MITSUBISHI ELECTRIC

CITY MULTI

Air-Conditioners For Building Application
Indoor unit

PCFY-MS40VKM2-E **PCFY-MS40VKM2-ET**
PCFY-MS63VKM2-E **PCFY-MS63VKM2-ET**
PCFY-MS100VKM2-E **PCFY-MS100VKM2-ET**
PCFY-MS125VKM2-E **PCFY-MS125VKM2-ET**

For use with the R410A/R32

English is original.

INSTALLATION MANUAL

FOR INSTALLER

English

Manual and DECLARATION OF CONFORMITY Download

http://www.mitsubishielectric.com/ldg/ibim/

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fr Rendez-vous sur le site Web ci-dessus pour télécharger les manuels et les DÉCLARATIONS DE CONFORMITÉ, sélectionnez le nom de modèle puis choisissez la langue.

nl Ga naar de bovenstaande website om handleidingen en CONFORMITEITSVERKLARINGEN te downloaden, de modelnaam te selecteren en vervolgens de taal te kiezen.

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it Andare sul sito web indicato sopra per scaricare i manuali e le DICHIARAZIONI DI CONFORMITÀ, selezionare il nome del modello e scegliere la lingua.

el Μεταβείτε στον παραπάνω ιστότοπο για να κατεβάσετε εγχειρίδια και τις ΔΗΛΩΣΕΙΣ ΣΥΜΜΟΡΦΩΣΗΣ. Επιλέξτε το όνομα του μοντέλου και, στη συνέχεια, τη γλώσσα.

pt Aceda ao site Web acima indicado para descarregar manuais e DECLARAÇÕES DE CONFORMIDADE, seleccione o nome do modelo e, em seguida, escolha o idioma.

da Gå til ovenstående websted for at downloade manualer og OVERENSSTEMMELSESERKLÆRINGER, vælg modelnavn, og vælg derefter sprog.

sv Gå till ovanstående webbplats för att ladda ner anvisningar och FÖRSÄKRINGAR OM ÖVERENSSTÄMMELSE, välj modellnamn och välj sedan språk.

tr Kılavuzları ve UYGUNLUK BEYANLARINI indirmek için yukarıdaki web sitesine gidin, model adını ve ardından dili seçin.

ru Чтобы загрузить руководства и ДЕКЛАРАЦИЮ СООТВЕТСТВИЯ, перейдите на указанный выше веб-сайт; выберите название модели, а затем язык.

uk Щоб завантажити керівництва та ДЕКЛАРАЦІЇ ВІДПОВІДНОСТІ НОРМАМ, перейдіть на зазначений вище вебсайт; виберіть назву моделі, а потім мову.

bg Посетете горепосочения уебсайт, за да изтеглите ръководства и ДЕКЛАРАЦИИ ЗА СЪОТВЕТСТВИЕ, като изберете име на модел и след това – език.

pl Odwiedź powyższą stronę internetową, aby pobrać instrukcje i DEKLARACJE ZGODNOŚCI, wybierz nazwę modelu, a następnie język.

no Gå til nettstedet over for å laste ned håndbøker og SAMSVARSERKLÆRINGER, velg modellnavn, og velg deretter språk.

fi Mene yllä mainitulle verkkosivulle ladataksesi oppaat ja VAATIMUSTENMUKAISUUSVAKUUTUKSET, valitse mallin nimi ja valitse sitten kieli.

cs Příručky a PROHLÁŠENÍ O SHODĚ naleznete ke stažení na internetové stránce zmíněné výše poté, co zvolíte model a jazyk.

sk Na webovej stránke vyššie si môžete stiahnuť návody a VYHLÁSENIA O ZHODE. Vyberte názov modelu a zvoľte požadovaný jazyk.

hu A kézikönyvek és a MEGFELELŐSÉGI NYILATKOZATOK letöltéséhez látogasson el a fenti weboldalra, válassza ki a modell nevét, majd válasszon nyelvet.

sl Obiščite zgornjo spletno stran za prenos priročnikov in IZJAV O SKLADNOSTI, izberite ime modela, nato izberite jezik.

ro Accesaţi site-ul web de mai sus pentru a descărca manualele și DECLARAȚIILE DE CONFORMITATE, selectaţi denumirea modelului, apoi alegeţi limba.

et Kasutusjuhendite ja VASTAVUSDEKLARATSIOONIDE allalaadimiseks minge ülaltoodud veebilehele, valige mudeli nimi ja seejärel keel.

lv Dodieties uz iepriekš norādīto tīmekļa vietni, lai lejupielādētu rokasgrāmatas un ATBILSTĪBAS DEKLARĀCIJAS; tad izvēlieties modeļa nosaukumu un valodu.

lt Norėdami atsisiųsti vadovus ir ATITIKTIES DEKLARACIJAS, apsilankykite pirmiau nurodytoje žiniatinklio svetainėje, pasirinkite modelio pavadinimą, tada – kalbą.

hr Kako biste preuzeli priručnike i IZJAVE O SUKLADNOSTI, idite na gore navedeno web-mjesto, odaberite naziv modela, a potom odaberite jezik.

sr Idite na gore navedenu veb stranicu da biste preuzeli uputstva i IZJAVE O USAGLAŠENOSTI, izaberite ime modela, a zatim izaberite jezik.

Contents

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

Note:
The phrase "Wired remote controller" in this installation manual refers only to the PAR-42MAAB.
If you need any information for the other remote controller, please refer to either the installation manual or initial setting manual which are included in these boxes.

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.**

MEANINGS OF SYMBOLS DISPLAYED ON THE UNIT

	**WARNING** (Risk of fire)	This mark is for R32 refrigerant only. Refrigerant type is written on nameplate of outdoor unit. In case that refrigerant type is R32, this unit uses a flammable refrigerant. If refrigerant leaks and comes in contact with fire or heating part, it will create harmful gas and there is risk of fire.
	Read the OPERATION MANUAL carefully before operation.	
	Service personnel are required to carefully read the OPERATION MANUAL and INSTALLATION MANUAL before operation.	
	Further information is available in the OPERATION MANUAL, INSTALLATION MANUAL, and the like.	

Symbols used in the text

⚠ 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.

Symbols used in the illustrations

⃠ : Indicates an action that must be avoided.
⏚ : Indicates a part which must be grounded.

⚠ Warning:

- **Carefully read the labels affixed to the main unit.**
- **Ask a dealer or an authorized technician to install, relocate and repair the unit.**
- **The user should never attempt to repair the unit or transfer it to another location.**
- **Do not alter the unit. It may cause fire, electric shock, injury or water leakage.**
- **For installation and relocation work, follow the instructions in the Installation Manual and use tools and pipe components specifically made for use with refrigerant specified in the outdoor unit installation manual.**
- **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.**
- **The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.**
- **If the air conditioner is installed in a small room or closed room, measures must be taken to prevent the refrigerant concentration in the room from exceeding the safety limit in the event of refrigerant leakage. Should the refrigerant leak and cause the concentration limit to be exceeded, hazards due to lack of oxygen in the room may result.**
- **Keep gas-burning appliances, electric heaters, and other fire sources (ignition sources) away from the location where installation, repair, and other air conditioner work will be performed.**
  If refrigerant comes into contact with a flame, poisonous gases will be released.
- **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.**
- **Use only specified cables for wiring. The wiring connections must be made securely with no tension applied on the terminal connections. Also, never splice the cables for wiring (unless otherwise indicated in this document). Failure to observe these instructions may result in overheating or a fire.**
- **Do not use intermediate connection of the electric wires.**
- **When installing or relocating, or servicing the air conditioner, use only the specified refrigerant written on outdoor unit to charge the refrigerant lines. Do not mix it with any other refrigerant and do not allow air to remain in the lines.**
  If air is mixed with the refrigerant, then it can be the cause of abnormal high pressure in the refrigerant line, and may result in an explosion and other hazards.
  The use of any refrigerant other than that specified for the system will cause mechanical failure or system malfunction or unit breakdown. In the worst case, this could lead to a serious impediment to securing product safety.
- **The appliance shall be installed in accordance with national wiring regulations.**
- **This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.**

1. Safety precautions

- Children should be supervised to ensure that they do not play with the air conditioner.
- The electrical box cover panel of the unit must be firmly attached.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- Use only accessories authorized by Mitsubishi Electric and ask a dealer or an authorized technician to install them.
- 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.
- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).
- Do not pierce or burn.
- Be aware that refrigerants may not contain an odour.
- Pipe-work shall be protected from physical damage.
- The installation of pipe-work shall be kept to a minimum.
- Compliance with national gas regulations shall be observed.
- Keep any required ventilation openings clear of obstruction.
- Do not use low temperature solder alloy in case of brazing the refrigerant pipes.
- When performing brazing work, be sure to ventilate the room sufficiently.
  Make sure that there are no hazardous or flammable materials nearby.
  When performing the work in a closed room, small room, or similar location, make sure that there are no refrigerant leaks before performing the work.
  If refrigerant leaks and accumulates, it may ignite or poisonous gases may be released.
- Do not touch the heat exchanger fins.
- Do not turn the breaker OFF except the case of burning smell, or when performing maintenance or inspection.
  The power cannot be supplied to the refrigerant sensor mounted in the indoor unit, and the sensor cannot detect the refrigerant leakage. This may cause a fire.
- Make sure that there are no operating ignition sources (example: open flames, an operating gas appliance or an operating electric heater) in case the floor area is less than the minimum floor area.
- Maintenance, service and repair operations shall be performed by authorized technician with required qualification.
- Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work.
  A degree of ventilation shall continue during the period that the work is carried out.
  The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.
- Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects.
  The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.
- Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.
- Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity may not be adequate, or may need re-calibration.
  (Detection equipment shall be calibrated in a refrigerant-free area.)
  Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used.
  Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 % maximum) is confirmed.
  Leak detection fluids are suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.
  If a leak is suspected, all naked flames shall be removed/extinguished.
  If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak.
  For appliances containing flammable refrigerants, oxygen free nitrogen (OFN) shall then be purged through the system both before and during the brazing process.
- Brazed, welded, or mechanical flare connections shall be accessible for maintenance purposes.

1.1. Before installation (Environment)

⚠ 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, 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.
- Do not keep food, plants, caged pets, artwork, or precision instruments in the direct airflow of the indoor unit or too close to the unit, as these items can be damaged by temperature changes or dripping water.
- When the room humidity exceeds 80% or when the drainpipe is clogged, water may drip from the indoor unit. Do not install the indoor unit where such dripping can 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.
- Do not install the unit in a place where smoke, gas, or chemicals may fill. The refrigerant sensor mounted in the indoor unit may react to it, and display an error of refrigerant leakage.
- Avoid installation in an environment where gas equipment such as propane, butane, or methane, sprays such as insecticides, equipment that generates smoke, paints, or chemicals are used, or where sulfur gas is generated. The refrigerant sensor inside the indoor unit will detect it and display a refrigerant leakage error, which may disable operation.

1.2. Before installation or 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 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 refrigerant pipe is necessary to prevent condensation. If the refrigerant pipe is not properly insulated, condensation will be formed.
- 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.
- 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.

1. Safety precautions

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.**
- **Be sure to ground the unit. 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.**
- **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 during and immediately after operation.**
- **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

For minimum installation area, refer to the outdoor unit installation manual.

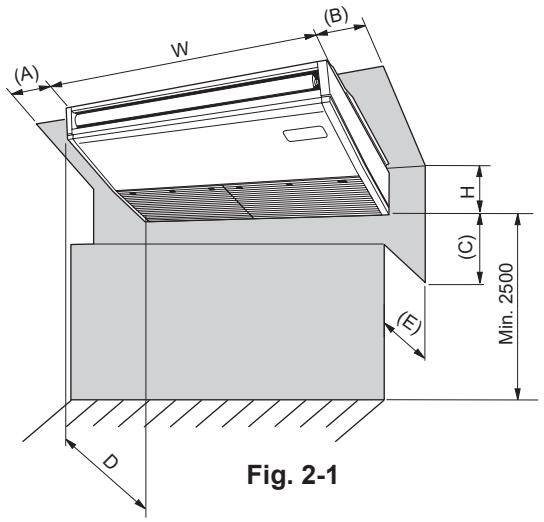


Fig. 2-1

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

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

Models	W	D	H	(A)	(B)	(C)	(E)
MS40	960	680	230	Min. 270	Min. 300	Min. 500	Max. 250
MS63	1280	680	230	Min. 270	Min. 300	Min. 500	Max. 250
MS100	1600	680	230	Min. 270	Min. 300	Min. 500	Max. 250
MS125	1600	680	230	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.**
- **Do not install the unit in a place where smoke, gas, or chemicals may fill. The refrigerant sensor mounted in the indoor unit may react to it, and display an error of refrigerant leakage.**

2.2. Outline dimensions (Outdoor unit)

Refer to the outdoor unit installation manual.

3. Installing the indoor unit

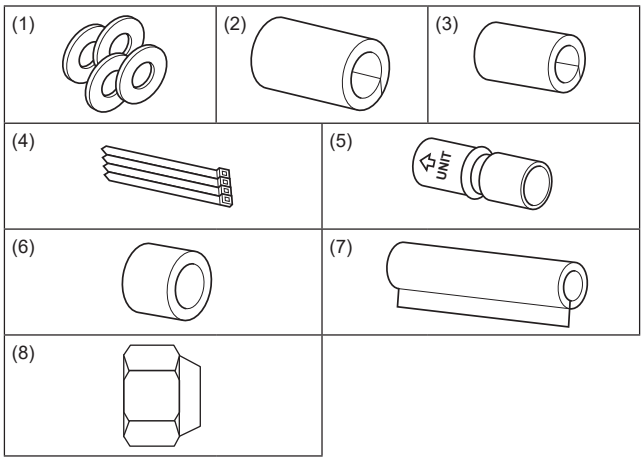


Fig. 3-1

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
(2)	Pipe cover (Large size) *For gas tubing	1
(3)	Pipe cover (Small size) *For liquid tubing	1
(4)	Band	4
(5)	Joint socket (Marked with "UNIT")	1
(6)	Socket cover	1
(7)	Drain tubing cover	1
(8)	Flare nut (ø6.35) *M63 only	1

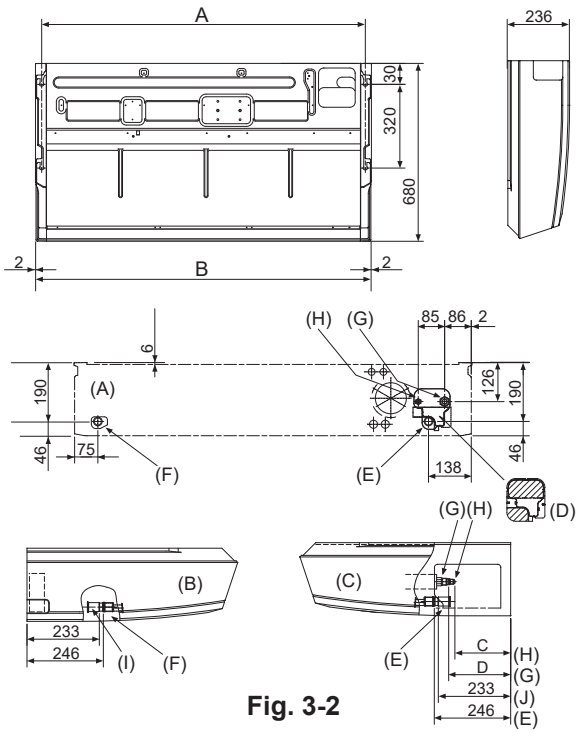


Fig. 3-2

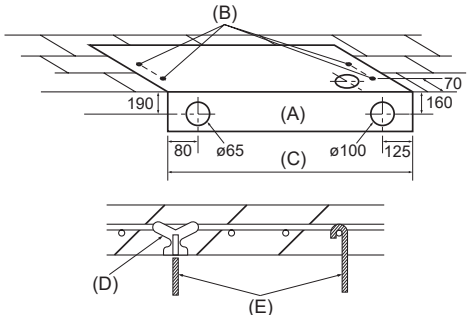


Fig. 3-3

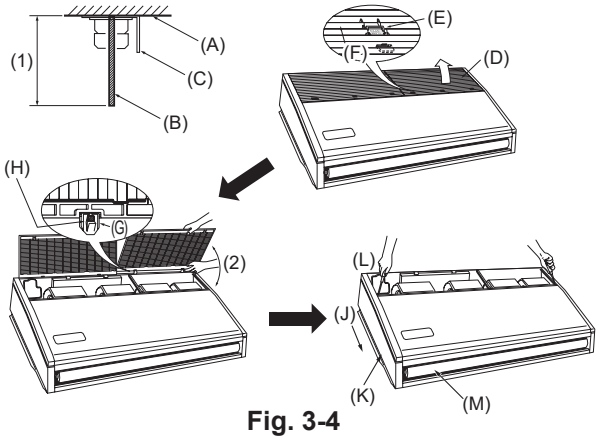


Fig. 3-4

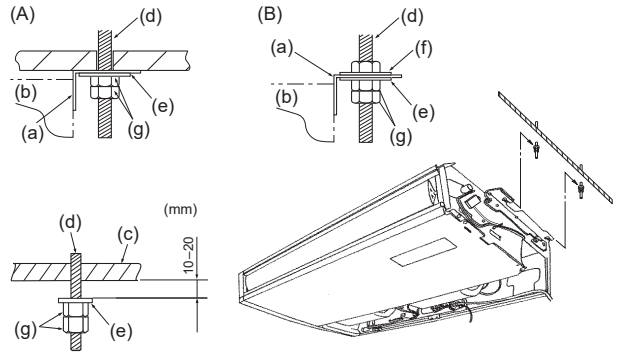


Fig. 3-5

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

3.2.1. Suspension bolt installing spacing

(mm)

Models	A	B
MS40	917	960
MS63	1237	1280
MS100,125	1557	1600

3.2.2. Refrigerant and drain tubing location

(mm)

Models	C	D
MS40	184	203
MS63	180	200
MS100,125	180	200

(A) Front side outlet
(B) Left side outlet
(C) Right side outlet
(D) Independent piece (Removable)
(E) Right drain tubing
(F) Left drain tubing
(G) Gas tubing
(H) Liquid tubing
(I) Rubber plug
(J) with Joint socket (5)

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.

(A) Pattern paper
(B) Suspension bolt hole
(C) Indoor unit width

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

(D) Use inserts of 100 kg to 150 kg each.
(E) 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).
   (A) Ceiling surface (B) Suspending bolt (C) Suspending bracket
2. Remove the intake grille.
   Slide the intake grille holding knobs (at 2 or 3 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.

(D) Intake grille
(E) Intake grille holding knob
(F) Slide
(G) Hinge
(H) Pushing the hinge, pull out the intake grille.
(J) Slide the side panel forward.
(K) Side panel
(L) Remove the side panel holding screws.
(M) Remove the protective vinyl of vane.
(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.

(A) In the presence of ceiling materials
(B) In the absence of ceiling materials
(a) Suspending bracket
(b) Unit
(c) Ceiling
(d) Suspending bolt
(e) Washer (1)
(f) Washer (Local procurement)
(g) 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 front and the rear of suspending brackets are horizontal.
  (To keep drainage,the unit is inclined to the suspending brackets. The unit slopes continuously downward from the front to the rear is the right installation position.)

3. Installing the indoor unit

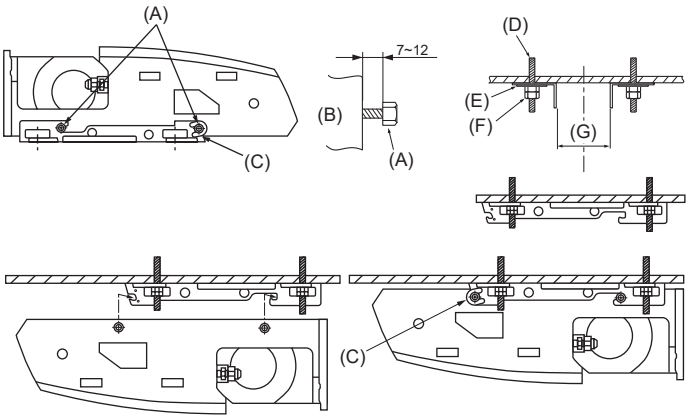


Fig. 3-6

2) Installing the suspending bracket first onto the ceiling (Fig. 3-6)

Installing procedures

1. Remove the suspending brackets and U-shaped washers from the unit.
2. Adjust the suspending bracket holding bolts on the unit.
3. Attach the suspending brackets to the suspending bolts.
4. Check that the suspending brackets are horizontal (front and rear/right and left).
5. Set (hook) the unit to the suspending brackets.
6. Tighten fixed bolts of the suspending brackets.

* Be sure to install the U-shaped washers.

(A) Suspending bracket holding bolt
(B) Unit
(C) U-shaped washer
(D) Suspending bolt
(E) Washer (1)
(F) Double nuts

(mm)

(G)	MS40	882 - 887
	MS63	1202 - 1207
	MS100, MS125	1522 - 1527

en

4. Installing the refrigerant piping

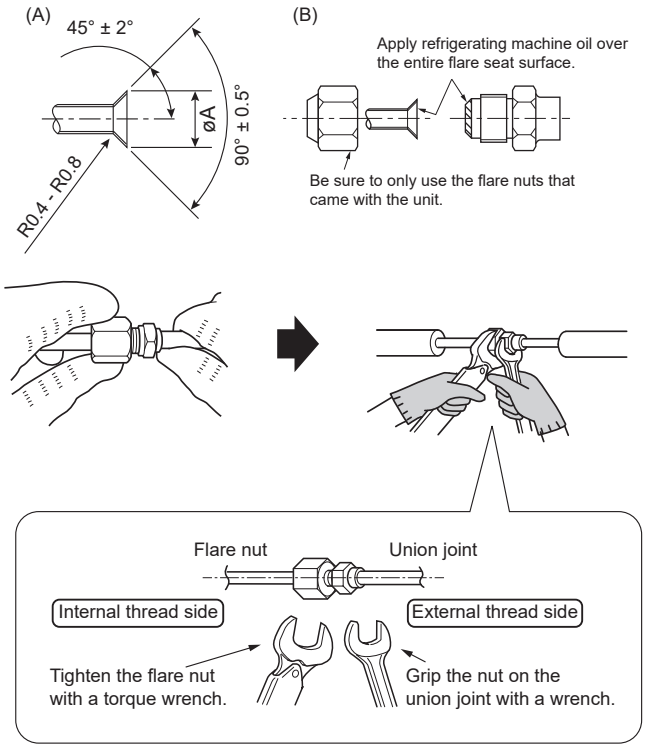


Fig. 4-1

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 2 wrenches to tighten piping connections.
- Use leak detector or soapy water to check for gas leaks after connections are completed.
- Use refrigerant piping insulation provided to insulate indoor unit connections. Insulate carefully.
- Use correct flare nuts meeting the pipe size of the outdoor unit.
- After connecting the refrigerant piping to the indoor unit, be sure to test the pipe connections for gas leakage with nitrogen gas. (Check that there is no refrigerant leakage from the refrigerant piping to the indoor unit.)
- Use flared nut installed to this indoor unit.
- In case of reconnecting the refrigerant pipes after detaching, make the flared part of pipe re-fabricated.
- Apply refrigerating machine oil over the entire flare seat surface.
  Do not apply refrigerating machine oil to the screw portions.
  (This will make the flare nuts more apt to loosen.)
- Field-made refrigerant joints indoors shall be tightness tested. The test method shall have a sensitivity of 5 grams per year of refrigerant or better under a pressure of at least 0.25 times the maximum allowable pressure. No leak shall be detected.

⚠ Warning:

- **Provision shall be made for expansion and contraction of long runs of piping.**
- **When installing the unit, securely connect the refrigerant pipes before starting the compressor.**

⚠ Caution:

To reduce the risk of failures of the compressor or valves, follow the instructions below to prevent abrasive components contained in sandpaper or cutting tools from entering the refrigerant circuit.

- To deburr pipes, use a reamer or other deburring tools, not sandpaper or sanding tools that use abrasive materials.
- To cut pipes, use a pipe cutter, not a grinder or other tools that use abrasive materials.
- When cutting or deburring pipes, do not allow cutting chips or other foreign matters to enter the pipes.
- If cutting chips or other foreign matters entered pipes, wipe inside the pipes to remove them.

(A) 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

(B) Refrigerant pipe sizes & Flare nut tightening torque

	R32				Flare nut O.D.	
	Liquid pipe		Gas pipe			
	Pipe size (mm)	Tightening torque (N·m)	Pipe size (mm)	Tightening torque (N·m)	Liquid pipe (mm)	Gas pipe (mm)
MS40	ODø6.35 (1/4”)	14 - 18	ODø12.7 (1/2”)	49 - 61	17	26
MS63	ODø9.52 (3/8”)	34 - 42	ODø15.88 (5/8”)	68 - 82	22	29
MS100/125	ODø9.52 (3/8”)	34 - 42	ODø15.88 (5/8”)	68 - 82	22	29

Available pipe size

	MS40	MS63	MS100, 125
Liquid side	ø6.35 O	ø6.35	—
	—	ø9.52 O	ø9.52 O
Gas side	ø12.7 O	ø15.88 O	ø15.88 O

O : Factory flare nut attachment to the heat exchanger.

4. Installing the refrigerant piping

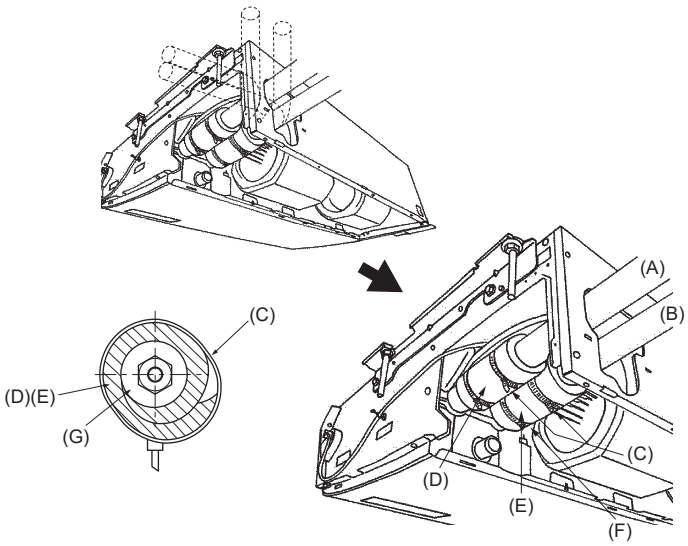


Fig. 4-2

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 thesheet 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 (20 mm) with the supplied bands (4).

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

en

5. Drainage piping work

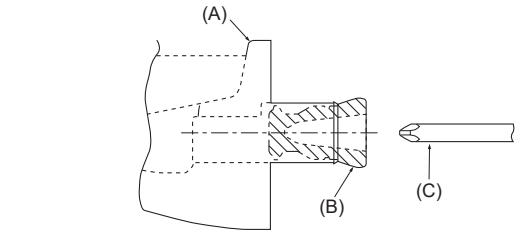


Fig. 5-1

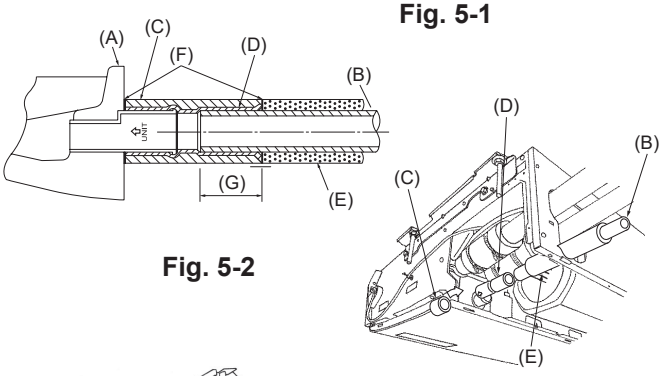


Fig. 5-2

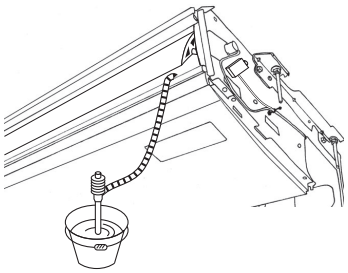


Fig. 5-3

- For left side tubing, be sure to insert the rubber plug into the right drain port. (Fig. 5-1)
- Use VP-20 (O.D. ø26 (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.

(A) Drain pan
(B) Plug
(C) Insert the driver etc.in the plug deeply.

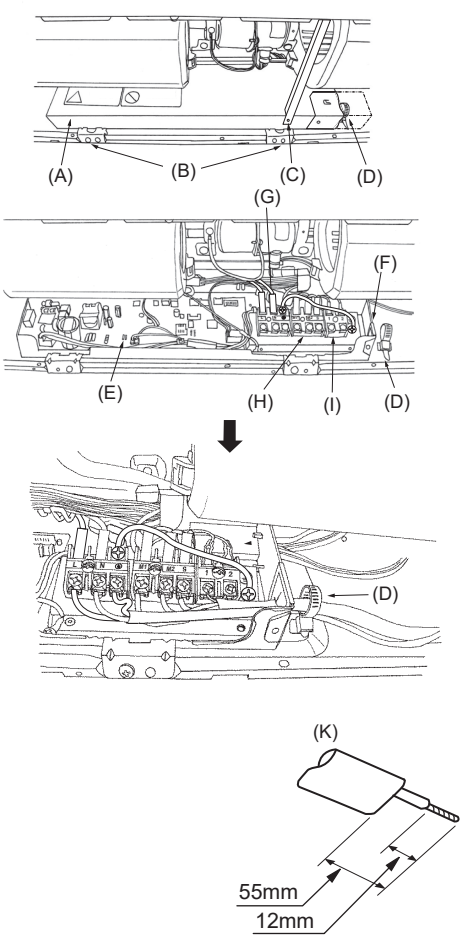
Installing procedures (Fig. 5-2)

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)

(A) Drain pan
(B) Drain tubing
(C) Socket cover (6)
(D) Joint socket (5)
(E) Drain tubing cover (7)
(F) Stopper
(G) Insertion length 37mm

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

* Fill the drain pan with water of about 1 L from the air outlet.



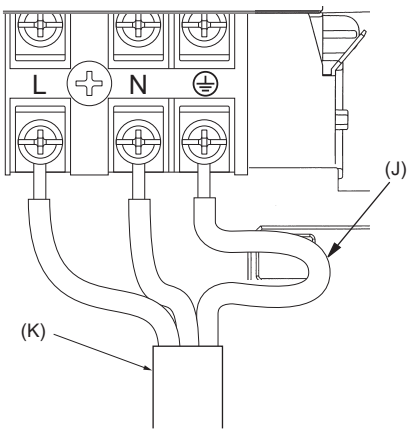


Fig. 6-1

6.1. Electric wiring (Fig. 6-1)

Wiring procedures

1. Remove the tapping screw (C) then remove the beam.
2. Remove two tapping screws (B) then remove the electric part cover (A).
3. Connect the electric wires securely to the corresponding terminals.
4. Replace the removed parts.
5. Tie the electric wires with the local wiring clamp (D) 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.)

(A) Cover
(B) Set screws (2 pcs)
(C) Set screws (Beam)
(D) Wiring clamp
(E) Control board
(F) Wire service entrance
(G) Terminal block for power supply
(H) Terminal block for transmission cable
(I) Terminal block for MA Remote controller
(J) Ground wire connection portion: Connect the ground wire in the direction illustrated in the diagram
(K) Power supply cable

⚠ Warning:

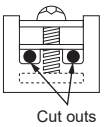
- **Never splice the power cable or the indoor-outdoor connection cable, otherwise it may result in a smoke, a fire or communication failure.**
- **Electrical components that can arc or spark, which are not considered ignition sources shall only be replaced with parts specified by the appliance manufacturer. Replacement with other parts may result in the ignition of refrigerant in the event of a leak.**

⚠ Caution:

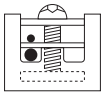
- **Wiring for remote controller cable and control (hereinafter referred to as transmission line) shall be (5 cm or more) apart from power source wiring so that it is not influenced by electric noise from power source wiring. (Do not insert transmission line and power source wire in the same conduit.)**
- **Be careful about the fan rotation when the breaker is ON.**
  When the refrigerant sensor detects the refrigerant leakage, the fan starts rotating automatically.
  This may cause injury.

<When wiring two indoor-outdoor connection cables>

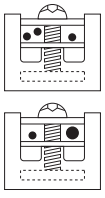
- If the cables have the same diameter, insert them into the cut outs on both sides.



- If the cables have different diameters, insert them on one side into separate spaces with one cable positioned above the other.



WARNING



- Connecting two wires on one side is prohibited.
- Connecting three wires or more to the same terminal is prohibited.
- Connecting wires with different diameters is prohibited.

When using a single cable, a round crimped terminal or other terminal work is prohibited.

6. Electrical work

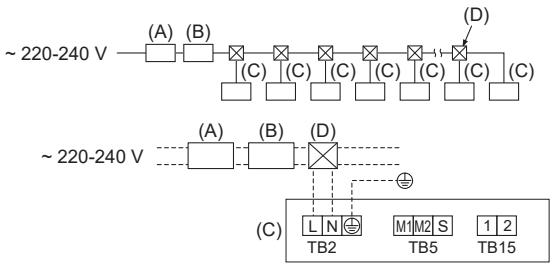


Fig. 6-2

6.2. Power supply wiring (Fig. 6-2)

- Wiring size must comply with the applicable local and national codes.
- Install an earth line longer than other cables. (Fig. 6-1)
- Power supply cable of appliance shall not be lighter than design 60245 IEC 53 or 60227 IEC 53, 60245 IEC57 or 60227 IEC57.
- A switch with at least 3 mm contact separation in each pole shall be provided by the air conditioner installation.

(A) Ground-fault interrupter
(B) Local switch/Wiring breaker
(C) Indoor unit
(D) Pull box

⚠ Warning:

Never splice the power cable or the indoor-outdoor connection cable, otherwise it may result in a smoke, a fire or communication failure.

- **Electrical components that can arc or spark, which are not considered ignition sources shall only be replaced with parts specified by the appliance manufacturer. Replacement with other parts may result in the ignition of refrigerant in the event of a leak.**

⚠ Caution:

Be careful about the fan rotation when the breaker is ON.
When the refrigerant sensor detects the refrigerant leakage, the fan starts rotating automatically.
This may cause injury.

en

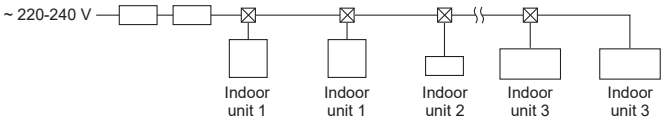
6. Electrical work

Total operating current of the indoor unit	Minimum wire thickness (mm²)			Ground-fault interrupter *1	Local switch (A)		Breaker for wiring (NFB)
	Main cable	Branch	Ground		Capacity	Fuse	
F0 = 16 A or less *2	1.5	1.5	1.5	20 A current sensitivity *3	16	16	20
F0 = 25 A or less *2	2.5	2.5	2.5	30 A current sensitivity *3	25	25	30
F0 = 32 A or less *2	4.0	4.0	4.0	40 A current sensitivity *3	32	32	40

Apply to IEC61000-3-3 about max. permissive system impedance.

*1 The Ground-fault interrupter should support inverter circuit.
The Ground-fault interrupter should combine using of local switch or wiring breaker.

*2 Please take the larger of F1 or F2 as the value for F0.
F1 = Total operating maximum current of the indoor units × 1.2
F2 = {V1 × (Quantity of indoor unit 1)/C} + {V1 × (Quantity of indoor unit 2)/C} + {V1 × (Quantity of indoor unit 3)/C} + ···

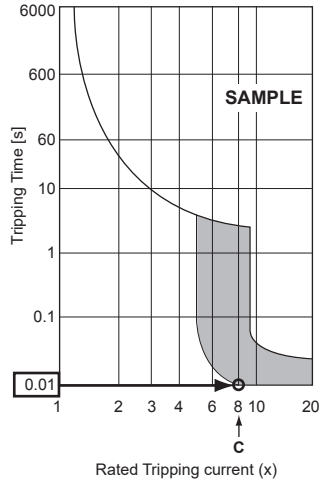


• V1 and V2
V1 and V2 are the breaker coefficient.
V1: Breaker coefficient of rated current
V2: Breaker coefficient of current sensitivity
The values of V1 and V2 differ from depending on the model.
Therefore, please refer to INSTALLATION MANUAL of each model.

	V1	V2
PCFY-VKM	19.8	2.4

• C : Multiple of tripping current at tripping time 0.01 s
Please pick up “C” from the tripping characteristic of the breaker.

Sample chart



<Example of “F2” calculation>
*Condition : PCFY-VKM × 4 + PEFY-VMA × 1
V1 of PCFY-VKM = 19.8, V1 of PEFY-VMA = 38, C = 8 (refer to right sample chart)
F2 = 19.8 × 4/8 + 38 × 1/8
= 14.65
= 16 A breaker (Tripping current = 8 × 16 A at 0.01 s)

*3 Current sensitivity is calculated using the following formula.
G1 = V2 × (Quantity of indoor unit 1) + V2 × (Quantity of indoor unit 2) + V2 × (Quantity of indoor unit 3) + ··· + V3 × (Wire length [km])

<Example of “G1” calculation>
*Condition : PCFY-VKM × 4 + PEFY-VMA × 1
V2 of PCFY-VKM = 2.4, V2 of PEFY-VMA = 1.6, Wire thickness and length :1.5 mm^2 0.2 km
G1 = 2.4 × 4 + 1.6 × 1 + 48 × 0.2
= 20.8
As a result , current sensitivity is 30 mA 0.1 sec or less.

G1	Current sensitivity
30 or less	30 mA 0.1 sec or less
100 or less	100 mA 0.1 sec or less

Wire thickness	V3
1.5 mm^2	48
2.5 mm^2	56
4.0 mm^2	66

6.3. Types of control cables

1. Wiring transmission cables

Types of transmission cable	Shielding wire CVVS or CPEVS
Cable diameter	More than 1.25 mm²
Length	Less than 200m

2. MA Remote control cables

Types of remote control cable	2-core cable (unshielded)	
Cable diameter	0.3 to 1.25 mm²	
Length	When one remote controller (main) is connected	Less than 200 m
	When two remote controllers (main and supervisor) are connected	Less than 100 m

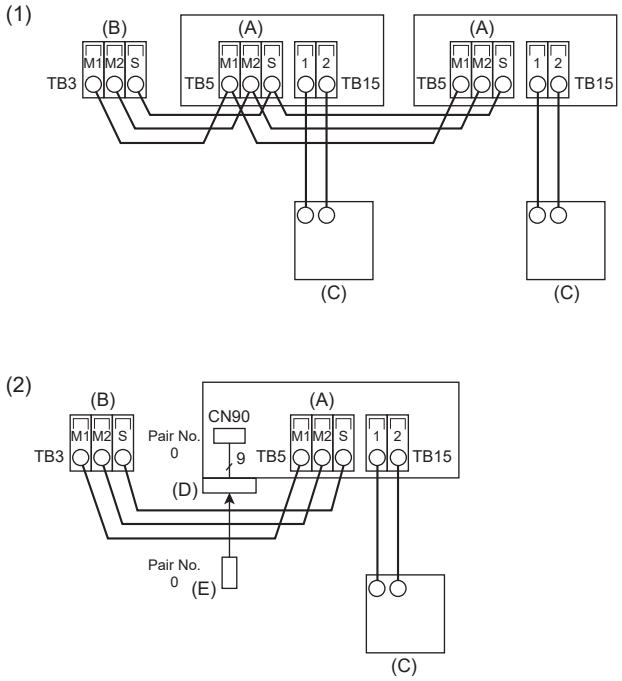


Fig. 6-3

6.4. Connecting remote controller, indoor and outdoor transmission cables (Fig. 6-3)

- 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 mm² core cable. If the distance is more than 10 m, use a 1.25 mm² 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) Wireless remote controller(When installing wireless signal receiver)

- Connect the wire of wireless signal receiver (9-pole cable) to CN90 of indoor controller board.
- To change Pair No. setting, refer to installation manual attached to wireless remote controller. (In initial setting of indoor unit and wireless remote controller, Pair No. is 0.)

(A) Terminal block for indoor transmission cable
(B) Terminal block for outdoor transmission cable (M1, M2, S)
(C) Remote controller
(D) wireless signal receiver
(E) wireless remote controller

⚠ Warning:

When connecting the MA remote controller, please observe the requirements in the table below.

Applicable system	Grouping of indoor units	Connection of multiple remote controllers to a group
R32 indoor units equipped with built-in refrigerant sensors	Allowed (*1) (*2) (*3)	Allowed * Do not use a sub remote controller as an alarm device. * Up to two remote controllers can be connected.
R32 indoor units equipped with Sensor and alarm kit	Allowed (*1) (*4)	
R32 indoor units set for large spaces	Allowed (*1)	
R410A indoor units	Allowed	Allowed

*1 Grouping connections between different refrigerant systems or between different system configurations are not allowed.
*2 Grouping connections across rooms are not allowed.
*3 The supervisor remote controller cannot be connected to grouped indoor units.
*4 The supervisor remote controller cannot be connected to indoor units that are grouped together using different Shut off valve kits or Sensor and alarm kits.

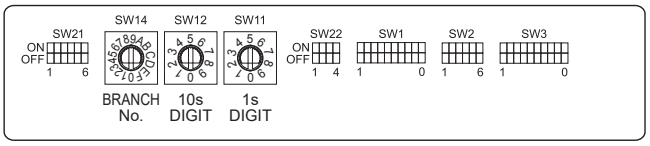


Fig. 6-4

6.5. Setting addresses (Fig. 6-4)

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

- There are 2 types of rotary switch setting available: setting addresses 1 to 9 and over 10, and setting branch numbers.

(1) How to set addresses
Example: If Address is “3”, remain SW12 (for over 10) at “0”, and match SW11 (for 1 to 9) with “3”.

(2) How to set branch numbers SW14 (Series R2 only)
Match the indoor unit’s refrigerant pipe with the BC controller’s end connection number.
Remain other than series R2 at “0”.

- The rotary switches are all set to “0” when shipped from the factory. These switches can be used to set unit addresses and branch numbers at will.
- The determination of indoor unit addresses varies with the system at site. Set them referring to the Data Book.
- Switches in the picture show “0”.

6.6. Switch setting for different ceiling heights (Fig. 6-4)

With this unit, the air flow rate and fan speed can be adjusted by setting the SW21 on the control board. Select a suitable setting from the table below according to the installation location.

* Make sure the SW21 switch is set, otherwise problems such as not getting cool/warm may occur.

	Silent		Standard		High ceiling	
	SW21-1	SW21-2	SW21-1	SW21-2	SW21-1	SW21-2
	OFF	ON	OFF	OFF	ON	OFF
MS40, MS63	2.5 m		2.7 m		3.5 m	
MS100, MS125	2.6 m		3.0 m		4.2 m	

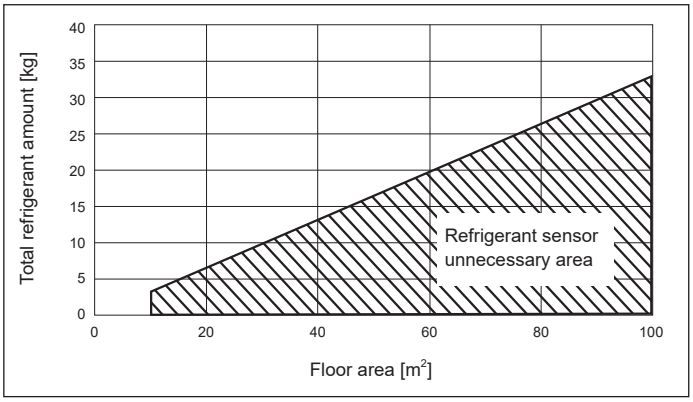
6.7. Sensing room temperature with the built-in sensor in a remote controller (Fig. 6-4)

If you want to sense room temperature with the built-in sensor in a remote controller, set SW1-1 on the control board to “ON”. The setting of SW1-7 and SW1-8 as necessary also makes it possible to adjust the air flow at a time when the heating thermometer is OFF.

6.8. Electrical characteristics

Symbols: MCA: Max. Circuit Amps (= 1.25×FLA) FLA: Full Load Amps
IFM: Indoor Fan Motor Output: Fan motor rated output

Model	Power supply			IFM	
	Volts/Hz	Range +- 10%	MCA (A)	Output (kW)	FLA (A)
PCFY-MS40VKM2	220 - 240 V/50 Hz 220 - 240 V/60 Hz	Max.: 264 V Min.: 198 V	0.35	0.09	0.28
PCFY-MS63VKM2			0.42	0.10	0.33
PCFY-MS100VKM2			0.82	0.16	0.65
PCFY-MS125VKM2			0.95	0.16	0.76



If M/A ≤ 0.33, the refrigerant sensor can be disabled by disconnecting the CNSB connector on the control board.
M: Total refrigerant amount [kg]
A: Floor area [m^2]

Caution: Do not disconnect the CNSB connector in an environment where M/A ≥ 0.33.
If a refrigerant leak occurs with the refrigerant sensor disabled, the safety device will not be able to operate.
Even if you are using the Sensor and Alarm Kit, you can disable the refrigerant sensor by disconnecting the CNSB connector on the control board.

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 1 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.

Controller interface

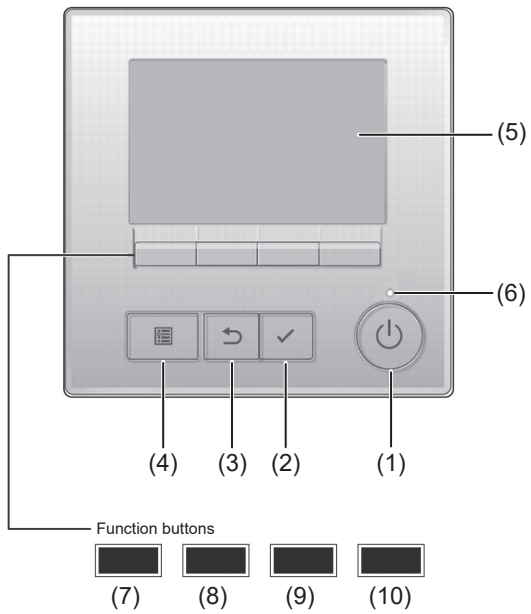


Fig. 7-1

Note: This remote control is compatible with the R32 refrigerant leak detection system, and is equipped with an alarm to notify you of refrigerant leaks. Please refer to IM of PAR-42MAAB for setting method of Supervisor remote controller to collectively monitor refrigerant leakage in the refrigerant system.

Note: The PAR-42MAAB will sound an alarm with 65 dB. The intensity of the alarm sound must be 15 dB larger than that of a background noise, so install the PAR-42MAAB into the room with a background noise of 50dB or less.

7.2. Test run

(1) [ON/OFF] button

Press to turn ON/OFF the indoor unit.

(2) [SELECT] button

Press to save the setting.

(3) [RETURN] button

Press to return to the previous screen.

(4) [MENU] button

Press to bring up the Main menu.

(5) Backlit LCD

Operation settings will appear.

When the backlight is off, pressing any button turns the backlight on and it will stay lit for a certain period of time depending on the screen.

When the backlight is off, pressing any button turns the backlight on and does not perform its function. (except for the [ON/OFF] button)

(6) ON/OFF lamp

This lamp lights up in green while the unit is in operation. It blinks while the remote controller is starting up or when there is an error.

(7) Function button [F1]

Main display: Press to change the operation mode.

Menu screen: The button function varies with the screen.

(8) Function button [F2]

Main display: Press to decrease temperature.

Main menu: Press to move the cursor left.

Menu screen: The button function varies with the screen.

(9) Function button [F3]

Main display: Press to increase temperature.

Main menu: Press to move the cursor right.

Menu screen: The button function varies with the screen.

(10) Function button [F4]

Main display: Press to change the fan speed.

Menu screen: The button function varies with the screen.

7. Test run

Step 1 Switch the remote controller to "Test run".

(1) Select "Service" from the Main menu, and press the [⌄] button.

(2) When the Service menu is selected, a window will appear asking for the password. (Fig. 7-2)
To enter the current maintenance password (4 numerical digits), move the cursor to the digit you want to change with the [F1] or [F2] button, and set each number (0 through 9) with the [F3] or [F4] button. Then, press the [⌄] button.

Note: The initial maintenance password is "9999". Change the default password as necessary to prevent unauthorized access. Have the password available for those who need it.

Note: If you forget your maintenance password, you can initialize the password to the default password "9999" by pressing and holding the [F1] and [F2] buttons simultaneously for three seconds on the maintenance password setting screen.

(3) Select "Test run" with the [F1] or [F2] button, and press the [⌄] button. (Fig. 7-3)

(4) Select "Test run" with the [F1] or [F2] button, and press the [⌄] button. (Fig. 7-4)

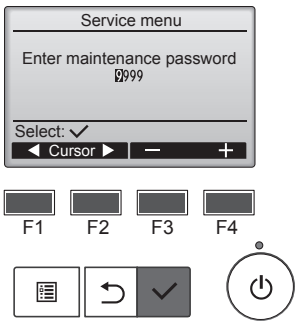


Fig. 7-2

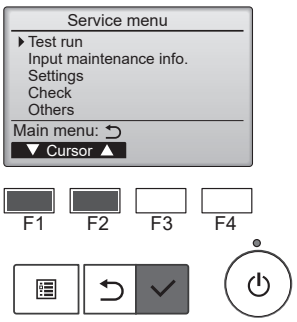


Fig. 7-3

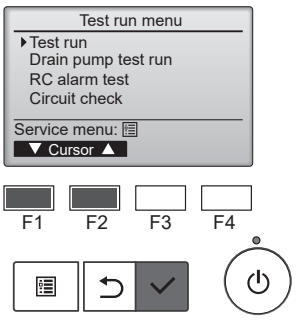


Fig. 7-4

Step 2 Perform the test run and check the airflow temperature and auto vane.

(1) Press the [F1] button to go through the operation modes in the order of "Cool" and "Heat". (Fig. 7-5)
Cool mode: Check the cold air blow off.
Heat mode: Check the heat blow off.
* Check the operation of the outdoor unit's fan.

(2) Press the [⌄] button and open the Vane setting screen.

AUTO vane check

(1) Check the auto vane with the [F1] [F2] buttons. (Fig. 7-6)

(2) Press the [⮌] button to return to "Test run operation".

(3) Press the [⏻] button.

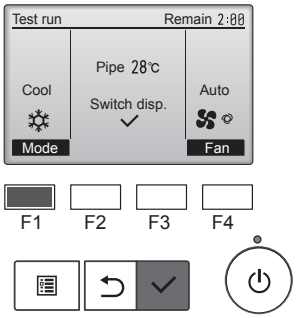


Fig. 7-5

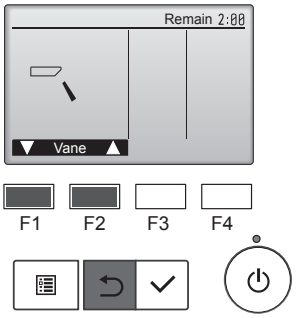


Fig. 7-6

This product is designed and intended for use in the residential, commercial and light-industrial environment.
Bu ürün konutlarda, ticari ve hafif endüstriyel ortamlarda kullanılmak amacıyla tasarlanmıştır.

Please be sure to put the contact address/telephone number on this manual before handing it to the customer.
Lütfen bu kılavuzu müşteriye teslim etmeden önce iletişim adresini/telefon numarasını eklemeyi unutmayın.

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