



CITY MULTI

Air-Conditioners For Building Application INDOOR UNIT

PLFY-P-VEM-E

For use with the R410A
Bei Verwendung von R410A
A utiliser avec le R410A
Bij gebruik van R410A
Para utilizar con el R410A
Uso del refrigerante R410A
Για χρήση με τα R410A

Para utilização com o R410A
Til anvendelse sammen med R410A
För användning med R410A
R410A ile beraber kullanmak için
Для использования с моделями R410A
For bruk med R410A
Do użytku z R410A

INSTALLATION MANUAL

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

FOR INSTALLER

English (GB)

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Note:
The phrase "Wired remote controller" in this installation manual refers only to the PAR-32MAA.
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.

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 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.

Caution:
Appliances not accessible to the general public.
Install the indoor unit at least 2.5 m above floor or grade level.
For appliances not accessible to the general public.

- Warning:**
- Ask the dealer or an authorized technician to install the air conditioner.
 - The user should never attempt to repair the unit or transfer it to another location.
 - Install the unit at a place that can withstand its weight.
 - 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.
 - The appliance shall be installed in accordance with national wiring regulations.

- If the air conditioner is installed in a small room, measures must be taken to prevent the refrigerant concentration from exceeding the safety limit even if the refrigerant should leak.
- 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.
- 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.

- Caution:**
- Do not use the existing refrigerant piping, when use R410A refrigerant.
 - Use ester oil, either oil or alkylbenzene (small amount) as the refrigerant 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 circuit breaker, as required.
 - Use power line cables of sufficient current carrying capacity and rating.

- Use only a circuit breaker and fuse of the specified capacity.
- Do not touch the switches with wet fingers.
- Do not touch the refrigerant pipes during and immediately after operation.
- Do not operate the air conditioner with the panels and guards removed.
- Do not turn off the power immediately after stopping operation.
- If the unit is run for long hours when the air above the ceiling is at high temperature/high humidity (dew point above 26 °C), dew condensation may be produced in the indoor unit or the ceiling materials. When operating the units in this condition, add insulation material (10-20 mm) to the entire surface of the unit and ceiling materials to avoid dew condensation.

2. Installing the indoor unit

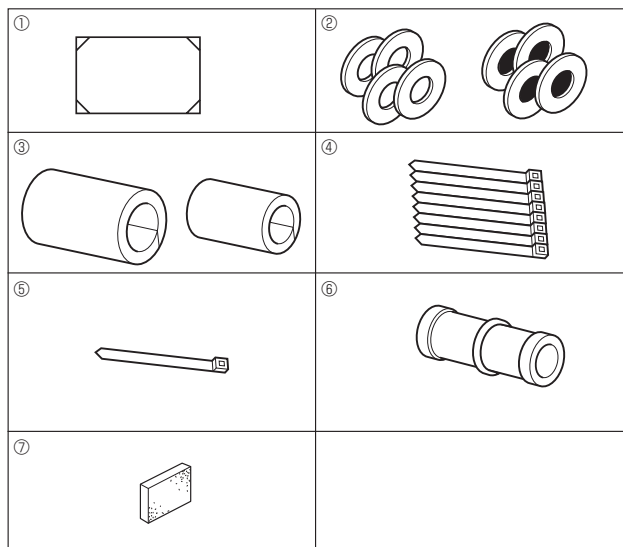


Fig. 2-1

2.1. Check the indoor unit accessories (Fig. 2-1)

The indoor unit should be supplied with the following accessories.

	Accessory name	Q'ty
①	Installation template (top of the package)	1
②	Washers (with insulation)	4
	Washers (without insulation)	4
③	Pipe cover (for refrigerant piping joint)	
	Small diameter	1
	Large diameter	1
④	Band (large)	8
⑤	Band (small)	1
⑥	Drain socket	1
⑦	Insulation	1

2. Installing the indoor unit

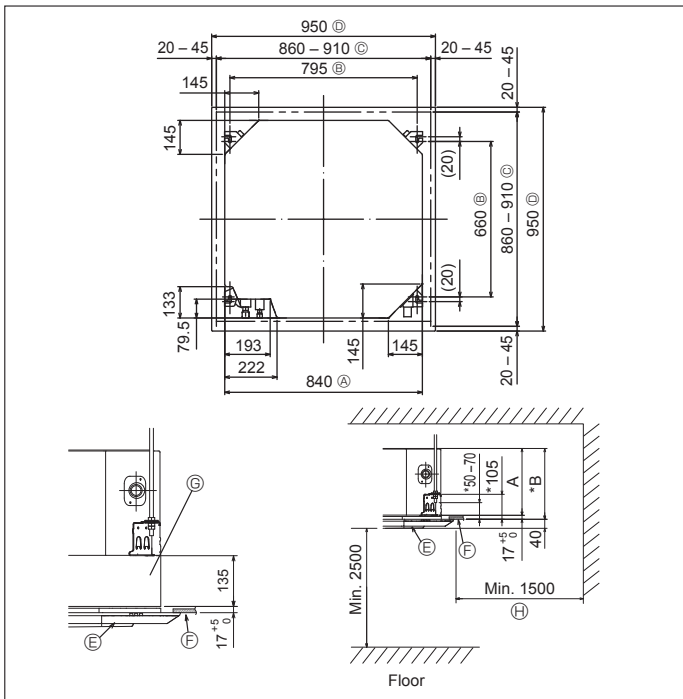


Fig. 2-2

2.2. Ceiling openings and suspension bolt installation locations (Fig. 2-2)

⚠ Caution:

Install the indoor unit at least 2.5 m above floor or grade level.

For appliances not accessible to the general public.

• Using the installation template (top of the package) and the gauge (supplied as an accessory with the grille), make an opening in the ceiling so that the main unit can be installed as shown in the diagram. (The method for using the template and the gauge is shown.)

* Before using, check the dimensions of template and gauge, because they change due to fluctuations of temperature and humidity.

* The dimensions of ceiling opening can be regulated within the range shown in Fig. 2-2; so center the main unit against the opening of ceiling, ensuring that the respective opposite sides on all sides of the clearance between them becomes identical.

• Use M10 (3/8") suspension bolts.

* Suspension bolts are to be procured at the field.

• Install securely, ensuring that there is no clearance between the ceiling panel & grille, and between the main unit & grille.

Ⓐ Outer side of main unit

Ⓔ Grille

Ⓑ Bolt pitch

Ⓕ Ceiling

Ⓒ Ceiling opening

Ⓖ Multi function casement (option)

Ⓓ Outer side of Grille

Ⓖ Entire periphery

* Note that the space between ceiling panel of the unit and ceiling slab and etc must be 7 mm or more.

* When the optional multi-functional casement is installed, add 135 mm to the dimensions marked on the figure.

(mm)

Models	A	B
20, 25, 32, 40, 50, 63, 80	241	258
100, 125	281	298

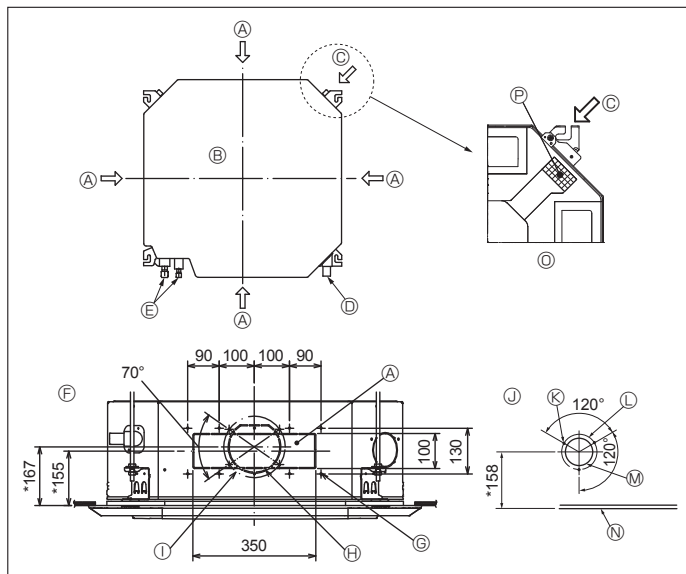


Fig. 2-3

2.3. Branch duct hole and fresh air intake hole (Fig. 2-3)

At the time of installation, use the duct holes (cut out) located at the positions shown in Fig. 2-3, as and when required.

• A fresh air intake hole for the optional multi function casement can also be made.

Note:

• The figure marked with * in the drawing represent the dimensions of the main unit excluding those of the optional multi function casement. When installing the optional multi function casement, add 135 mm to the dimensions marked on the figure.

• When installing the branch ducts, be sure to insulate adequately. Otherwise condensation and dripping may occur.

• When installing the fresh air intake hole, be sure to remove the insulator Ⓔ that is pasted on the indoor unit.

• When external air is input directly through the main unit, intake-air volume should be 5% or less of indoor unit air volume.

• To input the external air, the duct fan and dust collecting filter to prevent drawing in dust and other particles are necessary.

For details, see "Fresh air intake volume & static pressure characteristics" in the City Multi DATA BOOK.

• When external air is input into the main unit, the operation noise can be larger.

Ⓐ Branch duct hole

Ⓛ ⌀175 burring hole pitch

Ⓑ Main unit

Ⓜ Fresh air intake hole diagram

Ⓒ Fresh air intake hole

Ⓨ 3-4×10 tapping screws

Ⓓ Drain pipe

Ⓩ ⌀125 burring hole pitch

Ⓔ Refrigerant pipe

ⓐ ⌀100 cut out hole

Ⓕ Branch duct hole diagram (view from either side)

ⓑ Ceiling

Ⓖ 14-4×10 tapping screws

ⓓ Detailed figure of removing the insulator

Ⓗ ⌀150 cut out hole

ⓔ Insulation

2. Installing the indoor unit

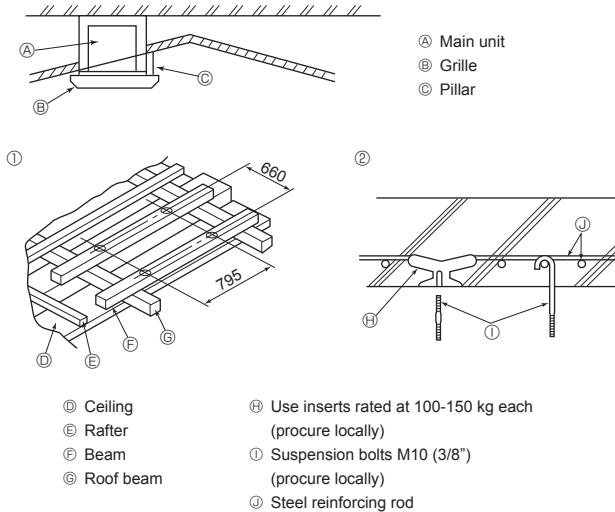


Fig. 2-4

2.4. Suspension structure (Give site of suspension strong structure) (Fig. 2-4)

- The ceiling work differs according to the construction of the building. Building constructors and interior decorators should be consulted for details.
- Extent of ceiling removal: The ceiling must be kept completely horizontal and the ceiling foundation (framework: wooden slats and slat holders) must be reinforced in order to protect the ceiling from vibration.
 - Cut and remove the ceiling foundation.
 - Reinforce the ends of the ceiling foundation where it has been cut and add ceiling foundation for securing the ends of the ceiling board.
 - When installing the indoor unit on a slanted ceiling, attach a pillar between the ceiling and the grille and set so that the unit is installed horizontally.

① Wooden structures

- Use tie beams (single storied houses) or second floor beams (two story houses) as reinforcing members.
- Wooden beams for suspending air conditioners must be sturdy and their sides must be at least 6 cm long if the beams are separated by not more than 90 cm and their sides must be at least 9 cm long if the beams are separated by as much as 180 cm. The size of the suspension bolts should be $\varnothing 10$ (3/8"). (The bolts do not come with the unit.)

② Ferro-concrete structures

- Secure the suspension bolts using the method shown, or use steel or wooden hangers, etc. to install the suspension bolts.

2.5. Unit suspension procedures (Fig. 2-5)

Suspend the main unit as shown in the diagram.

Figures given in parentheses represent the dimensions in case of installing optional multi function casement.

- In advance, set the parts onto the suspension bolts in the order of the washers (with insulation), washers (without insulation) and nuts (double).
- Fit the washer with cushion so that the insulation faces downward.
- In case of using upper washers to suspend the main unit, the lower washers (with insulation) and nuts (double) are to be set later.
- Lift the unit to the proper height of the suspension bolts to insert the mounting plate between washers and then fasten it securely.
- When the main unit can not be aligned against the mounting hole on the ceiling, it is adjustable owing to a slot provided on the mounting plate.
- Make sure that A is performed within 17-22 mm. Damage could result by failing to adhere to this range. (Fig. 2-6)

⚠ Caution:

Use the top half of the box as a protective cover to prevent dust or debris from getting inside the unit prior to installation of the decorative cover or when applying ceiling materials.

2.6. Confirming the position of main unit and tightening the suspension bolts (Fig. 2-7)

- Using the gauge attached to the grille, ensure that the bottom of the main unit is properly aligned with the opening of the ceiling. Be sure to confirm this, otherwise condensation may form and drip due to air leakage, etc.
- Confirm that the main unit is horizontally levelled, using a level or a vinyl tube filled with water.
- After checking the position of the main unit, tighten the nuts of the suspension bolts securely to fasten the main unit.
- The installation template (top of the package) can be used as a protective sheet to prevent dust from entering the main unit when the grilles are left unattached for a while or when the ceiling materials are to be lined after installation of the unit is finished.

* As for the details of fitting, refer to the instructions given on the Installation template. (top of the package)

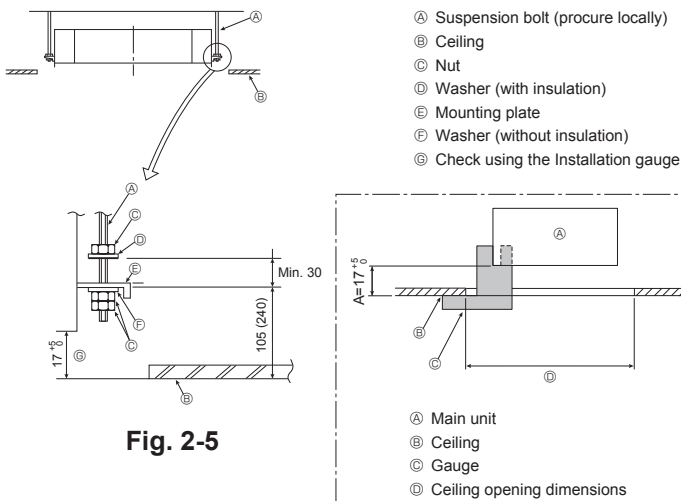


Fig. 2-5

Fig. 2-6

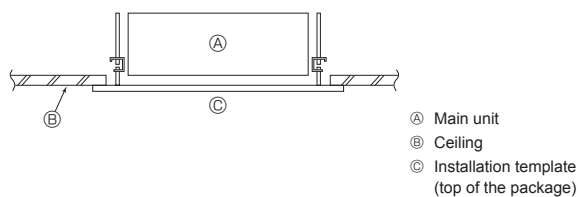


Fig. 2-7

3. Refrigerant pipe and drain pipe

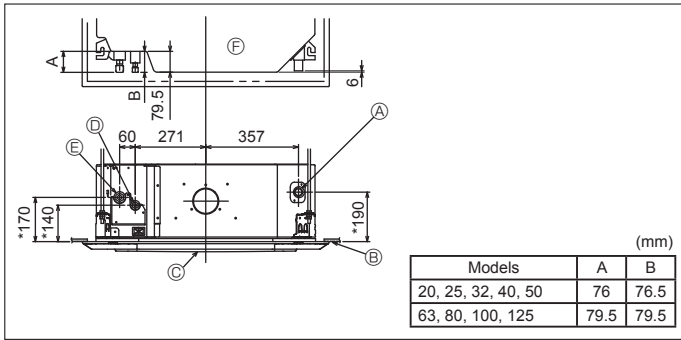


Fig. 3-1

3.1. Refrigerant and drainage piping locations of indoor unit (Fig. 3-1)

The figure marked with * in the drawing represent the dimensions of the main unit excluding those of the optional multi function casement.

- Ⓐ Drain pipe
- Ⓑ Ceiling
- Ⓒ Grille
- Ⓓ Refrigerant pipe (liquid)
- Ⓔ Refrigerant pipe (gas)
- Ⓕ Main unit

* When the optional multi-functional casement is installed, add 135 mm to the dimensions marked on the figure.

3.2. Precautions

For devices that use R410A refrigerant

- Use alkylbenzene oil (small amount) as the refrigeration oil applied to the flared sections.
- Use C1220 copper phosphorus for copper and copper alloy seamless pipes, to connect the refrigerant pipes. Use refrigerant pipes with the thicknesses specified in the following table. Make sure the insides of the pipes are clean and do not contain any harmful contaminants such as sulfuric compounds, oxidants, debris, or dust.

⚠ Warning:

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.

ø6.35 thickness 0.8 mm	ø9.52 thickness 0.8 mm
ø12.7 thickness 0.8 mm	ø15.88 thickness 1.0 mm

- Do not use pipes thinner than those specified above.

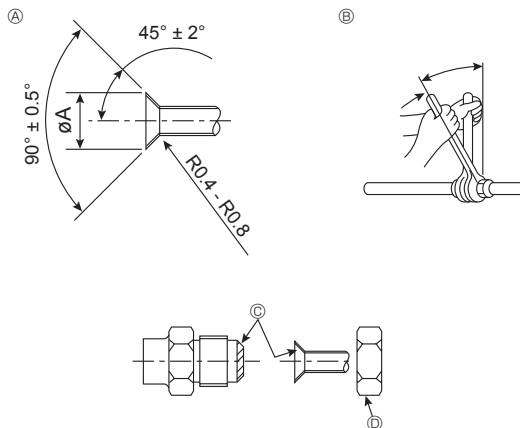


Fig. 3-2

3.3. Connecting pipes (Fig. 3-2)

- 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:

- Be careful of flying flare nut! (Internally pressurized)

Remove the flare nut as follows:

1. Loosen the nut until you hear a hissing noise.
 2. Do not remove the nut until the gas has been completely released (i.e., hissing noise stops).
 3. Check that the gas has been completely released, and then remove the nut.
- 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

Ⓑ Refrigerant pipe sizes & Flare nut tightening torque

	R410A				Flare nut O.D.	
	Liquid pipe		Gas pipe		Liquid pipe (mm)	Gas pipe (mm)
	Pipe size (mm)	Tightening torque (N·m)	Pipe size (mm)	Tightening torque (N·m)		
P20/25/32/40/50	ODø6.35 (1/4")	14 - 18	ODø12.7 (1/2")	49 - 61	17	26
P63/80/100/125	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.)

3. Refrigerant pipe and drain pipe

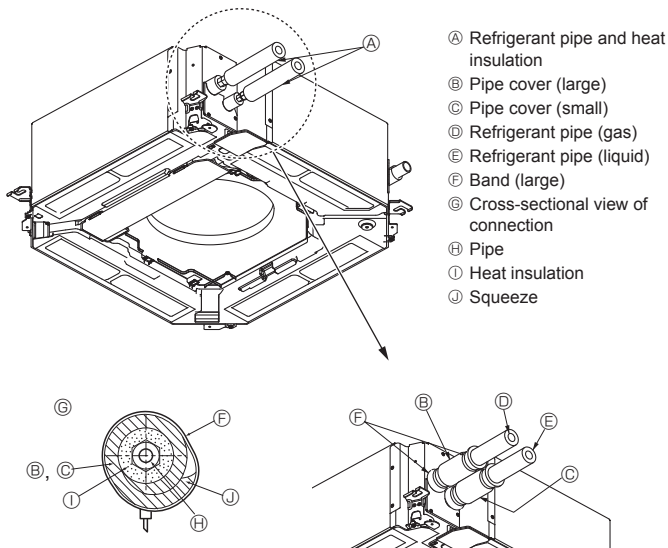


Fig. 3-3

3.4. Indoor unit (Fig. 3-3)

Heat insulation for refrigerant pipes:

- 1 Wrap the enclosed large-sized pipe cover around the gas pipe, making sure that the end of the pipe cover touches the side of the unit.
 - 2 Wrap the enclosed small-sized pipe cover around the liquid pipe, making sure that the end of the pipe cover touches the side of the unit.
 - 3 Secure both ends of each pipe cover with the enclosed bands. (Attach the bands 20 mm from the ends of the pipe cover.)
- 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.)

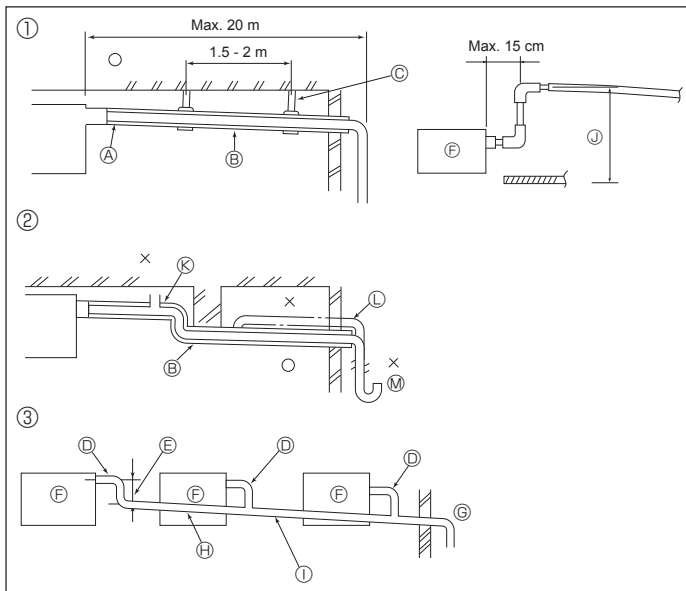


Fig. 3-4

3.5. Drainage piping work (Fig. 3-4)

- 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).
 - Use VP25 (O.D. $\phi 32$ PVC TUBE) for drain piping and provide 1/100 or more downward slope.
 - Be sure to connect the piping joints using a PVC type adhesive.
 - Observe the figure for piping work.
 - Use the included drain hose to change the extraction direction.
 - When performing the drainage piping work, be sure to use the support metal holders.
- If a load is applied to the drain socket that damages the hose or causes the hose to become detached, water leakage may result.

- | | |
|--|--|
| ① Correct piping | Ⓞ Make the piping size large for grouped piping. |
| ② Wrong piping | Ⓢ Downward slope (1/100 or more) |
| ③ Grouped piping | ① O.D. $\phi 38$ PVC TUBE for grouped piping (9 mm or more insulation) |
| Ⓐ Insulation (9 mm or more) | Ⓤ Up to 85 cm |
| Ⓑ Downward slope (1/100 or more) | Ⓚ Air bleeder |
| Ⓒ Support metal | Ⓛ Raised |
| Ⓓ O.D. $\phi 32$ PVC TUBE | Ⓜ Odor trap |
| Ⓔ Make it as large as possible (about 10 cm) | |
| Ⓕ Main unit | |

1. Connect the drain socket (supplied with the unit) to the drain port. (Fig. 3-5) (Fix the tube using PVC adhesive then secure it with a band.)
2. Install a locally purchased drain pipe (PVC pipe, O.D. $\phi 32$). (Fix the pipe using PVC adhesive then secure it with a band.)
3. Check that drain flows smoothly.
4. Insulate the drain port and socket with insulating material, then secure the material with a band. (Both insulating material and band are supplied with the unit.)
5. Insulate the tube and pipe. (PVC pipe, O.D. $\phi 32$)

- | | |
|----------------------------|---|
| Ⓐ Main unit | Ⓒ Drain pipe (O.D. $\phi 32$ PVC TUBE) |
| Ⓑ Insulating material | Ⓓ Insulating material (purchased locally) |
| Ⓒ Band (large) | ① Transparent PVC pipe |
| Ⓓ Drain port (transparent) | Ⓤ O.D. $\phi 32$ PVC TUBE (Slope 1/100 or more) |
| Ⓔ Insertion margin | Ⓚ Drain socket |
| Ⓕ Matching | |

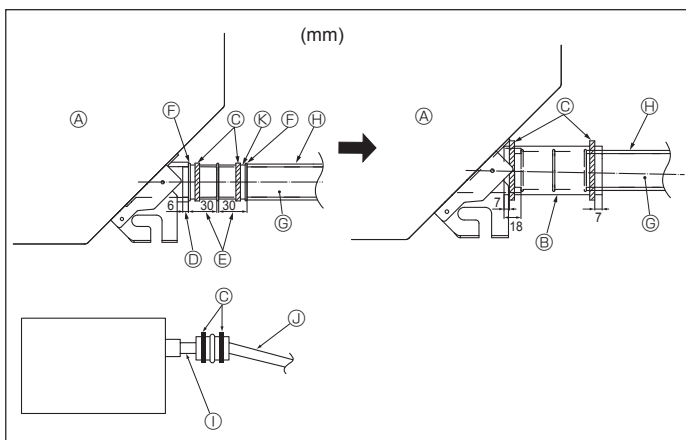


Fig. 3-5

4. Electrical work

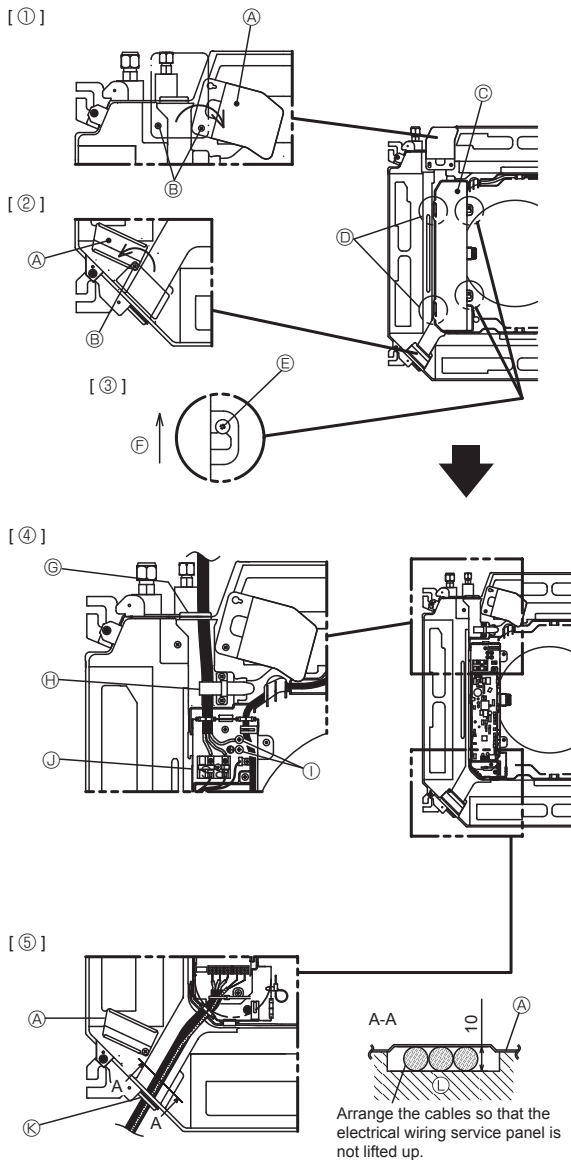
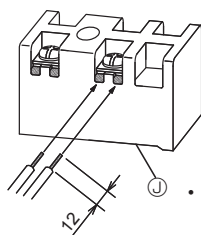
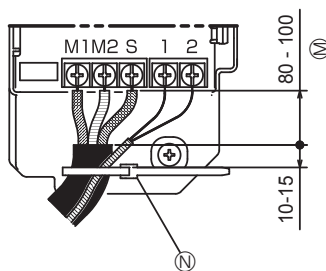


Fig. 4-1



- The U-shaped groove opens if you push the screw head after the screw is loosened.

Fig. 4-2



Secure the remote controller cable and indoor-outdoor connection cable with the cable strap.
If only one indoor-outdoor connection cable is connected, secure it using the cable strap according to the dimensions marked on the diagram.

Fig. 4-3

4.1. Indoor unit (Fig. 4-1)

- Loosen the two screws securing the electrical wiring service panel, and then turn the electrical wiring service panel. [Fig. 4-1 ①]
 - Loosen the one screw securing the electrical wiring service panel at the cable entry (remote controller cable and indoor-outdoor connection cable), and then turn the service panel to the position shown in the diagram. [Fig. 4-1 ②]
 - Loosen the two screws securing the electrical box cover, then slide the electrical box cover. [Fig. 4-1 ③]
 - Pass and wire the power cable and the earth cable through the wiring entries given in the diagram. [Fig. 4-1 ④]
 - Pass and wire the remote controller cable and the indoor - outdoor connection cable through the wiring entries given in the diagram. [Fig. 4-1 ⑤, Fig. 4-2, Fig. 4-3]
- Put the sheath portion of the power cable, earth cable and the indoor - outdoor connection cable into the electrical box.
 - Refer to 4.2., 4.3. and 4.4. for the connection.
 - Do not allow slackening of the terminal screws.

Screw tightening torque

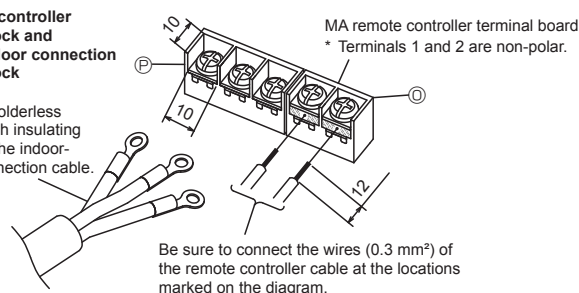
	Tightening torque (N·m)
Remote controller terminal board	1.2 ± 0.1
Indoor-outdoor connection terminal board	1.2 ± 0.1
Power terminal board	1.6 ± 0.1
Earth cable	1.6 ± 0.1

- Leave excess cable so that the electrical box can be suspended below the unit during servicing (approx. 50 to 100 mm).

- Ⓐ Electrical wiring service panel
- Ⓑ Screw
- Ⓒ Electrical box cover
- Ⓓ Temporary hook for electrical box cover
- Ⓔ Screw
- Ⓕ Slide direction of the electrical box cover
- Ⓖ Entry for power cable
- Ⓗ Secure with the cable strap.
- Ⓚ Earth cable
- Ⓛ Power terminal
- Ⓜ Entry for wired remote controller and indoor-outdoor connection cable
- Ⓝ Drain Pan
- Ⓨ Length of the cable not covered by the indoor - outdoor connection cable sheath.
- Ⓩ Secure with the cable strap
- Ⓟ Wired remote controller terminal
- Ⓠ Indoor - outdoor connection terminal

⚠ Caution:

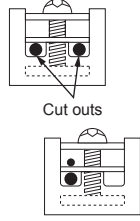
- Wiring for remote controller cable shall be apart (5 cm or more) from power source wiring so that it is not influenced by electric noise from power source wiring.



4. Electrical work

<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.

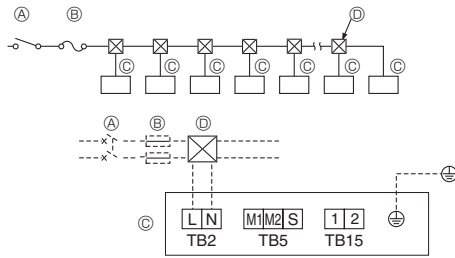


Fig. 4-4

4.2. Power supply wiring (Fig. 4-4)

- Wiring size must comply with the applicable local and national code.
 - Install an earth longer than other cables.
 - Power supply codes of appliance shall not be lighter than design 60245 IEC 53 or 60227 IEC 53.
 - 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.

Total operating current of the indoor unit	Minimum wire thickness (mm ²)			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-VHM, PKFY-VKM, PLFY-VCM, PLFY-VFM	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)

$$F2 = 19.8 \times 4/8 + 38 \times 1/8$$

$$= 14.65$$

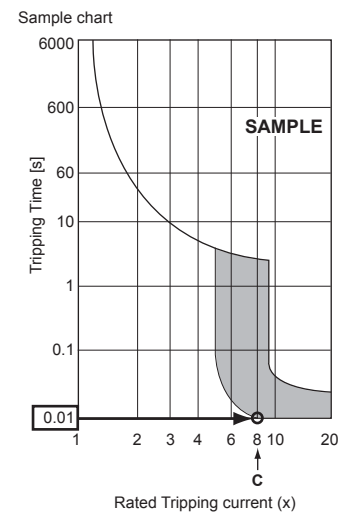
→ 16 A breaker (Tripping current = 8 × 16 A at 0.01 s)

*3 Current sensitivity is calculated using the following formula.

$$G1 = V2 \times (\text{Quantity of Type1}) + V2 \times (\text{Quantity of Type2}) + V2 \times (\text{Quantity of Type3}) + V2 \times (\text{Quantity of Others}) + V3 \times (\text{Wire length[km]})$$

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 mm ²	48
2.5 mm ²	56
4.0 mm ²	66



4. Electrical work

4.3. Types of control cables

1. Wiring transmission cables

Types of transmission cable	Shielding wire CVVS or CPEVS
Cable diameter	More than 1.25 mm ²
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 mm ²
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 mm ²
Length	Less than 200 m

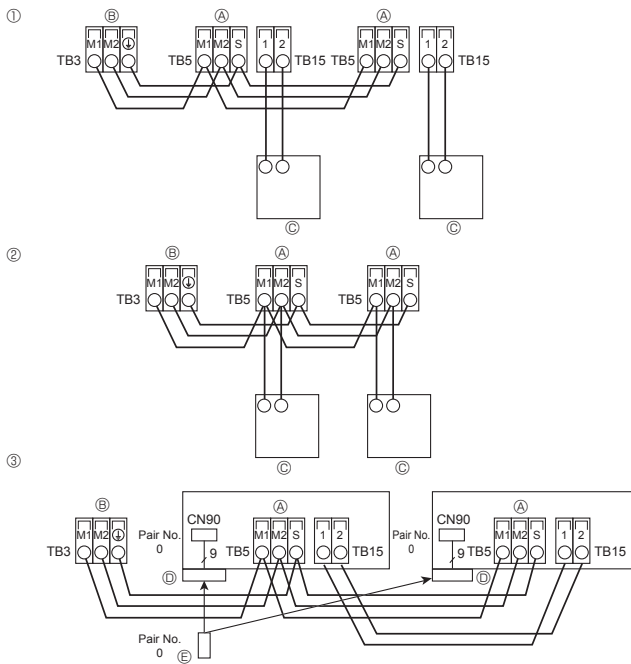


Fig. 4-5

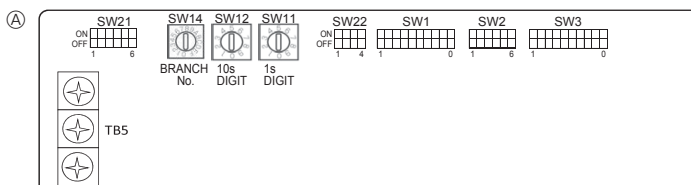


Fig. 4-6

4.4. Connecting remote controller, indoor and outdoor transmission cables (Fig. 4-5)

- 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.
- 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)
 - M-NET Remote controller
 - Connect the "M1" and "M2" on indoor unit TB5 to a M-NET remote controller. (Non-polarized 2-wire)
 - DC 24 to 30 V between M1 and M2 (M-NET remote controller)
 - Wireless remote controller (When installing wireless signal receiver)
 - Connect the wire of wireless signal receiver (9-pole cable) to CN90 of indoor controller board.
 - 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 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(A), M2(B), (S))
 (C) Remote controller
 (D) wireless signal receiver
 (E) wireless remote controller

4.5. Setting addresses (Fig. 4-6)

(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.
- 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".
 - 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.
- (A) Controller board

4. Electrical work

4.6. Switch setting for high ceiling or at the time of changing the number of air outlets (Fig. 4-6)

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

Note:

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

			PLFY-P20-P80VEM						PLFY-P100-P125VEM					
			Silent		Standard		High ceiling		Silent		Standard		High ceiling	
			SW21-1	SW21-2	SW21-1	SW21-2	SW21-1	SW21-2	SW21-1	SW21-2	SW21-1	SW21-2	SW21-1	SW21-2
			OFF	ON	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF	ON	OFF
4 direction	SW21-3	OFF	2.5 m		2.7 m		3.5 m		2.7 m		3.2 m		4.5 m	
	SW21-4	ON												
3 direction	SW21-3	OFF	2.7 m		3.0 m		3.5 m		3.0 m		3.6 m		4.5 m	
	SW21-4	OFF												
2 direction	SW21-3	ON	3.0 m		3.3 m		3.5 m		3.3 m		4.0 m		4.5 m	
	SW21-4	OFF												

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

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.

4.8. 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)
PLFY-P20VEM-E	220 - 240V/50Hz 220V/60Hz	Max.: 264V Min.: 198V	0.28	0.05	0.22
PLFY-P25VEM-E			0.28	0.05	0.22
PLFY-P32VEM-E			0.28	0.05	0.22
PLFY-P40VEM-E			0.36	0.05	0.29
PLFY-P50VEM-E			0.36	0.05	0.29
PLFY-P63VEM-E			0.45	0.05	0.36
PLFY-P80VEM-E			0.64	0.05	0.51
PLFY-P100VEM-E			1.25	0.12	1.00
PLFY-P125VEM-E			1.34	0.12	1.07

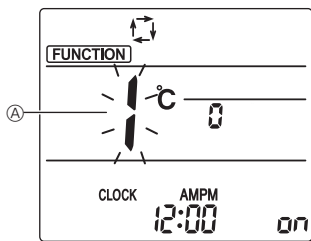
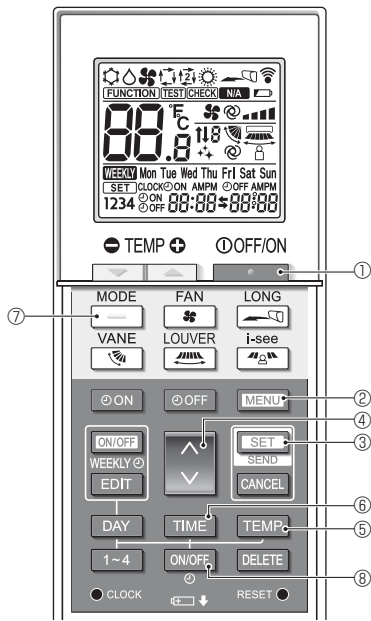


Fig. 4-7

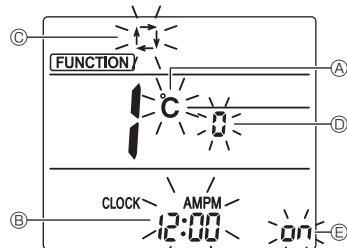


Fig. 4-8

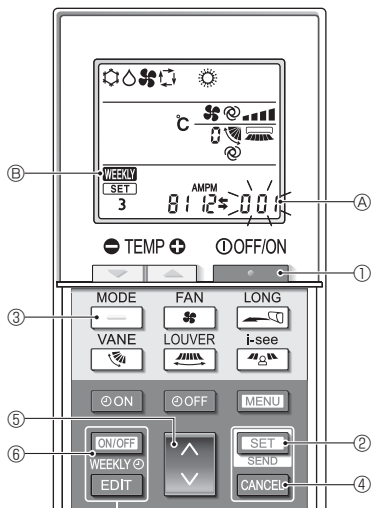


Fig. 4-9

4.9. Initial setting

The following settings can be made in the initial setting mode.

Item	Setting	Fig. 4-8
Temperature unit	°C/°F	Ⓐ
Time display	12-hour format/24-hour format	Ⓑ
AUTO mode	Single set point/Dual set point	Ⓒ
Pair No.	0-3	Ⓓ
Backlight	On/Off	Ⓔ

4.9.1. Switching to the initial setting mode

1. Press the **STOP** button ① to stop the air conditioner.
2. Press the **MENU** button ②.
The Function setting screen will be displayed and the function No. ④ will flash. (Fig. 4-7)
3. Check that function No. "1" is displayed, and then press the **SET** button ③.
The Screen display setting screen will be displayed. (Fig. 4-8)
Press the **DOWN** button ④ to change the function No.

4.9.2. Changing the temperature unit (Fig. 4-8 Ⓐ)

- Press the **TEMP** button ⑤.
- Each time the **TEMP** button ⑤ is pressed, the setting switches between °C and °F.
- °C : The temperature is displayed in degrees Celsius.
°F : The temperature is displayed in degrees Fahrenheit.

4.9.3. Changing the time display (Fig. 4-8 Ⓑ)

- Press the **TIME** button ⑥.
- Each time the **TIME** button ⑥ is pressed, the setting switches between 12:00^{AM/PM} and 24:00.
- 12:00^{AM/PM} : The time is displayed in the 12-hour format.
24:00 : The time is displayed in the 24-hour format.

4.9.4. Changing the AUTO mode (Fig. 4-8 Ⓒ)

- Press the **MODE** button ⑦.
- Each time the **MODE** button ⑦ is pressed, the setting switches between and .
- : The AUTO mode operates as the usual automatic mode.
 : The AUTO mode operates using dual set points.

4.9.5. Changing the pair No. (Fig. 4-8 Ⓓ)

- Press the **UP** button ④.
- Each time the **UP** button ④ is pressed, the pair No. 0-3 changes.

Pair No. of wireless remote controller	Indoor PC board SW22		
	SW22-3	SW22-4	
0	ON	ON	Initial setting
1	OFF	ON	
2	ON	OFF	
3	OFF	OFF	

4.9.6. Changing the backlight setting Ⓔ

- Press the **ON/OFF** button ⑩.
- Each time the **ON/OFF** button ⑩ is pressed, the setting switches between and .
- : The backlight comes on when a button is pressed.
 : The backlight does not come on when a button is pressed.

4.9.7. Completing the setting

- Press the **SET** button ②.
- The function No ④ blinks (Fig. 4-7)
- Press the **MENU** button ②.
- The remote controller exits the initial setting mode. (The air conditioner operation is stopped.)

4.9.8. How to disable Auto mode operation (Fig. 4-9)

1. Press the **STOP** button ① to stop the air conditioner.
 - If the weekly timer is enabled, press the **ON/OFF WEEKLY** button ⑥ to disable the timer. (**WEEKLY** ⑧ disappears.)
2. Press the **SET** button ② for 5 seconds.
 - The unit enters the function setting mode. (The group model setting number ④ blinks.)
3. Press the **DOWN** button ④.
 - Enter the group model setting number to "066". (The factory setting is "002".)
4. Completing the settings (Fig. 4-9)
 - Press the **SET** button ② for 5 seconds.
 - The remote controller exits the function setting mode.

5. Test run

5.1. 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

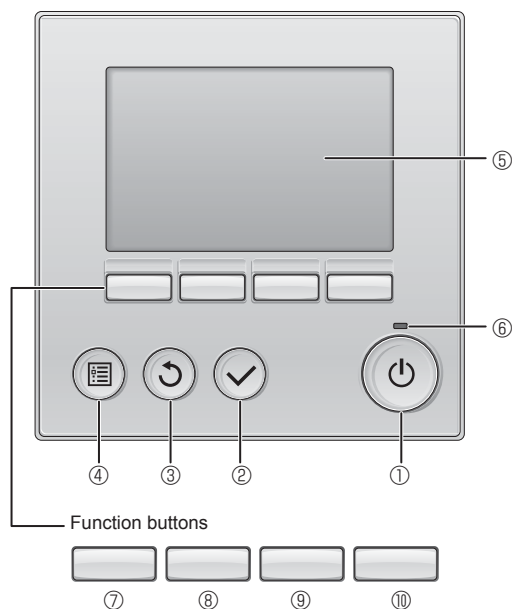


Fig. 5-1

5.2. Test run

The following 3 methods are available.

5.2.1. Using wired remote controller (Fig. 5-1)

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.

5. 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. 5-2)
To enter the current maintenance password (4 numerical digits), move the cursor to the digit you want to change with the or button, and set each number (0 through 9) with the or 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 and buttons simultaneously for three seconds on the maintenance password setting screen.

- ③ Select "Test run" with the or button, and press the button. (Fig. 5-3)
- ④ Select "Test run" with the or button, and press the button. (Fig. 5-4)

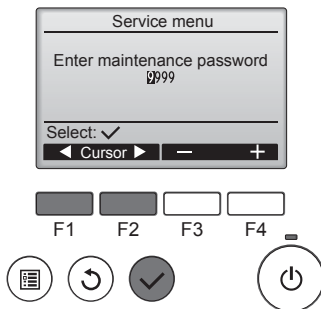


Fig. 5-2

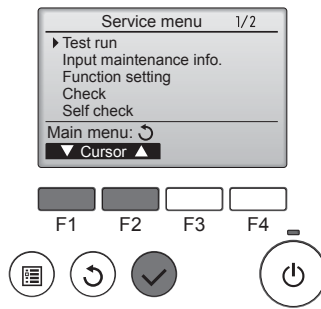


Fig. 5-3

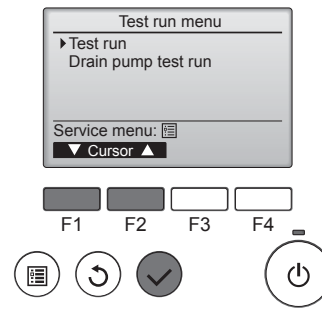


Fig. 5-4

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

- ① Press the button to go through the operation modes in the order of "Cool" and "Heat". (Fig. 5-5)
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 buttons. (Fig. 5-6)
- ② Press the button to return to "Test run operation".
- ③ Press the button.

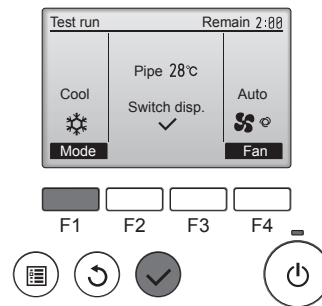


Fig. 5-5

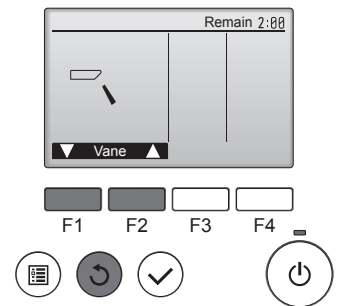


Fig. 5-6

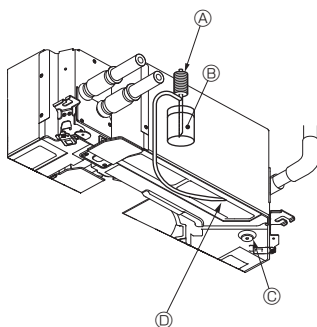


Fig. 5-7

- Ⓐ Water supply pump
- Ⓑ Water (about 1000cc)
- Ⓒ Drain plug
- Ⓓ Pour water through outlet
· Be careful not to spray water into the drain pump mechanism.

5.3. Check of drainage (Fig. 5-7)

- Ensure that the water is being properly drained out and that no water is leaking from joints.

When electric work is completed.

- Pour water during cooling operation and check.

When electric work is not completed.

- Pour water during emergency operation and check.

* Drain pan and fan are activated simultaneously when single phase 220-240V is turned on to L and N on terminal block after the connector (SWE) on controller board in the electrical branch box is set to ON.

Be sure to turn it back to the former state after work.

6. Installing the grille

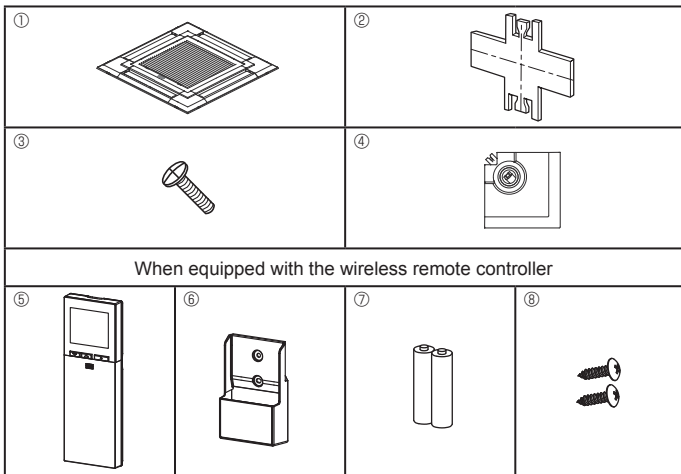


Fig. 6-1

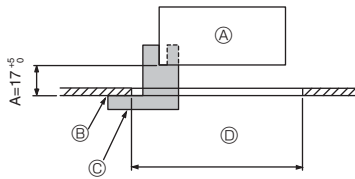


Fig. 6-2

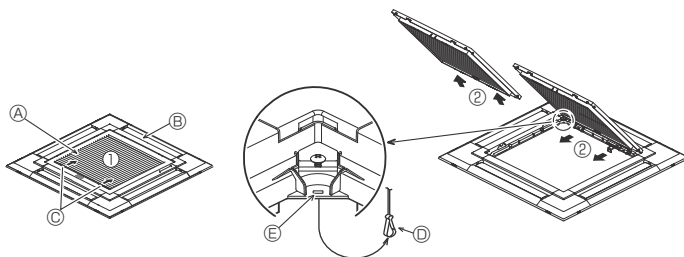


Fig. 6-3

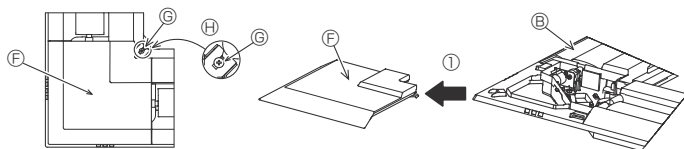


Fig. 6-4

	4-directional	3-directional
Blowout direction patterns	1 pattern: initial setting 	4 patterns: one air outlet fully closed
Blowout direction patterns	2-directional 6 patterns: 2 air outlet fully closed 	

Table 1

<Hook is in the raised position>

<Hook is in the lowered position>



Fig. 6-5

6.1. Checking the contents (Fig. 6-1)

- This kit contains this manual and the following parts.

	Accessory name	Q'ty	Remarks
①	Grille	1	950 × 950 (mm)
②	Installation gauge	1	(Divided into 4 parts)
③	Screw (4 × 16)	1	For PLP-6EAE, PLP-6EALME, PLP-6EALME
④	i-see Sensor corner panel	1	For PLP-6EAE, PLP-6EALME, PLP-6EALME
⑤	Wireless remote controller	1	For PLP-6EALM, PLP-6EALME
⑥	Remote controller holder	1	Included when equipped with the wireless remote controller.
⑦	LR6 AA batteries	2	Included when equipped with the wireless remote controller.
⑧	3.5 × 16 tapping screws	2	Included when equipped with the wireless remote controller.

6.2. Preparing to attach the grille (Fig. 6-2)

- With the gauge ② supplied with this kit, adjust and check the positioning of the main unit relative to the ceiling surface. If the main unit is not properly positioned relative to the ceiling surface, it may allow air leaks or cause condensation to collect.
- Make sure that the opening in the ceiling is within the following tolerances: 860 × 860 - 910 × 910
- Make sure that A is performed within 17-22 mm. Damage could result by failing to adhere to this range.
 - Ⓐ Main unit
 - Ⓑ Ceiling surface
 - Ⓒ Installation gauge ② (inserted into the main unit)
 - Ⓓ Ceiling opening dimensions

6.2.1. Removing the intake grille (Fig. 6-3)

- Slide the levers in the direction indicated by the arrows ① to open the intake grille.
- Unlatch the hook that secures the grille.
 - * Do not unlatch the hook for the intake grille.
- With the intake grille in the "open" position, remove the hinge of the intake grille from the grille as indicated by the arrows ②.

6.2.2. Removing the corner panel (Fig. 6-4)

- Loose the 4 screws on the corner. Slide the corner panel in the direction of the arrow ① in the figure and remove the corner panel.

[Fig. 6-3] [Fig. 6-4]

- Ⓐ Intake grille
- Ⓑ Grille ①
- Ⓒ Intake grille levers
- Ⓓ Grille hook
- Ⓔ Hole for the grille's hook
- Ⓕ Corner panel
- Ⓖ Screw
- Ⓗ Detail

6.3. Selection of air outlets

For this grille the discharge direction is available in 11 patterns. Also, by setting the switch on the control board to the appropriate settings, you can adjust the air-flow and speed. Select the required settings from the Table 1 according to the location in which you want to install the unit. (More than two directions must be selected.)

- Decide on the discharge direction pattern.
- Be sure to set the switch on the control board to the appropriate settings according to the number of air outlets and the height of the ceiling on which the main unit will be installed.

Note:

- When changing the number of directions, you need an air outlet shutter plate, which is optional part.
- Do not select 2 directions in a hot and humid environment. (Dew formation or dew drop may result.)

6.4. Installing the grille

6.4.1. Preparations (Fig. 6-5)

Make sure to flip 2 hooks on the grille up.

6. Installing the grille

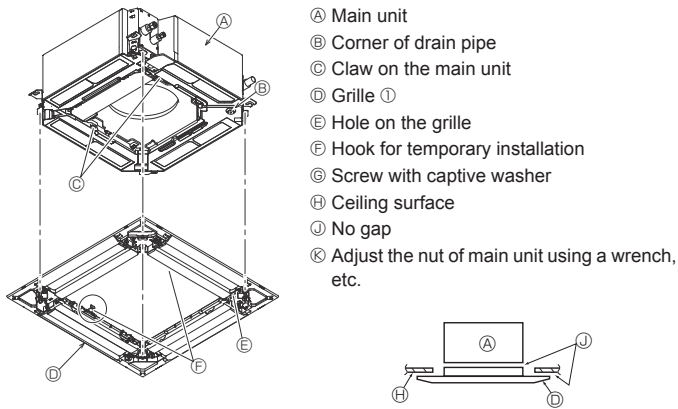


Fig. 6-6

< The grille temporary installed >

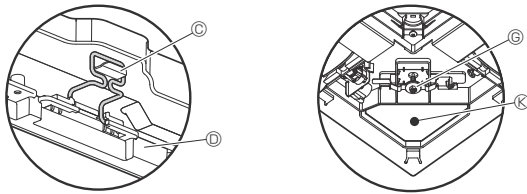


Fig. 6-7

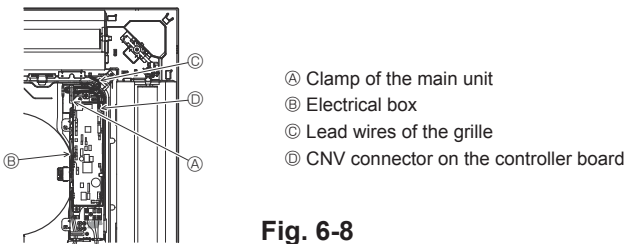


Fig. 6-8

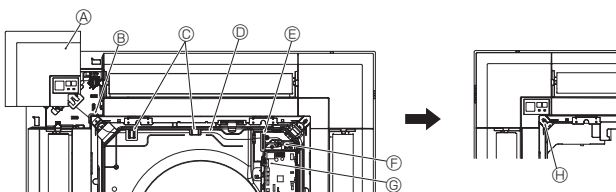


Fig. 6-9

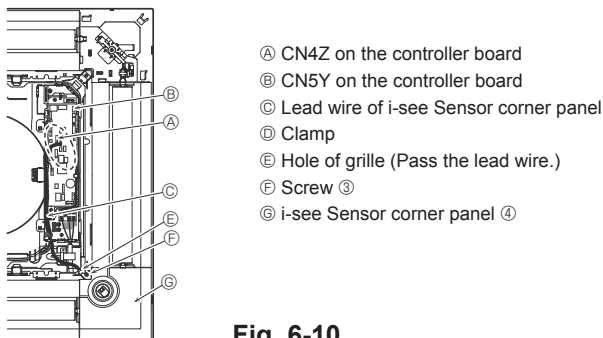


Fig. 6-10

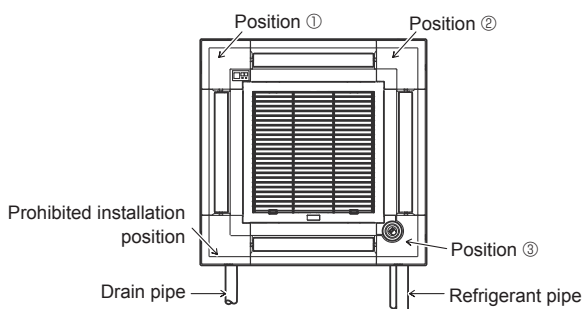


Fig. 6-11

6.4.2. Temporary installation of the grille (Fig. 6-6)

- Join the corner of drain pipe on the main unit with the corner with hole on the grille and put them together temporarily by hanging the hook of the grille to the claw of the main unit.

6.4.3. Fixing the grille

- By tightening the pre-installed screws, fix the grille onto the main unit. (Fig. 6-6)
Note:
Make sure there is no gap between the main unit and the grille or between the grille and the ceiling surface. (Fig. 6-6)

If there is a gap between the grille and the ceiling:

With the grille attached, slightly adjust the installation height of the main unit and clear the gap.

⚠ Caution:

- When tightening the screw, make sure that the tightening torque is 2.8 N·m to 3.6 N·m. Never use an impact screw driver.
- After tightening the screw, confirm that the two grille hooks (Fig. 6-7) are latched onto the hooks on the main unit.

6.4.4. Wire connection (Fig. 6-8)

- Loose the 2 screws fixing the electrical box cover on the main unit, and slide the cover to open.
- Route the lead wire from side of the electrical box.
- Make sure to connect a connector for vane motor (white, 20 poles) to CNV connector (white) on the controller board of the main unit.
- Lead wires that lead off the grille must be held together without slack using a clamp into the electrical box.

6.4.5. Installing signal receiver (Fig. 6-9)

- Route the lead wire (white, 9 poles) for signal receiver corner panel from the side of the electrical box on the main unit.
- Make sure to connect to CN90 (white) on the controller board.
- Make sure that the lead wire of the signal receiver corner panel is passed through the claw of bellmouth.
- The remaining lead wire must be held together without slack using a clamp into the electrical box.
- Put the cover back on the electrical box with 2 screws.

Note:

Make sure wires are not caught in the electrical box cover.

Install the signal receiver corner panel to the panel and fix with the screw.

The signal receiver corner panel can not be installed on the drain pipe side for the main unit. (Refer to Fig. 6-11)

- Signal receiver corner panel
- Hole of grille (Pass the lead wire.)
- Claw of bell mouth
- Wire
- Clamp
- Cable band (Secure the lead wire.)
- CN90 on controller board
- Screw

6.4.6. Installation of i-see Sensor corner panel (Fig. 6-10)

- Route the lead wire from the side of electrical box.
- Route the lead wire connector (white, 4 poles and white, 5 poles) of the i-see Sensor corner panel ④ from the side of the electrical box on the main unit and connect to the connector CN4Z and CN5Y on the controller board.
- The remaining lead wire of i-see Sensor corner panel must be held together without slack using the clamp into the electrical box.
- Put the cover back on the electrical box with 2 screws.

Note:

Make sure wires are not caught in the electrical box cover.

- The i-see Sensor corner panel should be fixed onto the grille ① with screw ③.
- If the position of the i-see Sensor was changed from default position (position ③) to the other position, change the function settings. (Fig. 6-11)
- The i-see Sensor corner panel can not be installed on the drain pipe side for the main unit. (Refer to Fig. 6-11)

Position ①: Default signal receiver position (Air outlet identification marks □/□□□)

Position ②: (Air outlet identification marks □/□)

Position ③: Default i-see Sensor position (Air outlet identification marks □□/□□)

6. Installing the grille

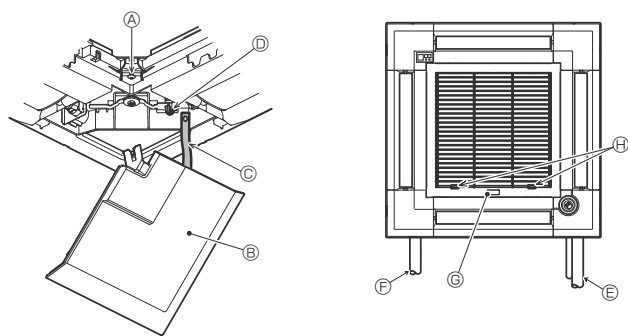


Fig. 6-12

6.5. Installing the intake grille (Fig. 6-12)

Note:

When reinstalling the corner panels (each with a safety strap attached), connect the other end of each safety strap to the grille as shown in the illustration.

* If the corner panels are not attached surely, they may fall off while the main unit is operating.

• Perform the procedure that is described in “6.2. Preparing to attach the grille” in reverse order to install the intake grille and the corner panel.

• The direction of the intake grille can be changed according to the wishes of the customer.

Ⓐ Screw (4 × 16)

Ⓑ Corner panel

Ⓒ Safety strap

Ⓓ Hook

Ⓔ Refrigerant pipe

Ⓕ Drain pipe

Ⓖ Company logo

* Installation in any position is possible.

Ⓗ Initial position of the levers on the intake grille

* Although the clips can be installed in any of 4 positions, the configuration shown here is recommended. (It is not necessary to remove the intake grille when maintenance is performed on the electrical box of the main unit.)

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.



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