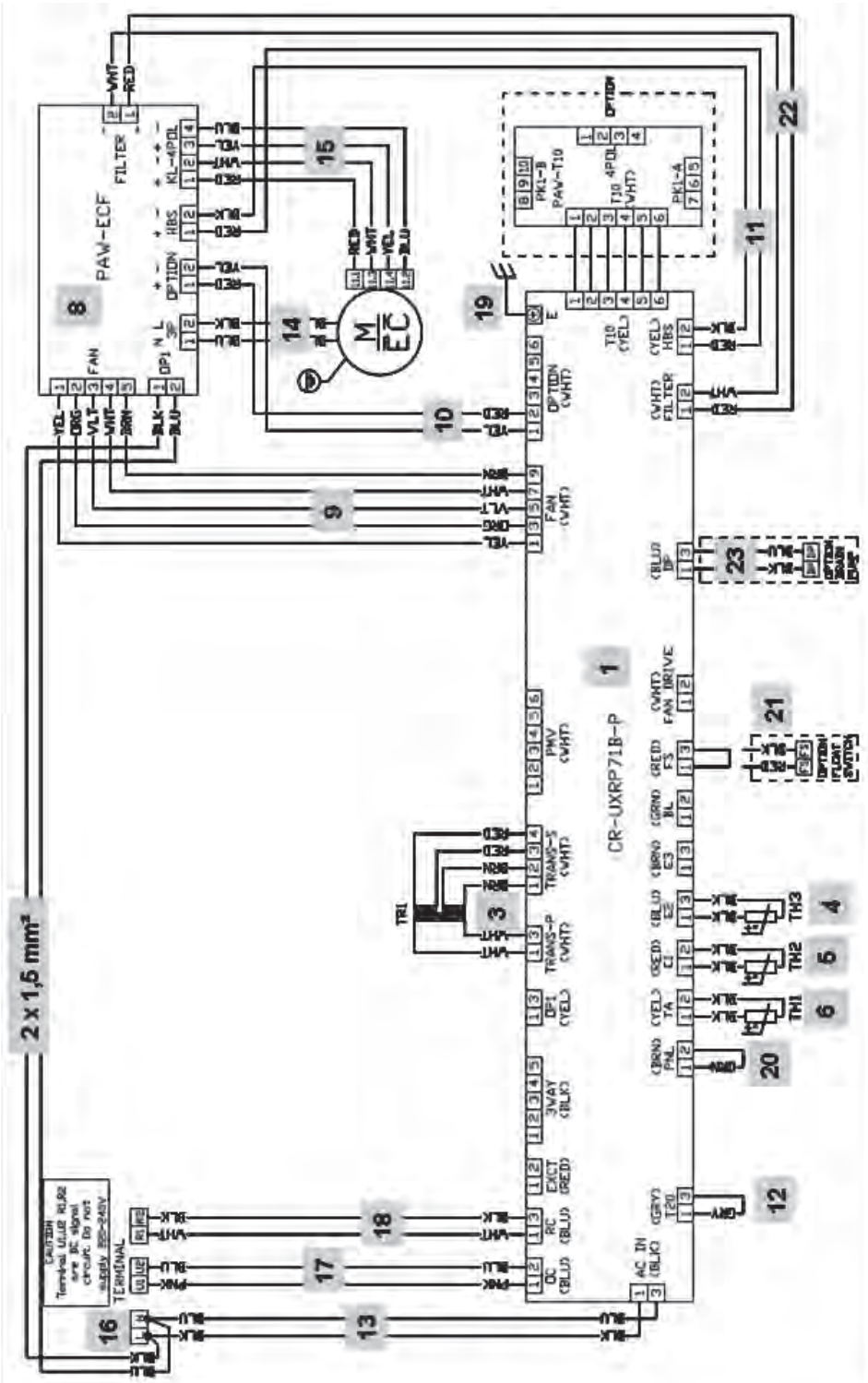


Fig. 5-10

Item	Description	Symbol	Colour
TH1	Air intake sensor (Room temperature)	TA	yellow
TH2	Gas tubing sensor	E1	red
	Evaporation temperature sensor		
TH3	Refrigerant gas temperatur sensor	E2	black

6 How to process tubing

The liquid tubing side is connected by a flare nut, and the gas tubing side is connected by brazing.

6.1 Connecting the Refrigerant Tubing

6.1.1 Use of the Flaring Method

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

Flaring Procedure with a Flare Tool

1. Cut the copper tube to the required length with a tube cutter. It is recommended to cut approx. 30–50 cm longer than the tubing length you estimate.
2. Remove burrs at each end of the copper tubing with a tube reamer or file. This process is important and should be done carefully to make a good flare. Be sure to keep any contaminants (moisture, dirt, metal filings, etc.) from entering the tubing. (Fig. 6-1 and Fig. 6-2).

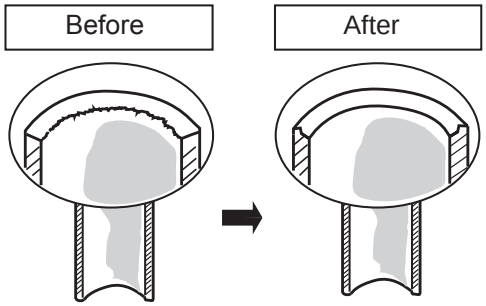


Fig. 6-1

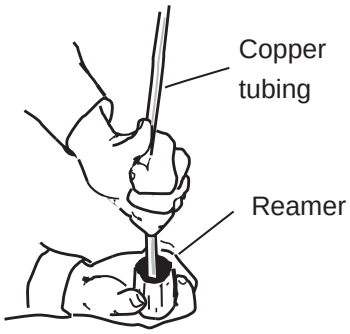


Fig. 6-2

NOTE

When reaming, hold the tube end downward and be sure that no copper scraps fall into the tube. (Fig. 6-2)

3. Remove the flare nut from the unit and be sure to mount it on the copper tube.
4. Make a flare at the end of the copper tube with a flare tool.

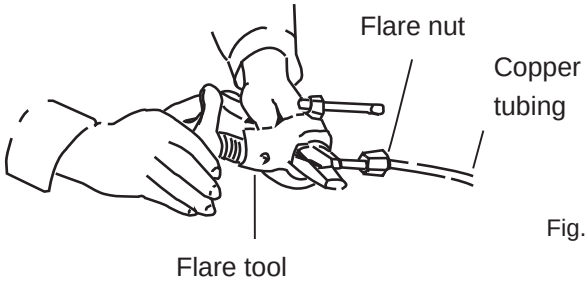


Fig. 6-3

NOTE

A good flare should have the following characteristics.

- Inside surface is glossy and smooth
- Edge is smooth
- Tapered sides are of uniform length

Tube diameter	Tightening torque (approximate)	Tube thickness
ø 6.35 (1/4“)	14–18 Nm (140–180 kgf • cm)	0.8 mm
ø 9.52 (3/8“)	34–42 Nm (340–420 kgf • cm)	0.8 mm
ø 12.7 (1/2“)	49–61 Nm (490–610 kgf • cm)	0.8 mm
ø 15.88 (5/8“)	68–82 Nm (680–820 kgf • cm)	1.0 mm
ø 19.05 (3/4“)	100–120 Nm (1000–1200 kgf • cm)	1.0 mm

Caution 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. Be sure to apply refrigerant lubricant (ether oil) to the inside of the flare nut before making piping connections.
   This is effective for reducing gas leaks. (Fig. 6-4)

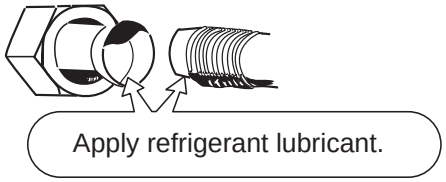


Fig. 6-4

3. For proper connection, align the union tube and flare tube straight with each other, then screw on the flare nut lightly at first to obtain a smooth match. (Fig. 6-5)

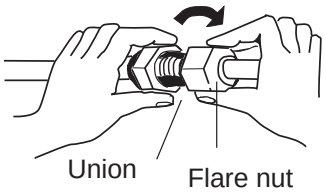


Fig. 6-5

- Adjust the shape of the liquid tube using a tube bender at the installation site and connect it to the liquid tubing side valve using a flare.

6.1.2 Cautions During Brazing

- Replace air inside the tube with nitrogen gas to prevent copper oxide film from forming during the brazing process. (Oxygen, carbon dioxide and Freon are not acceptable)
- Do not allow the tubing to get too hot during brazing. The nitrogen gas inside the tubing may overheat, causing refrigerant system valves to become damaged. Therefore allow the tubing to cool when brazing.
- Use a reducing valve for the nitrogen cylinder.
- Do not use agents intended to prevent the formation of oxide film. These agents adversely affect the refrigerant and refrigerant oil, and may cause damage or malfunctions.

6.1.3 Connecting Tubing Between Indoor and Outdoor Units

6.1.3.1 Indoor Unit Tubing Connection Dimensions

Refer to Section “Technical Data” in the appendix

1. Tightly connect the indoor-side refrigerant tubing extended from the wall with the outdoor-side tubing.
2. To fasten the flare nuts, apply specified torque.

- When removing the flare nuts from the tubing connections, or when tightening them after connecting the tubing, be sure to use 2 adjustable wrenches or spanners. (Fig. 5-6)
  If the flare nuts are over-tightened, the are may be damaged, which could result in refrigerant leakage and cause injury or asphyxiation to room occupants.

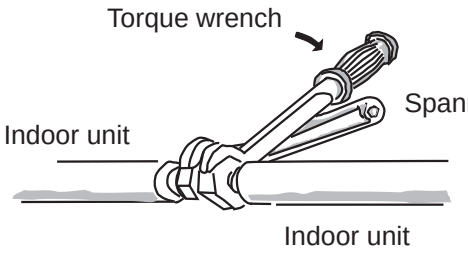


Fig. 6-6

- When removing or tightening the gas tube flare nut, use 2 adjustable wrenches together: one at the gas tube flare nut, and the other at part A.

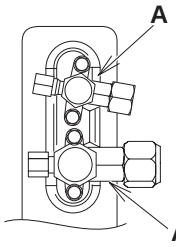


Fig. 6-7

- For the flare nuts at tubing connections, be sure to use the flare nuts that were supplied with the unit, or else flare nuts for R410A (type 2). The refrigerant tubing that is used must be of the correct wall thickness as shown in the table below.

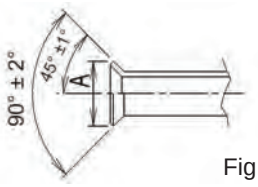
Tubing size	Tightening torque (approx.)	Flare section dimensions A	Tube thickness	Flare configuration
Ø6.35 mm	14–18 nm	8.7–9.1 mm	0.8 mm	
Ø9.52 mm	34–42 Nm	12.8–13.2 mm	0.8 mm	
Ø12.7 mm	49–55 Nm	16.2–16.6 mm	0.8 mm	
Ø15.88 mm	68–82 Nm	19.3–19.7 mm	1.0 mm	
Ø19.05 mm	100–120 Nm	23.6–24.0 mm	1.2 mm	

Fig. 6-8

Because the pressure is approximately 1.6 times higher than conventional refrigerant pressure, the use of ordinary flare nuts (type 1) or thin-walled tubes may result in tube rupture, injury, or asphyxiation caused by refrigerant leakage.

- In order to prevent damage to the flare caused by over-tightening of the flare nuts, use the table above as a guide when tightening.
- When tightening the flare nut on the liquid tube, use an adjustable wrench with a nominal handle length of 200 mm.
- When tightening the flare nut with the adjustable wrench, do not apply to the valve stem cap with the other one. If doing so, the valve will be damaged.
- Depending on the installation conditions, applying excessive torque may cause the nuts to crack.

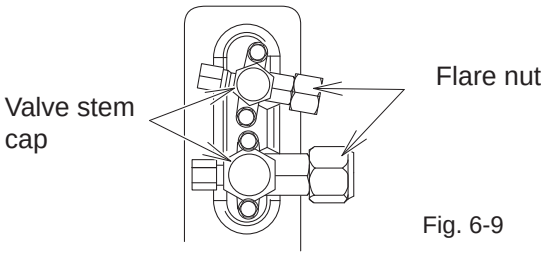


Fig. 6-9

6.1.3.2 Precautions for Packed Valve Operation

- If the packed valve is left for a long time with the valve stem cap removed, refrigerant will leak from the valve. Therefore, do not leave the valve stem cap removed.
- Use a torque wrench to securely tighten the valve stem cap.

Charging port	Tightening torque (approx.)
(Valve stem cap)	10.7–14.7 N • m (107–147 kgf • cm)
Ø 6.35 (Liquid side)	14.0–20.0 N • m (140–200 kgf • cm)
Ø 9.52 (Liquid side)	20.6–28.4 N • m (206–284 kgf • cm)
Ø 12.7, Ø 15.88 (Gas side)	48.0–59.8 N • m (480–598 kgf • cm)

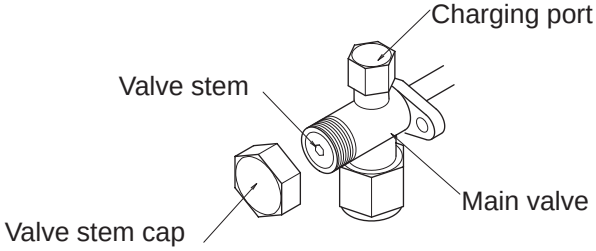


Fig. 6-10

6.2 Insulating the Refrigerant Tubing

6.2.1 Tubing Insulation

Thermal insulation must be applied to all units tubing, including distribution joint (field supply).

*For gas tubing, the insulation material must be heat resistant to 120 °C or above. For other tubing, it must be heat resistant to 80 °C or above.

Insulation material thickness must be 10 mm or greater.
If the conditions inside the ceiling exceed DB 30 °C and RH 70 %, increase the thickness of the gas tubing insulation material by 1 step.

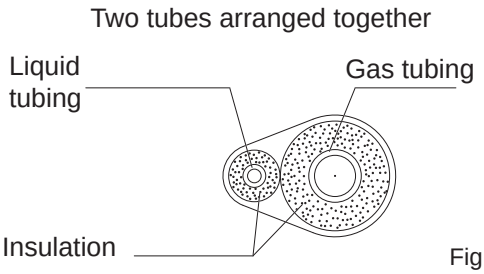


Fig. 6-11

CAUTION

If the exterior of the outdoor unit valves has been finished with a square duct covering, make sure you allow sufficient space to access the valves and to allow the panels to be attached and removed.

6.2.2 Taping the flare nuts

Wind the white insulation tape around the flare nuts at the gas tube connections. Then cover up the tubing connections with the flare insulator, and fill the gap at the union with the supplied black insulation tape. Finally, fasten the insulator at both ends with the supplied vinyl clamps. (Fig. 6-12)

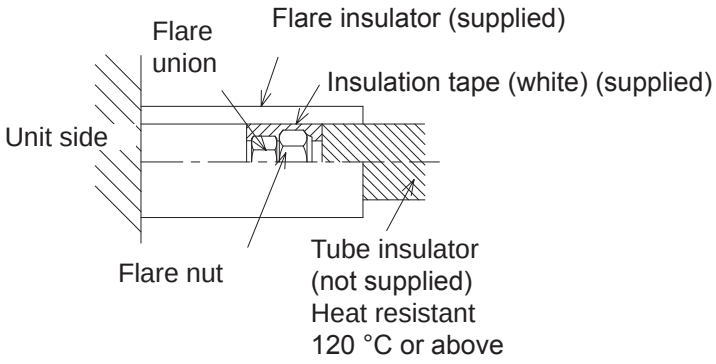


Fig. 6-12

6.2.3 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

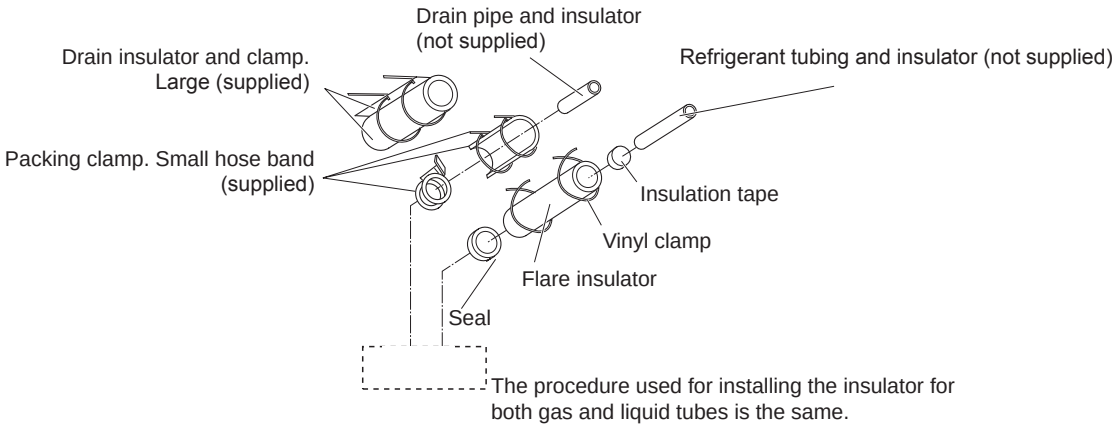


Fig. 6-13

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.

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

6

6.2.4 Taping the Tubes

1. At this time, the refrigerant tubes (and electrical wiring if local codes permit) should be taped together with armoring tape in 1 bundle. To prevent 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.
3. Clamp the tubing bundle to the wall, using 1 clamp approx. each meter. (Fig. 6-14)

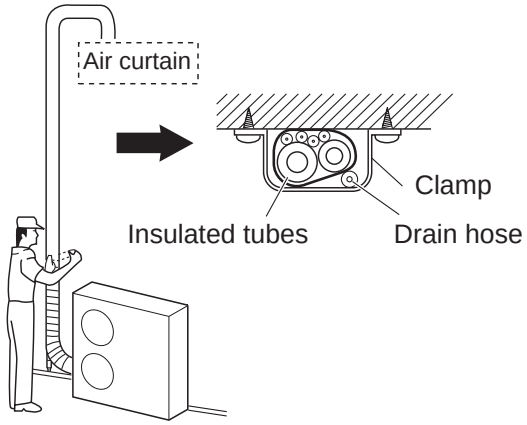


Fig. 6-14

NOTE

Do not wind the amoring 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.

6.2.5 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. 6-15)

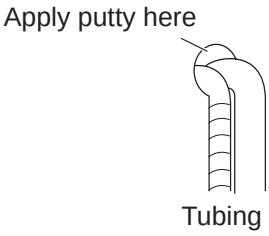


Fig. 6-15

6.3 Leak Test, Evacuation and Additional Refrigerant Charge

Perform an air-tightness test for this package A/C. Check that there is no leakage from any of the connections.

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 tubing between the indoor and outdoor unit must be leak tested and evacuated to remove any non-condensables and moisture from the system.

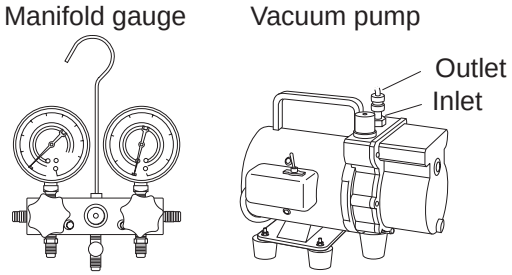


Fig. 6-16

6

6.3.1 Air Purging with a Vacuum Pump (for Test Run) Preparation

Check that each tube (both liquid and gas tubes) 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 gas and liquid service valves on the outdoor unit. Note that both liquid and gas tube service valves on the outdoor unit are kept closed at this stage

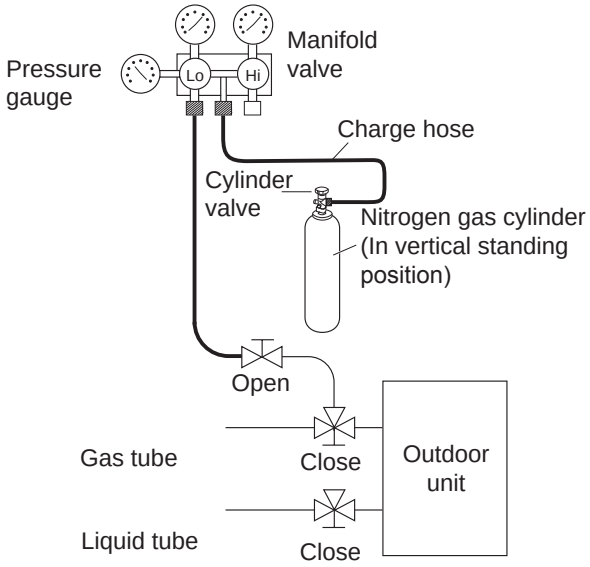


Fig. 6-17

- The refrigerant charge at the time of shipment is only guaranteed sufficient for a tubing length of up to 30* m. The tubing may exceed this length, up to the maximum permitted length; however, an additional charge is necessary for the amount that the tubing exceeds 30 m. (No additional refrigerating machine oil is needed.)

6.3.2 Leak Test

1. With the service valves on the outdoor unit closed, remove the 7.94 mm cap nut on the gas tube service valve. (Save for reuse.)
2. Attach a manifold valve (with pressure gauges) and dry nitrogen gas cylinder to this service port with charge hoses.

CAUTION

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

3. Pressurize the system up to 4.15 MPa {42 kgf/cm²G} with dry nitrogen gas and close the cylinder valve when the gauge reading reaches 4.15 MPa {42 kgf/cm²G}. Then, test for leaks with liquid soap.

NOTE

Do not pressurize to the default value at once. Pressurize gradually as follows.

(1) Pressurize to 0.5 MPa {5 kgf/cm²G} and then leave it for 5 minutes to ensure that the pressure does not drop.

(2) Pressurize to 1.5 MPa {15 kgf/cm²G} and leave it for 5 minutes to ensure that the pressure does not drop.

(3) For the test, pressurize to 4.15 MPa and leave it for about 1 day to ensure that the pressure does not drop.

CAUTION

To avoid nitrogen entering the refrigerant system in a liquid state, the top of the cylinder must be higher than the bottom when you pressurize the system. Usually, the cylinder is used in a vertical standing position.

4. Do a leak test of all joints of the tubing (both indoor and outdoor) and both gas and liquid service valves. Bubbles indicate a leak. Wipe off the soap with a clean cloth after a leak test.
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.

6.3.3 Evacuation

Be sure to use a vacuum pump that includes a function for prevention of back-flow, in order to prevent back-flow of pump oil into the unit tubing when the pump is stopped.

Perform vacuuming of the indoor unit and tubing.

Connect the vacuum pump to the gas tube valve and apply vacuum at a pressure of –101 kPa {–755 mmHg, 5 Torr} or below.

Continue vacuum application for a minimum of 1 hour after the pressure reaches –101 kPa {–755 mmHg, 5 Torr}.

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.
2. When the desired vacuum is reached, close the “Lo” knob of the manifold valve and turn off the vacuum pump.
   Confirm that the gauge pressure is under –101 kPa {–755 mmHg, 5 Torr} after 4 to 5 minutes of vacuum pump operation

CAUTION

Use a cylinder specifically designed for use with R410A or R32.

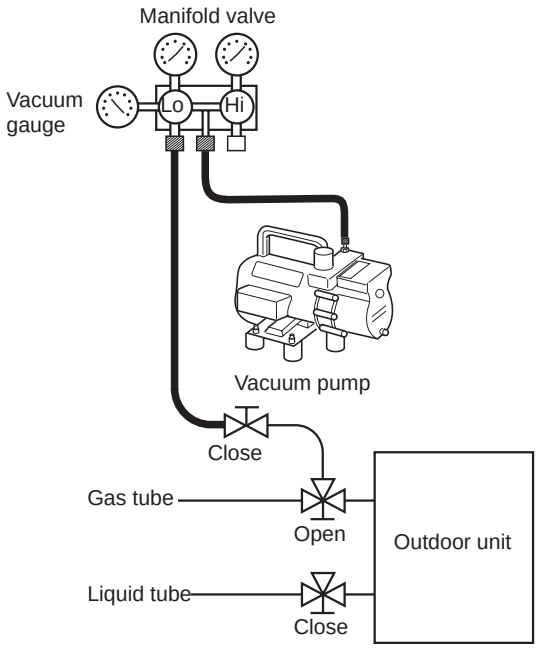


Fig. 6-18

6.3.4 Charging Additional Refrigerant

- Charge additional refrigerant (calculated from the liquid tube length as shown in sec. “Tubing Size” using the liquid tube service valve.
- Use a balance to measure the refrigerant accurately.
- If the additional refrigerant charge amount cannot be charged at once, charge the remaining refrigerant in liquid form by using the gas tube service valve with the system in Cooling mode at the time of test run.

  * If an additional refrigerant charge has been performed, list the refrigerant tubing length and amount of additional refrigerant charge on the product label (inside the panel).

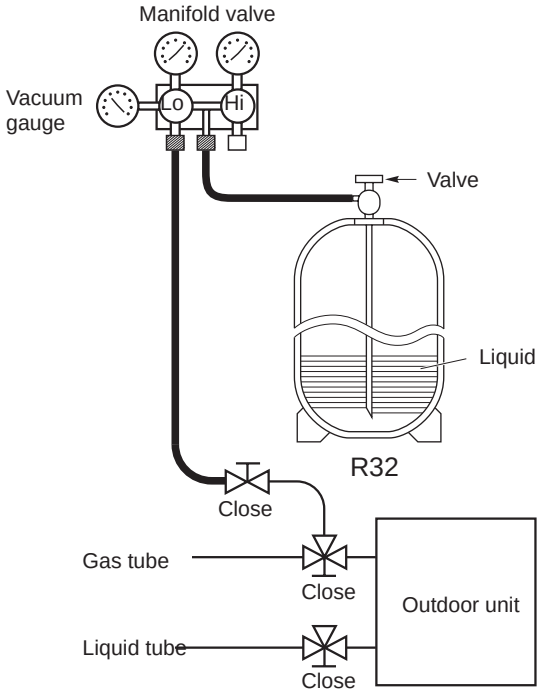


Fig. 6-19

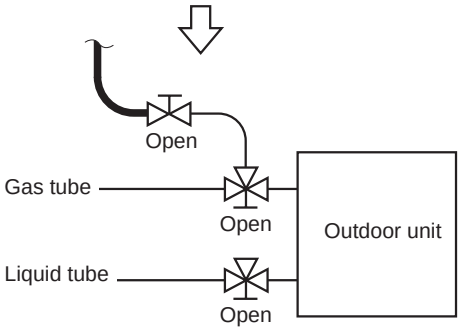


Fig. 6-20

6.3.5 Finishing the Job

1. With a hex wrench, turn the liquid tube service valve shaft counterclockwise to fully open the valve.
2. Turn the gas tube service valve shaft counterclockwise to fully open the valve.

CAUTION

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

3. Loosen the charge hose connected to the gas tube service port (7.94 mm) slightly to release the pressure, and then remove the hose.
4. Replace the 7.94 mm cap nut on the gas 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 at both gas and liquid service valves and fasten them securely.

7 Test Run

■ U-200PZH2E8, U-250PZH2E8

7.1 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 supplied 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. 7-1)
  6. Both the gas and liquid tube service valves are open. If not, open them now. (Fig. 7-2)
  7. Request that the customer be present for the test run. Explain the contents of the instruction manual, and then have the customer actually operate the system.
  8. Be sure to give the instruction manual and warranty certificate to the customer.
  9. When replacing the control PCB, be sure to make all the same settings on the new PCB as were in use before replacement. The existing EEPROM is not changed, and is connected to the new control PCB.

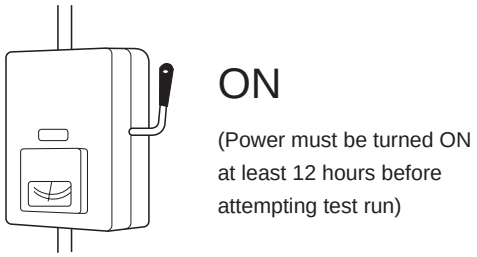


Fig. 7-1

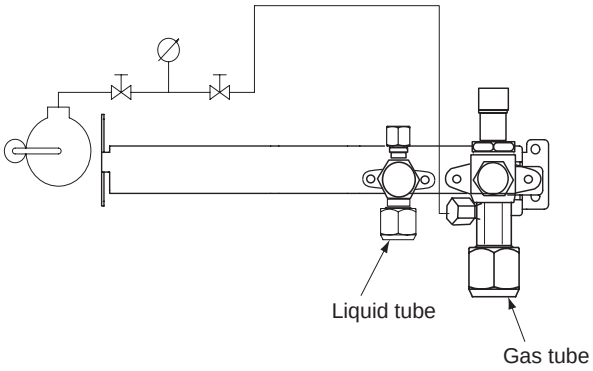


Fig. 7-2

Table 7-1: Check Before Test Run

	Content check
Power supply cable Indoor/outdoor connection wire Earth wire	• Is the wire set up and connected as described in the instructions? Check for any phase sequence. • Are the wire connection's screws loose? • Is the open and close device / leakage breaker installed? • Is the power supply cable's thickness and length appropriately measured as described in the instructions? • Is it earthed (grounded)? • Check that the insulation resistant value is more than 1MΩ. Use the 500 V mega-testers to measure the insulation. Do not use the mega-tester for any other circuit except for voltage of 220-230-240V~ or 380-400-415V 3N~. • Are the wire connections for the indoor/outdoor units connected as described in the instructions? Are there any looped wires? • Was the "N-phase" surely connected when connecting the power supply wire on the three-phase model? If N-phase is not connected, only the fan may repeat turning ON/OFF without the compressor operating. In that case, check if there is any problem with N-phase connection
Refrigerant tube	• Is the tubing installed as described in the instructions? • Are the tubes sizes appropriate? • Does the tube's length adhere to the specifications? • Is the branch tube slant being appropriately done as described in the instructions? • Was vacuum removal sufficiently carried out? • Was the leak tightness test carried out with nitrogen gas? Use the testing pressure of 4.15 MPa. • Is the tubing insulation material appropriately installed? (Insulation material is necessary for both gas and liquid tubing.) • Is the 3-way valve for the liquid tube and gas tube open?

- Always be sure to use a properly insulated tool to operate the short-circuit pin on the circuit board. (Do not use your finger.)
- Never switch the power supply ON until the installation has completed.
- Supply electrical current through all indoor units and check the voltage.
- Supply electrical current through all the outdoor units and check each inter-phase voltage.
- Before the test run, ensure to check that the 3-way valve is open. Operating while the valve is closed causes the compressor to fail.

Important Precautions

Request that the customer be present when the test run is performed.
At this time, explain the operation manual and have the customer perform the actual steps.

7.2 Items to Check Before the Test Run

7.2.1 Refrigerant circuit and Power line

1. Turn the remote power switch ON at least 12 hours in advance in order to energize the crankcase heater.
2. Fully open the closed valves on the liquid-tube and gas-tube sides.

7.2.2 Check Control Connection on the Main PCBs

7.2.2.1 Outdoor Unit Main PCB (CR) (U-200/U-250)

Check that the 220 – 240 VAC power is not connected to the inter-unit control wiring connector terminal.

* If 220 – 240 VAC is accidentally applied, the indoor or outdoor unit control PCB fuse will blow in order to protect the PCB.
Correct the wiring connections, then disconnect the 2P connectors that are connected to the PCB, and replace them with 2P connectors.
If operation is still not possible after changing the brown connectors, try cutting the varistor.
(Be sure to turn the power OFF before performing this work.)

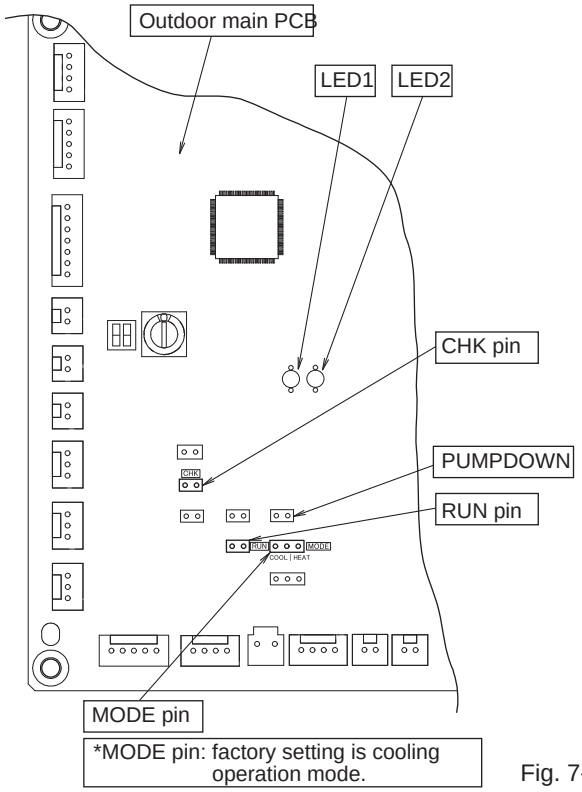


Fig. 7-3

7.2.2.2 Indoor Unit Main PCB (CR)

Example: Please see Installation manuals of the used indoor units for detailed information.

Check that the 220 –240 VAC power is not connected to the inter-unit control wiring connector terminal.

* If 220 –240 VAC is accidentally applied, the indoor unit control PCB fuse will blow in order to protect the PCB.
In this case, make the wiring correctly.
Then disconnect the 2P connectors (OC) that are connected to the indoor unit PCB, and replace them with 2P connectors (EMG).
If operation is still not possible after changing the brown connectors, cut the jumper on the indoor unit PCB.
(Be sure to turn the power OFF before performing this work.)

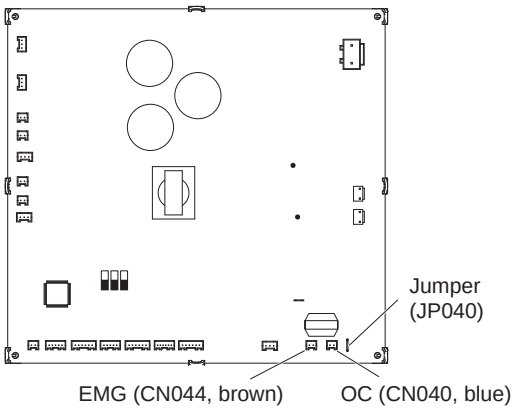


Fig. 7-4

7.3 Test run for Indoor units

Important

The indoor and outdoor unit control PCB utilizes a semiconductor memory element (EEPROM).
The settings required for operation were made at the time of shipment.
Only the correct combinations of indoor and outdoor units can be used.
This test run section describes primarily the procedure when using the wired remote controller.

7.3.1 Test Run Procedure Chart

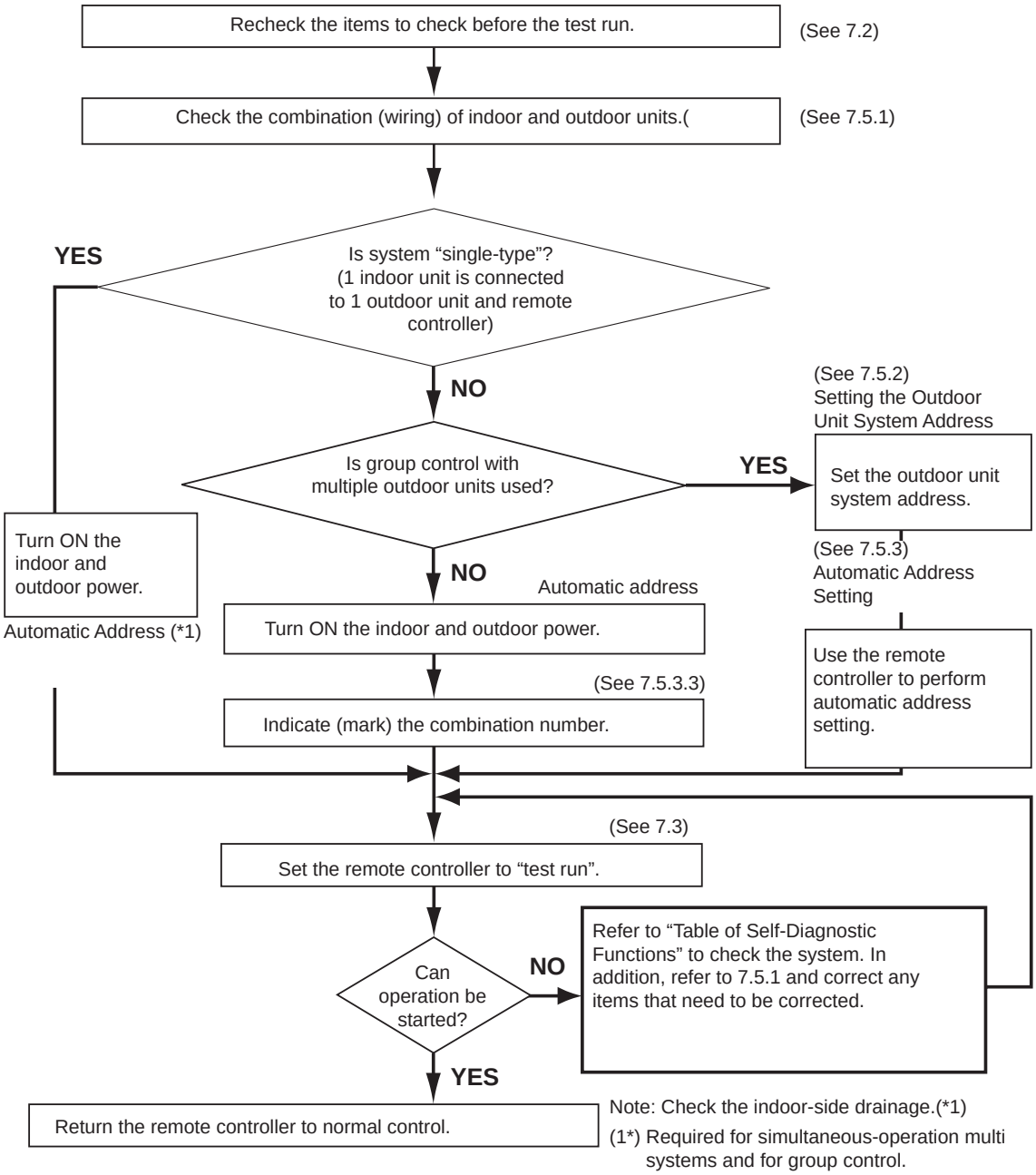
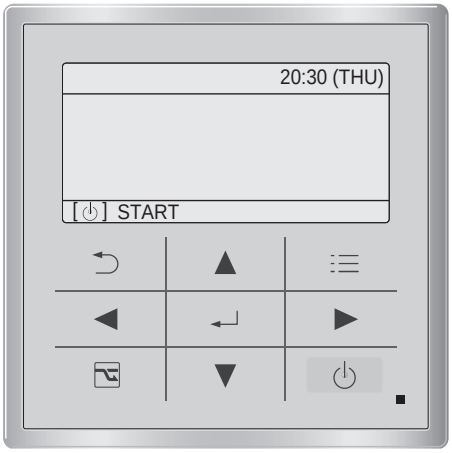


Fig. 7-5

7.3.2 Test Run Using the Remote Controller

■ CZ-RTC5B (High-spec wired remote controller)



CZ-RTC5B Fig. 7-6

1. Keep pressing the [↩], [↵] and [►] buttons simultaneously for 4 or more seconds.
   The “Maintenance func” screen appears on the LCD display.

Maintenance func 20:30 (THU)
1. Outdoor unit error data
2. Service contact
3. RC setting mode
4.Test run
▼ Sel. ▸ Page [↵] Confirm

Fig. 7-7

2. Press the [▼] or [▲] button to see each menu.
   If you wish to see the next screen instantly, press the [◄] or [►] button.
   Select “4. Test run” on the LCD display and press the [↵] button.

Maintenance func 20:30 (THU)
1. Outdoor unit error data
2. Service contact
3. RC setting mode
4.Test run
▲▼ Sel. ◂ ▸ Page [↵] Confirm

Fig. 7-8

   Change the display from OFF to ON by pressing the [▼] or [▲] button.
   Then press the [↵] button.

Test run 20:30 (THU)
Test run ▲ ON ▼
▲▼ Change [↵] Confirm

Fig. 7-9

3. Press the [↩] button. “TEST” will be displayed on the LCD display.

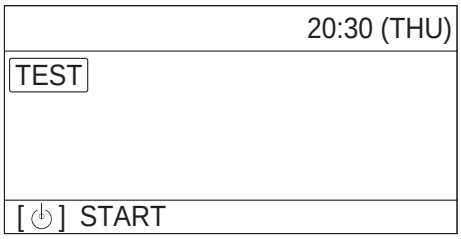


Fig. 7-10

4. Press the [⏻] button. Test run will be started.
   Test run setting mode screen appears on the LCD display.

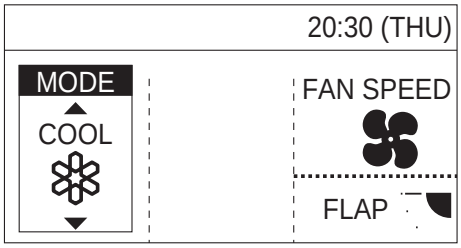


Fig. 7-11

■ CZ-RTC5B (Timer remote controller)

1. Press the remote controller [ ] button for 4 seconds or longer. Then press the [⏻] button.
   - "TEST" appears on the LCD display while the test run is in progress.
   - The temperature cannot be adjusted when in Test Run mode.
     (This mode places a heavy load on the machines.
     Therefore use it only when performing the test run.)
2. Press test run can be performed using the HEAT, COOL, or FAN operation modes.

Note

The outdoor units will not operate for approximately 3 minutes after the power is turned ON and after operation is stopped (Compressor protection function).

3. If correct operation is not possible, a code is displayed on the remote controller LCD display. (See the section “7. Self-Diagnostic Function Table and Contents of Alarm Display” and correct the problem.)
4. After the test run is completed, press the [ ] button again.
   Check that "TEST" disappears from the LCD display.
   (To prevent continuous test runs, this remote controller includes a timer function that cancels the test run after 60 minutes.)

* If the test run is performed using the wired remote controller, operation is possible even if the cassette-type ceiling panel has not been installed. (“P09” display does not occur.)

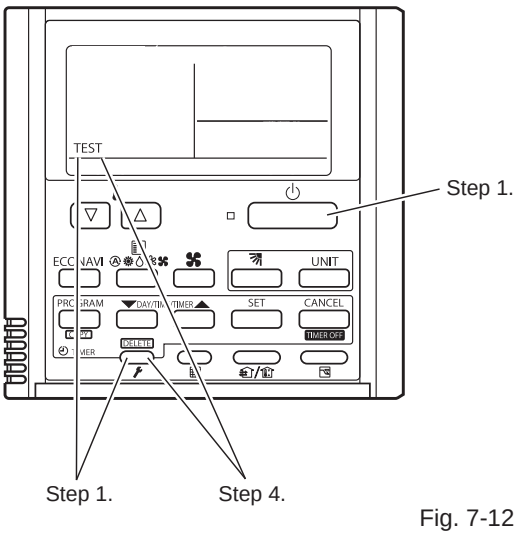


Fig. 7-12

7.4 Remote Controller Switch Alarm Display (Error codes)

Table 7-2: Contents of Remote Controller Switch Alarm Display

ON: ○ Blinking: ☼ OFF: ●

Abnormal display		Wireless remote controller receiver display: Operation	Timer	Standby	Alarm contents	Error location and remedy
Remote controller • Indoor Unit	E01	Operating lamp blinking ☼	●	●	• Faulty remote controller	• Replace the remote controller
					• Disconnection / Contact failure of remote controller wiring	• Correct the remote controller wiring
					• CHK (check) pins on the indoor unit control PCB are short circuited	• Remove the short
					• In the case of non-group control : Power supply OFF of outdoor unit Disconnection / Contact failure of inter-unit wiring • In the case of group control : Automatic address operation was not carried out	• Execute automatic address setting
					• Faulty setting of EEPROM (IC010) on indoor unit	• Replace the indoor unit EEPROM
	E02				• Faulty remote controller • Wrong wiring of remote controller	• Replace the remote controller • Correct the remote controller wiring
	E03				• Error in indoor unit receiving signal from remote controller (central)	• Check the indoor unit control PCB • Check the remote controller wiring • Check the inter-unit control wiring
	E04	Standby lamp blinking ●	●	☼	• Disconnection / Contact failure of inter-unit wiring • Faulty indoor unit control PCB • Faulty outdoor unit control PCB • Communication circuit fuse (F302) on indoor unit control PCB opened	• Check the electrical connection of inter-unit control wiring • Replace the indoor unit control PCB • Replace the outdoor unit control PCB • Check the electrical connection of fuse (F302) on indoor unit control PCB In the case of the fuse opened on an indoor unit control PCB, after correcting wiring connection, it substitutes an EMG plug for OC plug
					• Fuse on outdoor unit control PCB opened Since failure of an outdoor fan motor is considered as a cause, both outdoor unit control PCB and outdoor unit fan motor are exchanged simultaneously	• In the case of the fuse opened on an outdoor unit control PCB, replace both outdoor unit control PCB (CR/HIC) and outdoor unit fan motor simultaneously
	E08	Operating lamp blinking ☼	●	●	• Duplication of indoor unit address setting	• Indoor unit address re-setting
	E09				• Error because of more than one remote controller setting to main	• Correct the setting
	E18				• Disconnection of wiring between main unit and additional units • Contact failure of wiring • Faulty indoor unit control PCB (main or addition)	• Correct the wiring connection • Replace the wiring • Replace the indoor unit control PCB

Continued on next page

ON: ○ Blinking: ☼ OFF: ●

Abnormal display		Wireless remote controller receiver display: Operation	Timer	Standby	Alarm contents	Error location and remedy
Remote controller • Indoor Unit	F01	Operating and timer lamp blinking simultaneously	☼	●	• Indoor heat exchanger temperature sensor (E1) trouble • Check the indoor unit heat exchanger temperature sensor (E1)	• Check the indoor unit control PCB
	F02				• Indoor heat exchanger temperature sensor (E2) trouble • Check the indoor unit heat exchanger temperature sensor (E2)	• Check the indoor unit control PCB
	F10				• Indoor air temperature sensor (TA) trouble •	• Check the indoor unit air temperature sensor (TA) • Check the indoor unit control PCB
	F29	Operating and timer lamp blinking simultaneously	☼	●	• Indoor unit EEPROM trouble	• Check the indoor unit EEPROM • Check the indoor unit control PCB
	L02	Operating and timer lamp blinking simultaneously	●	☼	• Setting error, indoor / outdoor unit type / model mismatched	• Address re-setting after correcting the combination of units
	L03				• Duplication of main indoor unit address in group control	• Correct the group (main and addition)
	L07				• Group control wiring is connected to individual control indoor unit	• Correct the indoor unit address
	L08				• Indoor unit address is not set	• Correct the indoor unit address
	L09				• Indoor unit capacity is not set	• Correct the capacity setting of indoor units
	P01	Timer and standby lamp blinking simultaneously	☼	☼	• Indoor unit fan motor locked • Indoor unit fan motor layer short • Contact failure in thermostat protector circuit	• Remove the cause • Replace the fan motor • Correct the wiring
	P09				• Faulty wiring connections of (ceiling) indoor unit panel	• Correct the wiring connection
	P10				• Faulty drain pump • Drainage failure • Contact failure of float switch wiring	• Repair / Replace • Correct • Correct the wiring
	P11				• Faulty drain pump • Drain pump locked	• Repair / Replace • Remove the cause
	P12				• Indoor unit fan motor locked • Faulty wiring connections of indoor unit fan motor	• Remove the cause • Correct the wiring
Outdoor Unit	E06	Standby lamp blinking	●	☼	• Disconnection / Contact failure of inter-unit wiring • Disconnection of inter-unit wiring • Communication circuit fuse (F302) on indoor unit control PCB opened • Indoor unit control PCB address settings error	• Correct the inter-unit control wiring Check the electrical connection of fuse (F302) on indoor unit control PCB In the case of the fuse opened on an indoor unit control PCB, after correcting wiring connection, it substitutes an EMG plug for OC plug • Indoor unit address re-setting

Continued on next page

ON: ○ Blinking: ☼ OFF: ●

Abnormal display		Wireless remote controller receiver display: Operation	Timer	Standby	Alarm contents		Error location and remedy
Outdoor Unit	E12	Operating lamp blinking ☼	●	●	• Auto address setting start is prohibited		• Check the inter-unit control wiring
	E14				• Duplication of main unit in group control		• Check the inter-unit control wiring • Check the indoor unit combination
	E15	Standby lamp blinking ●	●	☼	Automatic address alarm	• The total capacity of indoor units are too low	• Check the inter-unit control wiring • Check the indoor and outdoor unit control PCB
	E16					• The total capacity of indoor units are too high • The numbers of indoor units are two or more	
	E20					• No indoor unit connected	
	E24				• Outdoor unit communication error		• Check the outdoor unit control PCB
	E29				• Outdoor unit communication error		• Check the outdoor unit control PCB
	F04	Operating and timer lamp blinking alternately ☼	☼	○	• Compressor discharge temperature sensor (TD) trouble		• Check the compressor discharge temperature sensor (TD) • Check the outdoor unit control PCB
	F06				• Outdoor heat exchanger temperature sensor (C1) • trouble		• Check the outdoor unit heat exchanger temperature sensor (C1) • Check the outdoor unit control PCB
	F07				• Outdoor heat exchanger temperature sensor (C2) • trouble		• Check the outdoor unit heat exchanger temperature sensor (C2) • Check the outdoor unit control PCB
	F08				• Outdoor air temperature sensor (TO) trouble		• Check the outdoor air temperature sensor (TO) • Check the outdoor unit control PCB
	F12				• Compressor suction temperature sensor (TS) trouble		• Check the compressor suction temperature sensor (TS) • Check the outdoor unit control PCB
	F31	Operating and timer lamp blinking alternately ☼	☼	○	• Outdoor unit EEPROM trouble		• Check the outdoor unit EEPROM • Check the outdoor unit control PCB
	H01	Timer lamp blinking ●	☼	●	• Primary (input) overcurrent detected		• Check the refrigerant cycle (abnormal overload operation) • Check the outdoor unit control PCB • Check the power supply
	H02				• PAM trouble		• Check the outdoor unit control PCB • Compressor locked • Check the power supply
	H03				• Primary current CT sensor failure •		• Check the outdoor unit control PCB
	H31				• HIC trouble • DC voltage not detected		• Check the outdoor unit control PCB • Check the HIC • Compressor locked • Valve blockage

Continued on next page

ON: ○ Blinking: ☼ OFF: ●

Abnormal display		Wireless remote controller receiver display: Operation	Timer	Standby	Alarm contents	Error location and remedy
Outdoor Unit	L04	Operating and standby lamp blinking simultaneously: ☼	○	☼	• Duplication of outdoor unit address	• Check the inter-unit control wiring
	L10				• Outdoor unit capacity is not set or setting error	• Replace the outdoor unit EEPROM • Capacity value re-setting
	L13				• Indoor unit type setting error • Type of indoor/outdoor units is different	• Replace the indoor unit EEPROM • Check the outdoor unit control PCB • Check the type of IU and OU, and re-set address
	L18				• 4-way valve locked trouble / operation failure	• Check the 4-way valve • Check the 4-way valve wiring • Check the outdoor unit control PCB
	P03	Operating and standby lamp blinking alternately: ☼	●	☼	• Compressor discharge temperature trouble	• Check the refrigerant cycle (gas leak) • Trouble with the electronic expansion valve • Check the discharge temperature sensor (TD)
	P04				• Compressor discharge pressure trouble	• Check the refrigerant cycle • Valve blockage • Heat exchanger obstruction
	P05				• Open phase detected • AC power supply trouble	• Check the power supply • Check the reactor wiring • Check the outdoor unit control PCB • Check the compressor wiring
	P13	Timer and standby lamp blinking alternately: ●	☼	☼	• Valve error • Refrigerant circuit error. • Wrong installation for refrigerant piping and wiring	• Valve blockage • Check the refrigerant circuit • Check the refrigerant piping and wiring installation
	P14				• O_2 sensor detected	• Input from the O_2 sensor
Outdoor Unit	P15	Operating and standby lamp blinking alternately: ☼	●	☼	• Insufficient gas level detected	• Check the refrigerant cycle (gas leak) • Trouble with the electronic expansion valve • Valve (or refrigerant circuit) blockage
	P16				• Compressor overcurrent trouble	• Layer short on the compressor • Compressor locked • Check the outdoor unit control PCB
	P22				• Outdoor unit fan motor trouble • Outdoor unit fan trouble	• Check the outdoor unit fan motor • Check the outdoor unit control PCB
	P29				• Inverter compressor trouble	• Layer short on the compressor • Check the outdoor unit control PCB • Check the inverter compressor wiring (Open phase/ Reverse phase) • Compressor actuation failure (include lock) • Valve (or refrigerant circuit) blockage
	P31				• Indoor unit in group control trouble	• Repair indoor unit which blinking alarm

7.5 System Control

System control refers to the link wiring connection for control of simultaneous-operation multi systems, group control, and main-sub remote controller control.

7.5.1 Basic wiring diagram

Be careful to avoid miswiring when connecting the wires.
(Miswiring will damage the units.)

Example of SINGLE type with 3-phase Outdoor unit

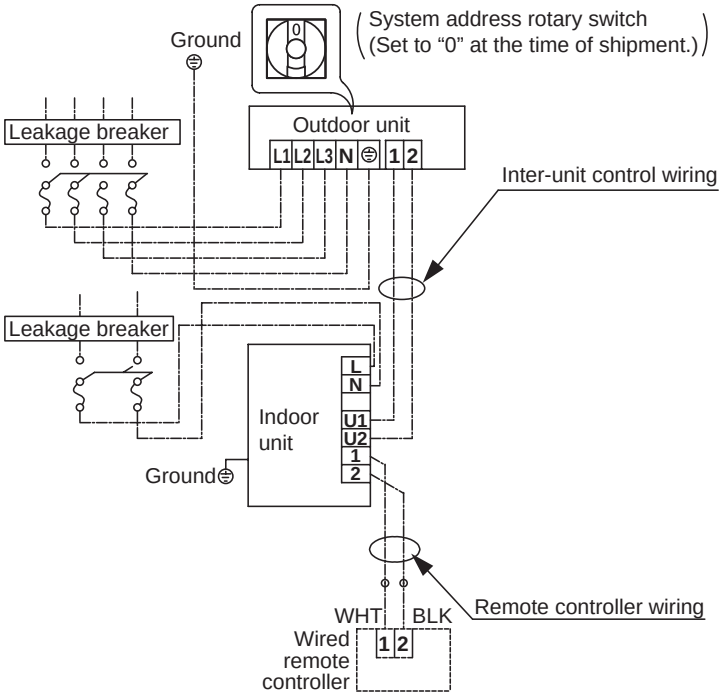


Fig. 7-13

Wiring procedure

1. Connect the remote controller to the indoor unit remote controller wiring terminal plate (R1, R2). (Remote controller wiring)
2. Connect the indoor units (U1, U2) and the outdoor units (U1, U2). Connect the other outdoor units and indoor units (with different refrigerant systems) in the same way. (Inter-unit control wiring) Connect the remote controller communication wiring to the indoor units (R1, R2) for each refrigerant system. (Remote controller wiring)
3. Connect the remote controller communication wiring (2 wires) from the remote controller wiring terminal plate (R1, R2) on the indoor unit (unit where the remote controller is connected) to the remote controller terminal plates (R1, R2) on the other indoor units. (Remote controller communication wiring)
4. Turn ON both the indoor and outdoor unit power and perform automatic address setting from the remote controller. (For the automatic address setting procedure, see section 7.5.3.)

Note

Be sure to use the indoor unit temperature sensor (body sensor) when using this control. (Status at shipment.).

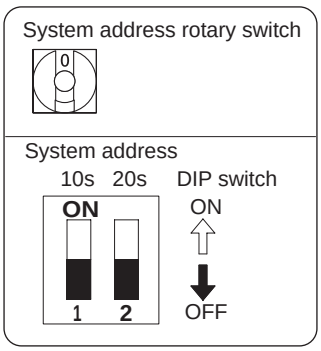
7.5.2 Setting the Outdoor unit system addresses

7.5.2.1 Manual setting

For basic wiring diagram (Set the system address: 1)

Outdoor unit control PCB

System address rotary switch
(Set to “0” at time of shipment)



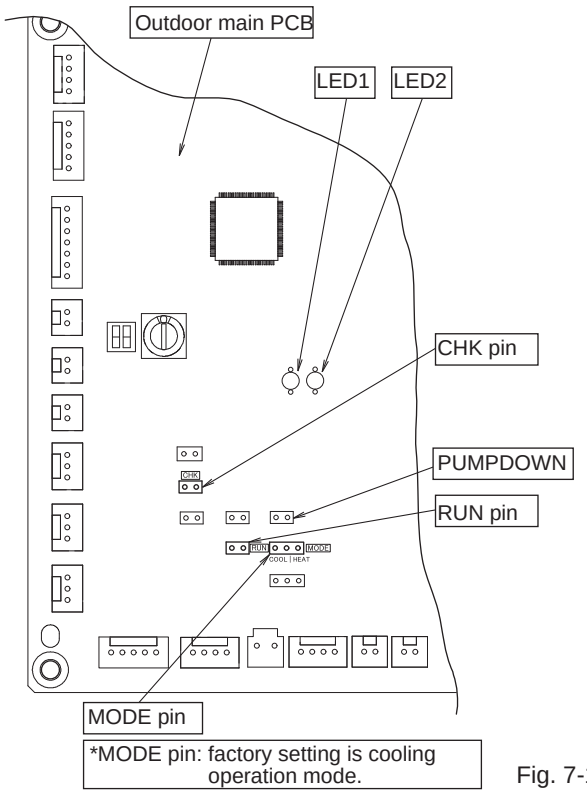
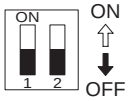


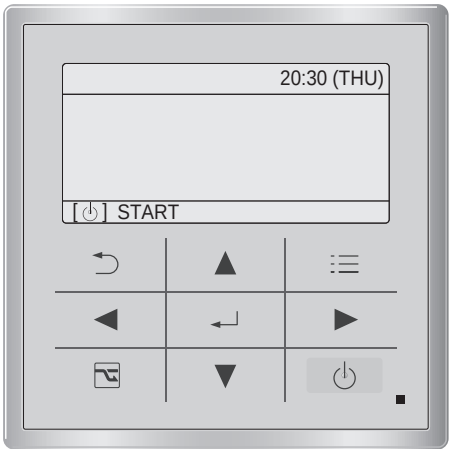
Fig. 7-14

Table 7-3: Outdoor unit addresses setting details

System address No.	System address 10 s digit (2P DIP switch)	System address 1 s place (Rotary switch)
0 Automatic address (Setting at shipment = “0”)	Both OFF 	“0” setting 
1 (If outdoor unit is No. 1)	Both OFF 	“1” setting 

7.5.3 Automatic address setting using the remote controller

7.5.3.1 Auto Address Setting from the High-spec Wired Remote Controller (CZ-RTC5B)



CZ-RTC5B

Fig. 7-15

1. Keep pressing the [↩], [↵] and [►] buttons simultaneously for 4 or more seconds.
   The “Maintenance func” screen appears on the LCD display. “TEST” appears in the LCD display.
2. Press the [▼] or [▲] button to see each menu.
   If you wish to see the next screen instantly, press the [◄] or [►] button.
   Select “9. Auto address” on the LCD display and press the [↵] button.

Maintenance func 20:30 (THU)
9. Auto address
10. Set elec. consumption
11. Set touch key
12. Check touch key
Sel. ◄ Page [↵] Confirm

Fig. 7-16

3. The “Auto address” screen appears on the LCD display.
   Change the “Code no.” to “A1” by pressing the [▼] or [▲] button.

Auto address	20:30 (THU)
Code no.	O/D unit no.
A1	1
Sel. ► Next	

Fig. 7-17

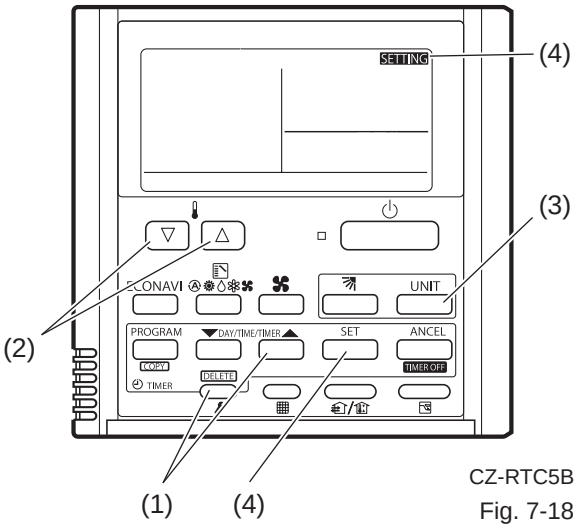
4. Select the “O/D unit no.” by pressing the [◄] or [►] button.
   Select one of the “O/D unit no.” for auto address by pressing the [▼] or [▲] button.
   Approximately about 10 minutes are required.
   When auto address setting is completed, the units return to normal stopped status.

7.5.3.2 Auto Address Setting from the Timer Remote Controller (CZ-RTC4)

Note

- Auto address setting in Cooling mode cannot be done from the timer remote controller.
- Selecting each refrigerant system individually for auto address setting.
- Auto address setting for each system: Item code “A1”

1. Press the remote controller timer time /TIMER button and button at the same time.
   (Press and hold for 4 seconds or longer.)
2. Next, press either the temperature setting / button. (Check that the item code is “A1”.)
3. Use either the UNIT button to set the system No. to perform auto address setting.
4. Then press the SET button.
   (Auto address setting for one refrigerant system begins.) (When auto address setting for one system is completed, the system returns to normal stopped status.)
   <Approximately 4–5 minutes is required.>
   (During auto address setting, “SETTING” is displayed on the remote controller.
   This message disappears when auto address setting is completed.)

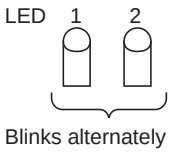


CZ-RTC5B
Fig. 7-18

5. Repeat the same steps to perform auto address setting for each successive system.

7.5.3.3 Display During Auto Address Setting for Outdoor models U-200/250PZH

- On the surface of outdoor unit control P.C. board



- Do not short circuit the A.ADD pin again during auto address setting. LEDs 1 and 2 go out and address setting is interrupted.
- When auto address setting is normally completed, both LEDs 1 and 2 go out. In other cases, correct settings referring to the following table and perform auto address setting again.

- Contents of LEDs 1 and 2 on outdoor unit control P.C. board

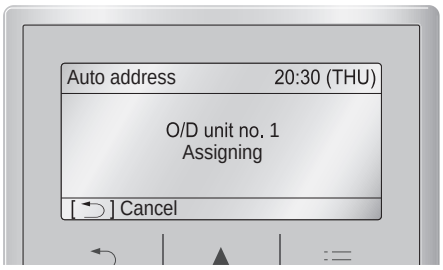
Table 7-4: ○ : Illuminating ☼ : Blinking ● : Go out

		LED1	LED2	Remark
Normal operation		●	●	
Pre-trip (High pressure protection)		☼	●	LED1 Blinking : 0.8sec-ON / 0.3sec-OFF
Pre-trip (other)		☼	●	LED1 Blinking : 0.5sec-ON / 0.5sec-OFF
Automatic address setting	Under automatic address setting	☼	☼	Blinking alternately
	Automatic address setting alarm	☼	☼	Follow the blinking patterns of each alarm
Alternate blinking of outdoor unit LED during alarms	LED1 blinks M times, and then LED2 blinks N times. The cycle then repeats. M=2:P alarm, 3:H alarm, 4:E alarm, 5:F alarm, 6:L alarm, N=alarm No Example: LED1 blinks 4 times, then LED2 blinks 6 times. The cycle then repeats. Alarm is “E06”			
Power ON sequence	No communication from indoor units in system	○	○	If it is not possible to advance to 3 repeats 1→2
	Communication received from 1 or more indoor units in system	●	○	At 3, advances to normal control
	Regular communication OK (Capacity and unit quantity match)	●	●	
Refrigerant recovery mode		☼	○	

(☼ : Blink) Connect the outdoor unit maintenance remote controller to the RC plug (3P, BLU) on outdoor main unit control P.C. board and make confirmation.

- Display of remote controller

CZ-RTC5A, CZ-RTC5B



CZ-RTC4

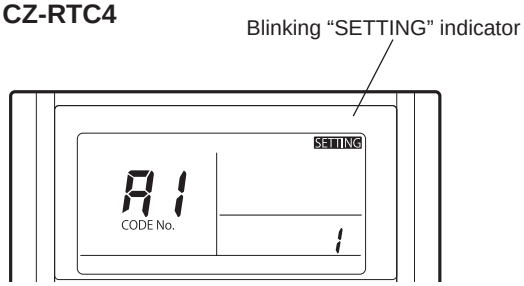


Fig. 7-19

Indicating (marking) the indoor and outdoor unit combination number

Indicate (mark) the number after auto address setting is completed.

- So that the combination of each indoor unit can be easily checked when multiple units are installed, ensure that the indoor and outdoor unit numbers correspond to the system address number on the outdoor unit control PCB, and use a magic marker or similar means which cannot be easily erased to indicate the numbers in an easily visible location on the indoor units (near the indoor unit nameplates).

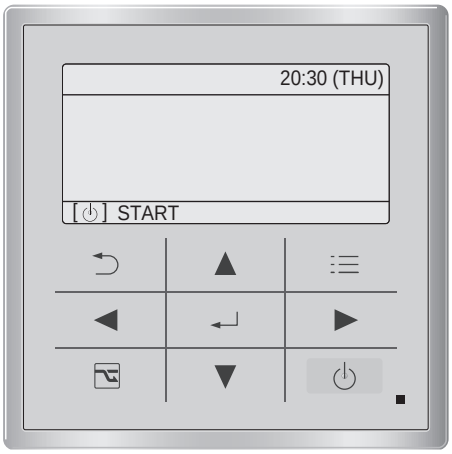
  Example: (Outdoor) 1 - (Indoor) 1
  (Outdoor) 2 - (Indoor) 1

- These numbers will be needed for maintenance.
  Be sure to indicate them.

7.6 Checking the indoor unit addresses

Use the remote controller to check the indoor unit address.

- **CZ-RTC5B (High-spec wired remote controller)**



CZ-RTC5B

Fig. 7-20

1. Keep pressing the [⮌], [↵] and [►] buttons simultaneously for 4 or more seconds.
   The “Maintenance func” screen appears on the LCD display. “TEST” appears in the LCD display.

Maintenance func 20:30 (THU)
1. Outdoor unit error data
2. Service contact
3. RC setting mode
4.Test run
▼ Sel. ▸ Page [↵] Confirm

Fig. 7-21

2. Press the [▼] or [▲] button to see each menu.
   If you wish to see the next screen instantly, press the [◄] or [►] button.
   Select “7. Simple settings” on the LCD display and press the [↵] button.

Maintenance func 20:30 (THU)
5. Sensor info.
6. Servicing check
7. Simple settings
8. Detailed settings
▲▼ Sel. ◂ ▸ Page [↵] Confirm

Fig. 7-22

3. The “Simple settings” screen appears on the LCD display.
   Select the “Unit no.” by pressing the [▼] or [▲] button for changes.

Simple settings		20:30 (THU)
Unit no.	Code no.	Set data
3-1	01	0001
▲▼ Sel. ▸ Next		

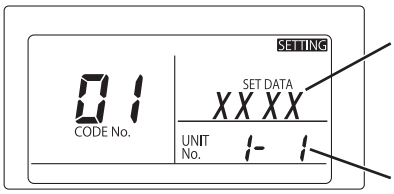
Fig. 7-23

The indoor unit fan operates only at the selected indoor unit.

- **CZ-RTC4 (Timer remote controller)**

  <If 1 indoor unit is connected to 1 remote controller>

  1. Press and hold the button and button for 4 seconds or longer (simple settings mode).
  2. The address is displayed for the indoor unit that is connected to the remote controller.
     (Only the address of the indoor unit that is connected to the remote controller can be checked.)
  3. Press the button again to return to normal remote controller mode.



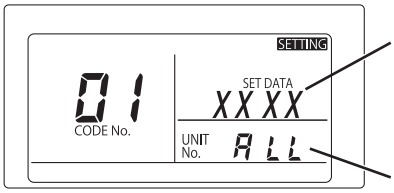
Number changes to indicate which indoor unit is currently selected.

Indoor unit address

Fig. 7-24

  <If multiple indoor units are connected to 1 remote controller (group control)>

  1. Press and hold the button and button for 4 seconds or longer (simple settings mode).
  2. “ALL” is displayed on the remote controller.
  3. Next, press the UNIT button.
  4. The address is displayed for 1 of the indoor units which is connected to the remote controller. Check that the fan of that indoor unit starts and that air is discharged.
  5. Press the UNIT button again and check the address of each indoor unit in sequence.
  6. Press the button again to return to normal remote controller mode.



Number changes to indicate which indoor unit is currently selected

Indoor unit address

Fig. 7-25

7.7 Main-sub remote controller control

Control using 2 remote controller switches Main-sub remote controller control refers to the use of 2 remote controllers to control 1 or multiple indoor units. (A maximum of 2 remote controllers can be connected.)

7.7.1 Connecting 2 remote controllers to control 1 Indoor unit

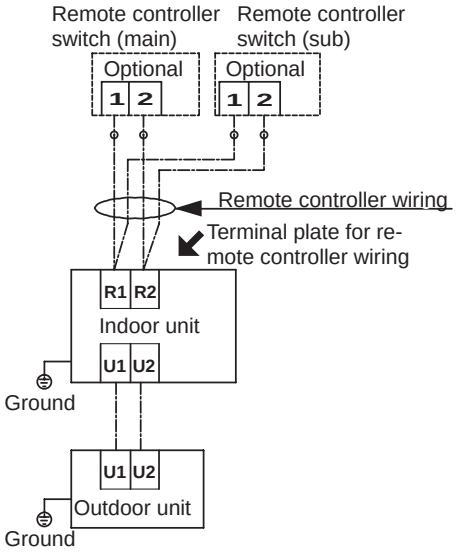
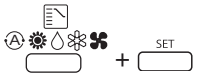


Fig. 7-26

Remote controller setting mode (CZ-RTC4)

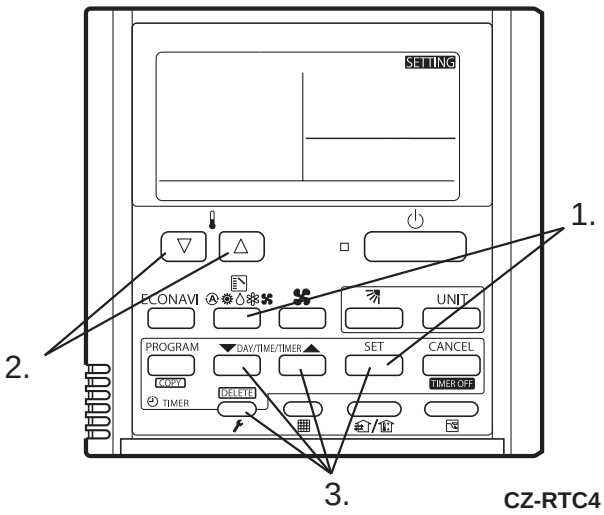
1. Press and hold the 2 buttons for several seconds simultaneously.
   

2. Select the Code no. ▽ △
3. Select the Set data.
   

   The indicator illuminates after blinking.
   Press

Table 7-5: Code no. and Set data

Code no.	Item	Set data	
		0000	0001
01	Main/Sub	Sub	Main

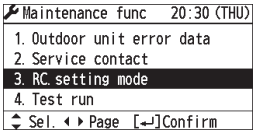


CZ-RTC4

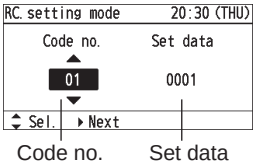
Fig. 7-27

Remote controller setting mode (CZ-RTC5B)

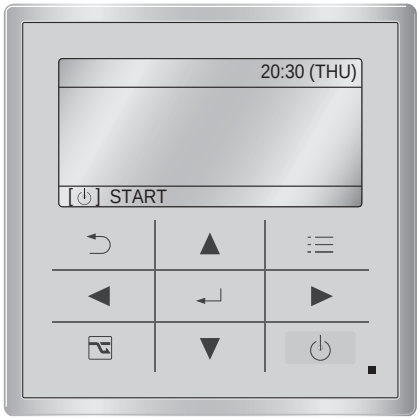
1. Press and hold the ⮌ , ↵ and ► buttons for 4 seconds or more simultaneously.
2. Select the item to set.
   ▼ ▲ → ↵



3. Set.
   (Select the Code no. and Set data.)
   ▼ ▲ → ► → ↵
   (Repeat)



4. Press ⮌
   - After Selecting [YES], the unit restarts.



CZ-RTC5B
Fig. 7-28

Table 7-6: Code no. and Set data

Code no.	Item	Set data	
		0000	0001
01	Main/Sub	Sub	Main

7.8 Test Run Procedure for Outdoor units

- If there are duplicated system addresses, or if the settings for the Nos. of the indoor units are not consistent, an alarm will occur and the system will not start.
- Switch the power supply ON both indoor and outdoor unit.
- Short-circuit CHK pin on the outdoor main PCB. Do not remove CHK pin until test run is completed. Removing CHK pin stops test run.
- Short-circuit RUN pin on the outdoor main PCB for one second or longer. Factory setting is cooling operation mode and cooling operation test run starts. If heating operation starts, short-circuit both right side and centre of the MODE pin (centre and COOL) continuously.
- Ensure to conduct a test run. In addition, be sure to run the cooling operation test run for at least 20 minutes before starting the heating operation test run.
- To conduct heating operation test run, short-circuit left side and centre of the MODE pin (centre and HEAT) continuously.
- Removing CHK pin's and MODE pin's short-circuit stops test run.
- For the test run using remote controller, please see installation instructions included with the remote controller.

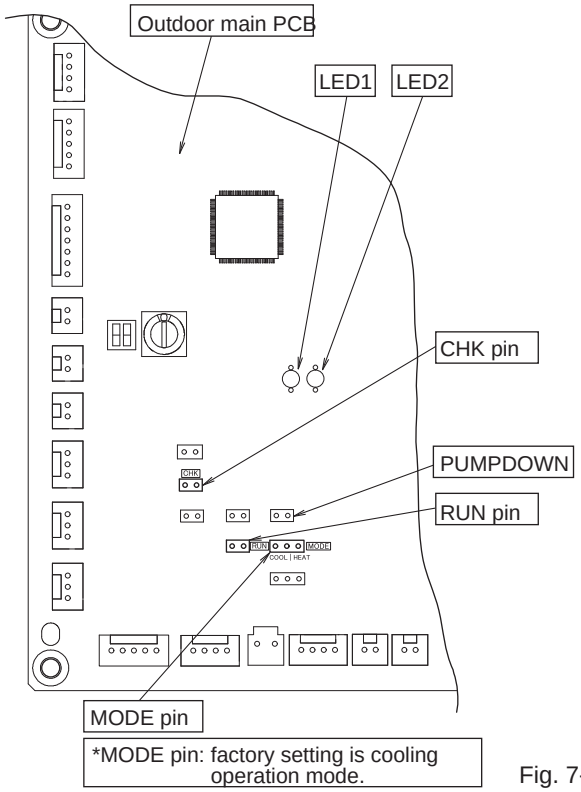


Fig. 7-29

7.9 Checks after Installation have Completed

Check the following items after completing installation.

- ☐ Is there a short circuit with the intake air flow?
- ☐ Is the insulation secure? (Refrigerant tubing)
- ☐ Are there any errors with the wiring?
- ☐ Are the terminal screws loose? Tightening torque (Unit: N•m {kgf•cm})
  M4...1.57~1.96{16~20}, M5...1.96~2.45{20~25}
- ☐ Is the drain water flowing smoothly?
- ☐ Is the insulation material properly installed?
- ☐ Is the earth wire securely connected?
- ☐ Is the front panel and the indoor unit air conditioner firmly fixed and was the installation completed without any leakage from the refrigerant?
- ☐ Are the indoor and outdoor units secured firmly installed with bolts at secured locations?

7.10 Regarding Delivery to the Customer

- Request the customer to review the operating instructions and explain the operating method for the product.
- In addition, it is also recommended that regular inspection checks are agreed upon for maintenance.

User inspection places → Filter and grill cleaning
→ Exterior cleaning

Serviceman inspection places → Check the operating status
→ Clean the drain pan or things related to the water discharge
→ Heat exchanger cleaning

7.11 Caution for Pump Down

Pump down means refrigerant gas in the system is returned to the outdoor unit. Pump down is used when the unit is to be moved, or before servicing the refrigerant circuit.

How to perform Pump-Down (Refrigerant recovery) properly

1. Stop operation of the unit (cooling, heating etc.).
2. Connect the pressure gauge to the service port of the gas tubing valve.
3. Short-circuit the “PUMPDOWN” pin on an outdoor unit control PCB (CR) for more than 1 second to release.
   - Pump-Down begins and the unit starts operating.
   - During Pump-Down, LED1 blinks and LED2 is lit on an outdoor unit control PCB (CR).
   - “CHK” blinks on the remote controller.
4. Fully close the liquid tubing valve 2-3 minutes later.
   The Pump-Down will begin.
5. When the pressure gauge drops to 0.1–0.2MPa, close the gas tubing valve tightly and short-circuit the “PUMPDOWN” pin for more than 1 second to release. That is the end of Pump-Down.
   - When running for more than 10 minutes, it stops even if the Pump-Down is not completed. Check the blocked state of the liquid tubing valve.
   - It also stops when the “PUMPDOWN” pin is short-circuited during the operation.

Important

For compressor protection, do not operate to the point where the unit wiring side reaches negative pressure.

Note

In the case that inter-unit wiring is 30m or longer, you cannot pump-down.
(It may trigger the operation of the overload protection device.)
In this case, perform pump-down with pump-down device.

■ U-71PZH2E5, U-100PZH2E5, U-125PZH2E5, U-140PZH2E5 U-71PZH2E8, U-100PZH2E8, U-125PZH2E8, U-140PZH2E8

7.12 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. Both the gas and liquid tube service valves are open. If not, open them now.

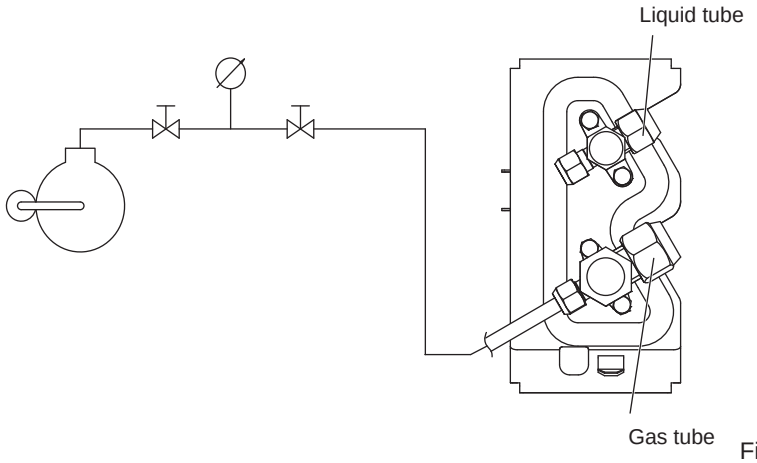
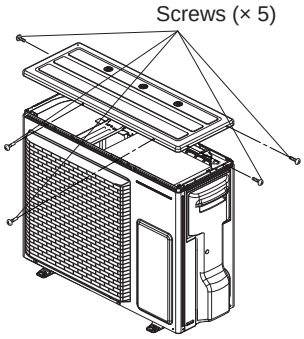


Fig. 7-30

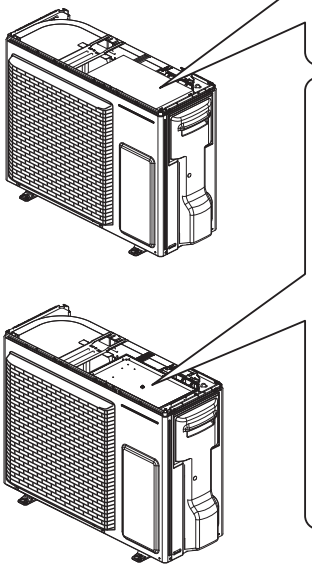
6. Request that the customer be present for the test run. Explain the contents of the instruction manual, and then have the customer actually operate the system.
7. Be sure to give the instruction manual and warranty certificate to the customer.

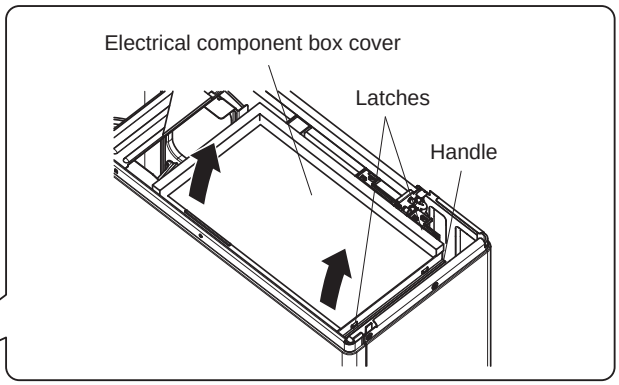
If it is necessary to make settings such as system address when performing a test run, remove the top panel and electrical component box cover as illustrated below and check each switch on the control PC board.

1. Remove the top panel by unfastening five screws.



2. To remove the electrical component box cover, press the latches on the cover in the direction of the arrow while holding the handle with one hand.





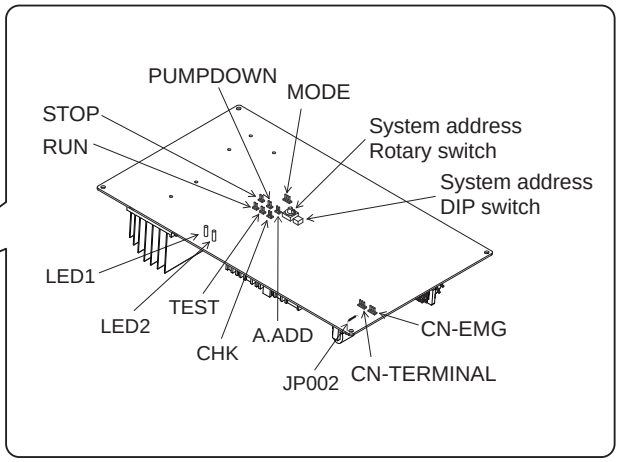


Fig. 7-31

Important

- This unit may be used in a single-type refrigerant system where 1 outdoor unit is connected to 1 indoor unit.
- The indoor and outdoor unit control PCB utilizes a semiconductor memory element (EEPROM). The settings required for operation were made at the time of shipment. Only the correct combinations of indoor and outdoor units can be used.
- This test run section describes primarily the procedure when using the wired remote controller. Regarding the wireless remote controller, refer to the Installation Instructions attached to the wireless remote controller.

7.13 Test Run Procedure

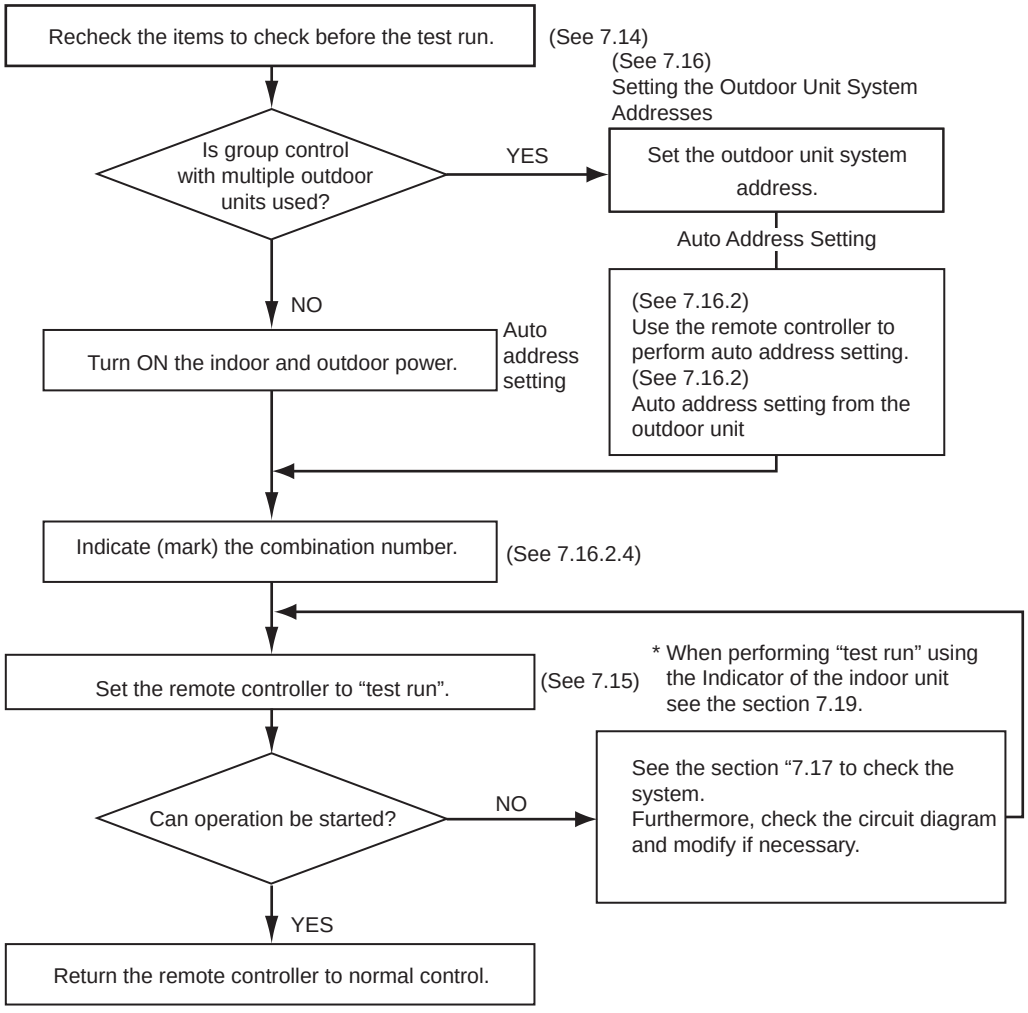


Fig. 7-32

7.14 Items to Check Before the Test Run

7.14.1 Refrigerant circuit

Fully open the closed valves on the liquid-tube and gas-tube sides.

7.14.2 Check Control Connection on the Main PCBs

7.14.2.1Outdoor Unit Main PCB (CR) (U-71–U-140)

Check that the 220 – 240 VAC power is not connected to the inter-unit control wiring connector terminal.

* If 220 – 240 VAC is accidentally applied, the indoor or outdoor unit control PCB fuse will blow in order to protect the PCB.
Correct the wiring connections, then disconnect the 2P connectors that are connected to the PCB, and replace them with 2P connectors.
If operation is still not possible after changing the brown connectors, try cutting the varistor.
(Be sure to turn the power OFF before performing this work.)

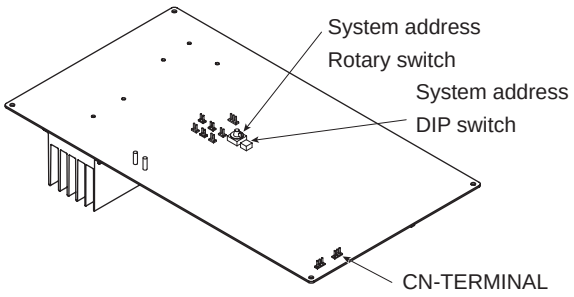


Fig. 7-33

7.14.2.2Indoor Unit Main PCB (CR)

Example: Please see Installation manuals of the used indoor units for detailed information.

Check that the 220 –240 VAC power is not connected to the inter-unit control wiring connector terminal.

* If 220 –240 VAC is accidentally applied, the indoor unit control PCB fuse will blow in order to protect the PCB.
In this case, make the wiring correctly.
Then disconnect the 2P connectors (OC) that are connected to the indoor unit PCB, and replace them with 2P connectors (EMG).
If operation is still not possible after changing the brown connectors, cut the jumper on the indoor unit PCB.
(Be sure to turn the power OFF before performing this work.)

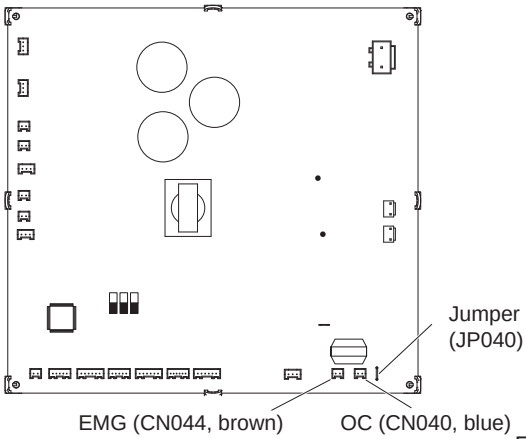
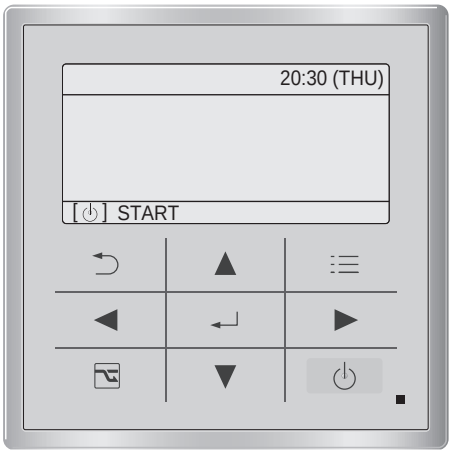


Fig. 7-34

7.15 Test Run Using the Remote Controller

■ CZ-RTC5B (High-spec wired remote controller)



CZ-RTC5B Fig. 7-35

1. Keep pressing the ⮌ , ↵ and ► buttons simultaneously for 4 or more seconds.
   The “Maintenance func” screen appears on the LCD display.

Maintenance func 20:30 (THU)
1. Outdoor unit error data
2. Service contact
3. RC setting mode
4.Test run
▼ Sel. ▸ Page [↵] Confirm

Fig. 7-36

2. Press the ▼ or ▲ button to see each menu.
   If you wish to see the next screen instantly, press the ◄ or ► button.
   Select “4. Test run” on the LCD display and press the ↵ button.

Maintenance func 20:30 (THU)
1. Outdoor unit error data
2. Service contact
3. RC setting mode
4.Test run
▲▼ Sel. ◂ ▸ Page [↵] Confirm

Fig. 7-37

   Change the display from OFF to ON by pressing the ▼ or ▲ button.
   Then press the ↵ button.

Test run 20:30 (THU)
Test run ▲ ON ▼
▲▼ Change [↵] Confirm

Fig. 7-38

3. Press the ⮌ button. “TEST” will be displayed on the LCD display.

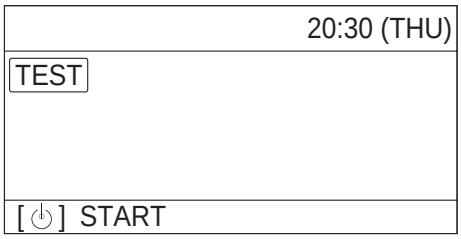


Fig. 7-39

4. Press the ⏻ button. Test run will be started.
   Test run setting mode screen appears on the LCD display.

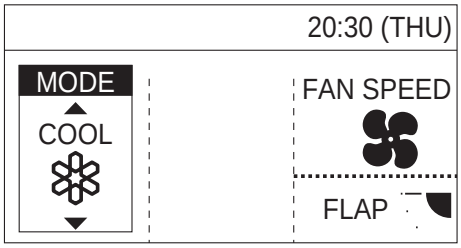


Fig. 7-40

■ CZ-RTC5B (Timer remote controller)

1. Press the remote controller button for 4 seconds or longer. Then press the ⏻ button.
   - "TEST" appears on the LCD display while the test run is in progress.
   - The temperature cannot be adjusted when in Test Run mode.
     (This mode places a heavy load on the machines.
     Therefore use it only when performing the test run.)
2. Press test run can be performed using the HEAT, COOL, or FAN operation modes.

Note

The outdoor units will not operate for approximately 3 minutes after the power is turned ON and after operation is stopped (Compressor protection function).

3. If correct operation is not possible, a code is displayed on the remote controller LCD display. (See the section “7. Self-Diagnostic Function Table and Contents of Alarm Display” and correct the problem.)
4. After the test run is completed, press the button again.
   Check that "TEST" disappears from the LCD display.
   (To prevent continuous test runs, this remote controller includes a timer function that cancels the test run after 60 minutes.)

* If the test run is performed using the wired remote controller, operation is possible even if the cassette-type ceiling panel has not been installed. (“P09” display does not occur.)

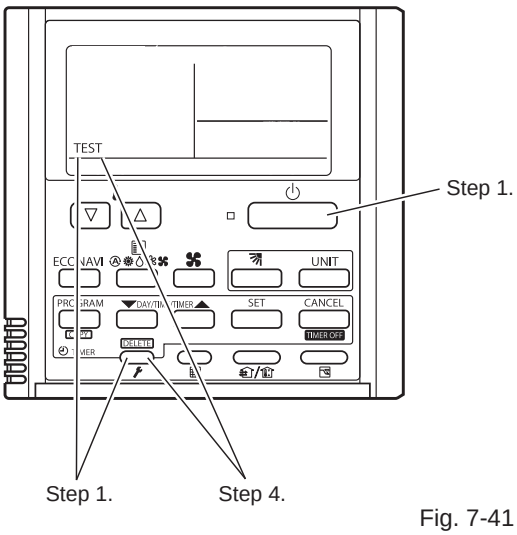


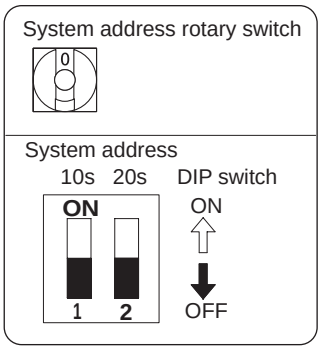
Fig. 7-41

7.16 Setting the outdoor unit system addresses

7.16.1 Manual setting

For link wiring (Set the system addresses: 1, 2, 3...)

System address rotary switch
(Set to “0” at time of shipment)



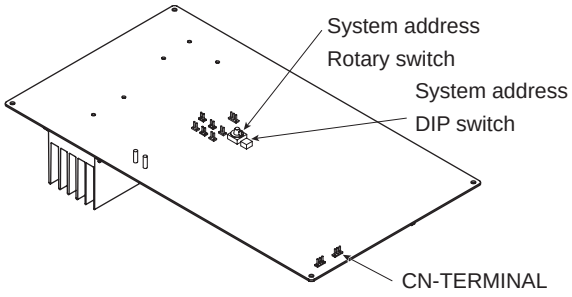


Fig. 7-42

Table 7-7: Outdoor unit addresses setting details

System address No.	System address 10 s digit (2P DIP switch)	System address 1 s place (Rotary switch)
0 Automatic address (Setting at shipment = “0”)	Both OFF	“0” setting
1 (If outdoor unit is No. 1)	Both OFF	“1” setting
2 (If outdoor unit is No. 2)	Both OFF	“2” setting
11 (If outdoor unit is No. 11)	10 s digit ON	“1” setting
21 (If outdoor unit is No. 21)	20 s digit ON	“1” setting
30 (If outdoor unit is No. 30)	10 s digit and 20 s digit ON	“0” setting

Link wiring sample

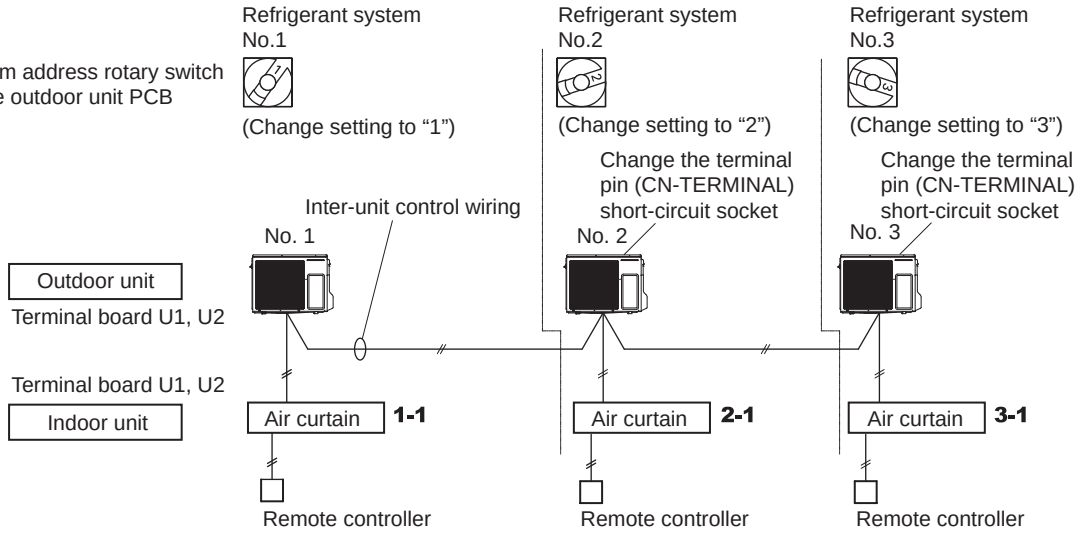


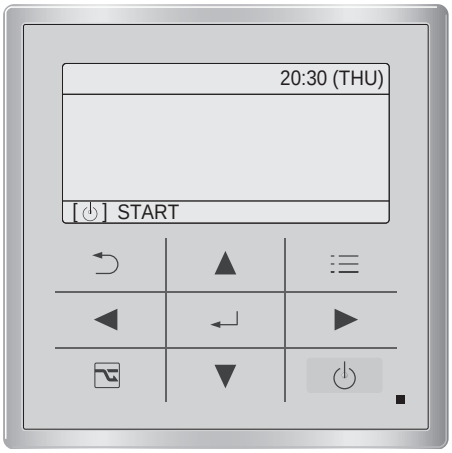
Fig. 7-43

Important Precautions

Request that the customer be present when the test run is performed.
At this time, explain the operation manual and have the customer perform the actual steps.

7.16.2 Automatic address setting using the remote controller

7.16.2.1 Auto Address Setting from the High-spec Wired Remote Controller (CZ-RTC5B)



CZ-RTC5B

Fig. 7-44

1. Keep pressing the ⮌, ↵ and ► buttons simultaneously for 4 or more seconds.
   The “Maintenance func” screen appears on the LCD display. “TEST” appears in the LCD display.
2. Press the ▼ or ▲ button to see each menu.
   If you wish to see the next screen instantly, press the ◄ or ► button.
   Select “9. Auto address” on the LCD display and press the ↵ button.

Maintenance func 20:30 (THU)
9. Auto address
10. Set elec. consumption
11. Set touch key
12. Check touch key
Sel. ◄ Page [↵] Confirm

Fig. 7-45

3. The “Auto address” screen appears on the LCD display.
   Change the “Code no.” to “A1” by pressing the ▼ or ▲ button.

Auto address	20:30 (THU)
Code no.	O/D unit no.
A1	1
Sel. ► Next	

Fig. 7-46

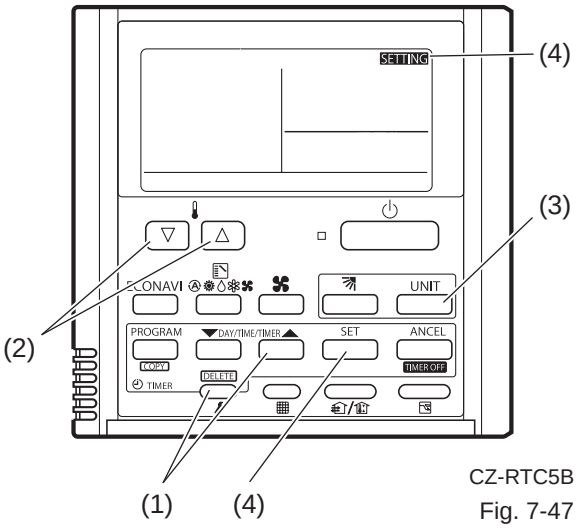
4. Select the “O/D unit no.” by pressing the ◄ or ► button.
   Select one of the “O/D unit no.” for auto address by pressing the ▼ or ▲ button.
   Approximately about 10 minutes are required.
   When auto address setting is completed, the units return to normal stopped status.

7.16.2.2Auto Address Setting from the Timer Remote Controller (CZ-RTC4)

Note

- Auto address setting in Cooling mode cannot be done from the timer remote controller.
- Selecting each refrigerant system individually for auto address setting.
- Auto address setting for each system: Item code “A1”

1. Press the remote controller timer time /TIMER button and button at the same time.
   (Press and hold for 4 seconds or longer.)
2. Next, press either the temperature setting / button. (Check that the item code is “A1”.)
3. Use either the UNIT button to set the system No. to perform auto address setting.
4. Then press the SET button.
   (Auto address setting for one refrigerant system begins.) (When auto address setting for one system is completed, the system returns to normal stopped status.)
   <Approximately 4–5 minutes is required.>
   (During auto address setting, “SETTING” is displayed on the remote controller.
   This message disappears when auto address setting is completed.)

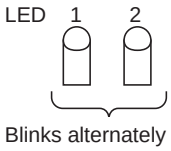


CZ-RTC5B
Fig. 7-47

5. Repeat the same steps to perform auto address setting for each successive system.

7.16.2.3Display During Auto Address Setting for Outdoor models U-36–U-140PZH

- On the surface of outdoor unit control P.C. board



- Do not short circuit the A.ADD pin again during auto address setting. LEDs 1 and 2 go out and address setting is interrupted.
- When auto address setting is normally completed, both LEDs 1 and 2 go out. In other cases, correct settings referring to the following table and perform auto address setting again.

- Contents of LEDs 1 and 2 on outdoor unit control P.C. board

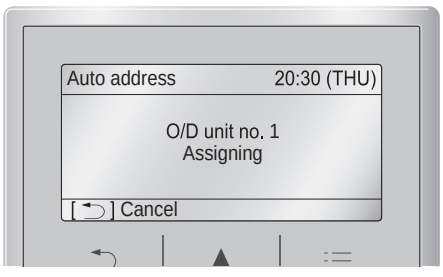
Table 7-8: ○ : Illuminating ☼ : Blinking ● : Go out

		LED1	LED2	Remark
Normal operation		●	●	
Pre-trip (High pressure protection)		☼	●	LED1 Blinking : 0.8sec-ON / 0.3sec-OFF
Pre-trip (other)		☼	●	LED1 Blinking : 0.5sec-ON / 0.5sec-OFF
Automatic address setting	Under automatic address setting	☼	☼	Blinking alternately
	Automatic address setting alarm	☼	☼	Follow the blinking patterns of each alarm
Alternate blinking of outdoor unit LED during alarms	LED1 blinks M times, and then LED2 blinks N times. The cycle then repeats. M=2:P alarm, 3:H alarm, 4:E alarm, 5:F alarm, 6:L alarm, N=alarm No Example: LED1 blinks 4 times, then LED2 blinks 6 times. The cycle then repeats. Alarm is “E06”			
Power ON sequence	No communication from indoor units in system	○	○	If it is not possible to advance to 3 repeats 1→2
	Communication received from 1 or more indoor units in system	●	○	At 3, advances to normal control
	Regular communication OK (Capacity and unit quantity match)	●	●	
Refrigerant recovery mode		☼	○	

(☼ : Blink) Connect the outdoor unit maintenance remote controller to the RC plug (3P, BLU) on outdoor main unit control P.C. board and make confirmation.

- Display of remote controller

CZ-RTC5A, CZ-RTC5B



CZ-RTC4

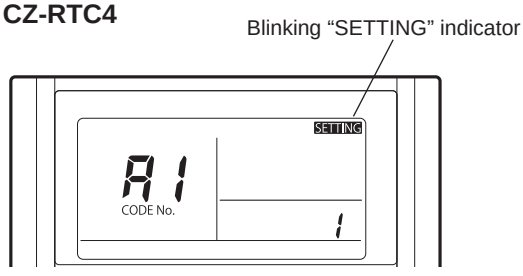


Fig. 7-48

7.16.2.4 Indicating (marking) the indoor and outdoor unit combination number

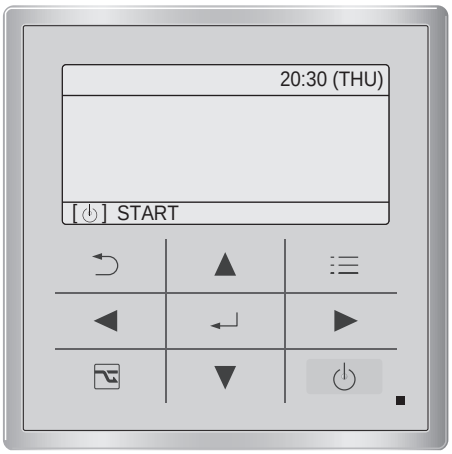
Indicate (mark) the number after auto address setting is completed.

- So that the combination of each indoor unit can be easily checked when multiple units are installed, ensure that the indoor and outdoor unit numbers correspond to the system address number on the outdoor unit control PCB, and use a magic marker or similar means which cannot be easily erased to indicate the numbers in an easily visible location on the indoor units (near the indoor unit nameplates).

  Example: (Outdoor) 1 - (Indoor) 1
  (Outdoor) 2 - (Indoor) 1

- These numbers will be needed for maintenance.
  Be sure to indicate them.

■ High-spec Wired Remote Controller (CZ-RTC5A, CZ-RTC5B)



CZ-RTC5B

Fig. 7-49

1. Keep pressing the [↩], [↵] and [►] buttons simultaneously for 4 or more seconds.
   The “Maintenance func” screen appears on the LCD display. “TEST” appears in the LCD display.

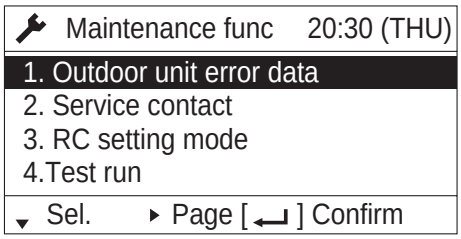


Fig. 7-50

2. Press the [▼] or [▲] button to see each menu.
   If you wish to see the next screen instantly, press the [◄] or [►] button.
   Select “7. Simple settings” on the LCD display and press the [↵] button.

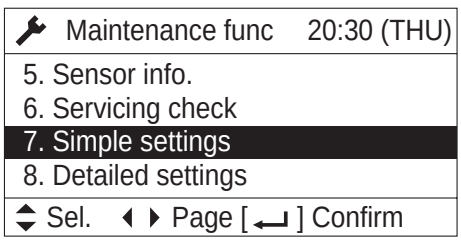


Fig. 7-51

3. The “Simple settings” screen appears on the LCD display.
   Select the “Unit no.” by pressing the ▼ or ▲ button for changes.

Simple settings		20:30 (THU)
Unit no.	Code no.	Set data
3-1	01	0001
⇕ Sel.	▸ Next	

Fig. 7-52

The indoor unit fan operates only at the selected indoor unit.

■ CZ-RTC4 (Timer remote controller)

<If 1 indoor unit is connected to 1 remote controller>

1. Press and hold the button and button for 4 seconds or longer (simple settings mode).
2. The address is displayed for the indoor unit that is connected to the remote controller.
   (Only the address of the indoor unit that is connected to the remote controller can be checked.)
3. Press the button again to return to normal remote controller mode.

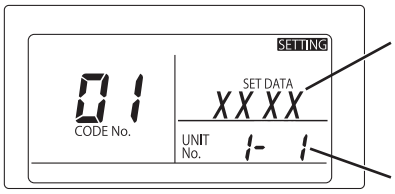


Fig. 7-53

7

7.17 Remote Controller Switch Alarm Display (Error codes)

Table 7-9: Contents of Remote Controller Switch Alarm Display

ON: ○ Blinking: ☼ OFF: ●

Abnormal display		Wireless remote controller receiver display: Operation (☼/⏻)	Timer (🕘)	Standby (❄)	Alarm contents	Error location and remedy
Remote controller • Indoor Unit	E01	Operating lamp blinking ☼	●	●	• Faulty remote controller	• Replace the remote controller
					• Disconnection / Contact failure of remote controller wiring	• Correct the remote controller wiring
					• CHK (check) pins on the indoor unit control PCB are short circuited	• Remove the short
					• In the case of non-group control : Power supply OFF of outdoor unit Disconnection / Contact failure of inter-unit wiring • In the case of group control : Automatic address operation was not carried out	• Execute automatic address setting
					• Faulty setting of EEPROM (IC010) on indoor unit	• Replace the indoor unit EEPROM
	E02				• Faulty remote controller • Wrong wiring of remote controller	• Replace the remote controller • Correct the remote controller wiring
	E03				• Error in indoor unit receiving signal from remote controller (central)	• Check the indoor unit control PCB • Check the remote controller wiring • Check the inter-unit control wiring
	E04	Standby lamp blinking ●	●	☼	• Disconnection / Contact failure of inter-unit wiring • Faulty indoor unit control PCB • Faulty outdoor unit control PCB • Communication circuit fuse (F302) on indoor unit control PCB opened	• Check the electrical connection of inter-unit control wiring • Replace the indoor unit control PCB • Replace the outdoor unit control PCB • Check the electrical connection of fuse (F302) on indoor unit control PCB In the case of the fuse opened on an indoor unit control PCB, after correcting wiring connection, it substitutes an EMG plug for OC plug
					• Fuse on outdoor unit control PCB opened Since failure of an outdoor fan motor is considered as a cause, both outdoor unit control PCB and outdoor unit fan motor are exchanged simultaneously	• In the case of the fuse opened on an outdoor unit control PCB, replace both outdoor unit control PCB (CR/HIC) and outdoor unit fan motor simultaneously
	E08	Operating lamp blinking ☼	●	●	• Duplication of indoor unit address setting	• Indoor unit address re-setting
	E09				• Error because of more than one remote controller setting to main	• Correct the setting
	E18				• Disconnection of wiring between main unit and additional units • Contact failure of wiring • Faulty indoor unit control PCB (main or addition)	• Correct the wiring connection • Replace the wiring • Replace the indoor unit control PCB

Continued on next page

ON: ○ Blinking: ☼ OFF: ●

Abnormal display		Wireless remote controller receiver display: Operation	Timer	Standby	Alarm contents	Error location and remedy
Remote controller • Indoor Unit	F01	Operating and timer lamp blinking simultaneously ☼ ☼ ● ☼			• Indoor heat exchanger temperature sensor (E1) trouble • Check the indoor unit heat exchanger temperature sensor (E1)	• Check the indoor unit control PCB
	F02				• Indoor heat exchanger temperature sensor (E2) trouble • Check the indoor unit heat exchanger temperature sensor (E2)	• Check the indoor unit control PCB
	F10				• Indoor air temperature sensor (TA) trouble •	• Check the indoor unit air temperature sensor (TA) • Check the indoor unit control PCB
	F29	Operating and timer lamp blinking simultaneously ☼ ☼ ●			• Indoor unit EEPROM trouble	• Check the indoor unit EEPROM • Check the indoor unit control PCB
	L02	Operating and timer lamp blinking simultaneously ☼ ● ☼			• Setting error, indoor / outdoor unit type / model mismatched	• Address re-setting after correcting the combination of units
	L03				• Duplication of main indoor unit address in group control	• Correct the group (main and addition)
	L07				• Group control wiring is connected to individual control indoor unit	• Correct the indoor unit address
	L08				• Indoor unit address is not set	• Correct the indoor unit address
	L09				• Indoor unit capacity is not set	• Correct the capacity setting of indoor units
	P01	Timer and standby lamp blinking simultaneously ● ☼ ☼			• Indoor unit fan motor locked • Indoor unit fan motor layer short • Contact failure in thermostat protector circuit	• Remove the cause • Replace the fan motor • Correct the wiring
	P09				• Faulty wiring connections of (ceiling) indoor unit panel	• Correct the wiring connection
	P10				• Faulty drain pump • Drainage failure • Contact failure of float switch wiring	• Repair / Replace • Correct • Correct the wiring
	P11				• Faulty drain pump • Drain pump locked	• Repair / Replace • Remove the cause
	P12				• Indoor unit fan motor locked • Faulty wiring connections of indoor unit fan motor	• Remove the cause • Correct the wiring
Outdoor Unit	E06	Standby lamp blinking ● ● ☼			• Disconnection / Contact failure of inter-unit wiring • Disconnection of inter-unit wiring • Communication circuit fuse (F302) on indoor unit control PCB opened • Indoor unit control PCB address settings error	• Correct the inter-unit control wiring Check the electrical connection of fuse (F302) on indoor unit control PCB In the case of the fuse opened on an indoor unit control PCB, after correcting wiring connection, it substitutes an EMG plug for OC plug • Indoor unit address re-setting

Continued on next page

ON: ○ Blinking: ☼ OFF: ●

Abnormal display		Wireless remote controller receiver display: Operation (☼/⏻)	Timer (◴)	Standby (✺)	Alarm contents		Error location and remedy
Outdoor Unit	E12	Operating lamp blinking			• Auto address setting start is prohibited		• Check the inter-unit control wiring
	E14	☼	●	●	• Duplication of main unit in group control		• Check the inter-unit control wiring • Check the indoor unit combination
	E15	Standby lamp blinking			Automatic address alarm	• The total capacity of indoor units are too low	• Check the inter-unit control wiring • Check the indoor and outdoor unit control PCB
	E16	●	●	☼		• The total capacity of indoor units are too high • The numbers of indoor units are two or more	
	E20					• No indoor unit connected	
	E24				• Outdoor unit communication error		• Check the outdoor unit control PCB
	E29				• Outdoor unit communication error		• Check the outdoor unit control PCB
	F04	Operating and timer lamp blinking alternately			• Compressor discharge temperature sensor (TD) trouble		• Check the compressor discharge temperature sensor (TD) • Check the outdoor unit control PCB
	F06	☼	☼	○	• Outdoor heat exchanger temperature sensor (C1) trouble		• Check the outdoor unit heat exchanger temperature sensor (C1) • Check the outdoor unit control PCB
	F07				• Outdoor heat exchanger temperature sensor (C2) trouble		• Check the outdoor unit heat exchanger temperature sensor (C2) • Check the outdoor unit control PCB
	F08				• Outdoor air temperature sensor (TO) trouble		• Check the outdoor air temperature sensor (TO) • Check the outdoor unit control PCB
	F12				• Compressor suction temperature sensor (TS) trouble		• Check the compressor suction temperature sensor (TS) • Check the outdoor unit control PCB
	F31	Operating and timer lamp blinking alternately			• Outdoor unit EEPROM trouble		• Check the outdoor unit EEPROM • Check the outdoor unit control PCB
	H01	☼	☼	○	• Primary (input) overcurrent detected		• Check the refrigerant cycle (abnormal overload operation) • Check the outdoor unit control PCB • Check the power supply
	H02	Timer lamp blinking			• PAM trouble		• Check the outdoor unit control PCB • Compressor locked • Check the power supply
	H03	●	☼	●	• Primary current CT sensor failure •		• Check the outdoor unit control PCB
	H31				• HIC trouble • DC voltage not detected		• Check the outdoor unit control PCB • Check the HIC • Compressor locked • Valve blockage

Continued on next page

ON: ○ Blinking: ☼ OFF: ●

Abnormal display		Wireless remote controller receiver display: Operation	Timer	Standby	Alarm contents	Error location and remedy
Outdoor Unit	L04	Operating and standby lamp blinking simultaneously ☼	○	☼	• Duplication of outdoor unit address	• Check the inter-unit control wiring
	L10				• Outdoor unit capacity is not set or setting error	• Replace the outdoor unit EEPROM • Capacity value re-setting
	L13				• Indoor unit type setting error • Type of indoor/outdoor units is different	• Replace the indoor unit EEPROM • Check the outdoor unit control PCB • Check the type of IU and OU, and re-set address
	L18				• 4-way valve locked trouble / operation failure	• Check the 4-way valve • Check the 4-way valve wiring • Check the outdoor unit control PCB
	P03	Operating and standby lamp blinking alternately ☼	●	☼	• Compressor discharge temperature trouble	• Check the refrigerant cycle (gas leak) • Trouble with the electronic expansion valve • Check the discharge temperature sensor (TD)
	P04				• Compressor discharge pressure trouble	• Check the refrigerant cycle • Valve blockage • Heat exchanger obstruction
	P05				• Open phase detected • AC power supply trouble	• Check the power supply • Check the reactor wiring • Check the outdoor unit control PCB • Check the compressor wiring
	P13	Timer and standby lamp blinking alternately ●	☼	☼	• Valve error • Refrigerant circuit error. • Wrong installation for refrigerant piping and wiring	• Valve blockage • Check the refrigerant circuit • Check the refrigerant piping and wiring installation
	P14				• O_2 sensor detected	• Input from the O_2 sensor
Outdoor Unit	P15	Operating and standby lamp blinking alternately ☼	●	☼	• Insufficient gas level detected	• Check the refrigerant cycle (gas leak) • Trouble with the electronic expansion valve • Valve (or refrigerant circuit) blockage
	P16				• Compressor overcurrent trouble	• Layer short on the compressor • Compressor locked • Check the outdoor unit control PCB
	P22				• Outdoor unit fan motor trouble • Outdoor unit fan trouble	• Check the outdoor unit fan motor • Check the outdoor unit control PCB
	P29				• Inverter compressor trouble	• Layer short on the compressor • Check the outdoor unit control PCB • Check the inverter compressor wiring (Open phase/ Reverse phase) • Compressor actuation failure (include lock) • Valve (or refrigerant circuit) blockage
	P31				• Indoor unit in group control trouble	• Repair indoor unit which blinking alarm

Table 7-10: Contents of LED Display on the Outdoor Unit Control PCB (CR)

○ : Blinking ● : ON

		LED1	LED2	Remark
Normal operation				
Pre-trip (High pressure protection)		○		
Pre-trip (other)		○		
Automatic address setting	Under automatic address setting	○	○	Blinking alternately
	Automatic address setting alarm	○	○	Follow the blinking patterns of each alarm
Alternate blinking of outdoor unit LED during alarms	LED1 blinks M times, and then LED2 blinks N times. The cycle then repeats. M=2:P alarm, 3:H alarm, 4:E alarm, 5:F alarm, 6:L alarm, N=alarm No Example: LED1 blinks 4 times, then LED2 blinks 6 times. The cycle then repeats. Alarm is “E06”			
Power ON sequence	No communication from indoor units in system	●	●	If it is not possible to advance to 3 repeats 1→2
	Communication received from 1 or more indoor units in system		●	At 3, advances to normal control
	Regular communication OK (Capacity and unit quantity match)			
Refrigerant recovery mode		○		

Note

In the case that inter-unit wiring is 30m or longer, you cannot pump-down.
(It may trigger the operation of the overload protection device.)
In this case, perform pump-down with pump-down device.

7.18 Auto address setting from the outdoor unit

- If the power can be turned ON separately for the indoor and outdoor units in each system:
  The indoor unit addresses can be set without running the compressor.
- Be sure to use a jig for short-circuiting.

Proceed as follows:

1. Turn on the indoor and outdoor unit power for refrigerant system 1.
   Short-circuit the A ADD pin.

   ↓

   Communication for auto address setting begins.

   ↓

   LED 1 and 2 on the outdoor unit control PCB blink alternately, and turn OFF when address setting is completed.

   ↓ <Approximately 4 – 5 minutes are required.>
2. Next, turn ON the power only at the indoor and outdoor units in a different system.
   Short-circuit the A ADD pin.

   ↓

   LED 1 and 2 on the outdoor unit control PCB blink alternately, and turn OFF when address setting is completed.

   ↓

   Repeat the same procedure for each system and complete auto address setting.

   ↓
3. Operation using the remote controller is now possible.

7.19 Advices for Pump Down Mode

Pump down means refrigerant gas in the system is returned to the outdoor unit. Pump down is used when the unit is to be moved, or before servicing the refrigerant circuit.

CAUTION

- ► This outdoor unit cannot collect more than the rated refrigerant amount as shown by the nameplate on the back.
- ► If the amount of refrigerant is more than that recommended, do not conduct a pump down. In this case use another refrigerant collecting system.
- ► Pay a special attention to the rotating of the fan while operating.

How to perform Pump-Down (Refrigerant recovery) properly

1. Stop operation of the unit (cooling, heating etc.).
2. Connect the pressure gauge to the service port of the gas wiring valve.
3. Short-circuit the “PUMPDOWN” pin on an outdoor unit control PCB (CR) for more than 1 second to release.
   - Pump-Down begins and the unit starts operating.
   - During Pump-Down, LED1 blinks and LED2 is lit on an outdoor unit control PCB (CR).
   - “CHK” blinks on the remote controller.
4. Fully close the liquid wiring valve 2-3 minutes later.
   The Pump-Down will begin.
5. When the pressure gauge drops to 0.1-0.2MPa, close the gas wiring valve tightly and short-circuit the “PUMPDOWN” pin for more than 1 second to release. That is the end of Pump-Down.
   - When running for more than 10 minutes, it stops even if the Pump-Down is not completed.
     Check the blocked state of the liquid side valve.
   - It also stops when the “PUMPDOWN” pin is short-circuited during the operation.

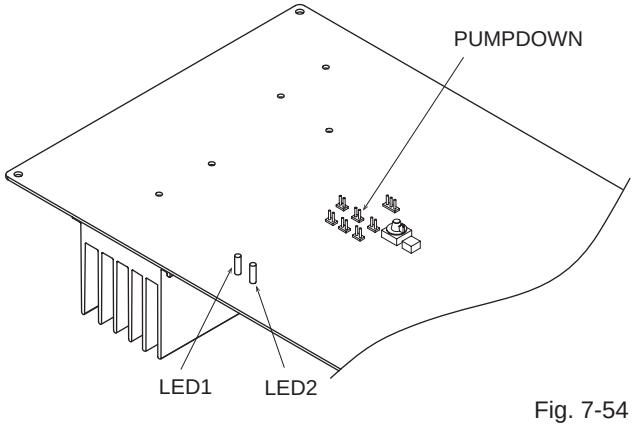


Fig. 7-54

Pay a special attention to the rotating of the fan while operating.

Important

For compressor protection, do not operate to the point where the unit wiring side reaches negative pressure

■ U-71PZH2E5, U-100PZH2E5, U-125PZH2E5, U-140PZH2E5 U-71PZH2E8, U-100PZH2E8, U-125PZH2E8, U-140PZH2E8

7.20 Precautions Regarding Test Run

7.20.1 Check Before Test Run

Table 7-11: Check Before Test Run

	Content check
Power supply cable Indoor/outdoor connection wire Earth wire	• Is the wire set up and connected as described in the instructions? Check for any phase sequence. • Are the wire connection's screws loose? • Is the open and close device / leakage breaker installed? • Is the power supply cable's thickness and length appropriately measured as described in the instructions? • Is it earthed (grounded)? • Check that the insulation resistant value is more than 1MΩ. Use the 500 V mega-testers to measure the insulation. Do not use the mega-tester for any other circuit except for voltage of 220-230-240V~ or 380-400-415V 3N~. • Are the wire connections for the indoor/outdoor units connected as described in the instructions? Are there any looped wires? • Was the "N-phase" surely connected when connecting the power supply wire on the three-phase model? If N-phase is not connected, only the fan may repeat turning ON/OFF without the compressor operating. In that case, check if there is any problem with N-phase connection
Refrigerant tube	• Is the tubing installed as described in the instructions? • Are the tubes sizes appropriate? • Does the tube's length adhere to the specifications? • Is the branch tube slant being appropriately done as described in the instructions? • Was vacuum removal sufficiently carried out? • Was the leak tightness test carried out with nitrogen gas? Use the testing pressure of 4.15 MPa. • Is the tubing insulation material appropriately installed? (Insulation material is necessary for both gas and liquid tubing.) • Is the 3-way valve for the liquid tube and gas tube open?

- Always be sure to use a properly insulated tool to operate the short-circuit pin on the circuit board. (Do not use your finger.)
- Never switch the power supply ON until the installation has completed.
- Supply electrical current through all indoor units and check the voltage.
- Supply electrical current through all the outdoor units and check each inter-phase voltage.
- Before the test run, ensure to check that the 3-way valve is open. Operating while the valve is closed causes the compressor to fail.

7.20.2 Test Run Procedure

- If there are duplicated system addresses, or if the settings for the Nos. of the indoor units are not consistent, an alarm will occur and the system will not start.
- Switch the power supply ON both indoor and outdoor unit.
- Short-circuit CHK pin on the outdoor main PCB.
  Do not remove CHK pin until test run is completed.
  Removing CHK pin stops test run.
- Short-circuit RUN pin on the outdoor main PCB for one second or longer.
  Factory setting is cooling operation mode and cooling operation test run starts.
  If heating operation starts, short-circuit both right side and centre of the MODE pin (centre and COOL) continuously.
- Ensure to conduct a test run. In addition, be sure to run the cooling operation test run for at least 20 minutes before starting the heating operation test run.
- To conduct heating operation test run, short-circuit left side and centre of the MODE pin (centre and HEAT) continuously.
- Removing CHK pin's and MODE pin's short-circuit stops test run.
- For the test run using remote control unit, please see installation instructions included with the remote control unit.

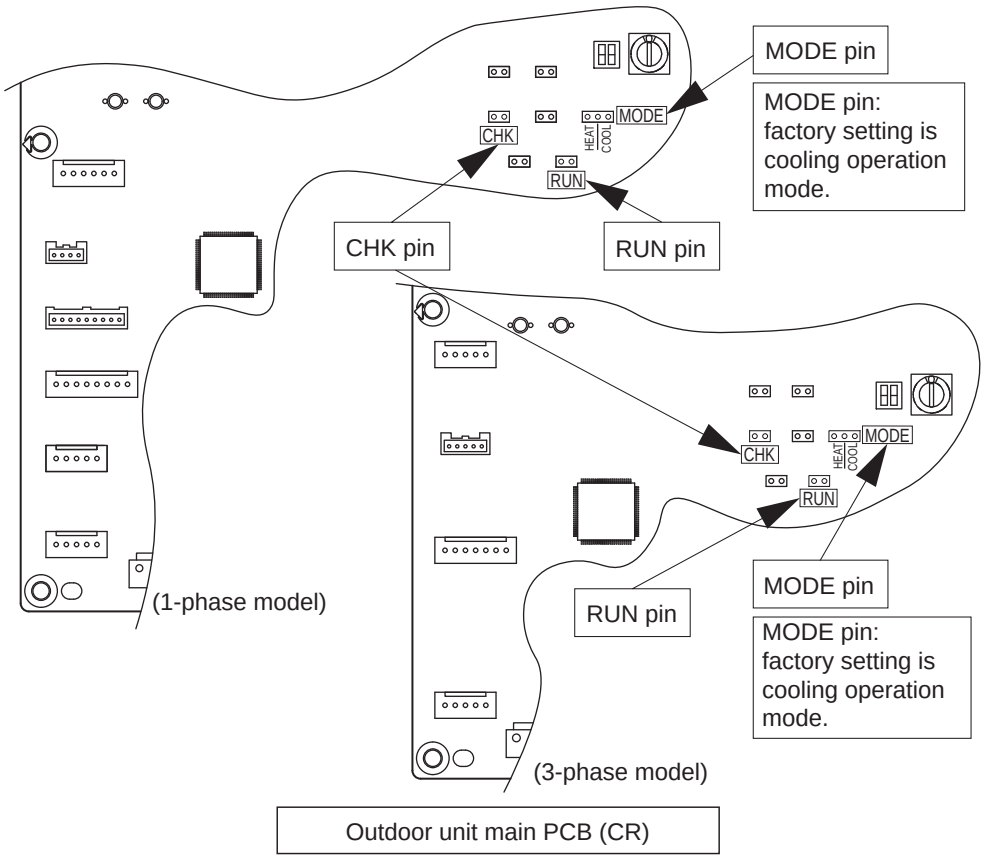


Fig. 7-55

7.21 Advices for Pump Down Mode

Pump down means refrigerant gas in the system is returned to the outdoor unit. Pump down is used when the unit is to be moved, or before servicing the refrigerant circuit.

CAUTION

- ► This outdoor unit cannot collect more than the rated refrigerant amount as shown by the nameplate on the back.
- ► If the amount of refrigerant is more than that recommended, do not conduct a pump down. In this case use another refrigerant collecting system.
- ► Pay a special attention to the rotating of the fan while operating.

How to perform Pump-Down (Refrigerant recovery) properly

1. Stop operation of the unit (cooling, heating etc.).
2. Connect the pressure gauge to the service port of the gas wiring valve.
3. Short-circuit the “PUMPDOWN” pin on an outdoor unit control PCB (CR) for more than 1 second to release.
   - Pump-Down begins and the unit starts operating.
   - During Pump-Down, LED1 blinks and LED2 is lit on an outdoor unit control PCB (CR).
   - “CHK” blinks on the remote controller.
4. Fully close the liquid wiring valve 2-3 minutes later.
   The Pump-Down will begin.
5. When the pressure gauge drops to 0.1-0.2MPa, close the gas wiring valve tightly and short-circuit the “PUMPDOWN” pin for more than 1 second to release. That is the end of Pump-Down.
   - When running for more than 10 minutes, it stops even if the Pump-Down is not completed.
     Check the blocked state of the liquid side valve.
   - It also stops when the “PUMPDOWN” pin is short-circuited during the operation.

Important

For compressor protection, do not operate to the point where the unit wiring side reaches negative pressure

Note

In the case that inter-unit wiring is 30m or longer, you cannot pump-down.
(It may trigger the operation of the overload protection device.)
In this case, perform pump-down with pump-down device.

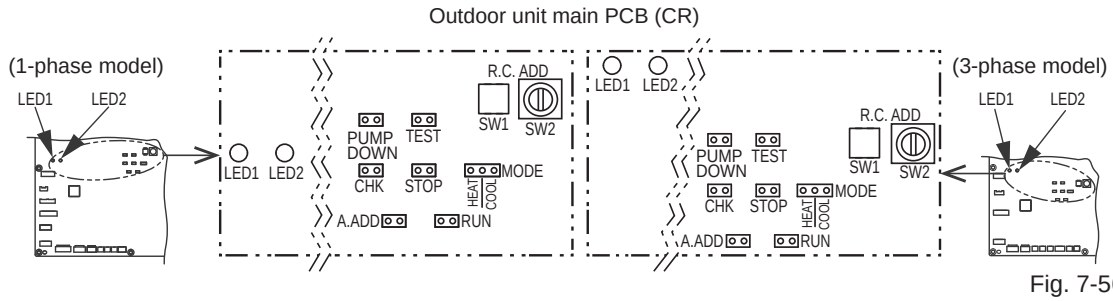


Fig. 7-56

7.22 Checks after Installation have Completed

Check the following items after completing installation.

- ☐ Is there a short circuit with the intake air flow?
- ☐ Is the insulation secure? (Refrigerant tubing)
- ☐ Are there any errors with the wiring?
- ☐ Are the terminal screws loose? Tightening torque (Unit: N•m {kgf•cm})
  M4...1.57~1.96{16~20}, M5...1.96~2.45{20~25}
- ☐ Is the drain water flowing smoothly?
- ☐ Is the insulation material properly installed?
- ☐ Is the earth wire securely connected?
- ☐ Is the front panel and the indoor unit air conditioner firmly fixed and was the installation completed without any leakage from the refrigerant?
- ☐ Are the indoor and outdoor units secured firmly installed with bolts at secured locations?

7.23 Regarding Delivery to the Customer

- Request the customer to review the operating instructions and explain the operating method for the product.
- In addition, it is also recommended that regular inspection checks are agreed upon for maintenance.

User inspection places	→ Filter and grill cleaning
	→ Exterior cleaning
Serviceman inspection places	→ Check the operating status
	→ Clean the drain pan or things related to the water discharge
	→ Heat exchanger cleaning

8 How to Prepare the System for Operation

In order to operate the air curtains properly, following settings must be made on the outdoor units:

1. After finishing the addressing procedure (refer to the outdoor unit test run service manual supplied with the outdoor unit) please connect the standard timer remote controller (CZ-RTC2 or alternative CZ-RTC4) just for the setting purpose to the outdoor unit as shown in Fig. 8-1 or Fig. 8-2 (please see following table for identifying the relevant figure for each outdoor model):

Table 8-1: PACi series units

PACi	Series	Refer to
PACi Standard	U-71PZ2E5 / U-100PZ2E5 / U-100PZ2E8 / U-125PZ2E5 / U-125PZ2E8 / U-140PZ2E5 / U-140PZ2E8	Fig. 8.1 / 8.2
PACi Elite	U-71PZH2E5 / U-71PZH2E8 / U-100PZH2E5 / U-100PZH2E8 / U-125PZH2E5 / U-125PZH2E8 / U-140PZH2E5 / U-140PZH2E8 / U-200PZH2E82 / U-250PZH2E8	

System diagram

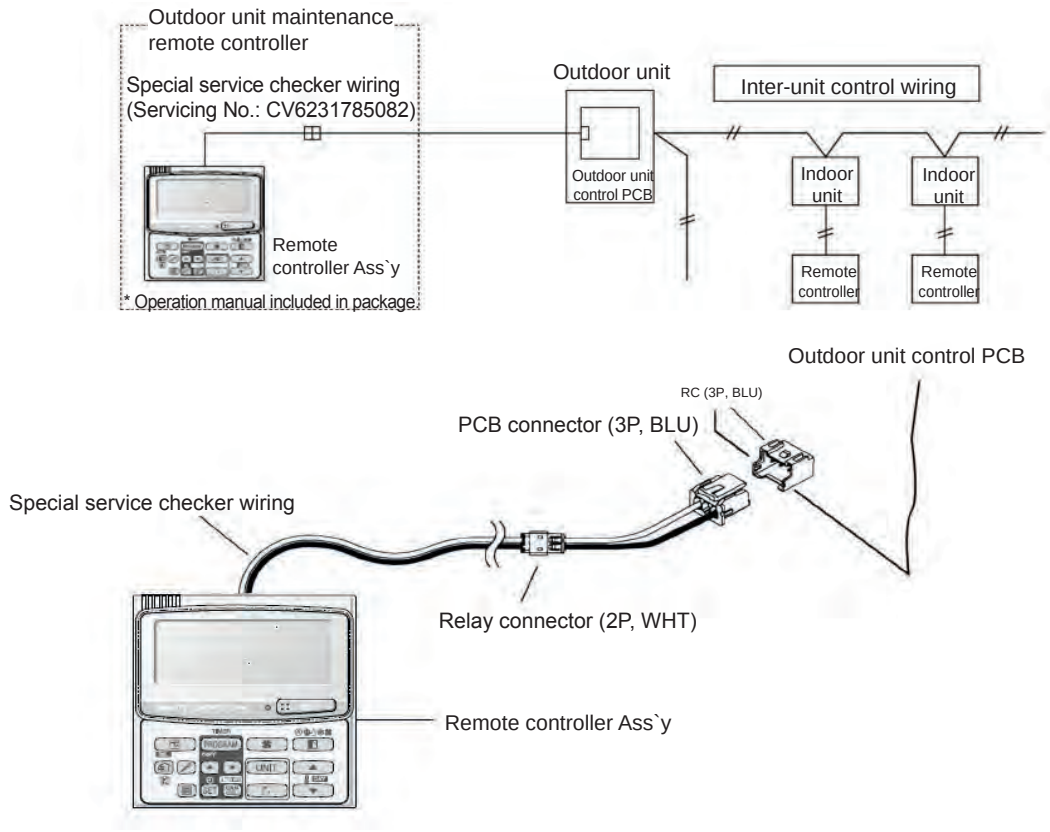


Fig. 8-59

Setting procedure

- To enter the setting mode, press and hold the CHECK button, SET button, and CANCEL button simultaneously for 4 seconds or longer.
- Press the TEMPERATURE UP and DOWN buttons to change the parameter.
- During this mode, “SET DATA” is displayed, blinking. The display shows the set outdoor unit address “System XX-YY” (System XX = system address; YY = address at outdoor unit sub-bus), parameter number, and the value (8 digits).
  The value is displayed in 8 digits. The display changes between the first 4 digits and the last 4 digits. When the first 4 digits are displayed, the top point of the colon is lit.
- Press the TIMER UP and DOWN buttons to change the value. To confirm the changed value, press the SET button.
- At this time, “SET DATA” display stops blinking and remains lit.
- To exit setting mode, press the CHECK button. The remote controller display returns to the normal display mode.

2. Go to setting mode 2.

Setting mode 2

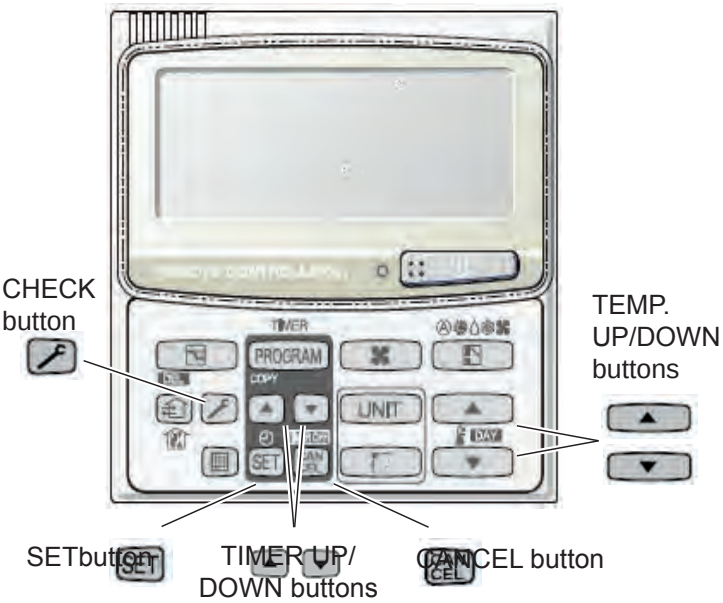


Fig. 8-60

Required settings

- Once you entered the setting mode 2, use the TEMP. UP and DOWN buttons to go to parameter 07.
  With the TIMER buttons, change the value to “001”. (Ignore indoor unit capacity.)
- In a similar manner, you can then go to the other parameters and change them depending on the model combinations and requirements according to the following table:

Table 8-2: Air outlet temperatures and Parameters

Air Outlet	Parameter	U-60PE1E5 / U-71PE1E5 / U-71PE1E8
40 °C	21*	055
	3F**	004
	40***	004
	41	001
	42	No change
35 °C	21*	055
	3F**	004
	40***	004
	41	001
	42	-004
30 °C	21*	055
	3F**	004
	40***	004
	41	001
	42	-006

* Thermostat off judgement time (165 sec.)

** Off set minimum evaporation temperature (K). Those parameters need to be changed only in case of using air curtains also for cooling operation summer.

*** Off set upper evaporation temperature (K). Those parameters need to be changed only in case of using air curtains also for cooling operation summer.

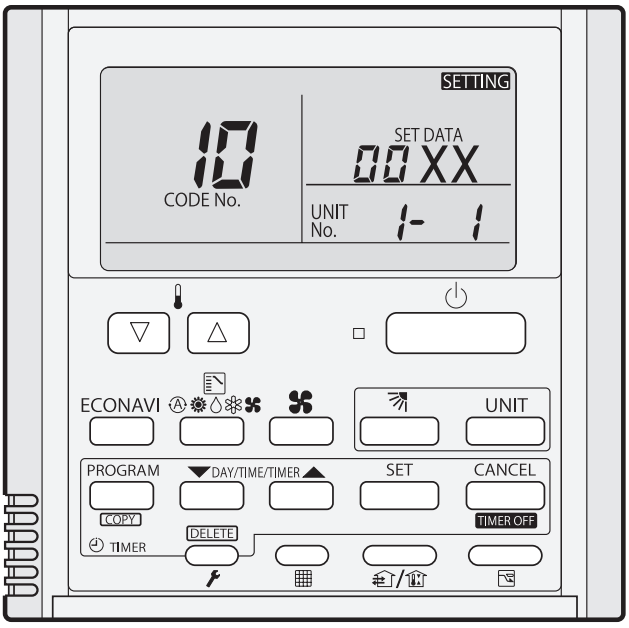
**** Condensation temperature upper limit valid.

***** Condensation temperature upper limit offset (K).

9 Remote Controller Servicing Functions

The remote controller includes a number of servicing functions. Use these as needed for test runs and inspections.

9.1 Timer Remote Controller CZ-RTC4



CZ-RTC4 Fig. 9-1

Table 9-1: List of Servicing Functions

Functions	Description	Button operation	Reset operation	Unit status
Test run	Operation with forced thermostat ON	Press and hold the button for 4 seconds or longer.	Press the button.	Current operation is maintained.
Sensor temperature display	Temperature display from each sensor	Press and hold the and CANCEL buttons for 4 seconds or longer		
Servicing check display	Alarm history display	Press and hold the and SET buttons for 4 seconds or longer		
Simple settings	Filter lifetime, operating mode priority, central control address, and other settings	Press and hold the and buttons for 4 seconds or longer.		When settings are made from a remote controller, the indoor unit where that remote controller is connected stops.
Detailed settings	System address, indoor unit address, central control address, and other settings	Press and hold the , CANCEL and SET buttons for 4 seconds or longer		
Automatic address	Automatic address setting based on command from the wired remote controller	Press and hold the and the timer operation buttons for 4 seconds or longer	Automatic reset	Entire system stops.
Address change	Change of indoor unit address	Press and hold the and the timer operation buttons for 4 seconds or longer.	Press the button.	

9.2 High-spec Wired Remote Controller CZ-RTC5

Display of “maintenance function” screen

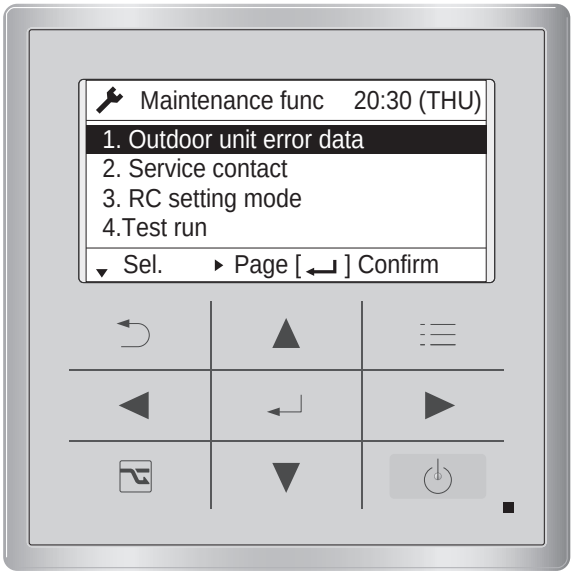


Fig. 9-2

1. Keep pressing the ⮌ , ↵ and ► buttons simultaneously for 4 or more seconds.
   The “Maintenance func” screen appears on the LCD display.
2. Press the ▼ or ▲ button to see each menu.
   If you wish to see the next screen instantly, press the ◄ or ► button.

Table 9-2: List of Servicing Functions

Functions	Description	Menu selection	Reset operation	Unit status
Test run	Operation with forced thermostat ON	4. Test run	Press the ⮌ button.	
Sensor temperature display	Temperature display from each sensor	5. Sensor info		
Servicing check display	Alarm history display	6. Service check		
Simple settings	Filter lifetime, operating mode priority, central control address, and other settings	7. Simple settings	Press the ⮌ button. (Restart)	When settings are made from a remote controller, the indoor unit where that remote controller is connected stops.
Detailed settings	System address, indoor unit address, central control address, and other settings	8. Detailed settings		
Automatic address	Automatic address setting based on command from the wired remote controller	9. Auto address	Automatic reset	Entire system stops.

A Appendix

A.1 Care and Cleaning

DANGER

- For safety, be sure to turn the air curtain off and also to disconnect the power before cleaning or maintenance.
- Do not pour water on the indoor unit to clean it. This will damage the internal components and cause an electric shock hazard.

Maintenance interval

The maintenance of the units should be carried out before the heating period, to ensure correct functioning of the air curtain.

The fans or motors are low maintenance. All motors are longterm lubricated and do not need special maintenance. Only check that the fans run freely and are securely fixed.

Cleaning interval

The cleaning of the inlet grilles depends on the contamination of the unit. It is recommended to clean it every 3 to 6 weeks.

CAUTION

- Never use solvents or harsh chemicals when cleaning the indoor unit. Do not wipe plastic parts using very hot water.
- Some metal edges and the ns are sharp and may cause injury if handled improperly; be especially careful when you clean these parts.
- The internal coil and other components of outdoor unit must be cleaned regularly. Consult your dealer or service center.

Casing

External staining on the unit has no impact on the functioning of the air curtain. For esthetical reasons we recommend to clean the casing with a damp cloth an a mild cleaning detergent.

Inlet grille (Filter)

The units are designed for easy cleaning and servicing. It is not necessary to disassemble the unit to clean the inlet grille. All dust can be removed with a hoover and a brush. A damp cloth can also be used for cleaning.

Let the inlet grille dry before restarting the unit.

Heat exchanger

To open the inspection cover, remove the inlet grille first by opening the clip fixings with a at-tip screw driver. Security ropes prevent the grille from falling down. The inspection cover is fixed with a security screw that can only be removed after the inlet grille has been detached. The cover is attached with clip fixings which can be opened with a at-tip screw driver.

The heat exchanger must be cleaned with a hoover and a brush behind the inlet grille.

Electrical units should only be cleaned on the outside. The inside and the controls of the air curtain must be checked by an authorised electrician, if necessary.

CAUTION

- Certain metal edges and the condenser fins are sharp and may cause injury if handled improperly; special care should be taken when you clean these parts.
- Periodically check the outdoor unit to see if the air outlet or air intake is clogged with dirt or soot.
- The internal coil and other components must also be cleaned periodically. Consult your dealer or service center.

Care: After a prolonged idle period

Check the indoor and outdoor unit air intakes and outlets for blockage; if there is a blockage, remove it.

Care: Before a prolonged idle period

- Operate the fan for half a day to dry out the inside.
- Disconnect the power supply and also turn off the circuit breaker.
- Clean the air filter and replace it in its original position.
- Outdoor unit internal components must be checked and cleaned periodically. Contact your local dealer for this service.

A

A.2 Trouble shooting

If your air conditioner does not work properly, check the following points before requesting service. If it still does not work properly, contact your dealer or a service center.

Indoor unit

Symptom	Description	Cause
Noise	Sound like streaming water during operation or after operation	● Sound of refrigerant flowing inside unit ● Sound of drainage water through drain pipe
	Cracking noise during operation or when operation stops.	Cracking sound due to temperature changes of parts.
Odor	Discharged air is smelled during operation.	Indoor odor components, cigarette odor and cosmetic odor acmcuulated in the air conditioner and its air is discharged. Clean the suction grill. Unit inside is dusty. Consult your dealer.
Dewdrop	Dewdrop gets accumulated near air discharge during operation.	Indoor moisture is cooled by cool wind and accumulated by dewdrop. If drewdrop appears in heating mode, check if the condensat pump is damaged and does not work.
Water overflow	Water drops out of the aircurtain.	● Float has dissolved in the drain pan. ● Condensat pipe is clogged. ● Condensat pump is damaged and does not work.
Fog	Fog occurs during operation in cooling mode. (Places where large amounts of oil mist exist at restaurants.)	● Cleaning is necessary because unit inside (heat exchanger) is dirty. Consult your dealer as technical engineering is required. ● During defrost operation.
Fan is rotating for a while even though operation stops.		● Fan rotating makes operation smoothly. ● Fan may sometimes rotate because of drying heat exchanger due to settings.
Air flow direction changes while operating. Air flow direction setting cannot be made. Air flow direction cannot be changed.		● When air discharge temperature is low or during defrost operation, horizontal air flow is made automatically. ● Flap position is occasionally set up individually.
When air flow direction is changed, flap operations several times and stops at designated position.		When air flow direction is changed, flap operations after searching for standard position.
Dust		Dust accumulation inside indoor unit is discharged.
During operation the inspection sign blinks on the remote controller display.		One or more of the fans do not work.

Outdoor unit

Symptom	Description	Cause
No operation	When power is turned ON instantly.	Operation is not activated for approx. 3 minutes because compressor protection circuit is activated.
	When operation is stopped and resumed immediately.	
Noise	Noise often occurs in heating mode.	During defrost operation
Steam	Steam often occurs in heating mode.	
When stopped by remote controller, outdoor unit fan is sometimes operating for a while even though outdoor compressor is stopped.		Fan rotating makes operation smoothly.

Check Before Requiring Services

Symptom	Cause	Remedy
Air conditioner does not run at all although power is turned on.	Power failure or after power failure	• Press ON/OFF operation button on remote control unit again.
	Operation button is turned off.	• Switch on power if circuit breaker is turned off. • If circuit breaker has tripped, consult your dealer without turning it on.
	Fuse blow out.	• If blown out, consult your dealer.
Poor cooling or heating performance	Air intake or air discharge port of indoor and outdoor units is clogged with dust or obstacles.	Remove dust or obstruction.
	Fan speed switch is set to “Low”.	Change to “High” or “Strong”.
	Improper temperature settings	Refer to “Tips for Energy Saving”.
	Room is exposed to direct sunlight in cooling mode.	
	Doors and /or windows are open.	
	Air filter is clogged.	Refer to sec. *A.1 "Care and Cleaning" on page 134*“.
	Too much heat sources in room in cooling mode.	Use minimum heat sources and for a short time.
	Too many people in room in cooling mode.	Reduce temperature settings or change to “High” or “Strong”.

If your air conditioner still does not work properly although you checked the points as described above, first stop the operation and turn off the power switch. Then contact your dealer and report the serial number and symptom. Never repair your air conditioner by yourself since it is very dangerous for you to do so. You also report if the inspection mark and the letters E, F, H, L, P in combination with the numbers appear on the LCD of the remote control unit.

A.3 Tips for Energy Saving

Avoid

- Do not block the air intake and outlet of the unit. If either is obstructed, the unit will not work well, and may be damaged.
- Do not let direct sunlight into the room. Use sunshades, blinds or curtains. If the walls and ceiling of the room are warmed by the sun, it will take longer to cool the room.

Do

- Always try to keep the air filter clean. (Refer to “Care and Cleaning”.) A clogged filter will impair the performance of the unit.
- To prevent conditioned air from escaping, keep windows, doors and any other openings closed.

Note

Should the power fail while the unit is running

If the power supply for this unit is temporarily cut off, the unit will automatically resume operation once power is restored using the same settings before the power was interrupted.

A

A.4 Technical Data

PAW-PAIRC-HS Types

HP		5	6	8	10
Air Curtain		**PAW-10PAIRC-HS**	**PAW-15PAIRC-HS**	**PAW-20PAIRC-HS**	**PAW-25PAIRC-HS**
Air flow type		HS			
Air Volume High	m³/h	2700	3600	5400	6300
Air Volume Medium	m³/h	2300	3000	4500	5300
Air Volume Low	m³/h	1900	2500	3800	4300
Air Flow Length (A)		1,0 m	1,5 m	2,0 m	2,5 m
Cooling capacity nominal	kW *2	9,1	13,0	19,5	23,7
Heating capacity with air in 20 °C, air out 40 °C	kW	18,2	24,3	NA	NA
Heating capacity with air in 20 °C, air out 35 °C	kW	11,5	15,8	23,6	27,6
Heating capacity with air in 20 °C, air out 30 °C	kW	9,1	12,2	18,2	21,2
Max inst. Height good condition	m	2,7	2,7	2,7	2,7
Max inst. Height normal condition	m	3,0	3,0	3,0	3,0
Max inst. Height bad condition	m	3,5	3,5	3,5	3,5
Refrigerant		R32			
Hot gas temp	°C	70	70	70	70
Pressure	bar	41,5	41,5	41,5	41,5
Tubing suction	mm	15,88	19,05	22,22	22,22
Tubing pressure	mm	9,52	9,52	9,52	9,52
Fan		230 V/50 Hz/1/N/PE			
Fan type		EC	EC	EC	EC
Currency High	A	4,1	5,5	8,2	9,6
El. Consumption	kW	0,75	1	1,5	1,75
Protecting Fuse	A	M16A	M16A	M16A	M16A
Noise	dB(A)*3	50/66	49/67	51/68	52/68
Dimensions L/H/D:	mm	1000×(260+140)×460	1500×(260+140)×460	2000×(260+140)×460	2500×(260+140)×460
Weight	kg	55	65	85	110

Outdoor combination with PACi Elite unit 40 °C	U-200PZH2E8	U-200PZH2E8	—	—
Outdoor combination with PACi Standard unit 40 °C	—	—	—	—
Outdoor combination with PACi Elite unit 35 °C	U-100PZH2E5/8	U-200PZH2E8	U-250PZH2E8	U-250PZH2E8
Outdoor combination with PACi Standard unit 35 °C	U-100PZ2E5/8	—	—	—
Outdoor combination with PACi Elite unit 30 °C	U-100PZH2E5/8	U-100PZH2E5/8	U-200PZH2E8	U-200PZH2E8
Outdoor combination with PACi Standard unit 30 °C	U-100PZ2E5/8	U-100PZ2E5/8	—	—

*1 All combinations under rated conditions: Heating Outdoor +7 °CDB/+6 °CWB Indoor +20 °CDB. In case of lower outdoor temperatures a higher capacity outdoor unit model may be necessary

*2 Rated Conditions Cooling Outdoor +35 °CDB Indoor +27 °CDB/+19 °CWB, Discharge temp.³ 16 °C

*3 Noise data distance to the unit 0,5 m, factor of direction 2, Surface of absorption 200 m², min./max. Vol.flow

PAW-PAIRC-LS Types

HP		2,5	5	6	8
Air Curtain		**PAW-10PAIRC-LS**	**PAW-15PAIRC-LS**	**PAW-20PAIRC-LS**	**PAW-25PAIRC-LS**
Air flow type		LS			
Air Volume High	m³/h	1800	2700	3600	4500
Air Volume Medium	m³/h	1500	2300	3000	3800
Air Volume Low	m³/h	1200	1900	2500	3100
Air Flow Length (A)		1,0 m	1,5 m	2,0 m	2,5 m
Cooling capacity nominal	kW *2	6,1	9,7	13,0	17,0
Heating capacity with air in 20 °C, air out 40 °C	kW	12,2	18,5	23,1	29,2
Heating capacity with air in 20 °C, air out 35 °C	kW	7,9	12,0	15,0	19,0
Heating capacity with air in 20 °C, air out 30 °C	kW	6,1	9,2	11,5	14,6
Max inst. Height good condition	m	2,4	2,4	2,4	2,4
Max inst. Height normal condition	m	2,7	2,7	2,7	2,7
Max inst. Height bad condition	m	3,0	3,0	3,0	3,0
Refrigerant		R32			
Hot gas temp	°C	70	70	70	70
Pressure	bar	41,5	41,5	41,5	41,5
Tubing suction	mm	15,88	19,05	22,22	22,22
Tubing pressure	mm	9,52	9,52	9,52	9,52
Fan		230 V/50 Hz/1/N/PE			
Fan type		EC	EC	EC	EC
Currency High	A	2,1	3,1	4,1	5,1
El. Consumption	kW	0,3	0,5	0,6	0,8
Protecting Fuse	A	M16A	M16A	M16A	M16A
Noise	dB(A)*3	49/65	48/66	50/67	51/69
Dimensions L/H/D:	mm	1000×(260+140)×460	1500×(260+140)×460	2000×(260+140)×460	2500×(260+140)×460
Weight	kg	50	65	80	95

Outdoor combination with PACi Elite unit 40 °C	U-100PZH2E5/8	U-200PZH2E8	U-200PZH2E8	U-250PZH2E8
Outdoor combination with PACi Standard unit 40 °C	U-100PZ2E5/8	—	—	—
Outdoor combination with PACi Elite unit 35 °C	U-100PZH2E5/8	U-100PZH2E5/8	U-140PZH2E5/8	U-200PZH2E8
Outdoor combination with PACi Standard unit 35 °C	U-100PZ2E5/8	U-100PZ2E5/8	—	—
Outdoor combination with PACi Elite unit 30 °C	U-50PZH2E5	U-100PZH2E5/8	U-100PZH2E5/8	U-125PZH2E5/8
Outdoor combination with PACi Standard unit 30 °C	U-60PZ2E5	U-100PZ2E5/8	U-100PZ2E5/8	U-125PZ2E5/8

*1 All combinations under rated conditions: Heating Outdoor +7 °CDB/+6 °CWB Indoor +20 °CDB. In case of lower outdoor temperatures a higher capacity outdoor unit model may be necessary

*2 Rated Conditions Cooling Outdoor +35 °CDB Indoor +27 °CDB/+19°CWB, Discharge temp.³ 16 °C

*3 Noise data distance to the unit 0,5 m, factor of direction 2, Surface of absorption 200 m², min./max. Vol.flow

A

A.5 Option: Condensate Pump

A.5.1 Model: PAW-Air 1-DP Maxi Orange

Fig. A-1

This part is fully cast and protected against damp, water.
Connected with 1.5 m power cord. Only suitable and improved for water transfer!

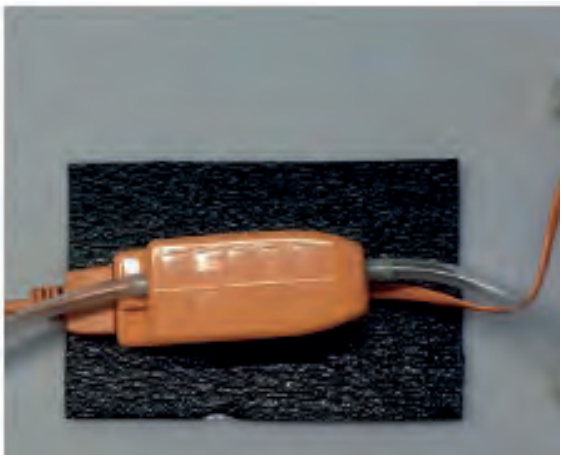


Fig. A-2

Fig. A-3

A.5.2 Dimensions

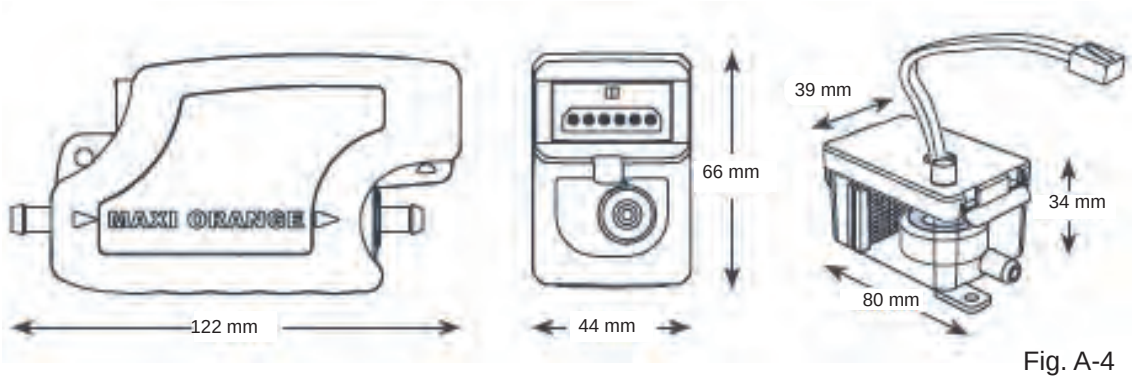


Fig. A-4

A.5.3 Mounting position

The pump unit is placed loose on top of the DX air curtain.

To fix installation on site damper material should be used on top the air curtain.

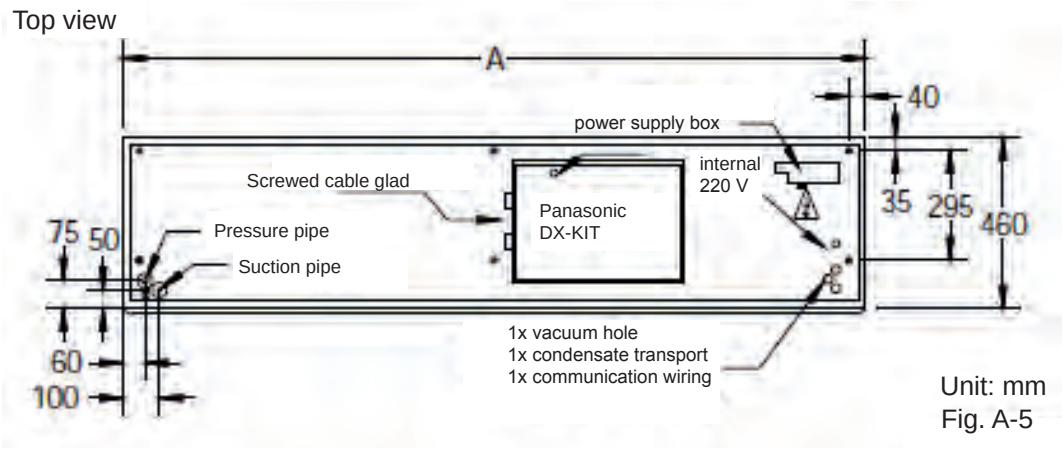


Fig. A-5

A.5.4 Electrical connection

The electric control connection 230 V is done on the Panasonic terminal position 23. The following graphic shows an example for the position.

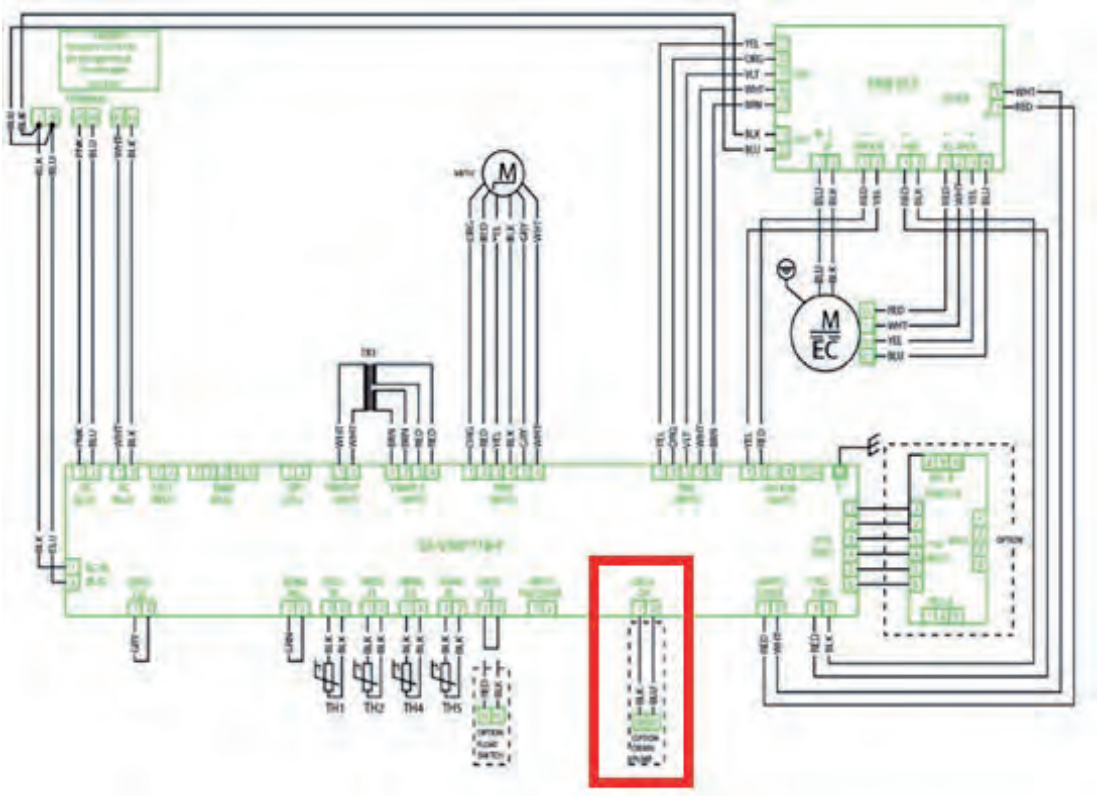


Fig. A-6

A.5.5 Function

The pump switches ON, if around 7 mm condensate is inside the trip tray, and will switch OFF if there is no condensate in.

Three strain reliefs and cable protections as well for vacuum and condensate hoses and 230 V power supply cable are on top from the casing like the drawing and picture show.

Connection between Pump and sensor takes place via:

- 1.5 m Suction tube 6 mm ID
- 220 mm Orange inlet hose 14 mm ID
- 150 mm Vinyl breather tube 6 mm ID

A.5.6 Sensor and magnetic flow switch

The special plastic trip tray material is preventing against condensate.

The magnetic flow switch, like in the picture below, is fixed and clamping inside a designated place from the trip tray.

Fig. A-7

For any service or changes of magnetic switch or condensate pump, it´s easy to remove the suction grill first, and then the screw from the Service opening.

Removable inspection flap and service friendly maintenance like the drawing shows.

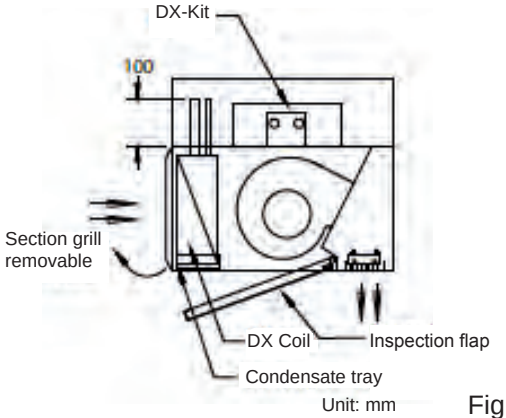


Fig. A-8

Note

If the PAW-Air 1-DP-Condensate pump will be like an accessory, the delivery included the complete fixing material and should be installed as if you will see before.

A.5.7 Pump performance curve

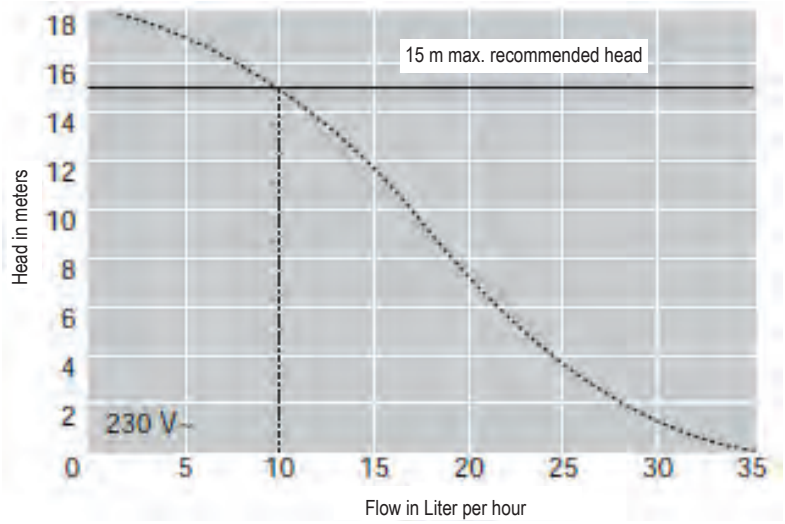


Fig. A-9

A.5.8 Technical parameter

- Max. flow 35 L/h @ 0 head
- Max. rec. head 15 m
- Max. suction lift 2 m
- Sound level@1 m 35 dB(A)
- Power supply 230 V AC, 0.11 A, 16 W, 50/60 Hz
- Rated Non-continuous
- Class II appliance
- Max. unit output 46 kW / 157,000 Btu/h
- Max. water temperature 40 °C/104 °F
- Discharge tube 6 mm ID
- IP Protection IP21
- Safety switch 3.0 A Normally closed
- Thermal protection
- Fully potted
- Self priming

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