MITSUBISHI ELECTRIC

CITY MULTI

Air-Conditioners For Building Application
INDOOR UNIT

PKFY-P·VKM-E

For use with the R410A

English is original.

INSTALLATION MANUAL

FOR INSTALLER

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

English

Manual Download

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

en Go to the above website to download manuals, select model name, then choose language.

de Besuchen Sie die oben stehende Website, um Anleitungen herunterzuladen, wählen Sie den Modellnamen und dann die Sprache aus.

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

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

es Visite el sitio web anterior para descargar manuales, seleccione el nombre del modelo y luego elija el idioma.

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

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

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

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

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

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

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

uk Щоб завантажити керівництва, перейдіть на зазначений вище веб-сайт; виберіть назву моделі, а потім мову.

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

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

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

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

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

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

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

sl Obiščite zgornjo spletno stran za prenos priročnikov; izberite ime modela, nato izberite jezik.

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

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

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

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

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

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

Contents

Note:
The phrase "Wired remote controller" in this installation manual refers only to the PAR-41MAA.
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.

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.**
- **Children should be supervised to ensure that they do not play with the appliance.**
- **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.**

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2. Installation location

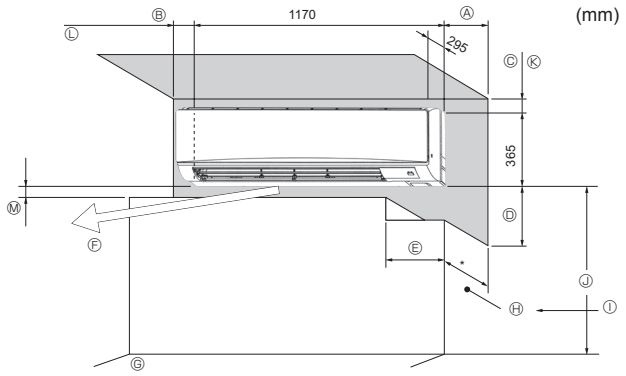


Fig. 2-1

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

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

(mm)

Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
Min. 100.5	Min. 52.3	Min. 48	Min. 250	Min. 220

Ⓕ Air outlet: Do not place an obstacle within 1500 mm of the air outlet.
Ⓖ Floor surface
Ⓗ Furnishings
Ⓘ When the projection dimension of a curtain rail or the like from the wall exceeds 60 mm, extra distance should be taken because the fan air current may create a short cycle.
Ⓙ 1800 mm or greater from the floor surface (for high location mounting)
Ⓚ 108 mm or greater with left or rear left piping and optional drain pump installation
Ⓛ 550 mm or greater with optional drain pump installation
Ⓜ Minimum 7 mm: 265 mm or greater with optional drain pump installation

3. Installing the indoor unit

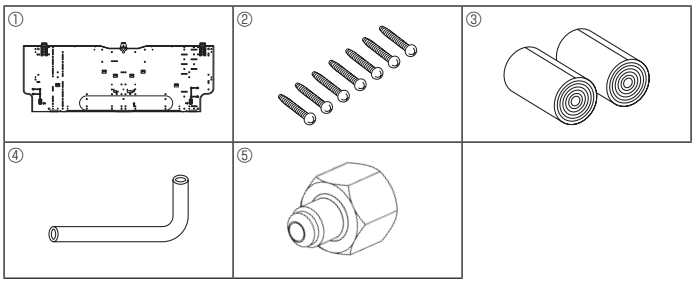


Fig. 3-1

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

The indoor unit should be supplied with the following accessories.

PART NUMBER	ACCESSORY	QUANTITY		LOCATION OF SETTING
		P63	P100	
①	Mount board	1	1	Fix at the back of the unit
②	Tapping screw 4 × 25	7	7	
③	Felt tape	2	2	
④	L-shaped connection pipe	1	1	
⑤	Charge nut	1	1	

3.2. Installing the mount board

3.2.1. Setting the mount board and piping positions

► Using the mount board, determine the unit's installation position and the locations of the piping holes to be drilled.

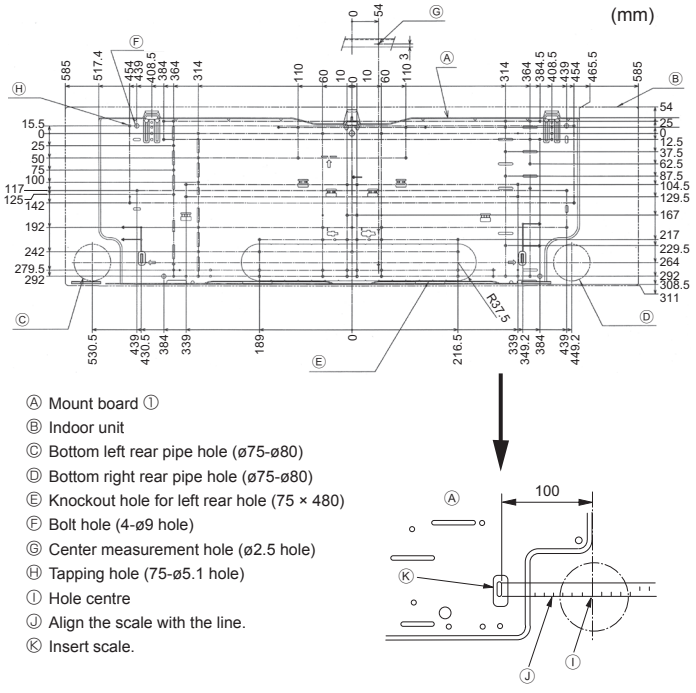
⚠ Warning:

Before drilling a hole in the wall, you must consult the building contractor.

3.2.2. Drilling the piping hole (Fig. 3-3)

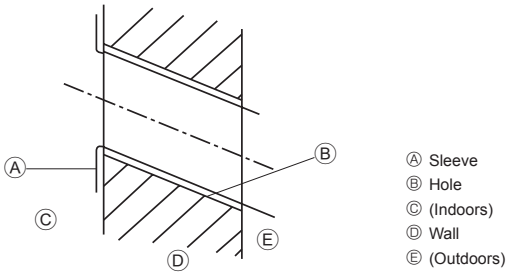
► Use a core drill to make a hole of 75-80 mm diameter in the wall in the piping direction, at the position shown in the diagram to the left.
► The hole should incline so that the outside opening is lower than the inside opening.
► Insert a sleeve (with a 75 mm diameter and purchased locally) through the hole.

Note:
The purpose of the hole's inclination is to promote drain flow.



Ⓐ Mount board ①
Ⓑ Indoor unit
Ⓒ Bottom left rear pipe hole (ø75-ø80)
Ⓓ Bottom right rear pipe hole (ø75-ø80)
Ⓔ Knockout hole for left rear hole (75 × 480)
Ⓕ Bolt hole (4-ø9 hole)
Ⓖ Center measurement hole (ø2.5 hole)
Ⓗ Tapping hole (75-ø5.1 hole)
Ⓘ Hole centre
Ⓙ Align the scale with the line.
Ⓚ Insert scale.

Fig. 3-2



Ⓐ Sleeve
Ⓑ Hole
Ⓒ (Indoors)
Ⓓ Wall
Ⓔ (Outdoors)

Fig. 3-3

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3. Installing the indoor unit

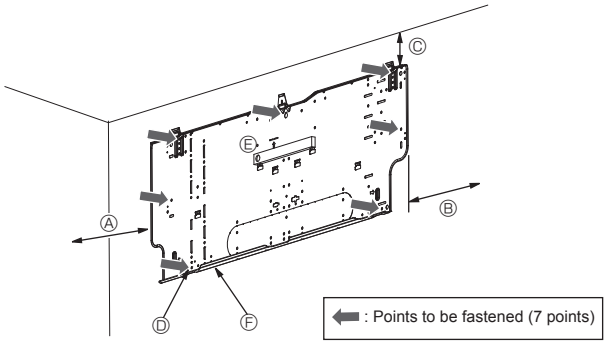

Fig. 3-4

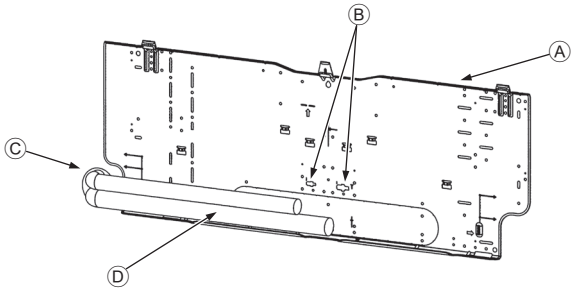

Fig. 3-5

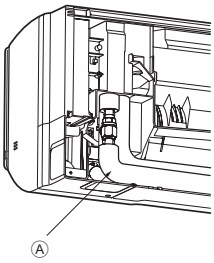

Fig. 3-6

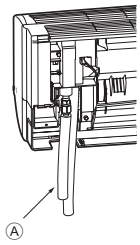

Fig. 3-7

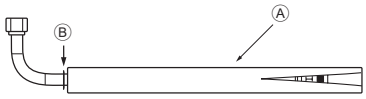

Fig. 3-8

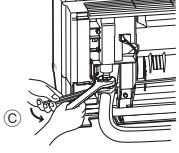

Fig. 3-9

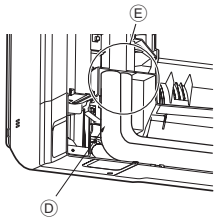

Fig. 3-10

3.2.3. Installing the mount board (Fig. 3-4)

► Since the indoor unit weighs near 22 kg, selection of the mounting location requires thorough consideration. If the wall does not seem to be strong enough, reinforce it with boards or beams before installation.

► The mounting fixture must be secured at both ends and at the centre, if possible. Never fix it at a single spot or in any nonsymetrical way. (If possible, secure the fixture at all the positions marked with a bold arrow.)

⚠ Warning:

If possible, secure the fixture at all positions indicated with a bold arrow.

⚠ Caution:

- **The unit body must be mounted horizontally.**
- **Fasten at the holes as shown by the arrows.**

Ⓐ Min. 120 mm (617.6 mm or greater with optional drain pump installation)
Ⓑ Min. 220 mm
Ⓒ Min. 70 mm (130 mm or greater with left, rear left, or lower left piping, and optional drain pump installation)
Ⓓ Fixing screws (4 × 25) ②
Ⓔ Level
Ⓕ Mount board ①

3.3. When embedding pipes into the wall (Fig. 3-5)

- The pipes are on the bottom left.
- When the cooling pipe, drain pipes internal/external connection lines etc are to be embedded into the wall in advance, the extruding pipes etc, may have to be bent and have their length modified to suit the unit.
- Use marking on the mount board as a reference when adjusting the length of the embedded cooling pipe.
- During construction, give the length of the extruding pipes etc some leeway.

Ⓐ Mount board ①
Ⓑ Reference marking for flare connection
Ⓒ Through hole
Ⓓ On-site piping

3.4. Preparing the indoor unit

* Check beforehand because the preparatory work will differ depending on the exiting direction of the piping.
* When bending the piping, bend gradually while maintaining the base of the piping exiting portion. (Abrupt bending will cause misshaping of the piping.)

Attachment of L-shaped connection pipe ④
Right, left and rear piping (Fig. 3-6)

1. Remove the flare nut and cap of the indoor unit. (Gas pipe only)
2. Apply refrigerating machine oil to the flare sheet surface. (Preparation on location)
3. Facing the direction in which the L-shaped connection pipe ④ will be removed, make a quick connection to the indoor unit flare connection opening.
4. Tighten the flare nut using a double open-end wrench. (Fig. 3-9)
   Tightening force: 68 to 82 N·m
5. Attach the charge nut ⑤ to the liquid pipe side joint portion, and check for leakage of the L-shaped connection pipe ④ connection portion.
   Remove the charge nut ⑤ after completion of the work.
   Tightening force: 34 to 42 N·m
6. Cover the flare connection portion with the pipe cover of the L-shaped connection pipe ④ so that it is not exposed. (Fig. 3-10)

Ⓐ L-shaped connection pipe ④
Ⓑ Cut-off position (Straight pipe portion)
Ⓒ Tightening direction
Ⓓ Cover with pipe cover
Ⓔ Cover the flare nut connection portion with the pipe cover.

Lower piping (Fig. 3-7)

1. Cut L-shaped connection pipe ④ at the position indicated in (Fig. 3-8).
2. Insert the flare nut that was removed earlier onto the straight pipe side of the cut L-shaped connection pipe ④ and then flare the end of the pipe.
3. Remove the flare nut and cap of the indoor unit. (Gas pipe only)
4. Apply refrigerating machine oil to the flare sheet surface. (Preparation on location)
5. Quickly connect the L-shaped connection pipe ④ that has been processed as described in part 2) to the indoor unit flare connection opening.
6. Tighten the flare nut using a double open-end wrench. (Fig. 3-9)
   Tightening force: 68 to 82 N·m
7. Attach the charge nut ⑤ to the liquid pipe side joint portion, and check for leakage of the L-shaped connection pipe ④ connection portion.
   Remove the charge nut ⑤ after completion of the work.
   Tightening force: 34 to 42 N·m
8. Cover the flare connection portion with the pipe cover of the L-shaped connection pipe ④ so that it is not exposed. (Fig. 3-10)

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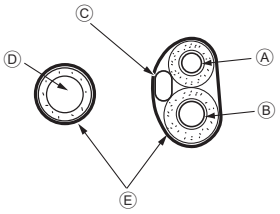


Fig. 3-11

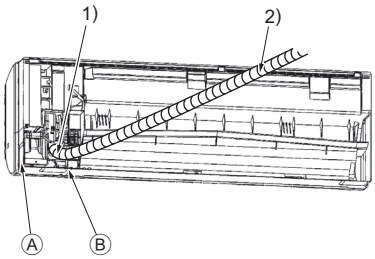


Fig. 3-12

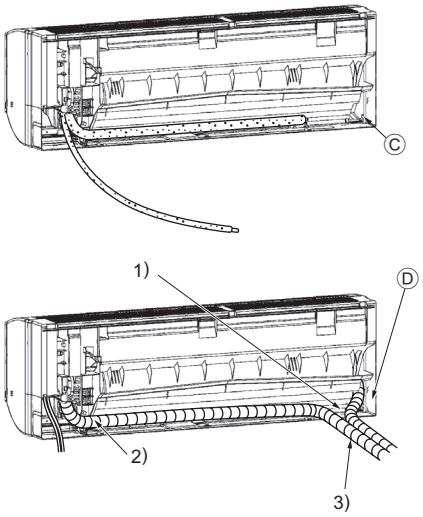


Fig. 3-13

Leakage check of the L-shaped connection pipe connection portion

1. Attach the charge nut ⑤ to the liquid pipe side joint portion.
   Tightening force: 34 to 42 N·m
2. Pressurize by filling with nitrogen gas from the charge nut.
   Do not pressurize to the current constant pressure all at once. Pressurize gradually.
   1) Pressurize to 0.5 MPa, wait five minutes, and make sure the pressure does not decrease.
   2) Pressurize to 1.5 MPa, wait five minutes, and make sure the pressure does not decrease.
   3) Pressurize to 4.15 MPa 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 0.01 MPa. 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.

Extraction and processing of the piping and wiring (Fig. 3-11)

1. Connection of indoor/outdoor wiring ➔ See page 7.
2. Wrap the felt tape ③ in the range of the refrigerant piping and drain hose which will be housed within the piping space of the indoor unit.
   • Wrap the felt tape ③ securely from the base for each of the refrigerant piping and the drain hose.
   • Overlap the felt tape ③ at one-half of the tape width.
   • Fasten the end portion of the wrapping with vinyl tape.
   Ⓐ Liquid pipe
   Ⓑ Gas pipe
   Ⓒ Indoor/outdoor connection cable
   Ⓓ Drain hose
   Ⓔ Felt tape ③
3. Be careful that the drain hose is not raised, and that contact is not made with the indoor unit box body.
   Do not pull the drain hose forcefully because it might come out.

Rear, right and lower piping (Fig. 3-12)

1) Be careful that the drain hose is not raised, and that contact is not made with the indoor unit box body.
   Arrange the drain hose at the underside of the piping and wrap it with felt tape ③.
2) Securely wrap the felt tape ③ starting from the base. (Overlap the felt tape at one-half of the tape width.)
   Ⓐ Cut off for right piping.
   Ⓑ Cut off for lower piping.

Left and left rear piping (Fig. 3-13)

4. Drain hose replacement ➔ See 5. Drainage piping work
   Be sure to replace the drain hose and the drain cap for the left and rear left piping. Dripping may occur if you forget to install or fail to replace these parts.
   Ⓒ Drain cap
   1) Be careful that the drain hose is not raised, and that contact is not made with the indoor unit box body.
   2) Securely wrap the felt tape ③ starting from the base. (Overlap the felt tape at one-half of the tape width.)
   3) Fasten the end portion of the felt tape ③ with vinyl tape.
      Ⓓ Cut off for left piping.

3. Installing the indoor unit

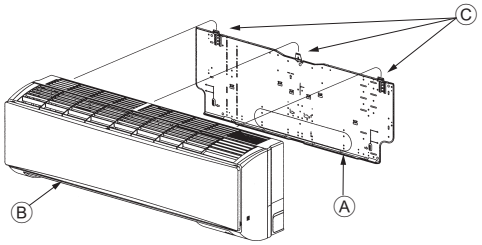


Fig. 3-14

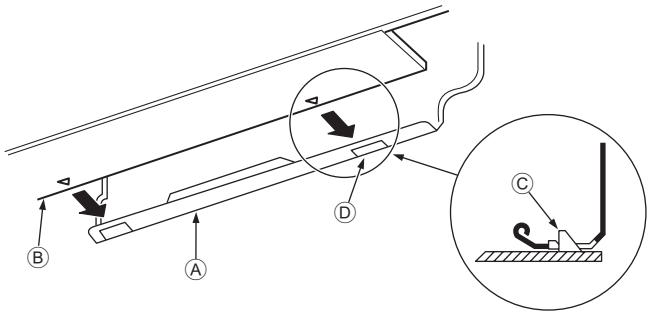


Fig. 3-15

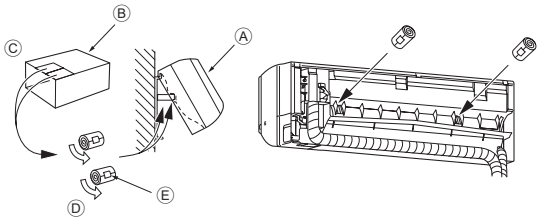


Fig. 3-16

3.5. Mounting the indoor unit

1. Affix the mount board ① to the wall.
2. Hang the indoor unit on the hook positioned on the upper part of the mount board.

Rear, right and lower piping (Fig. 3-14)

3. While inserting the refrigerant piping and drain hose into the wall penetration hole (penetration sleeve), hang the top of the indoor unit to the mount board ①.
4. Move the indoor unit to the left and right, and verify that the indoor unit is hung securely.
5. Fasten by pushing the bottom part of the indoor unit onto the mount board ①. (Fig. 3-15)

* Check that the knobs on the bottom of the indoor unit are securely hooked into the mount board ①.

6. After installation, be sure to check that the indoor unit is installed level.

Ⓐ Mount board ①
Ⓑ Indoor unit
Ⓒ Hook
Ⓓ Square hole

Left and left rear piping (Fig. 3-16)

3. While inserting the drain hose into the wall penetration hole (penetration sleeve), hang the top of the indoor unit to the mount board ①.
   Giving consideration to the piping storage, move the unit all the way to the left side, then cut part of the packaging carton and wrap into a cylindrical form as illustrated in the diagram. Hook this to the rear surface rib as a spacer, and raise the indoor unit.
4. Connect the refrigerant piping with the site-side refrigerant piping.
5. Fasten by pushing the bottom part of the indoor unit onto the mount board ①.

* Check that the knobs on the bottom of the indoor unit are securely hooked into the mount board ①.

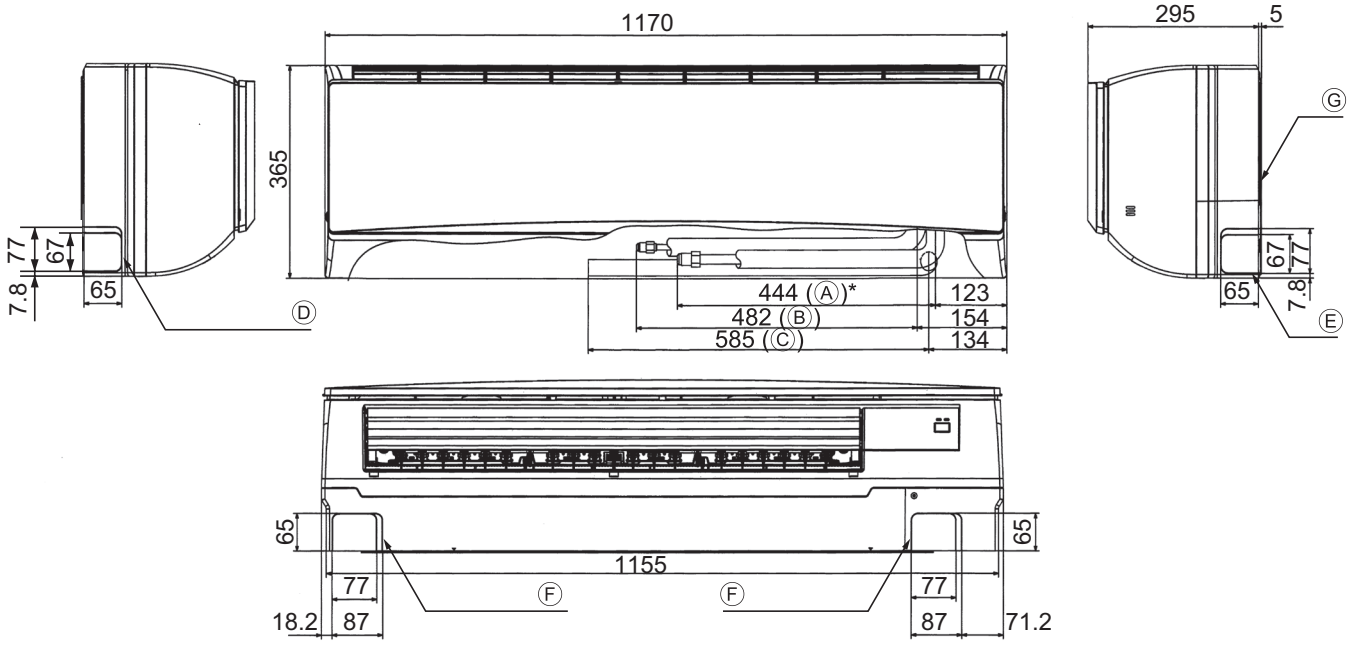
6. After installation, be sure to check that the indoor unit is installed level.

Ⓐ Indoor unit
Ⓑ Packaging carton
Ⓒ Cut off
Ⓓ Wrap into a cylindrical form
Ⓔ Fasten with tape

en

4. Installing the refrigerant piping

4.1. Positioning refrigerant and drain piping



Ⓐ Gas pipe
Ⓑ Liquid pipe
Ⓒ Drain hose
Ⓓ Left-side piping knockout hole
Ⓔ Right-side piping knockout hole
Ⓕ Lower piping knockout hole
Ⓖ Mount board ①

* Indicates the condition with accessories mounted.

Fig. 4-1

4. Installing the refrigerant piping

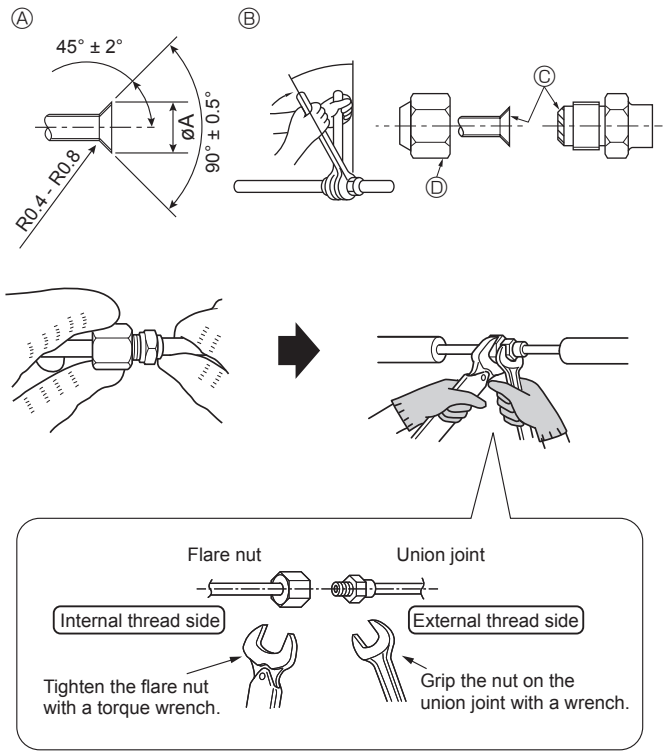


Fig. 4-2

Ⓐ Flare cutting dimensions

Copper pipe O.D. (mm)	Flare dimensions øA dimensions (mm)
ø9.52	12.8 - 13.2
ø15.88	19.3 - 19.7

Ⓑ Refrigerant pipe sizes & Flare nut tightening torque

	R410A				Flare nut O.D.	
	Liquid pipe		Gas pipe			
	Pipe size O.D. (mm)	Tightening torque. (N·m)	Pipe size O.D. (mm)	Tightening torque. (N·m)	Liquid pipe (mm)	Gas pipe (mm)
P63	ODø9.52 (3/8”)	34 - 42	ODø15.88 (5/8”)	68 - 82	22	29
P100	ODø9.52 (3/8”)	34 - 42	ODø15.88 (5/8”)	68 - 82	22	29

Ⓒ 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.)

Ⓓ Be certain to use the flare nuts that are attached to the main unit.
(Use of commercially-available products may result in cracking.)

4.2. Connecting pipes (Fig. 4-2)

- 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.
- 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.

⚠ Warning:

When installing the unit, securely connect the refrigerant pipes before starting the compressor.

4.3. Refrigerant piping (Fig. 4-2)

Indoor unit

1. Remove the flare nut and cap of the indoor unit.
2. Make a flare for the liquid pipe and gas pipe and apply refrigerating machine oil (available from your local supplier) to the flare sheet surface.
3. Quickly connect the on site cooling pipes to the unit.
4. Wrap the pipe cover that is attached to the gas pipe and make sure that the connection join is not visible.
5. Wrap the pipe cover of the unit’s liquid pipe and make sure that it covers the insulation material of the on site liquid pipe.
6. The portion where the insulation material is joined is sealed by taping.

4.3.1. Storing in the piping space of the unit (Fig. 4-3)

1. Wrap the supplied felt tape in the range of the refrigerant piping which will be housed within the piping space of the unit to prevent dripping.
2. Overlap the felt tape at one-half of the tape width.
3. Fasten the end portion of the wrapping with vinyl tape, etc.

Ⓐ Gas pipe
Ⓑ Liquid pipe
Ⓒ Indoor/outdoor connection cable
Ⓓ Felt tape ③

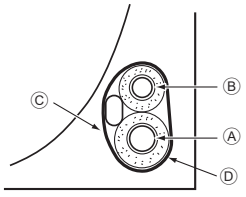


Fig. 4-3

en

5. Drainage piping work

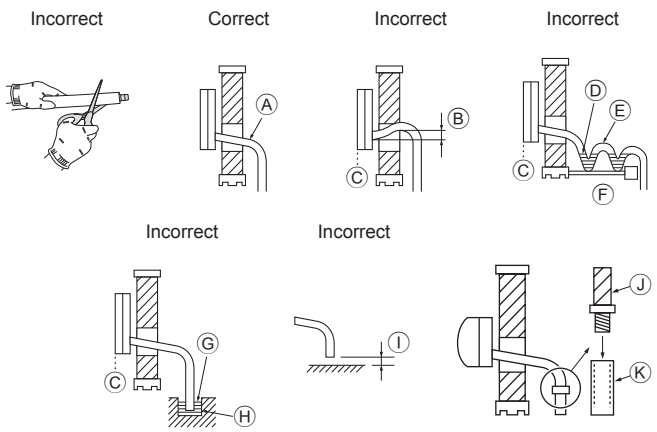


Fig. 5-1

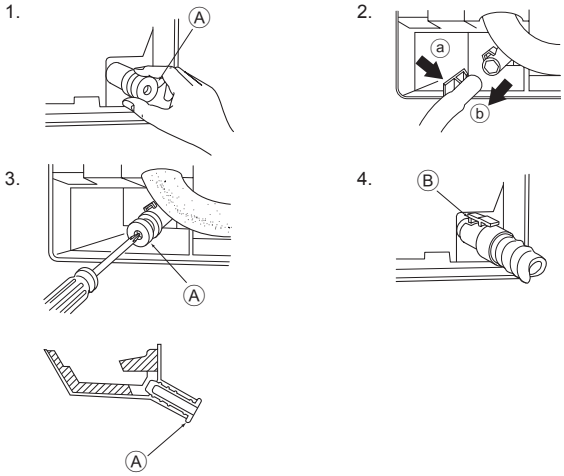


Fig. 5-2

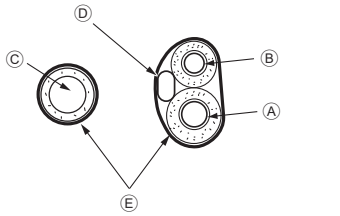


Fig. 5-3

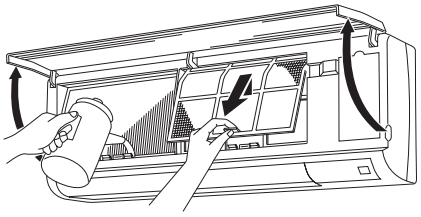


Fig. 5-4

5.1. Drainage piping work (Fig. 5-1)

- Do not cut the product's drain pipe.
- Drain pipes should have an inclination of 1/100 or more.
- For extension of the drain pipe, use a soft hose (inner dia. 15 mm) available on the market or hard vinyl chloride pipe (VP-16/O.D. ø22 PVC TUBE). Make sure that there is no water leakage from the connections.
- Do not put the drain piping directly in a drainage ditch where sulphuric gas may be generated.
- When piping has been completed, check that water flows from the end of the drain pipe.

⚠ Caution:

The drain pipe should be installed according to this Installation Manual to ensure correct drainage. Thermal insulation of the drain pipes is necessary to prevent condensation. If the drain pipes are not properly installed and insulated, condensation may drip on the ceiling, floor or other possessions.

Ⓐ Inclined downwards
Ⓑ Must be lower than outlet point
Ⓒ Water leakage
Ⓓ Trapped drainage
Ⓔ Air
Ⓕ Wavy
Ⓖ The end of drain pipe is under water.
Ⓗ Drainage ditch
Ⓘ 5 cm or less between the end of drain pipe and the ground.
Ⓙ Drain hose
Ⓚ Soft PVC hose (Inside diameter 15 mm)
or
Hard PVC pipe (VP-16)
* Bond with PVC type adhesive

Preparing left and left rear piping (Fig. 5-2)

1. Remove the drain cap.
- Remove the drain cap by holding the bit that sticks out at the end of the pipe and pulling.
  Ⓐ Drain cap
2. Remove the drain hose.
- Remove the drain hose by holding on to the base of the hose ⓐ (shown by arrow) and pulling towards yourself ⓑ.
3. Insert the drain cap.
- Insert a screwdriver etc into the hole at the end of the pipe and be sure to push to the base of the drain cap.
4. Insert the drain hose.
- Push the drain hose until it is at the base of the drain box connection outlet.
- Please make sure the drain hose hook is fastened properly over the extruding drain box connection outlet.
  Ⓑ Hooks

♦ Storing in the piping space of the indoor unit (Fig. 5-3)

* When the drain hose will be routed indoors, be sure to wrap it with commercially available insulation.
* Gather the drain hose and the refrigerant piping together and wrap them with the supplied felt tape ③.
* Overlap the felt tape ③ at one-half of the tape width.
* Fasten the end portion of the wrapping with vinyl tape, etc.

Ⓐ Gas pipe
Ⓑ Liquid pipe
Ⓒ Drain hose
Ⓓ Indoor/outdoor connection wiring
Ⓔ Felt tape ③

♦ Check of drainage (Fig. 5-4)

1. Open the front grille and remove the filter.
2. Facing the fins of the heat exchanger, slowly fill with water.
3. After the drainage check, attach the filter and close the grille.

en

6. Electrical work

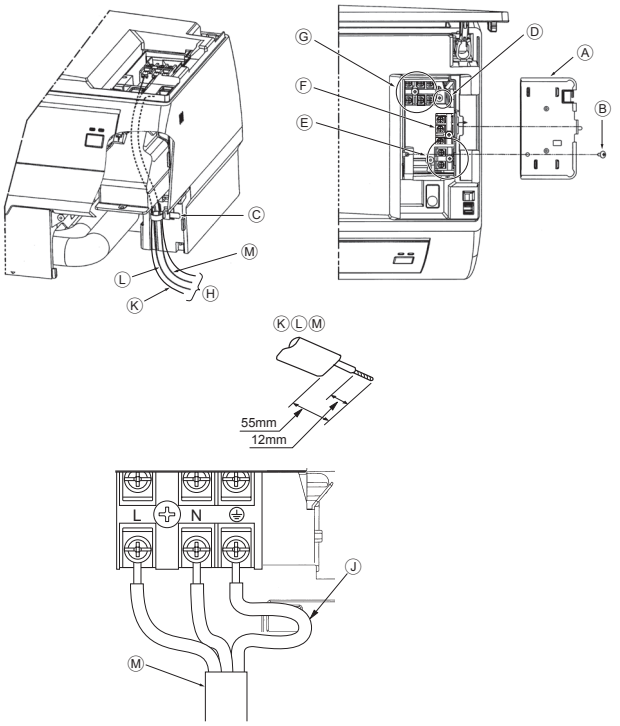


Fig. 6-1

6.1. Electrical work (Fig. 6-1)

Installation must be comply with the electrical wiring rule.

Connection can be made without removing the front panel.

1. Open the front grille, remove the screw (1 piece), and remove the electrical parts cover.
2. Securely connect each wire to the terminal board.

* In consideration of servicing, provide extra length for each of the wires.

* Take care when using strand wires, because beards may cause the wiring to short out.

3. Install the parts that were removed back to their original condition.
4. Fasten each of the wires with the clamp under the electrical parts box.

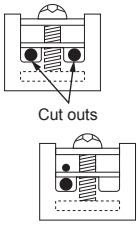
Ⓐ Electrical box cover
Ⓑ Fixing screw
Ⓒ Clamp
Ⓓ Ground wire connection portion
Ⓔ MA remote control terminal board: (1, 2) do not have polarity
Ⓕ Transmission terminal board: (M1, M2, S) do not have polarity
Ⓖ Power supply terminal board (L, N, Earth).
Ⓗ Lead
Ⓙ Ground wire connection portion: Connect the ground wire in the direction illustrated in the diagram.
Ⓚ Remote control cable
Ⓛ Transmission cable
Ⓜ Power supply cable

⚠ Caution:

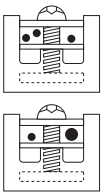
Wiring for remote controller cable and control (hereinafter referred to as transmission line) shall be (5 cm or more) apart from power source wiring so that it is not influenced by electric noise from power source wiring. (Do not insert transmission line and power source wire in the same conduit.)

<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.

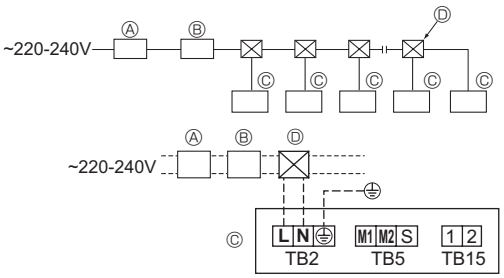


Fig. 6-2

6.2. Power supply wiring

- Wiring size must comply with the applicable local and national codes.
- Power supply cable of appliance shall not be lighter than design 245 IEC 53 or 227 IEC57, 245 IEC 53 or 227 IEC 53.
- Install an earth line longer than other cables.
- A switch with at least 3 mm, 1/8 inch contact separation in each pole shall be provided by the air conditioner installation.

[Fig. 6-2]

Ⓐ Ground-fault interrupter
Ⓑ Local switch/Wiring breaker
Ⓒ Indoor unit
Ⓓ 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.

en

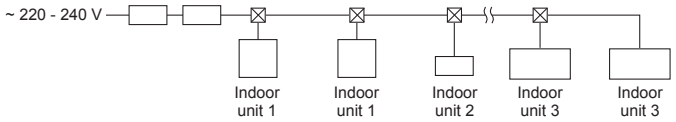
6. Electrical work

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} + ···

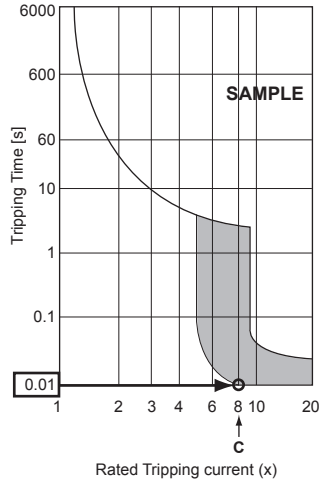


• V1 and V2
V1 and V2 are the breaker coefficient.
V1: Breaker coefficient of rated current
V2: Breaker coefficient of current sensitivity
The values of V1 and V2 differ from depending on the model. Therefore, please refer to IM of each model.

	V1	V2
PKFY-P·VKM-ER2	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 : PLFY-VEM × 4 + PEFY-VMA × 1
V1 of PLFY-VEM = 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 : PLFY-VEM × 4 + PEFY-VMA × 1
V2 of PLFY-VEM = 2.4, V2 of PEFY-VMA = 1.6, Wire thickness and length :1.5 mm² 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 mm²	48
2.5 mm²	56
4.0 mm²	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 200 m

2. M-NET Remote control cables

Types of remote control cable	Shielding wire MVVS
Cable diameter	More than 0.5 to 1.25 mm²
Length	Add any portion in excess of 10 m to within the longest allowable transmission cable length 200 m.

3. MA Remote control cables

Types of remote control cable	2-core cable (unshielded)
Cable diameter	0.3 to 1.25 mm²
Length	Less than 200 m

6. Electrical work

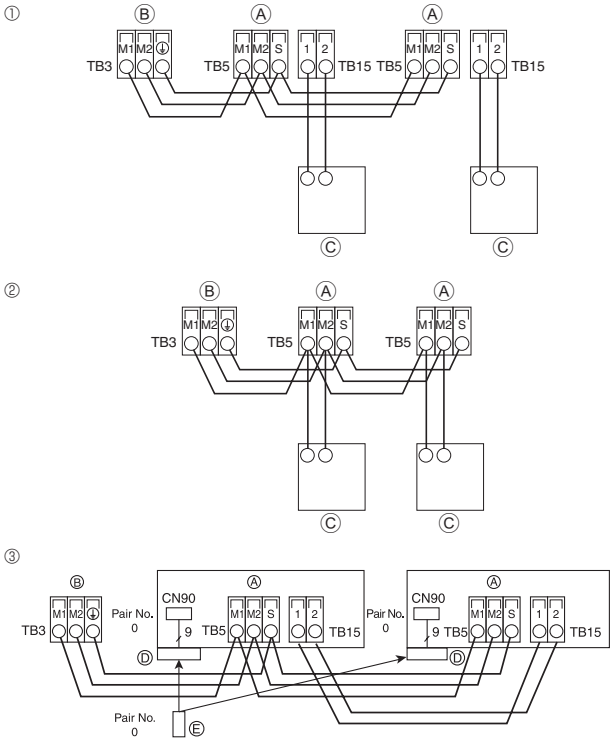


Fig. 6-3

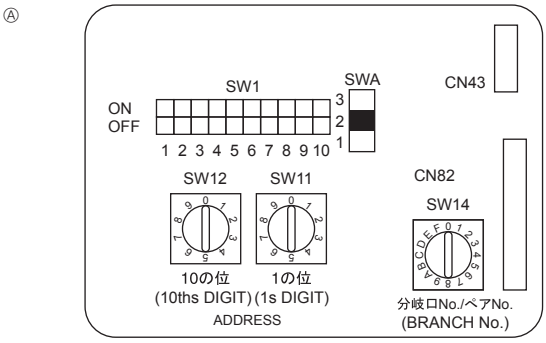


Fig. 6-4

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 mm^2 core cable. If the distance is more than 10 m, use a 1.25 mm^2 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. (Nonpolarized 2-wire)
- DC 24 to 30 V between M1 and M2 (M-NET remote controller)

③ Wireless remote controller (When installing wireless signal receiver)

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

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

6.5. 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.
  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.

6.6. Sensing room temperature with the built-in sensor in a remote controller

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.

6.7. 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)
PKFY-P63VKM-E	220-240 V / 50 Hz 220 V / 60 Hz	Max.: 264 V Min.: 198 V	0.36	0.069	0.29
PKFY-P100VKM-E			0.63	0.069	0.50

en

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.

Controller interface

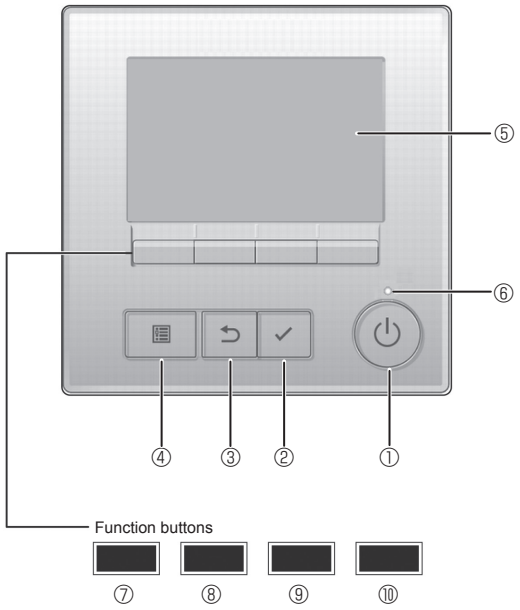


Fig. 7-1

7.2. Test run

The following 3 methods are available.

7.2.1. Using wired remote controller (Fig. 7-1)

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.

Main menu: Press to move the cursor down.

⑧ Function button [F2]

Main display: Press to decrease temperature.

Main menu: Press to move the cursor up.

⑨ Function button [F3]

Main display: Press to increase temperature.

Main menu: Press to go to the previous page.

⑩ Function button [F4]

Main display: Press to change the fan speed.

Main menu: Press to go to the next page.

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)

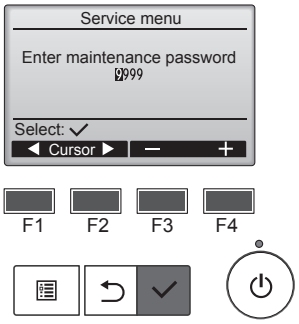


Fig. 7-2

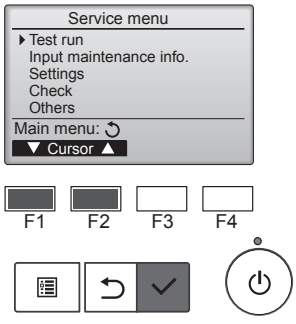


Fig. 7-3

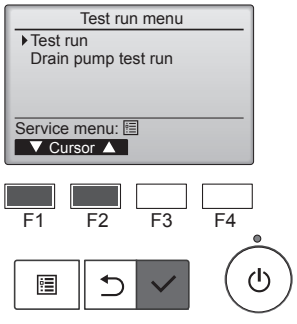


Fig. 7-4

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.

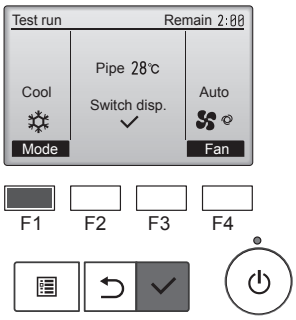


Fig. 7-5

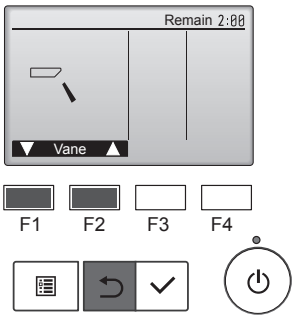


Fig. 7-6

en

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

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

MITSUBISHI ELECTRIC CORPORATION

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