

# Air-Conditioners For Building Application

## INDOOR UNIT

### PCFY-P.VGM-E

For use with the R410A, R407C & R22    Για χρήση με τα R410A, R407C και R22  
Bei Verwendung von R410A, R407C & R22    Para utilização com o R410A, R407C e o R22  
A utiliser avec le R410A, R407C et le R22    R410A, R407C ve R22 ile beraber kullanmak için  
Bij gebruik van R410A, R407C & R22    Для использования с моделями R410A, R407C и R22  
Para utilizar con el R410A, R407C y el R22    使用R410A, R407C和R22制冷剂  
Usò del refrigerante R410A, R407C e R22

#### INSTALLATION MANUAL

**FOR INSTALLER**

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

**English**

#### INSTALLATIONSHANDBUCH

**FÜR INSTALLATEURE**

Zum sicheren und ordnungsgemäßen Gebrauch der Klimaanlage das Installationshandbuch gründlich durchlesen.

**Deutsch**

#### MANUEL D'INSTALLATION

**POUR L'INSTALLATEUR**

Veillez lire le manuel d'installation en entier avant d'installer ce climatiseur pour éviter tout accident et vous assurer d'une utilisation correcte.

**Français**

#### INSTALLATIEHANDLEIDING

**VOOR DE INSTALLATEUR**

Voor een veilig en juist gebruik moet u deze installatiehandleiding grondig doorlezen voordat u de airconditioner installeert.

**Nederlands**

#### MANUAL DE INSTALACIÓN

**PARA EL INSTALADOR**

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

**Español**

#### MANUALE DI INSTALLAZIONE

**PER L'INSTALLATORE**

Per un uso sicuro e corretto, leggere attentamente questo manuale di installazione prima di installare il condizionatore d'aria.

**Italiano**

#### ΕΓΧΕΙΡΙΔΙΟ ΟΔΗΓΙΩΝ ΕΓΚΑΤΑΣΤΑΣΗΣ

**ΓΙΑ ΑΥΤΟΝ ΠΟΥ ΚΑΝΕΙ ΤΗΝ ΕΓΚΑΤΑΣΤΑΣΗ**

Για ασφάλεια και σωστή χρήση, παρακαλείστε διαβάσετε προσεκτικά αυτό το εγχειρίδιο εγκατάστασης πριν αρχίσετε την εγκατάσταση της μονάδας κλιματισμού.

**Ελληνικά**

#### MANUAL DE INSTALAÇÃO

**PARA O INSTALADOR**

Para segurança e utilização correctas, leia atentamente este manual de instalação antes de instalar a unidade de ar condicionado.

**Português**

#### MONTAJ ELKİTABI

**MONTÖR İÇİN**

Emniyetli ve doğru biçimde nasıl kullanılacağını öğrenmek için lütfen klima cihazını monte etmeden önce bu elkitabını dikkatle okuyunuz.

**Türkçe**

#### РУКОВОДСТВО ПО УСТАНОВКЕ

**ДЛЯ УСТАНОВИТЕЛЯ**

Для осторожного и правильного использования прибора необходимо тщательно ознакомиться с данным руководством по установке до выполнения установки кондиционера.

**Русский**

#### 安装说明书

**安装人员适用**

在安装空调机之前，请先通读此安装说明书，以便安全正确地使用。

**中文**

# Contents

1. Safety precautions .....	2	5. Drainage piping work .....	5
2. Installation location .....	2	6. Electrical work .....	5
3. Installing the indoor unit .....	2	7. Test run (Fig. 7-1) .....	7
4. Installing the refrigerant piping .....	4		

## 1. Safety precautions

- ▶ Before installing the unit, make sure you read all the “Safety precautions”.
- ▶ 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.

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 an action that must be avoided.

ⓘ : Indicates that important instructions must be followed.

**Warning:**

- Ask the dealer or an authorized technician to install the air conditioner.
- Install the unit at a place that can withstand its weight.
- Use the specified cables for wiring.
- Use only accessories authorized by Mitsubishi Electric and ask the dealer or an authorized technician to install them.
- Do not touch the heat exchanger fins.
- Install the air conditioner according to this Installation Manual.

**Caution:**

- Do not use the existing refrigerant piping, when use R410A or R407C refrigerant.
- Use ester oil, either oil or alkylbenzene (small amount) as the refrigerator oil to coat flares and flange connections, when use R410A or R407C refrigerant.
- Do not use the air conditioner where food, pets, plants, precision instruments, or artwork are kept.
- Do not use the air conditioner in special environments.

## 2. Installation location

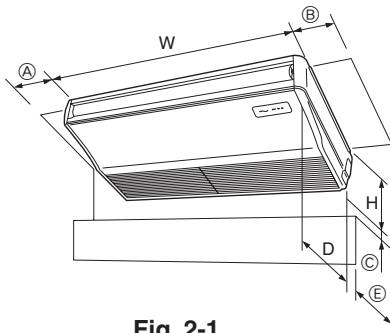


Fig. 2-1

## 3. Installing the indoor unit

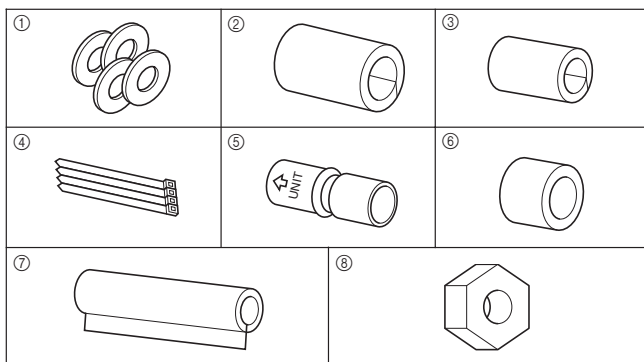


Fig. 3-1

⚡ : Indicates a part which must be grounded.

⚠ : Indicates that caution should be taken with rotating parts.

⚡ : Indicates that the main switch must be turned off before servicing.

⚡ : Beware of electric shock.

⚠ : Beware of hot surface.

⚡ ELV : At servicing, please shut down the power supply for both the Indoor and Outdoor Unit.

**Warning:**

Carefully read the labels affixed to the main unit.

- Have all electric work done by a licensed electrician according to local regulations.
- If the air conditioner is installed in a small room, measures must be taken to prevent the refrigerant concentration from exceeding the safety limit even if the refrigerant should leak.
- The cut face punched parts may cause injury by cut, etc. The installers are requested to wear protective equipment such as gloves, etc.

- Ground the unit.
- Install an leak circuit breaker, as required.
- Use power line cables of sufficient current carrying capacity and rating.
- Use only a circuit breaker and fuse of the specified capacity.
- Do not touch the switches with wet fingers.
- Do not touch the refrigerant pipes during and immediately after operation.
- Do not operate the air conditioner with the panels and guards removed.
- Do not turn off the power immediately after stopping operation.

### 2.1. Outline dimensions (Indoor unit) (Fig. 2-1)

Select a proper position allowing the following clearances for installation and maintenance.

Models	W	D	H	(mm)			
				A	B	C	E
P40	1000	680	221	Min. 270	Min. 300	Min. 500	Max. 250
P63	1310	680	221	Min. 270	Min. 300	Min. 500	Max. 250
P100	1310	680	281	Min. 270	Min. 300	Min. 500	Max. 250
P125	1620	680	281	Min. 270	Min. 300	Min. 500	Max. 250

**Warning:**

Mount the indoor unit on a ceiling strong enough to withstand the weight of the unit.

### 2.2. Outline dimensions (Outdoor unit)

Refer to the outdoor unit installation manual.

### 3.1. Check the indoor unit accessories (Fig. 3-1)

The indoor unit should be supplied with the following accessories (contained in the inside of the intake grille).

	Accessory name	Q'ty
①	Washer	4 pcs
②	Pipe cover	1 pc Large size (For gas tubing)
③	Pipe cover	1 pc Small size (For liquid tubing)
④	Band	4 pcs
⑤	Joint socket	1 pc Marked with “UNIT”
⑥	Socket cover	1 pc
⑦	Drain tubing cover	1 pc
⑧	Flare nut 3/4 F P100/P125	1 pc

### 3. Installing the indoor unit

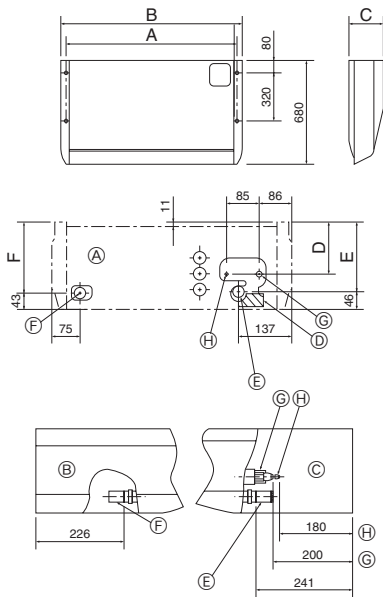


Fig. 3-2

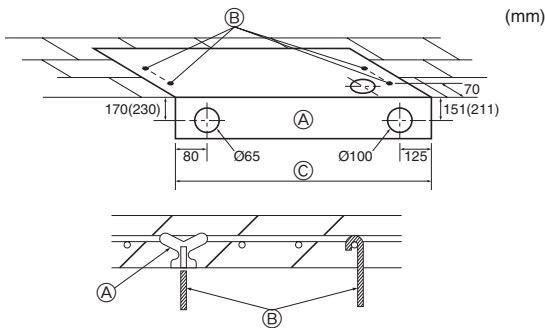


Fig. 3-3

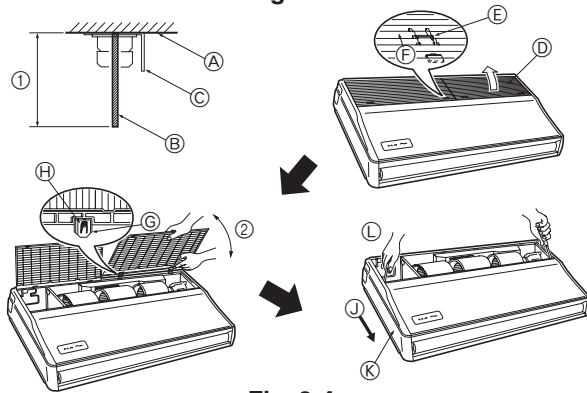


Fig. 3-4

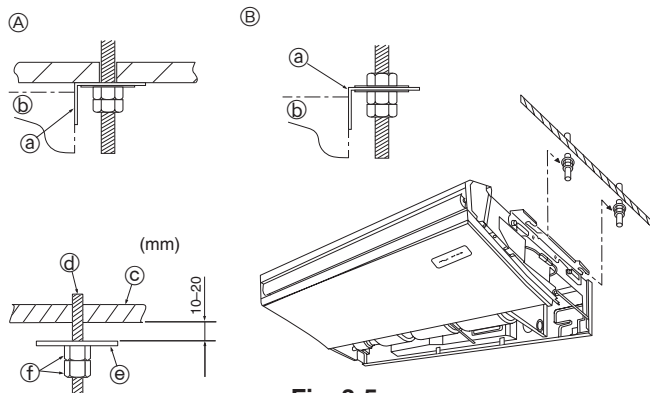


Fig. 3-5

### 3.2. Preparation for installation (Fig. 3-2)

#### 3.2.1. Suspension bolt installing spacing

Models	A	B	C
P40	933	1000	221
P63	1240	1310	221
P100	1240	1310	281
P125	1547	1620	281

#### 3.2.2. Refrigerant and drain tubing location

Models	D	E	F	G	H	J	K	L
P40, P63	131	175	178	90	82	159	156	90
P100, 125	191	235	238	150	142	219	216	150

- Ⓐ Front side outlet
- Ⓑ Left side outlet
- Ⓒ Right side outlet
- Ⓓ Independent piece (Removable)
- Ⓔ Right drain tubing
- Ⓕ Left drain tubing
- Ⓖ Gas tubing
- Ⓗ Liquid tubing

#### 3.2.3. Selection of suspension bolts and tubing positions (Fig. 3-3)

Using the pattern paper provided for installation, select proper positions for suspension bolts and tubing and prepare relative holes.

- Ⓐ Pattern paper
- Ⓑ Suspension bolt hole
- Ⓒ Indoor unit width

Secure the suspension bolts or use angle stock braces or square timbers for bolt installation.

- Ⓐ Use inserts of 100 kg to 150 kg each.
- Ⓑ Use suspension bolts of W3/8 or M10 in size.

#### 3.2.4. Indoor unit preparation (Fig. 3-4)

1. Install the suspending bolts. (Procure the W3/8 or M10 bolts locally.)

Predetermine the length from the ceiling (① within 100 mm).

- Ⓐ Ceiling surface
- Ⓑ Suspending bolt
- Ⓒ Suspending bracket

2. Remove the intake grille.

Slide the intake grille holding knobs (at two locations) backward to open the intake grille.

3. Remove the side panel.

Remove the side panel holding screws (one in each side, right and left) then slide the side panel forward for removal.

- Ⓓ Intake grille
- Ⓔ Slide the side panel forward.
- Ⓕ Intake grille holding knob
- Ⓖ Side panel
- Ⓖ Slide
- Ⓗ Remove the side panel holding screws.
- Ⓖ Hinge

Ⓗ Pushing the hinge, pull out the intake grille.

② Forcing open the intake grille or opening it to an angle of more than 120° may damage the hinges.

### 3.3. Installing the indoor unit (Fig. 3-5)

Use a proper suspending method depending on the presence or absence of ceiling materials as follows.

In the absence of ceiling materials

- Ⓐ In the presence of ceiling materials
- Ⓑ In the case of unit suspension (in the absence of ceiling materials)
- Ⓐ Ceiling
- Ⓓ Suspending bolt
- Ⓖ Washer
- Ⓐ Suspending bracket
- Ⓕ Unit
- Ⓕ Double nuts

#### 1) Directly suspending the unit

Installing procedures

1. Install the washer ① (supplied with the unit) and the nuts (to be locally procured).

2. Set (hook) the unit through the suspending bolts.

3. Tighten the nuts.

Check the unit installing condition.

• Check that the unit is horizontal between the right and left sides.

• Check that the unit slopes continuously downward from the front to the rear.

### 3. Installing the indoor unit

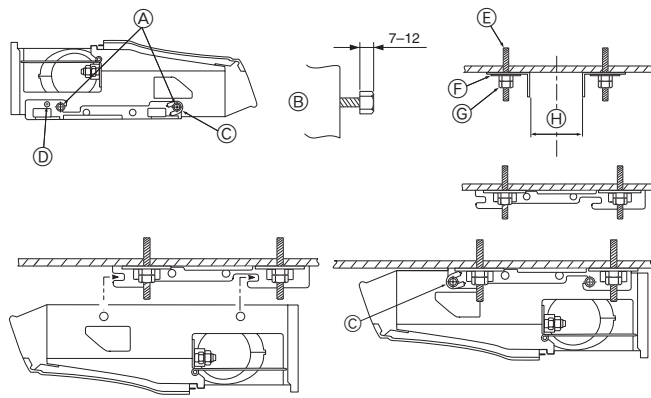


Fig. 3-6

When embedding pipes, into the wall (Fig. 3-6)

#### 2) Installing the suspending bracket first onto the ceiling

Installing procedures

1. Remove the suspending brackets, U-shaped washers, and suspending bracket holding screws from the unit.
2. Adjust the suspending bracket holding bolts on the unit.
3. Attach the suspending brackets to the suspending bolts.
4. Set (hook) the unit to the suspending brackets.

\* Be sure to install the U-shaped washers.

- Ⓐ Bolt
- Ⓑ Unit
- Ⓒ Washer
- Ⓓ Suspending bracket holding screw
- Ⓔ Bolt
- Ⓕ Washer ①
- Ⓖ Double nuts

(mm)

Ⓔ	P40	900 - 905
	P63, P100	1207 - 1212
	P125	1514 - 1519

### 4. Installing the refrigerant piping

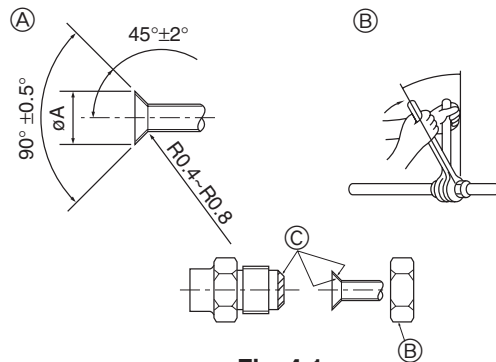


Fig. 4-1

#### 4.1. 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.
- Use two wrenches to tighten piping connections.
- Use refrigerant piping insulation provided to insulate indoor unit connections. Insulate carefully.

Ⓐ Flare cutting dimensions

Copper pipe O.D. (mm)	Flare dimensions øA dimensions (mm)
ø6.35	8.7 - 9.1
ø9.52	12.8 - 13.2
ø12.7	16.2 - 16.6
ø15.88	19.3 - 19.7
ø19.05	22.9 - 23.3

Ⓑ Refrigerant pipe sizes & Flare nut tightening torque

	R407C or R22				R410A				Flare nut O.D.	
	Liquid pipe		Gas pipe		Liquid pipe		Gas pipe		Liquid pipe (mm)	Gas pipe (mm)
	Pipe size (mm)	Tightening torque (N.m)	Pipe size (mm)	Tightening torque (N.m)	Pipe size (mm)	Tightening torque (N.m)	Pipe size (mm)	Tightening torque (N.m)		
P20/25/32/40	ODø6.35 (1/4")	14 - 18	ODø12.7 (1/2")	49 - 61	ODø6.35 (1/4")	14 - 18	ODø12.7 (1/2")	49 - 61	17	26
P50	ODø9.52 (3/8")	34 - 42*	ODø15.88 (5/8")	68 - 82*	ODø6.35 (1/4")	34 - 42	ODø12.7 (1/2")	68 - 82	22	29
P63/80	ODø9.52 (3/8")	34 - 42	ODø15.88 (5/8")	68 - 82	ODø9.52 (3/8")	34 - 42	ODø15.88 (5/8")	68 - 82	22	29
P100/125	ODø9.52 (3/8")	34 - 42	ODø19.05 (3/4")	100 - 120*	ODø9.52 (3/8")	34 - 42	ODø15.88 (5/8")	100 - 120	22	36

\* Use the provided flare nut for the following pipes: Liquid pipe of P50, P100, P125, and gas pipe of P50.

Ⓒ Apply refrigerating machine oil over the entire flare seat surface.

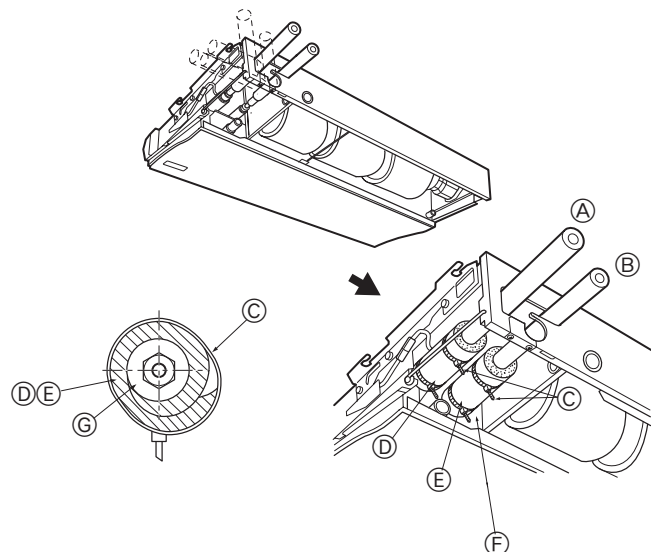


Fig. 4-2

#### 4.2. Indoor unit (Fig. 4-2)

Installing procedures

1. Slide the supplied pipe cover ② over the gas tubing until it is pressed against the sheet metal inside the unit.
2. Slide the provided pipe cover ③ over the liquid tubing until it is pressed against the sheet metal inside the unit.
3. Tighten the pipe covers ② and ③ at the both ends (15 - 20 mm) with the supplied bands ④.

- Ⓐ Gas tubing
- Ⓑ Liquid tubing
- Ⓒ Band ④
- Ⓓ Pipe cover ②
- Ⓔ Pipe cover ③
- Ⓕ Press the pipe cover against the sheet metal.
- Ⓖ Refrigerant tubing heat insulating material

## 5. Drainage piping work

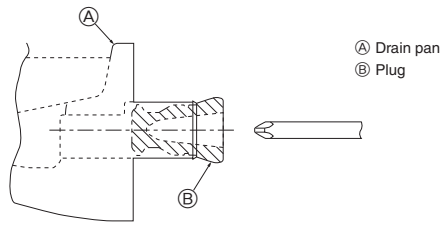


Fig. 5-1

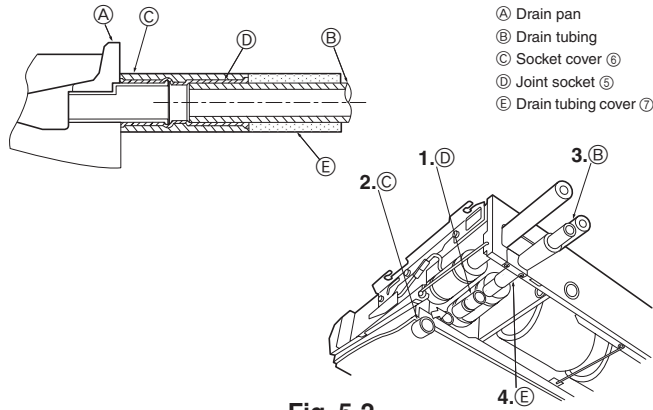


Fig. 5-2

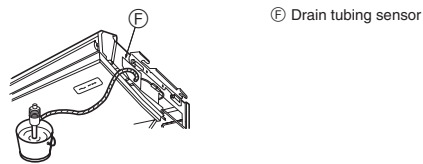


Fig. 5-3

- For left side tubing, be sure to insert the rubber plug into the right drain port. (Fig. 5-1)
- Use VP-20 (O.D.  $\phi 26$  (1") PVC TUBE) for drain piping and provide 1/100 or more downward slope.
- After completion of work, check that correct drain is available from the outflow port of the drain tubing.

### Installing procedures (Fig. 5-2)

1. Attach the joint socket ⑤ supplied with the unit to the drain port on the unit with a vinyl chloride adhesive.
2. Fasten the socket cover ⑥ supplied with the unit to the joint socket ⑤.
3. Attach the field drain tubing (VP-20) to the joint socket ⑤ with a vinyl chloride adhesive.
4. Wrap the drain tubing cover ⑦ supplied with the unit. (Seam taping)

5. Check for correct drainage. (Fig. 5-3)

\* Fill the drain pan with water of about 1 L from the tubing sensor access port.  
\* After checking for correct drainage, replace the tubing sensor access port cover.

## 6. Electrical work

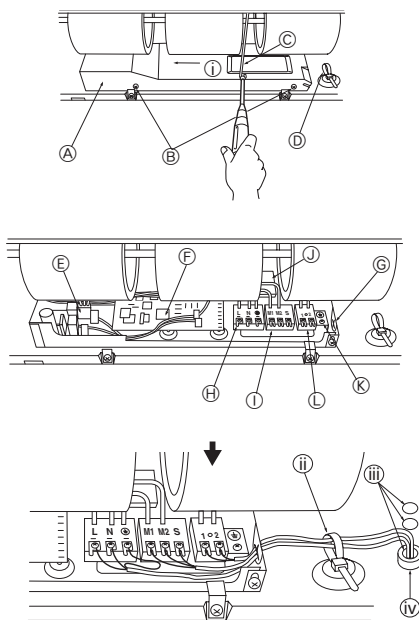


Fig. 6-1

### 6.1. Electric wiring (Fig. 6-1)

#### Wiring procedures

1. Remove the (two) tapping screws ② then remove the electric part cover ①.
2. Connect the electric wires securely to the corresponding terminals.
3. Replace the removed parts.
4. Tie the electric wires with the local wiring clamp located in the right side of the junction box.

A means for the disconnection of the supply with an isolation switch, or similar device, in all active conductors shall be incorporated in the fixed wiring.  
\* Label each breaker according to purpose (heater, unit etc.)

#### Power supply wiring

- Power supply codes of appliance shall not be lighter than design 245 IEC 53 or 227 IEC 53.
  - A switch with at least 3 mm contact separation in each pole shall be provided by the air conditioner installation.
- Power cable size: more than 1.5 mm<sup>2</sup>.
- Install an earth longer and thicker than other cables.

- |                                   |   |
|-----------------------------------|---|
| ① Cover                           | ① Terminal block for transmission cable   |
| ② Set screws (2 pcs)              | ② Address board                           |
| ③ Beam                            | ③ Grounding cable connector               |
| ④ Wiring clamp                    | ④ Terminal block for MA Remote controller |
| ⑤ Power board                     | ⑤ Slide leftward.                         |
| ⑥ Control board                   | ⑥ Secure with the wiring clamp.           |
| ⑦ Wire service entrance           | ⑦ Knockout hole ( $\phi 27$ )             |
| ⑧ Terminal block for power supply | ⑧ Bush (To be locally procured)           |
|                                   | ⑨ ii                                      |
|                                   | ⑩ iii                                     |
|                                   | ⑪ iv                                      |

## 6. Electrical work

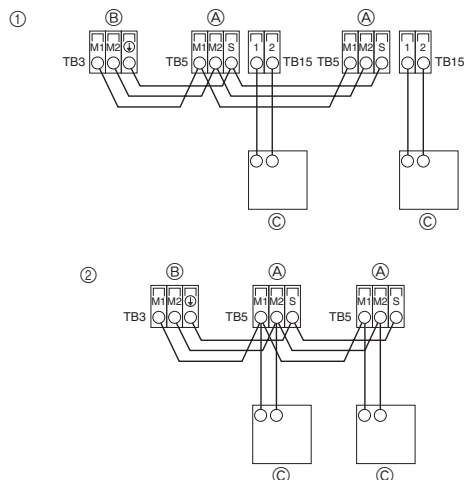


Fig. 6-2

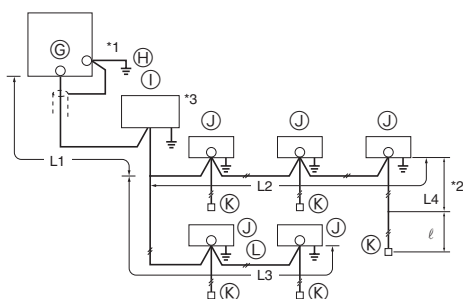


Fig. 6-3

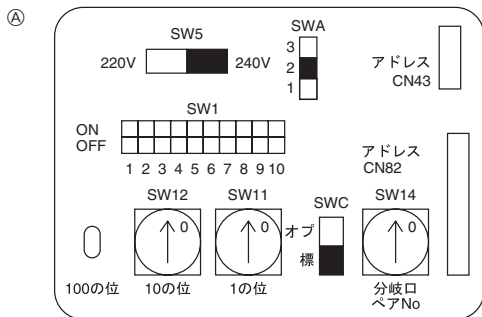


Fig. 6-4

### 6.2. Connecting remote controller, indoor and outdoor transmission cables (Fig. 6-2)

- Connect indoor unit TB5 and outdoor unit TB3. (Non-polarized 2-wire)  
The "S" on indoor unit TB5 is a shielding wire connection. For specifications about the connecting cables, refer to the outdoor unit installation manual.
  - Install a remote controller following the manual supplied with the remote controller.
  - Connect the remote controller's transmission cable within 10 m using a 0.75 mm<sup>2</sup> core cable. If the distance is more than 10 m, use a 1.25 mm<sup>2</sup> junction cable.
- ① MA Remote controller
- Connect the "1" and "2" on indoor unit TB15 to a MA remote controller. (Non-polarized 2-wire)
  - DC 9 to 13 V between 1 and 2 (MA remote controller)
- ② M-NET Remote controller
- Connect the "M1" and "M2" on indoor unit TB5 to a M-NET remote controller. (Non-polarized 2-wire)
  - DC 24 to 30 V between M1 and M2 (M-NET remote controller)
- Ⓐ Terminal block for indoor transmission cable  
Ⓑ Terminal block for outdoor transmission cable  
Ⓒ Remote controller

### Constraints on transmission cable (Fig. 6-3)

Longest wiring length (L1+L2+L4 or L1+L3 or L2+L3+L4): less than 200 m  
Length between indoor unit and remote controller (ℓ): within 10 m

- Ⓒ Outdoor unit
- Ⓓ Earth
- Ⓔ BC controller
- Ⓕ Indoor unit
- Ⓖ M-NET Remote controller
- Ⓗ Non-polarized 2-wire

#### Note:

- \*1 Put the transmission cable earth via the outdoor unit's earth terminal ⊕ to the ground.
- \*2 If the remote controller cable exceeds 10 m, use a 1.25 mm<sup>2</sup> diameter cable over the exceeded portion, and add that exceeded portion to within 200 m.
- \*3 The BC controller is required only for simultaneous cooling and heating series R2.

### 6.3. Setting addresses (Fig. 6-4)

(Be sure to operate with the main power turned OFF.)

- There are two types of rotary switch setting available: setting addresses 1 to 9 and over 10, and setting branch numbers.

#### Note:

- Please set the switch SW5 according to the power supply voltage.
- Set SW5 to 240 V side when the power supply is 230 and 240 volts.
- When the power supply is 220 volts, set SW5 to 220 V side.

- Ⓐ Address board

### 6.4. Switch setting for different ceiling heights

With this unit, the air flow rate and fan speed can be adjusted by setting the SWA (slide switch). Select a suitable setting from the table below according to the installation location.

- \* Make sure the SWA switch is set, otherwise problems such as no wind blowing will occur.

Ceiling Height	3.5 m	2.8 m	2.3 m
SWA	3 (high ceiling)	2 (standard)	1 (low ceiling)

SWA: Factory setting: 2 (Standard)

### 6.5. Types of control cables

#### 1. Wiring transmission cables: Shielding wire CVVS or CPEVS

- Cable diameter: More than 1.25 mm<sup>2</sup>

#### 2. M-NET Remote control cables

Kind of remote control cable	Shielding wire MVVS
Cable diameter	More than 0.5 to 1.25 mm <sup>2</sup>
Remarks	When 10 m is exceeded, use cable with the same specifications as transmission line wiring

#### 3. MA Remote control cables

Kind of remote control cable	2-core cable (unshielded)
Cable diameter	0.3 to 1.25 mm <sup>2</sup>

## 7. Test run (Fig. 7-1)

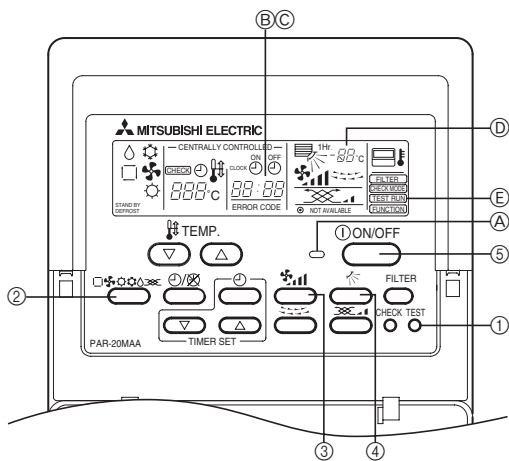


Fig. 7-1

- ① Press [TEST RUN] button twice → displaying [TEST RUN] on the screen.
  - ② Press [Selecting operation] button. → Check that wind is blowing out.
  - ③ Press [Fan speed adjustment] button. → Check that the wind speed is changed.
  - ④ Press [Up/down airflow selection] button to change wind direction.
  - ⑤ Press [ON/OFF] button to clear test run. → Test run stops.
- A Lighting in operation  
 B Displaying inspection code  
 C Displaying remaining test run time  
 D Displaying indoor unit's liquid pipe temperature  
 E Displaying test run

**Note:**

- The 2-hour-set timer is activated to automatically stop test run after two hours.
- The remote controller displays the temperature of the indoor unit's liquid pipe on the temperature display section during test run.

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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.