MITSUBISHI ELECTRIC

CITY MULTI

Air-Conditioners For Building Application
INDOOR UNIT

PKFY-P·VLM Series

INSTALLATION MANUAL

FOR INSTALLER

English

Contents

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

Note:
The phrase "Wired remote controller" in this installation manual refers only to the PAR-40MAA.
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.**

⚠ **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.

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

: Indicates an action that must be avoided.
: Indicates that important instructions must be followed.
: Indicates a part which must be grounded.
: Indicates that caution should be taken with rotating parts.
: Indicates that the main power switch must be turned off before servicing.
: Beware of electric shock.
: Beware of hot surface.
ELV : At servicing, please shut down the power supply for both the Indoor and Outdoor Unit.

⚠ **Warning:**
Carefully read the labels affixed to the main unit.

⚠ **Warning:**
- **Ask the dealer or an authorized technician to install the air conditioner.**
- **Install the unit at a place that can withstand its weight.**
- **Do not alter the unit. It may cause fire, electric shock, injury or water leakage.**
- **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.
- **Use only accessories authorized by Mitsubishi Electric and ask the dealer or an authorized technician to install them.**
- **Do not touch the heat exchanger fins.**
- **Install the air conditioner according to this Installation Manual.**
- **Have all electric work done by a licensed electrician according to local regulations.**
- **Do not use intermediate connection of electric wires.**
- **If the air conditioner is installed in a small room, measures must be taken to prevent the refrigerant concentration from exceeding the safety limit even if the refrigerant should leak.**
- **The cut face punched parts may cause injury by cut, etc. The installers are requested to wear protective equipment such as gloves, etc.**
- **When installing or relocating, or servicing the air conditioner, use only the specified refrigerant (R410A) 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.**
- **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.**

⚠ **Caution:**
- **Do not use the existing refrigerant piping, when use R410A refrigerant.**
- **Use ester oil, ether oil or alkylbenzene (small amount) as the refrigerator oil to coat flares and flange connections, when use R410A refrigerant.**
- **Do not use the air conditioner where food, pets, plants, precision instruments, or artwork are kept.**
- **Do not use the air conditioner in special environments.**
- **Ground the unit.**
- **Install an leak molded case circuit breaker, as required.**
- **Use power line cables of sufficient current carrying capacity and rating.**
- **Use only a molded case circuit breaker and fuse of the specified capacity.**
- **Do not touch the switches with wet fingers.**
- **Do not touch the refrigerant pipes during and immediately after operation.**
- **Do not operate the air conditioner with the panels and guards removed.**
- **Do not turn off the power immediately after stopping operation.**

2. Installation location

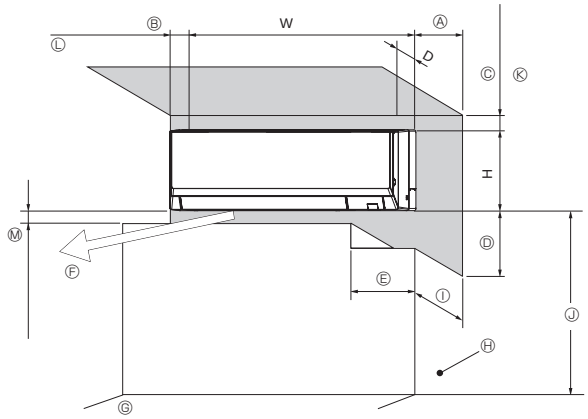

Fig. 2-1

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

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

(mm)

	D	W	H	Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ
PKFY-P10*/15/20/25/32VLM	237	773	299	Min. 150	Min. 50	Min. 50	Min. 250	Min. 260
PKFY-P40/50VLM	237	898	299					

* Specific region only

Ⓕ Air outlet: Do not place an obstacle within 1500 mm of the air outlet.
Ⓖ Floor surface
Ⓗ Furnishing
Ⓘ 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)
Ⓚ 75 mm or greater with left, rear left, or lower left piping, and optional drain pump installation. (Use the hook positioned on the lower part of the mount board when the dimension is 55 mm or greater and less than 75 mm (Less than 55 mm: NG). Refer to 3.5. for details.)
Ⓛ 350 mm or greater with optional drain pump installation
Ⓜ Minimum 7 mm: 250 mm or greater with optional drain pump installation

3. Installing the indoor unit

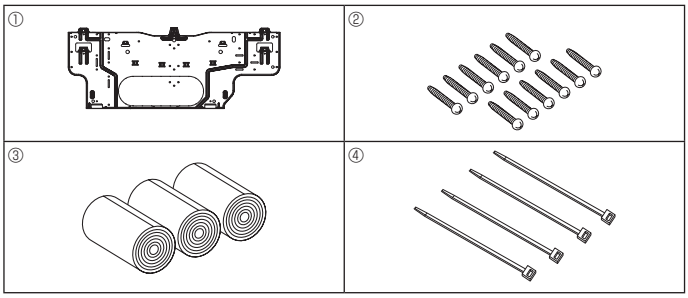

Fig. 3-1

■ **PKFY-P10*/15/20/25/32VLM** * Specific region only

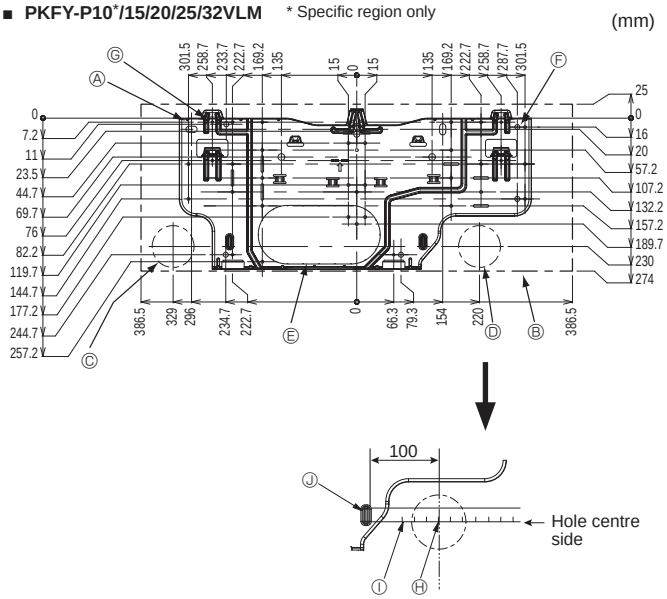

Fig. 3-2

■ **PKFY-P40/50VLM**

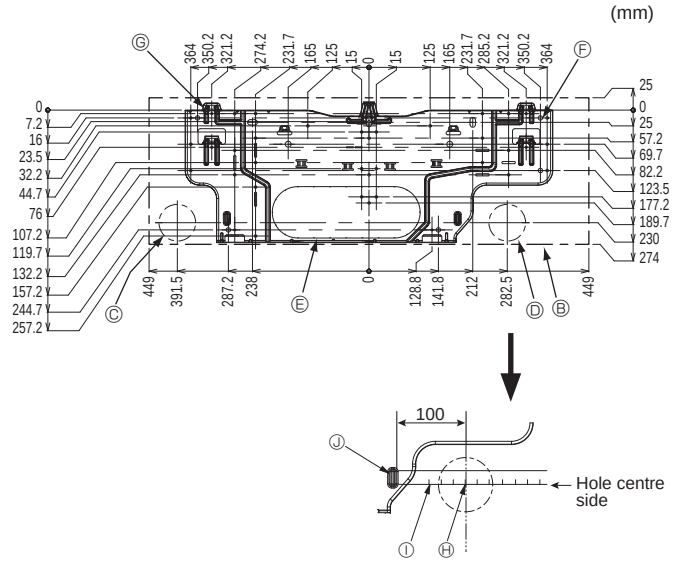

Fig. 3-3

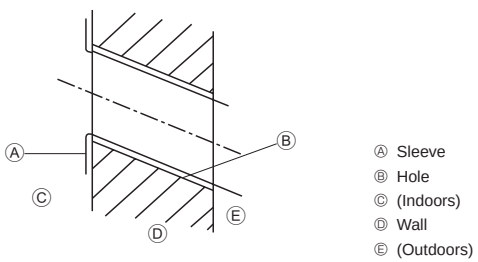

Fig. 3-4

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
①	Mount board	1	Fix at the back of the unit
②	Tapping screw 4 × 25	12	
③	Felt tape	3	
④	Band	4	

3.2. Installing the wall mounting fixture

3.2.1. Setting the wall mounting fixture and piping positions

► Using the wall mounting fixture, 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.

[Fig. 3-2, Fig. 3-3]

Ⓐ Mount board ①
Ⓑ Indoor unit
Ⓒ Bottom left rear pipe hole (ø75)
Ⓓ Bottom right rear pipe hole (ø75)
Ⓔ Knockout hole for left rear hole (P10/15/20/25/32: 105×215, P40/50: 105×300)
Ⓕ Bolt hole (4-ø9 hole)
Ⓖ Tapping hole (6-ø4.3 hole)
Ⓗ Hole centre
Ⓘ Align the scale with the line.
Ⓙ Insert scale.

3.2.2. Drilling the piping hole (Fig. 3-4)

► 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.

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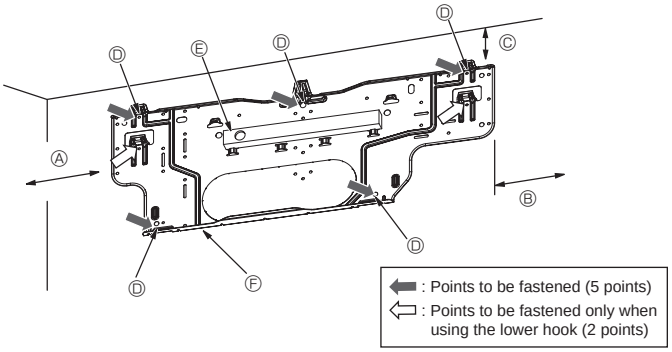

Fig. 3-5

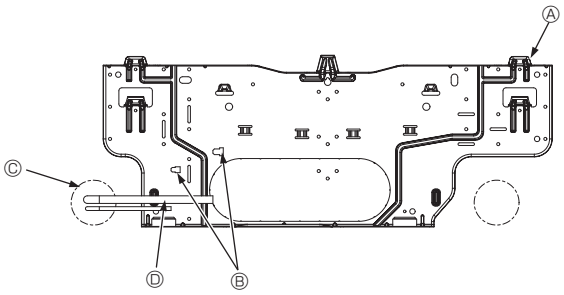

Fig. 3-6

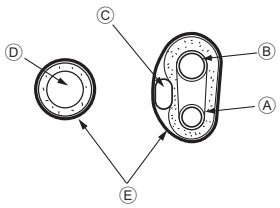

Fig. 3-7

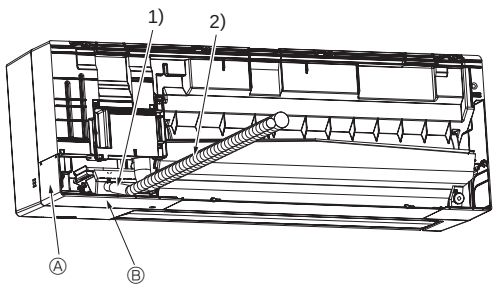

Fig. 3-8

3.2.3. Installing the wall mounting fixture

► Since the indoor unit weighs near 13 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.**

(Fig. 3-5)

■ **PKFY-P10*/15/20/25/32VLM** * Specific region only

Ⓐ Min. 124 mm (674 mm or greater with optional drain pump installation)
Ⓑ Min. 224 mm
Ⓒ Min. 75 mm (Use the hook positioned on the lower part of the mount board when the dimension is less than 100 mm with left, rear left, or lower left piping, and optional drain pump installation. Refer to 3.5. for details.)
Ⓓ Fixing screws (4 × 25) ②
Ⓔ Level
Ⓕ Mount board ①

■ **PKFY-P40/50VLM**

Ⓐ Min. 119 mm (669 mm or greater with optional drain pump installation)
Ⓑ Min. 224 mm
Ⓒ Min. 75 mm (Use the hook positioned on the lower part of the mount board when the dimension is less than 100 mm with left, rear left, or lower left piping, and optional drain pump installation. Refer to 3.5. for details.)
Ⓓ Fixing screws (4 × 25) ②
Ⓔ Level
Ⓕ Mount board ①

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

- 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.)
* Cut off outlet of the pipe depending on the exiting direction of the piping.

Extraction and processing of the piping and wiring (Fig. 3-7)

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. 3-8)

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.

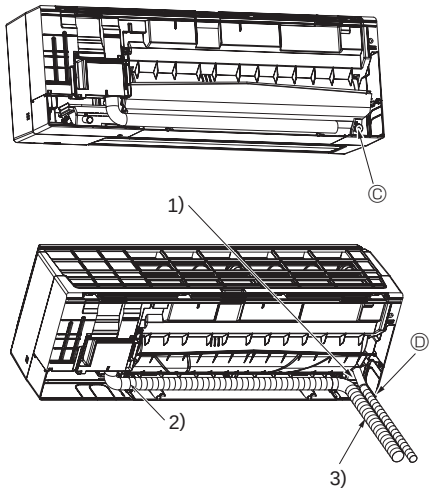

Fig. 3-9

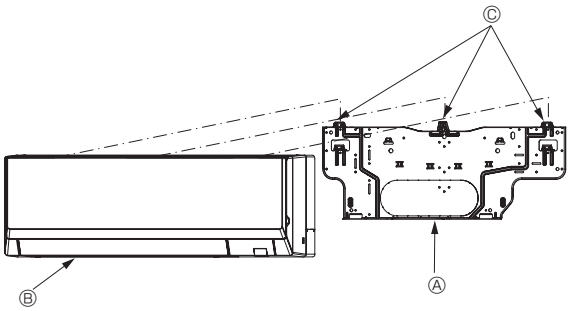

Fig. 3-10

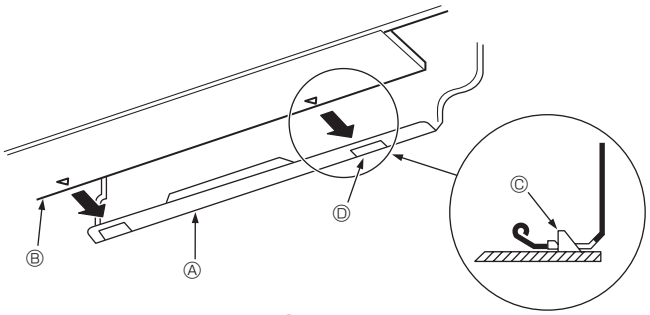

Fig. 3-11

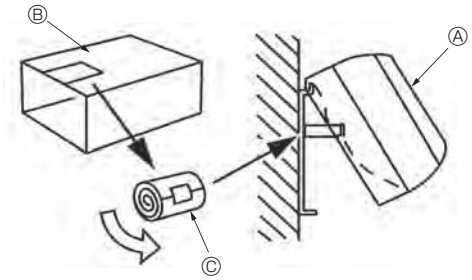

Fig. 3-12

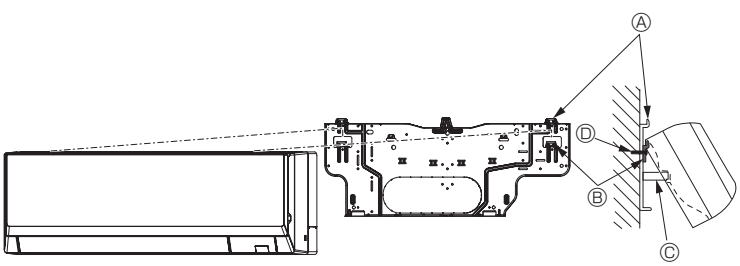

Fig. 3-13

Left and left rear piping (Fig. 3-9)

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.

3.5. 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.

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Rear, right and lower piping (Fig. 3-10)

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. 3-11)

* 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. 3-12)

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.
   Cut part of the shipping box 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
   Ⓑ Shipping box
   Ⓒ Spacer (Cut out a piece of card board from shipping box.)

Note:

- **When the indoor unit cannot be hanged and lifted up with the regular hook (the dimension of 2.1. Ⓚ (the clearance between the ceiling and the unit) is 75 mm or less), hang the unit on the lower hook for left piping. (Fig. 3-13)**
- **The lower hook is a temporary hook only for installation. When the installation is done, be sure to hang the indoor unit on the regular hook. The indoor unit cannot be operated while it is hanged on the lower hook.**

(Fig. 3-13)

Ⓐ Regular hook
Ⓑ Lower hook for left piping
Ⓒ Spacer
Ⓓ Fixing screw ②

* When using the lower hook, be sure to screw on the base of the lower hook with a fixing screw ②, otherwise the indoor unit will fall.

4. Installing the refrigerant piping

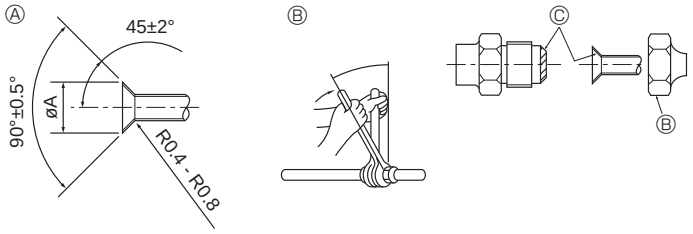

Fig. 4-1

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).
- 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.
- Do not apply refrigerating machine oil to the screw portions. (This will make the flare nuts more apt to loosen.)
- Use flare nut installed to this indoor unit.

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

Ⓐ Flare cutting dimensions

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

Ⓑ Refrigerant pipe sizes & Flare nut tightening torque

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)
ODø6.35 (1/4")	14 - 18	ODø12.7 (1/2")	49 - 61	17	26

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

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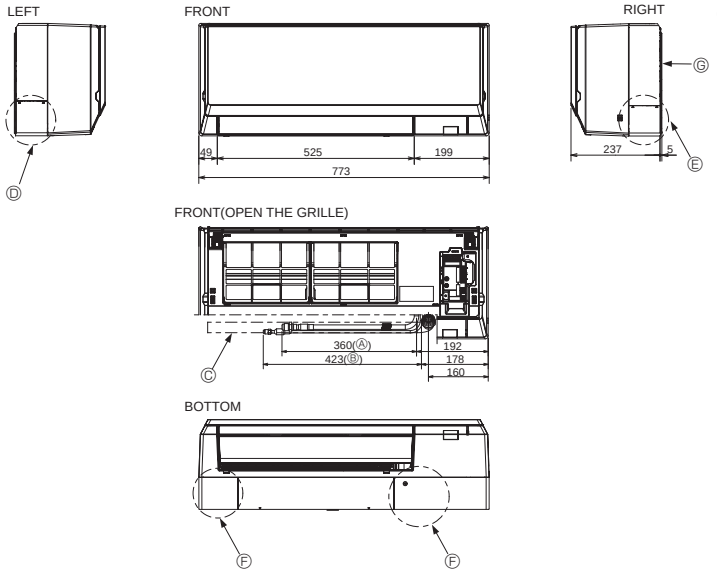
■ **PKFY-P10*/15/20/25/32VLM** * Specific region only



4.2. Positioning refrigerant and drain piping (Fig. 4-2)

Ⓐ Gas pipe * Indicates the condition with accessories mounted.
Ⓑ Liquid pipe
Ⓒ Drain hose (Effective length: 500)
Ⓓ Left-side piping knockout hole
Ⓔ Right-side piping knockout hole
Ⓕ Lower piping knockout hole
Ⓖ Mount board ①

■ **PKFY-P40/50VLM**

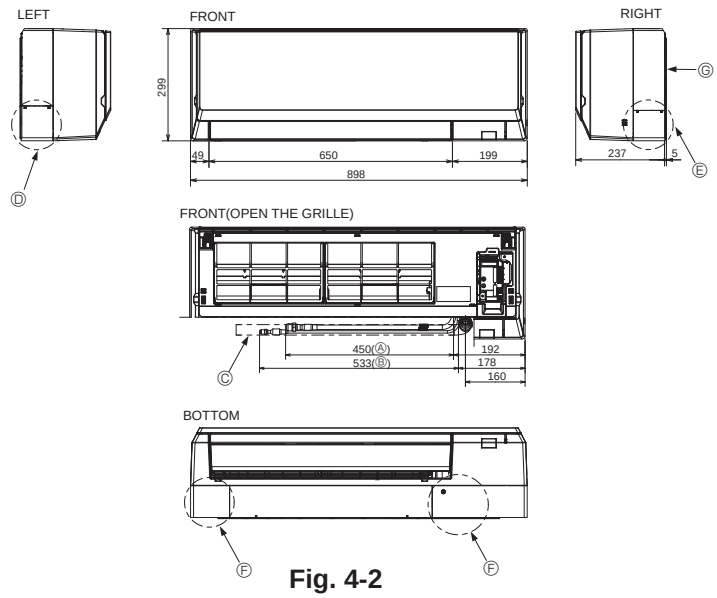


Fig. 4-2

4. Installing the refrigerant piping

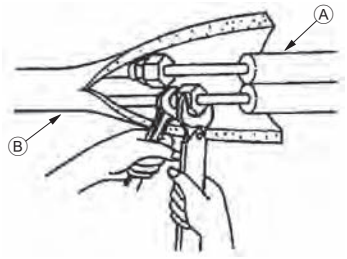


Fig. 4-3

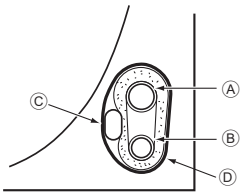


Fig. 4-4

4.3. Refrigerant piping (Fig. 4-3)

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.

Ⓐ Site-side refrigerant piping
Ⓑ Unit side refrigerant piping

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

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

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5. Drainage piping work

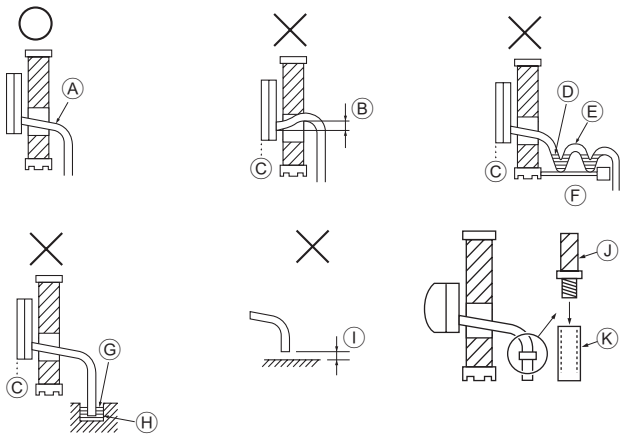


Fig. 5-1

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

- 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

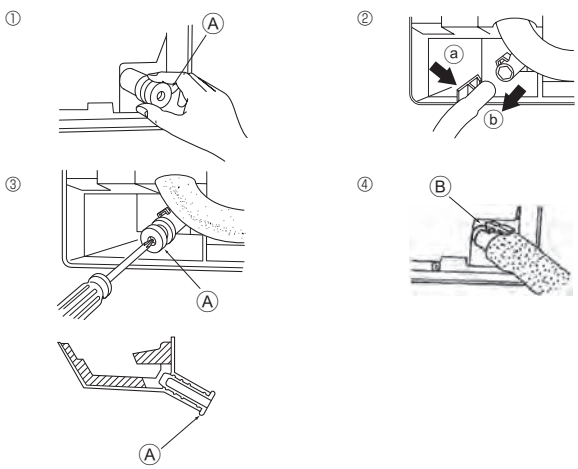


Fig. 5-2

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

5. Drainage piping work

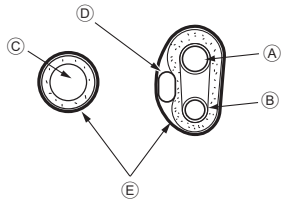


Fig. 5-3

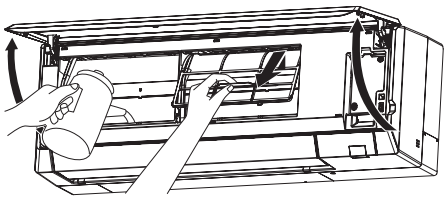


Fig. 5-4

♦ 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

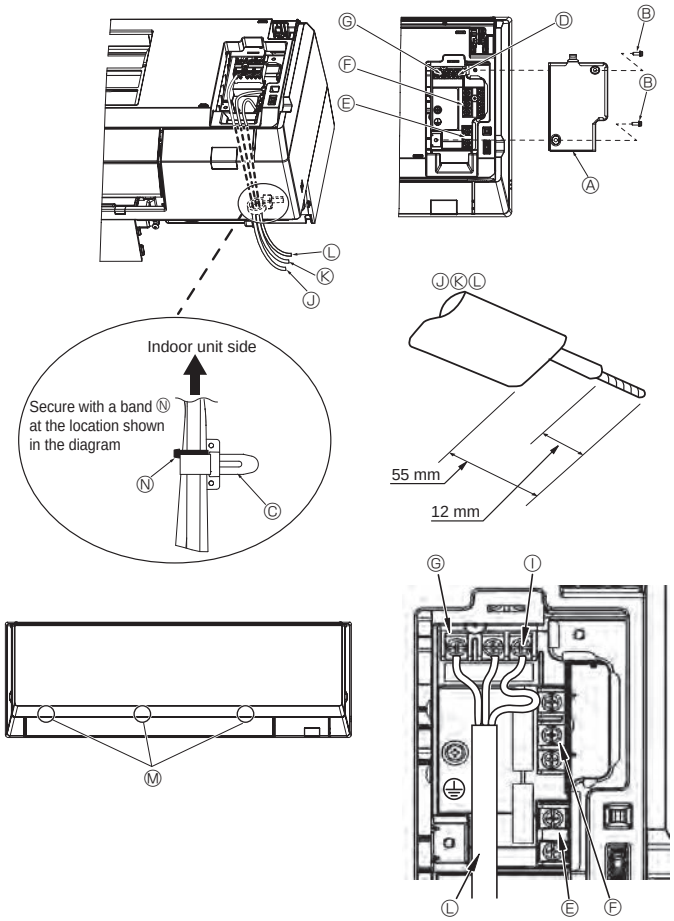


Fig. 6-1

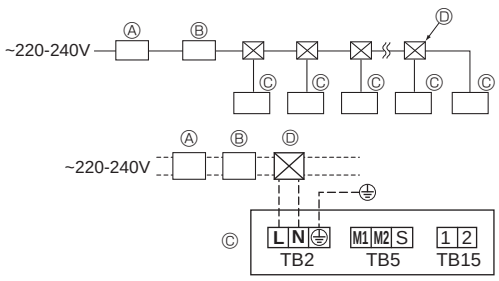


Fig. 6-2

6.1. Electric wiring

[Fig. 6-1]

Connection can be made without removing the front panel.

1. Open the front grille, remove the screw (2 pieces), and remove the electrical parts cover.
* Electrical work can be conducted more effectively with the panel removed. When attaching the panel, check that the hooks Ⓜ at three locations on the air outlet side are connected securely.
2. Securely connect each wire to the terminal block.
* 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 block: (1, 2) do not have polarity
Ⓕ Transmission terminal block: (M1, M2, S) do not have polarity
Ⓖ Power supply terminal block (L, N, ⏚).
Ⓗ Terminal screw
Ⓘ Ground wire connection portion: Connect the ground wire in the direction illustrated in the diagram.
Ⓙ Remote control cable
Ⓚ Transmission cable
Ⓛ Power supply cable
Ⓜ Hook
Ⓝ Band

⚠ Caution:

Wiring for remote controller cable shall be apart (5 cm or more) from power source wiring so that it is not influenced by electric noise from power source wiring.

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 60245 IEC 53 or 60227 IEC57, 60245 IEC 53 or 60227 IEC 53.
- Install a ground wire 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.

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

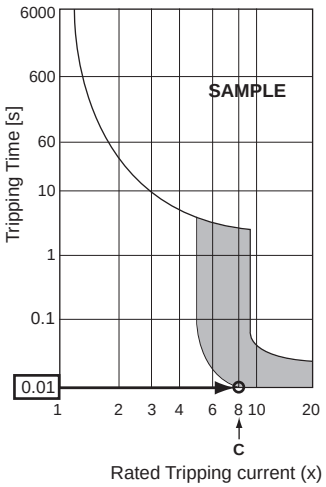
Apply to IEC61000-3-3 about max. permissive system impedance.
*1 The Ground-fault interrupter should support inverter circuit.
The Ground-fault interrupter should combine using of local switch or wiring breaker.
*2 Please take the larger of F1 or F2 as the value for F0.
F1 = Total operating maximum current of the indoor units × 1.2
F2 = {V1 × (Quantity of Type1)/C} + {V1 × (Quantity of Type2)/C} + {V1 × (Quantity of Type3)/C} + {V1 × (Quantity of Others)/C}

Indoor unit		V1	V2
Type 1	PLFY-VEM, PMFY-VBM, PEFY-VMS, PCFY-VKM, PKFY-VKM, PLFY-VCM, PLFY-VFM, PKFY-VLM	19.8	2.4
Type 2	PEFY-VMA	38	1.6
Type 3	PEFY-VMHS	13.8	4.8
Others	Other indoor unit	0	0

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

<Example of "F2" calculation>
*Condition PEFY-VMS × 4 + PEFY-VMA × 1, 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)

Sample chart



*3 Current sensitivity is calculated using the following formula.
G1 = V2 × (Quantity of Type1) + V2 × (Quantity of Type2) + V2 × (Quantity of Type3) + V2 × (Quantity of Others) + V3 × (Wire length[km])

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	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

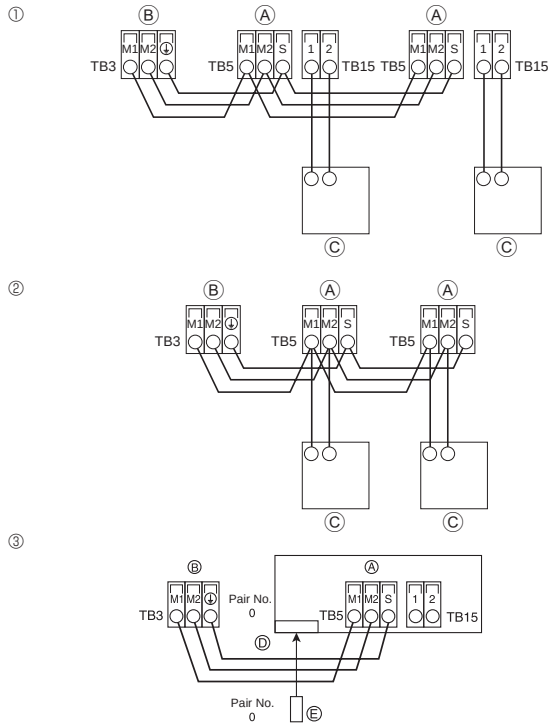


Fig. 6-3

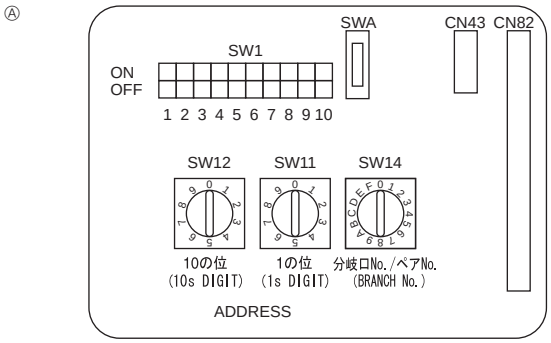


Fig. 6-4

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 more than two units are run under group control using wireless remote controller, connect TB15 each with the same number.
- 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-P10VLM*	220-240 V / 50 Hz 220-230 V / 60 Hz	Max.: 264 V Min.: 198 V	0.25	0.03	0.20
PKFY-P15VLM			0.25	0.03	0.20
PKFY-P20VLM			0.25	0.03	0.20
PKFY-P25VLM			0.32	0.03	0.25
PKFY-P32VLM			0.44	0.03	0.35
PKFY-P40VLM			0.44	0.03	0.35
PKFY-P50VLM			0.57	0.03	0.45

* Specific region only

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

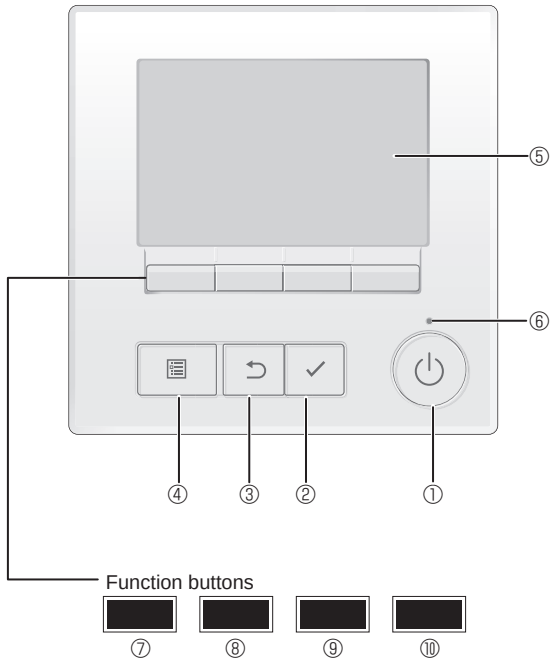


Fig. 7-1

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.

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)

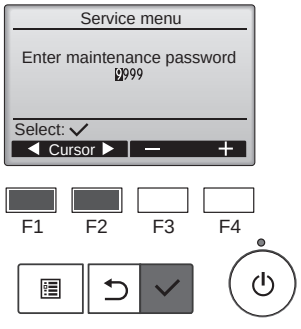


Fig. 7-2

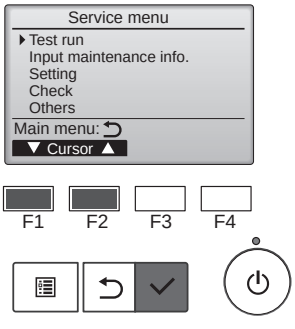


Fig. 7-3

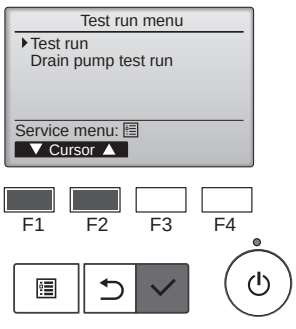


Fig. 7-4

7. Test run

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.

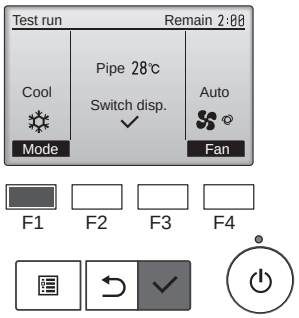


Fig. 7-5

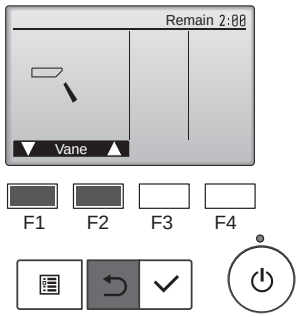


Fig. 7-6

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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