

# Air-Conditioners PU(H)-P·GAA

## INSTALLATION MANUAL

**FOR INSTALLER**

For safe and correct use, read this manual and the indoor unit installation manual thoroughly before installing the air-conditioner unit.

## INSTALLATIONSHANDBUCH

**FÜR INSTALLATEURE**

Aus Sicherheitsgründen und zur richtigen Verwendung vor der Installation die vorliegende Bedienungsanleitung und die Installationsanleitung der Innenanlage gründlich durchlesen die Klimaanlage.

## MANUEL D'INSTALLATION

**POUR L'INSTALLATEUR**

Avant d'installer le climatiseur, lire attentivement ce manuel, ainsi que le manuel d'installation de l'appareil intérieur pour une utilisation sûre et correcte.

## INSTALLATIEHANDLEIDING

**VOOR DE INSTALLATEUR**

Lees deze handleiding en de installatiehandleiding van het binnenapparaat zorgvuldig door voordat u met het installeren van de airconditioner begint.

## MANUAL DE INSTALACIÓN

**PARA EL INSTALADOR**

Para un uso correcto y seguro, lea detalladamente este manual y el manual de instalación de la unidad interior antes de instalar la unidad de aire acondicionado.

## MANUALE DI INSTALLAZIONE

**PER L'INSTALLATORE**

Per un uso sicuro e corretto, leggere attentamente il presente manuale ed il manuale d'installazione dell'unità interna prima di installare il condizionatore d'aria.

## ΕΓΧΕΙΡΙΔΙΟ ΟΔΗΓΙΩΝ ΕΓΚΑΤΑΣΤΑΣΗΣ

**ΓΙΑ ΑΥΤΟΝ ΠΟΥ ΚΑΝΕΙ ΤΗΝ ΕΓΚΑΤΑΣΤΑΣΗ**

Για σωστή και ασφαλή χρήση, διαβάστε προσεκτικά αυτό το εγχειρίδιο καθώς και το εγχειρίδιο εγκατάστασης της εσωτερικής μονάδας, προτού εγκαταστήσετε τη μονάδα του κλιματιστικού.

## MANUAL DE INSTALAÇÃO

**PARA O INSTALADOR**

Para uma utilização segura e correcta, leia atentamente este manual e o manual de instalação da unidade interior antes de instalar o aparelho de ar condicionado.

## INSTALLATIONSMANUAL

**TIL INSTALLATØREN**

Læs af sikkerhedshensyn denne manual samt manualen til installation af indendørsenheden grundigt, før du installerer klimaanlægget.

## INSTALLATIONSMANUAL

**FÖR INSTALLATÖREN**

Läs bruksanvisningen och inomhusenhetens installationshandbok noga innan luftkonditioneringen installeras så att den används på ett säkert och korrekt sätt.

## MONTAJ ELKİTABI

**MONTÖR İÇİN**

Emniyetli ve doğru kullanım için, klima cihazını monte etmeden önce bu kılavuzu ve iç ünite montaj kılavuzunu tamamiyle okuyun.

## РУКОВОДСТВО ПО УСТАНОВКЕ

**ДЛЯ УСТАНОВИТЕЛЯ**

Для обеспечения безопасной и надлежащей эксплуатации внимательно прочтите данное руководство и руководство по установке внутреннего прибора перед установкой кондиционера.

English

Deutsch

Français

Nederlands

Español

Italiano

Ελληνικά

Português

Dansk

Svenska

Türkçe

Русский

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## 1. Safety precautions

- ▶ Before installing the unit, make sure you read all the “Safety precautions”.
- ▶ This equipment does not comply with the relevant technical standard for the limitation of flicker and this may cause adverse effects on other electrical appliances. Please provide an exclusive circuit for the air conditioner and ensure, the max. impedance in this manual. Do not connect other appliances to this circuit.
- ▶ Please report to your supply authority or obtain their consent before connecting this equipment to the power supply system.

### ⚠ Warning:

Describes precautions that must be observed to prevent danger of injury or death to the user.

### ⚠ Caution:

Describes precautions that must be observed to prevent damage to the unit.

### ⚠ Warning:

- The unit must not be installed by the user. Ask a dealer or an authorized technician to install the unit. If the unit is installed incorrectly, water leakage, electric shock, or fire may result.
- For installation work, follow the instructions in the Installation Manual and use tools and pipe components specifically made for use with R407C refrigerant.
- The unit must be installed according to the instructions in order to minimize the risk of damage from earthquakes, typhoons, or strong winds. An incorrectly installed unit may fall down and cause damage or injuries.
- The unit must be securely installed on a structure that can sustain its weight. If the unit is mounted on an unstable structure, it may fall down and cause damage or injuries.
- If the air conditioner is installed in a small room, measures must be taken to prevent the refrigerant concentration in the room from exceeding the safety limit in the event of refrigerant leakage. Consult a dealer regarding the appropriate measures to prevent the allowable concentration from being exceeded. Should the refrigerant leak and cause the concentration limit to be exceeded, hazards due to lack of oxygen in the room may result.
- Ventilate the room if refrigerant leaks during operation. If refrigerant comes into contact with a flame, poisonous gases will be released.
- All electric work must be performed by a qualified technician according to local regulations and the instructions given in this manual. The units must be powered by dedicated power lines and the correct voltage and circuit breakers must be used. Power lines with insufficient capacity or incorrect electrical work may result in electric shock or fire.

After installation work has been completed, explain the “Safety Precautions,” use, and maintenance of the unit to the customer according to the information in the Operation Manual and perform the test run to ensure normal operation. Both the Installation Manual and Operation Manual must be given to the user for keeping. These manuals must be passed on to subsequent users.

⚡ : Indicates a part which must be grounded.

### ⚠ Warning:

Carefully read the labels affixed to the main unit.

- Use only specified cables for wiring. The connections must be made securely without tension on the terminals. If the cables are connected or installed incorrectly, overheating or fire may result.
- The terminal block cover panel of the outdoor unit must be firmly attached. If the cover panel is mounted incorrectly and dust and moisture enter the unit, electric shock or fire may result.
- When installing or moving the air conditioner, use only the specified refrigerant (R407C) to charge the refrigerant lines. Do not mix it with any other refrigerant and do not allow air to remain in the lines. Air enclosed in the lines can cause pressure peaks resulting in a rupture and other hazards.
- Use only accessories authorized by Mitsubishi Electric and ask a dealer or an authorized technician to install them. If accessories are incorrectly installed, water leakage, electric shock, or fire may result.
- Do not alter the unit. Consult a dealer for repairs. If alterations or repairs are not performed correctly, water leakage, electric shock, or fire may result.
- The user should never attempt to repair the unit or transfer it to another location. If the unit is installed incorrectly, water leakage, electric shock, or fire may result. If the air conditioner must be repaired or moved, ask a dealer or an authorized technician.
- After installation has been completed, check for refrigerant leaks. If refrigerant leaks into the room and comes into contact with the flame of a heater or portable cooking range, poisonous gases will be released.

### 1.1. Before installation

#### ⚠ Caution:

- Do not use the unit in an unusual environment. If the air conditioner is installed in areas exposed to steam, volatile oil (including machine oil), or sulfuric gas, areas exposed to high salt content such as the seaside, or areas where the unit will be covered by snow, the performance can be significantly reduced and the internal parts can be damaged.
- Do not install the unit where combustible gases may leak, be produced, flow, or accumulate. If combustible gas accumulates around the unit, fire or explosion may result.
- The outdoor unit produces condensation during the heating operation. Make sure to provide drainage around the outdoor unit if such condensation is likely to cause damage.
- When installing the unit in a hospital or communications office, be prepared for noise and electronic interference. Inverters, home appliances, high-frequency medical equipment, and radio communications equipment can cause the air conditioner to malfunction or breakdown. The air conditioner may also affect medical equipment, disturbing medical care, and communications equipment, harming the screen display quality.

# 1. Safety precautions

## 1.2. Before installation (relocation)

### ⚠ Caution:

- Be extremely careful when transporting the units. Two or more persons are needed to handle the unit, as it weighs 20 kg or more. Do not grasp the packaging bands. Wear protective gloves to remove the unit from the packaging and to move it, as you can injure your hands on the fins or other parts.
- Be sure to safely dispose of the packaging materials. Packaging materials, such as nails and other metal or wooden parts may cause stabs or other injuries.
- Thermal insulation of the drainpipe is necessary to prevent condensation. If the drainpipe is not properly insulated, condensation will be formed and the ceiling, floor, or important items may be damaged.
- Install the drainpipe according to this Installation Manual to ensure proper drainage. Place thermal insulation on the pipes to prevent condensation. If the drainpipe is installed incorrectly, water leakage and damage to the ceiling, floor, furniture, or other possessions may result.
- The base and attachments of the outdoor unit must be periodically checked for looseness, cracks or other damage. If such defects are left uncorrected, the unit may fall down and cause damage or injuries.
- Do not clean the air conditioner unit with water. Electric shock may result.
- Tighten all flare nuts to specification using a torque wrench. If tightened too much, the flare nut can break after an extended period and refrigerant can leak out.

## 1.3. Before electric work

### ⚠ Caution:

- Be sure to install circuit breakers. If not installed, electric shock may result.
- For the power lines, use standard cables of sufficient capacity. Otherwise, a short circuit, overheating, or fire may result.
- When installing the power lines, do not apply tension to the cables. If the connections are loosened, the cables can snap or break and overheating or fire may result.
- Be sure to ground the unit. Do not connect the ground wire to gas or water pipes, lighting rods, or telephone grounding lines. If the unit is not properly grounded, electric shock may result.
- Use circuit breakers (ground fault interrupter, isolating switch (+B fuse), and molded case circuit breaker) with the specified capacity. If the circuit breaker capacity is larger than the specified capacity, breakdown or fire may result.

## 1.4. Before starting the test run

### ⚠ Caution:

- Turn on the main power switch more than 12 hours before starting operation. Starting operation just after turning on the power switch can severely damage the internal parts. Keep the main power switch turned on during the operation season.
- Before starting operation, check that all panels, guards and other protective parts are correctly installed. Rotating, hot, or high voltage parts can cause injuries.
- Do not operate the air conditioner without the air filter set in place. If the air filter is not installed, dust may accumulate and breakdown may result.
- Do not touch any switch with wet hands. Electric shock may result.
- Do not touch the refrigerant pipes with bare hands during operation. The refrigerant pipes are hot or cold depending on the condition of the flowing refrigerant. If you touch the pipes, burns or frostbite may result.
- After stopping operation, be sure to wait at least five minutes before turning off the main power switch. Otherwise, water leakage or breakdown may result.

# 2. Installation location

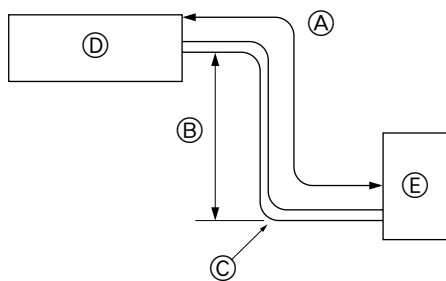


Fig. 2-1

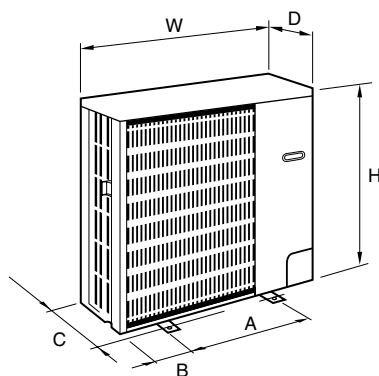


Fig. 2-2

## 2.1. Refrigerant pipe (Fig. 2-1)

- ▶ Check that the difference between the heights of the indoor and outdoor units, the length of refrigerant pipe, and the number of bends in the pipe are within the limits shown below.

Models	Ⓐ Pipe length (one way)	Ⓑ Height difference	Ⓒ Number of bends (one way)
P25	max. 30 m	max. 30 m	max. 9
P35, 50	max. 40 m	max. 40 m	max. 12
P60-140	max. 50 m	max. 50 m	max. 15

- Height difference limitations are binding regardless of which unit, indoor or outdoor, is positioned higher.
- Ⓓ Indoor unit
- Ⓔ Outdoor unit

## 2.2. Choosing the outdoor unit installation location

- Avoid locations exposed to direct sunlight or other sources of heat.
- Select a location from which noise emitted by the unit will not inconvenience neighbors.
- Select a location permitting easy wiring and pipe access to the power source and indoor unit.
- Avoid locations where combustible gases may leak, be produced, flow, or accumulate.
- Note that water may drain from the unit during operation.
- Select a level location that can bear the weight and vibration of the unit.
- Avoid locations where the unit can be covered by snow. In areas where heavy snow fall is anticipated, special precautions such as raising the installation location or installing a hood on the air intake must be taken to prevent the snow from blocking the air intake or blowing directly against it. This can reduce the airflow and a malfunction may result.
- Avoid locations exposed to oil, steam, or sulfuric gas.
- Use the transportation handles of the outdoor unit to transport the unit. If the unit is carried from the bottom, hands or fingers may be pinched.

## 2.3. Outline dimensions (Outdoor unit) (Fig. 2-2)

(mm)

Models	W	D	H	A	B	C
P25, 35	900	330+20	650	500	200	370
P50-71	900	330+20	855	500	200	370
P100	900	330+20	1260	500	200	370
P125, 140	1050	330+20	1260	600	225	370

## 2. Installation location

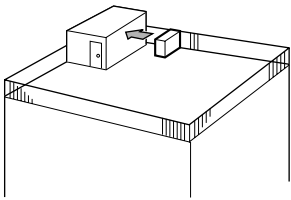


Fig. 2-3

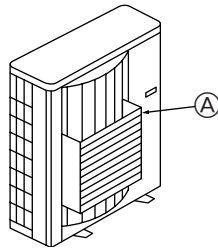


Fig. 2-4

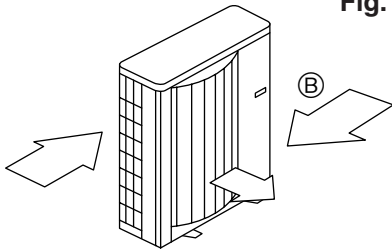


Fig. 2-5

### 2.4. Ventilation and service space

#### 2.4.1. Windy location installation

When installing the outdoor unit on a rooftop or other location unprotected from the wind, situate the air outlet of the unit so that it is not directly exposed to strong winds. Strong wind entering the air outlet may impede the normal airflow and a malfunction may result.

The following shows three examples of precautions against strong winds.

- ① Face the air outlet towards the nearest available wall about 50 cm away from the wall. (Fig. 2-3)
- ② Install an optional air outlet guide and air guide if the unit is installed in a location where strong winds from a typhoon, etc. may directly enter the air outlet. (Fig. 2-4)
  - Ⓐ Air outlet guide
- ③ Position the unit so that the air outlet blows perpendicularly to the seasonal wind direction, if possible. (Fig. 2-5)
  - Ⓑ Wind direction

#### 2.4.2. When installing a single outdoor unit (Refer to the last page)

Minimum dimensions are as follows, except for Max., meaning Maximum dimensions, indicated.

The figure in parentheses are for P100-140 models.

Refer to the figures for each case.

- ① Obstacles at rear only (Fig. 2-6)
- ② Obstacles at rear and above only (Fig. 2-7)
- ③ Obstacles at rear and sides only (Fig. 2-8)
- ④ Obstacles at front only (Fig. 2-9)
  - \* When using an optional air outlet guide, the clearance for P100-140 models is 500 mm or more.
- ⑤ Obstacles at front and rear only (Fig. 2-10)
  - \* When using an optional air outlet guide, the clearance for P100-140 models is 500 mm or more.
- ⑥ Obstacles at rear, sides, and above only (Fig. 2-11)
  - \* Do not install the optional air outlet guides for upward airflow.

#### 2.4.3. When installing multiple outdoor units (Refer to the last page)

Leave a 10 mm space or more between the units.

- ① Obstacles at rear only (Fig. 2-12)
- ② Obstacles at rear and above only (Fig. 2-13)
  - \* No more than three units must be installed side by side. In addition, leave space as shown.
  - \* Do not install the optional air outlet guides for upward airflow.
- ③ Obstacles at front only (Fig. 2-14)
  - \* When using an optional air outlet guide, the clearance for P100-140 models is 1000 mm or more.
- ④ Obstacles at front and rear only (Fig. 2-15)
  - \* When using an optional air outlet guide, the clearance for P100-140 models is 1000 mm or more.
- ⑤ Single parallel unit arrangement (Fig. 2-16)
  - \* When using an optional air outlet guide installed for upward airflow, the clearance is 500 (1000) mm or more.
- ⑥ Multiple parallel unit arrangement (Fig. 2-17)
  - \* When using an optional air outlet guide installed for upward airflow, the clearance is 1000 (1500) mm or more.
- ⑦ Stacked unit arrangement (Fig. 2-18)
  - \* The units can be stacked up to two units high.
  - \* No more than two stacked units must be installed side by side. In addition, leave space as shown.

## 3. Installing the outdoor unit

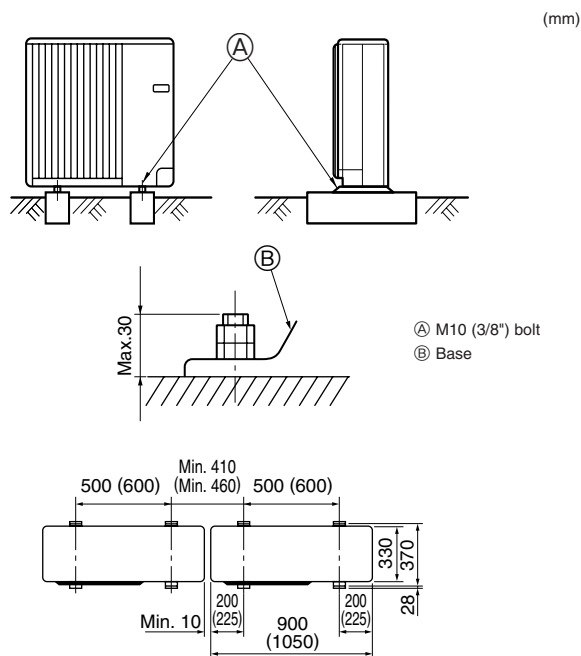


Fig. 3-1

- Be sure to install the unit in a sturdy, level surface to prevent rattling noises during operation. (Fig. 3-1)

<Foundation specifications>

Foundation bolt	M10 (3/8")
Thickness of concrete	120 mm
Length of bolt	70 mm
Weight-bearing capacity	320 kg

- Make sure that the length of the foundation bolt is within 30 mm of the bottom surface of the base.
- Secure the base of the unit firmly with four-M10 foundation bolts in sturdy locations. The figures in parentheses are for P125, 140 models.

#### ⚠ Warning:

- **The unit must be securely installed on a structure that can sustain its weight. If the unit is mounted on an unstable structure, it may fall down and cause damage or injuries.**
- **The unit must be installed according to the instructions in order to minimize the risk of damage from earthquakes, typhoons, or strong winds. An incorrectly installed unit may fall down and cause damage or injuries.**

## 4. Installing the refrigerant piping

### 4.1. Precautions for devices that use R407C refrigerant

- Do not use the existing refrigerant piping.
- Do not use crushed, misshapen, or discolored tubing. The inside of the tubing should be clean and free from harmful sulfuric compounds, oxidants, dirt, debris, oils and moisture.
- Store the piping to be used during installation indoors and keep both ends of the piping sealed until just before brazing.
- Use ester oil, ether oil or alkylbenzene (small amount) as the refrigerant oil to coat flares and flange connections.
- Use liquid refrigerant to fill the system.
- Do not use a refrigerant other than R407C.
- Use a vacuum pump with a reverse flow check valve.
- Do not use the tools that are used with conventional refrigerants.
- Do not use a charging cylinder.
- Be especially careful when managing the tools.
- Do not use commercially available dryers.

### 4.2. Connecting pipes (Fig. 4-1)

- When commercially available copper pipes are used, wrap liquid and gas pipes with commercially available insulation materials (heat-resistant to 100 °C or more, thickness of 12 mm or more).
- The indoor parts of the drain pipe should be wrapped with polyethylene foam insulation materials (specific gravity of 0.03, thickness of 9 mm or more).
- Apply thin layer of refrigerant oil to pipe and joint seating surface before tightening flare nut. (A)
- Use two wrenches to tighten piping connections. (B)
- Use leak detector or soapy water to check for gas leaks after connections are completed.
- Apply refrigerating machine oil over the entire flare seat surface. (C)
- Use the flare nuts as attached to the unit. (D)
- When bending the pipes, be careful not to break them. Bend radii of 100 mm to 150 mm are sufficient.
- Make sure the pipes do not contact the compressor. Abnormal noise or vibration may result.

① Pipes must be connected starting from the indoor unit.

Flare nuts must be tightened with a torque wrench.

② Flare the liquid pipes and gas pipes and apply a thin layer of refrigeration oil (Applied on site).

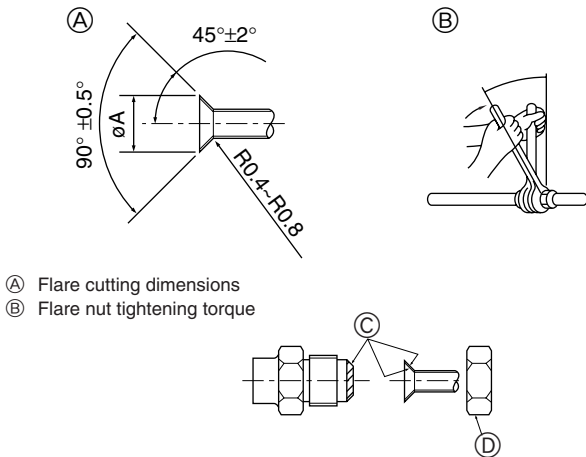


Fig. 4-1

Table 1 (Fig. 4-1)

Copper pipe O.D. (mm)	Flare dimensions øA dimensions (mm)	Tightening torque (N·m)
ø6.35	8.6 - 9.0	14 - 18
ø9.52	12.6 - 13.0	35 - 42
ø12.7	15.8 - 16.2	50 - 58
ø15.88	19.3 - 19.7	75 - 80
ø19.05	22.9 - 23.3	100 - 120

Refrigerant Piping Sizes				
Item	Model	P25	P35, 50, 60, 71	P100, 125, 140
Refrigerant piping	Liquid	O.D. ø6.35 (1/4")	O.D. ø9.52 (3/8")	O.D. ø9.52 (3/8")
	Gas	O.D. ø12.7 (1/2")	O.D. ø15.88 (5/8")	O.D. ø19.05 (3/4")

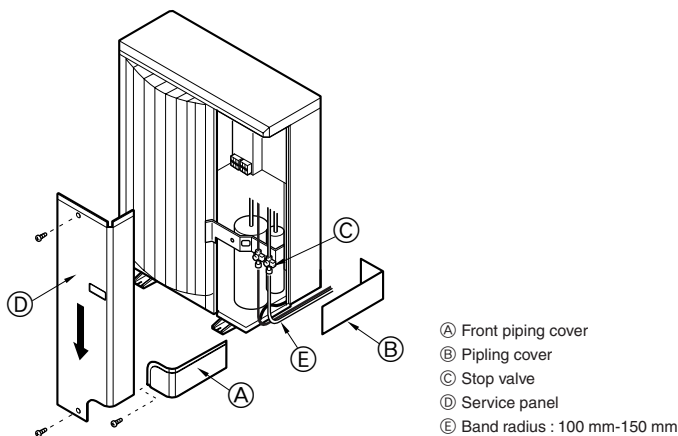


Fig. 4-2

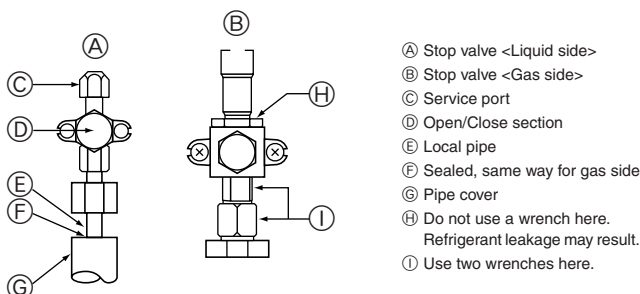


Fig. 4-3

### 4.3. Refrigerant piping (Fig. 4-2), (Fig. 4-3)

Remove the service panel (D) (three screws) and the front piping cover (A) (one screw) and rear piping cover (B) (two screws).

- ① Perform refrigerant piping connections for the indoor/outdoor unit when the outdoor unit's stop valve is completely closed.
- ② Vacuum-purge air from the indoor unit and the connection piping.
- ③ After connecting the refrigerant pipes, check the connected pipes and the indoor unit for gas leaks. (Refer to 4.4 Refrigerant pipe airtight testing method)
- ④ Vacuumize the refrigerant lines through the service port of the liquid stop valve and then open the stop valves completely (for both the liquid and gas stop valves). This will completely connect the refrigerant lines of the indoor and outdoor units.
  - If the stop valves are left closed and the unit is operated, the compressor and control valves will be damaged.
  - Use a leak detector or soapy water to check for gas leaks at the pipe connection sections of the outdoor unit.
  - Do not use the refrigerant from the unit to purge air from the refrigerant lines.
  - After the valve work is completed, tighten the valve caps to the correct torque: 20 to 25 N·m (200 to 250 kgf·cm). Failure to replace and tighten the caps may result in refrigerant leakage. In addition, do not damage the insides of the valve caps as they act as a seal to prevent refrigerant leakage.
- ⑤ Use sealant to seal the ends of the thermal insulation around the pipe connection sections to prevent water from entering the thermal insulation.

## 4. Installing the refrigerant piping

### 4.4. Refrigerant pipe airtight testing method

- (1) Connect the testing tools.
  - Make sure the stop valves are closed and do not open them.
  - Add pressure to the refrigerant lines through the service port of the liquid stop valve.
- (2) Do not add pressure to the specified pressure all at once; add pressure little by little.
  - ① Pressurize to 0.5 MPa (5 kgf/cm<sup>2</sup>G), wait five minutes, and make sure the pressure does not decrease.
  - ② Pressurize to 1.5 MPa (15 kgf/cm<sup>2</sup>G), wait five minutes, and make sure the pressure does not decrease.
  - ③ Pressurize to 3.3 MPa (33 kgf/cm<sup>2</sup>G) and measure the surrounding temperature and refrigerant pressure.
- (3) If the specified pressure holds for about one day and does not decrease, the pipes have passed the test and there are no leaks.
  - If the surrounding temperature changes by 1 °C, the pressure will change by about 0.03 MPa (0.3 kgf/cm<sup>2</sup>G). Make the necessary corrections.
- (4) If the pressure decreases in steps (2) or (3), there is a gas leak. Look for the source of the gas leak.

### 4.5. Stop valve opening method

- (1) Gas side (Fig. 4-4)
    - ① Remove the cap, pull the handle toward you and rotate 1/4 turn in a counterclockwise direction to open.
    - ② Make sure that the stop valve is open completely, push in the handle and rotate the cap back to its original position.
  - (2) Liquid side (Fig. 4-5)
    - ① Remove the cap and turn the valve rod counterclockwise as far as it will go with the use of a 4 mm hexagonal wrench. Stop turning when it hits the stopper. (ø6.35: Approximately 4.5 revolutions) (ø9.52: Approximately 10 revolutions)
    - ② Make sure that the stop valve is open completely, push in the handle and rotate the cap back to its original position.
- A Valve  
 B Unit side  
 C Handle  
 D Cap  
 E Local pipe side  
 F Open position side  
 G Service port  
 H Wrench hole  
 I Refrigerant flow direction

Refrigerant pipes are protectively wrapped

- The pipes can be protectively wrapped up to a diameter of ø90 before or after connecting the pipes. Cut out the knockout in the pipe cover following the groove and wrap the pipes.

Pipe inlet gap

- Use putty or sealant to seal the pipe inlet around the pipes so that no gaps remain. (If the gaps are not closed, noise may be emitted or water and dust will enter the unit and breakdown may result.)

### 4.6. Addition of refrigerant

Refrigerant charge:

- The liquid refrigerant should be charged using the low pressure charge plug in the service panel.
- Use the following table when adding R407C refrigerant to tubing that is over 20 m (P25-P60)/30 m (P71-P140).

Models	Piping length (One way)					Factory charged
	-10 m	-20 m	-30 m	-40 m	-50 m	
P25	1.7	1.8	—	—	—	1.7
P35	2.5	2.6	3.0	—	—	2.5
P50	2.6	3.1	3.7	—	—	2.6
P60	3.1	3.3	3.9	4.5	—	3.1
P71	3.3		3.9	4.5	—	3.3
P100	4.0		4.7	5.4	—	4.0
P125	4.6		5.3	6.0	—	4.6
P140	4.9		5.6	6.3	—	4.9

Example) For P125 model with 38 m of piping.

5.3 kg (40 m) – 4.6 kg

Therefore, additional refrigerant required = 0.7 kg

### 4.7. For twin/triple combination

Refrigerant piping limitation of length, height difference are shown in the figure. (Fig. 4-6)

- A Indoor unit
- B Outdoor unit
- C Multi distribution pipe (option)
- D Height difference (Indoor unit-Outdoor unit) Max. 30 m
- E Height difference (Indoor unit-Indoor unit) Max. 1 m

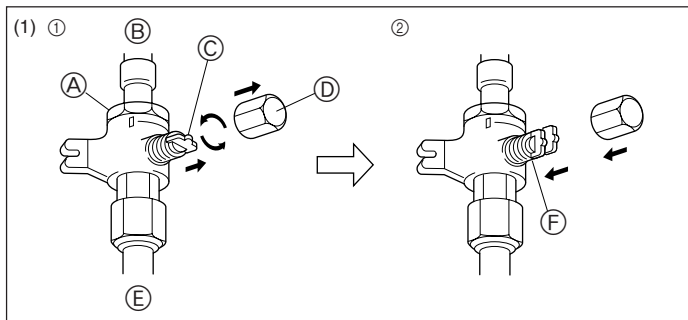


Fig. 4-4

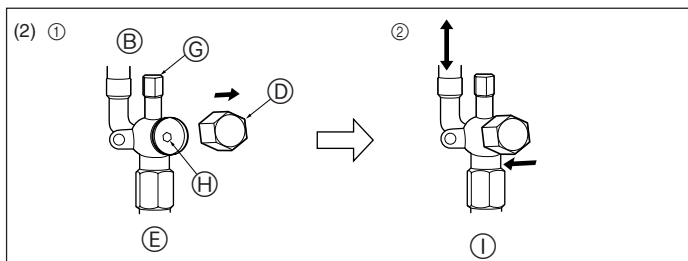


Fig. 4-5

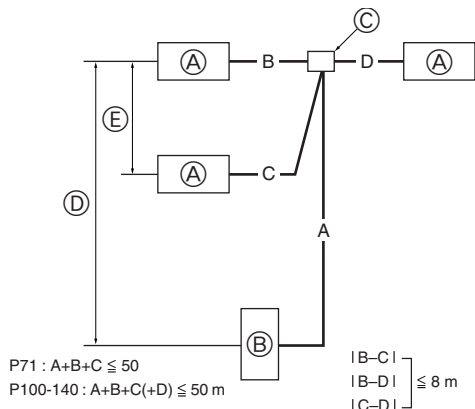


Fig. 4-6

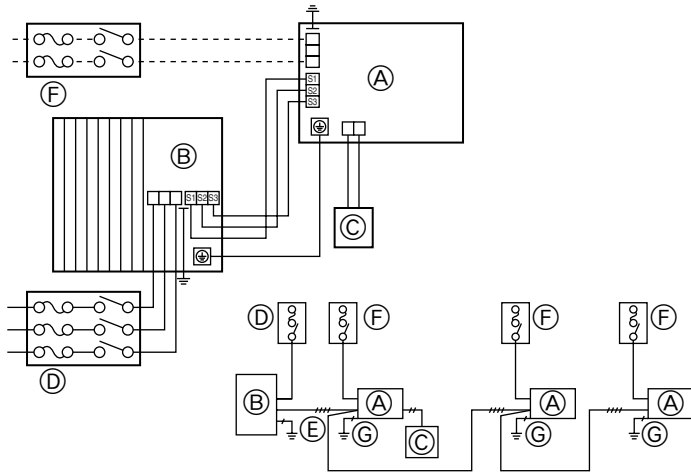
## 5. Drainage piping work

### Outdoor unit drainage pipe connection

When drain piping is necessary, use the drain pan (optional parts).

## 6. Electrical work

For PU(H)-P-YGAA



For PU(H)-P-VGAA

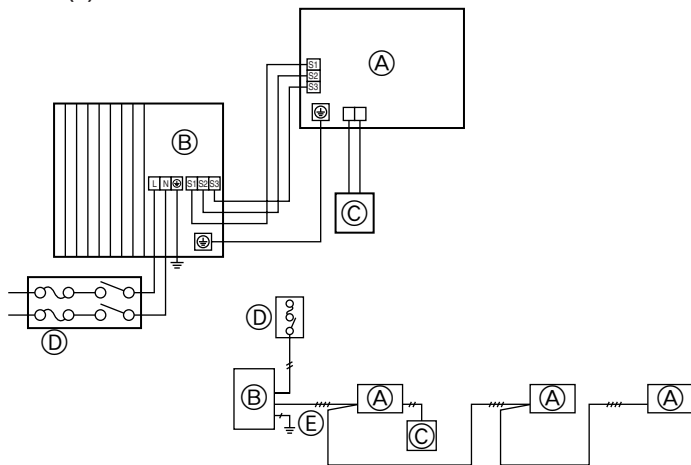


Fig. 6-1

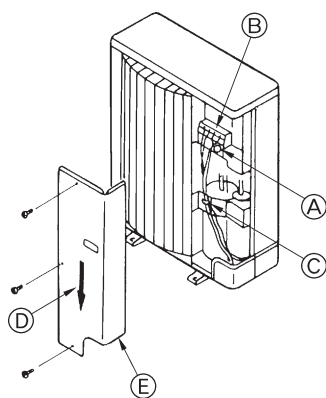


Fig. 6-2

### 6.1. Precautions (Fig. 6-1)

- The compressor will not operate unless the power supply phase connection is correct.
- Grounding protection with a no-fuse breaker (earth leakage breaker [ELB]) is usually installed for (D), (F).
- The connection wiring between the outdoor and indoor units can be extended up to a maximum of 50 meters, and the total extension including the crossover wiring between rooms is a maximum of 80 m.

A switch with at least 3 mm contact separation in each pole shall be provided by the air conditioner installation.

\* Label each breaker according to purpose (heater, unit etc.).

- (A) Indoor unit
- (B) Outdoor unit
- (C) Remote controller
- (D) Main switch/fuse
- (E) Grounding
- (F) Main switch/fuse for Electric heater
- (G) Grounding for Electric heater

### 6.2. Outdoor unit wiring (Fig. 6-2)

1. Remove the service panel.
2. Wire the cables referring to the figure.

- (A) Earth terminal
- (B) Terminal block (Left: Power supply, Right: Indoor/Outdoor unit connecting wire)
- (C) Fasten with wiring clamp
- (D) Extraction direction for service panel
- (E) Service panel

## 6. Electrical work

### 6.3. Field electrical wiring

Outdoor unit model	P25V	P35V	P50V	P60V	P71V	P100V	P35Y	P50Y	P60Y	P71Y	P100Y	P125Y	P140Y	
Outdoor unit Power supply	~/N (single), 50 Hz, 230 V						3N~(3phase), 50 Hz, 400 V							
Outdoor unit input capacity Main switch (Breaker) *1	16 A		25 A		32 A		16 A				25 A			
Max. Permissible System Impedance (Ω)	0.35	0.26	0.12	0.09	0.06		0.69	0.43	0.36	0.23	0.22	0.14	0.12	
Wiring Wire No. × size (mm <sup>2</sup> )	Outdoor unit power supply		2 × Min. 1.5		2 × Min. 2.5		2 × Min. 4		4 × Min. 1.5				4 × Min. 2.5	
	Outdoor unit power supply earth		1 × Min. 1.5		1 × Min. 2.5		1 × Min. 4		1 × Min. 1.5				1 × Min. 2.5	
	Indoor unit-Outdoor unit		*2		3 × 1.5 (polar)		1 × Min. 1.5							
Circuit rating	Indoor unit-Outdoor unit earth						2 × 0.3 (Non-polar)							
	Remote controller-Indoor unit		*3											
	Outdoor unit L-N		*4				AC 230 V							
	Outdoor unit L1-N, L2-N, L3-N													
	Indoor unit-Outdoor unit S1-S2		*4				AC 230 V							
Indoor unit-Outdoor unit S2-S3		*4				DC 24 V								
Remote controller-Indoor unit		*4				DC 12 V								

\*1. A breaker with at least 3 mm contact separation in each pole shall be provided. Use non-fuse breaker (NF) or earth leakage breaker (NV).

\*2. Max. 45 m

If 2.5 mm<sup>2</sup> used, Max. 50 m

If 2.5 mm<sup>2</sup> used and S3 separated, Max. 80 m

\*3. The 10 m wire is attached in the remote controller accessory.

\*4. The voltage are NOT against the ground.

S3 terminal has DC 24 V against S2 terminal. However between S3 and S1, these terminals are not electrically insulated by the transformer or other device.

**Notes:** 1. Wiring size must comply with the applicable local and national code.

2. Power supply cords and Indoor unit/Outdoor unit connecting cords shall not be lighter than polychloroprene sheathed flexible cord. (Design 245 IEC 57)

3. Install an earth longer than other cables.

**⚠ Caution:**

Do not push the contactor button (52C) on the outdoor unit, otherwise the compressor may be damaged.

## 7. Test run

### 7.1. Before test run

- ▶ After completing installation and the wiring and piping of the indoor and outdoor units, check for refrigerant leakage, looseness in the power supply or control wiring, wrong polarity, and no disconnection of one phase in the supply.
- ▶ Use a 500-volt megohmmeter to check that the resistance between the power supply terminals and ground is at least 1.0 MΩ.
- ▶ Do not carry out this test on the control wiring (low voltage circuit) terminals.

**⚠ Warning:**

Do not use the air conditioner if the insulation resistance is less than 1.0 MΩ.

#### Insulation resistance

After installation or after the power source to the unit has been cut for an extended period, the insulation resistance will drop below 1 MΩ due to refrigerant accumulating in the compressor. This is not a malfunction. Perform the following procedures.

1. Remove the wires from the compressor and measure the insulation resistance of the compressor.
2. If the insulation resistance is below 1 MΩ, the compressor is faulty or the resistance dropped due the accumulation of refrigerant in the compressor.
3. After connecting the wires to the compressor, the compressor will start to warm up after power is supplied. After supplying power for the times indicated below, measure the insulation resistance again.
  - The insulation resistance drops due to accumulation of refrigerant in the compressor. The resistance will rise above 1 MΩ after the compressor is warmed up for two to three hours.  
(The time necessary to warm up the compressor varies according to atmospheric conditions and refrigerant accumulation.)
  - To operate the compressor with refrigerant accumulated in the compressor, the compressor must be warmed up at least 12 hours to prevent breakdown.
4. If the insulation resistance rises above 1 MΩ, the compressor is not faulty.

**⚠ Caution:**

- The compressor will not operate unless the power supply phase connection is correct.

- Turn on the power at least 12 hours before starting operation.

- Starting operation immediately after turning on the main power switch can result in severe damage to internal parts. Keep the power switch turned on during the operational season.

▶ The followings must be checked as well.

- The outdoor unit is not faulty. LED1 and LED2 on the control board of the outdoor unit flash when the outdoor unit is faulty.
- Both the gas and liquid stop valves are completely open.
- A protective sheet covers the surface of the DIP switch panel on the control board of the outdoor unit. Remove the protective sheet to operate the DIP switches easily.
- Make sure that the all of the SW5 DIP switches for function changes on the control board of the outdoor unit are set to OFF. If all of the SW5 switches are not set to OFF, record the settings and then set all of the switches to OFF. Begin recovering the refrigerant. After moving the unit to a new location and completing the test run, set the SW5 switches to the previously recorded settings.

### 7.2. Test run

#### 7.2.1. Using SW4 in outdoor unit

##### 1) PUH Type

SW4-1	ON	Cooling operation
SW4-2	OFF	
SW4-1	ON	Heating operation
SW4-2	ON	

##### 2) PU Type

SW4-1	ON	Cooling operation
SW4-2	ON or OFF	

\* After performing the test run, set SW4-1 to OFF.

- After power is supplied, a small clicking noise may be heard from the inside of the outdoor unit. The electronic expansion valve is opening and closing. The unit is not faulty.
- A few seconds after the compressor starts, a clanging noise may be heard from the inside of the outdoor unit. The noise is coming from the check valve due to the small difference in pressure in the pipes. The unit is not faulty.

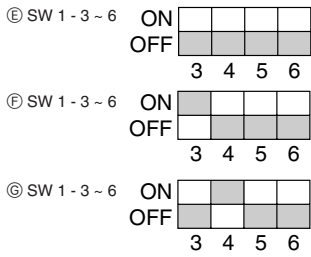
The test run operation mode cannot be changed by DIP switch SW4-2 during the test run. (To change the test run operation mode during the test run, stop the test run by DIP switch SW4-1. After changing the test run operation mode, resume the test run by switch SW4-1.)

#### 7.2.2. Using remote controller

Refer to the indoor unit installation manual.



## 8. System control (Fig. 8-1)



- Ⓐ Outdoor unit
- Ⓑ Indoor unit
- Ⓒ Master remote controller
- Ⓓ Subordinate remote controller
- Ⓔ Standard 1:1 (Refrigerant address = 00)
- Ⓕ Simultaneous twin (Refrigerant address = 01)
- Ⓖ Simultaneous triple (Refrigerant address = 02)

\* Set the refrigerant address using the DIP switch of the outdoor unit.

① Wiring from the Remote Control

This wire is connected to TB5 (terminal board for remote controller) of the indoor unit (non-polar).

② When a Different Refrigerant System Grouping is Used.

Up to 16 refrigerant systems can be controlled as one group using the slim MA remote controller.

### Note:

In single refrigerant system (twin/triple), there is no need of wiring ②.

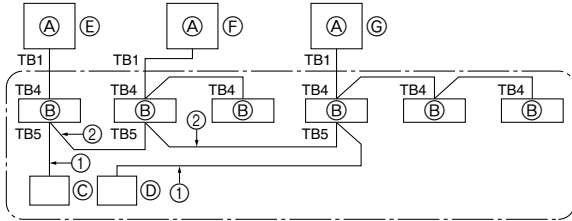


Fig. 8-1

SW1  
Function table

<SW1>



	Function	Operation according to switch setting	
		ON	OFF
SW1 function settings	1 Compulsory de-frosting	Start	Normal
	2 Error history clear	Clear	Normal
	3 Refrigerant sys-tem address set-ting 4 5 6	Settings for outdoor unit ad-dresses 0 to 15	

This product is designed and intended for use in the residential,  
commercial and light-industrial environment.

The product at hand is based on the following EU regulations:

- Low Voltage Directive 73/23/ EEC
- Electromagnetic Compatibility Directive 89/336/ EEC

Please be sure to put the contact address/telephone number on  
this manual before handing it to the customer.