

CEILING CASSETTE TYPE AIR CONDITIONERS

MLZ-KA25VA MLZ-KA35VA MLZ-KA50VA

INSTALLATION MANUAL

For INSTALLER

- This manual only describes the installation of indoor unit.
When installing the outdoor unit, refer to the installation manual of outdoor unit.

English

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This installation manual describes only for the indoor unit. Refer to the MXZ type manual for outdoor unit set up.

Required Tools for Installation

Phillips screwdriver	Flare tool for R410A
Level	Gauge manifold for R410A
Scale	Vacuum pump for R410A
Utility knife or scissors	Charge hose for R410A
75 mm hole saw	Pipe cutter with reamer
Torque wrench	Water bottle
Wrench (or spanner)	0.9 to 1.0 L water

1. BEFORE INSTALLATION

1-1. THE FOLLOWING SHOULD ALWAYS BE OBSERVED FOR SAFETY

- Be sure to read "THE FOLLOWING SHOULD ALWAYS BE OBSERVED FOR SAFETY" before installing the air conditioner.
- Be sure to observe the warnings and cautions specified here as they include important items related to safety.
- After reading this manual, be sure to keep it together with the OPERATING INSTRUCTIONS for future reference.

⚠ WARNING (Could lead to death, serious injury, etc.)

- **Do not install the unit by yourself (user).**
Incomplete installation could cause fire or electric shock, injury due to the unit falling, or leakage of water. Consult the dealer from whom you purchased the unit or a qualified installer.
- **Perform the installation securely referring to the installation manual.**
Incomplete installation could cause fire or electric shock, injury due to the unit falling, or leakage of water.
- **When installing the unit, use appropriate protective equipment and tools for safety.**
Failure to do so could cause injury.
- **Install the unit securely in a place which can bear the weight of the unit.**
If the installation location cannot bear the weight of the unit, the unit could fall causing injury.
- **Electrical work should be performed by a qualified, experienced electrician, according to the installation manual. Be sure to use an exclusive circuit. Do not connect other electrical appliances to the circuit.**
If the capacity of the power circuit is insufficient or there is incomplete electrical work, it could result in a fire or an electric shock.
- **Earth the unit correctly.**
Do not connect the earth to a gas pipe, water pipe, lightning rod or telephone earth. Defective earthing could cause electric shock.
- **Do not damage the wires by applying excessive pressure with parts or screws.**
Damaged wires could cause fire or electric shock.
- **Be sure to cut off the main power in case of setting up the indoor P.C. board or wiring works.**
Failure to do so could cause electric shock.
- **Use the specified wires to connect the indoor and outdoor units securely and attach the wires firmly to the terminal block connecting sections so the stress of the wires is not applied to the sections. Do not extend the wires, or use intermediate connection.**
- **Incomplete connecting and securing could cause fire.**
- **Do not install the unit in a place where inflammable gas may leak.**
If gas leaks and accumulates in the area around the unit, it could cause an explosion.
- **Do not use intermediate connection of the power cord or the extension cord and do not connect many devices to one AC outlet.**
It could cause a fire or an electric shock due to defective contact, defective insulation, exceeding the permissible current, etc.
- **Be sure to use the parts provided or specified parts for the installation work.**
The use of defective parts could cause an injury or leakage of water due to a fire, an electric shock, the unit falling, etc.
- **When plugging the power supply plug into the outlet, make sure that there is no dust, clogging, or loose parts in both the outlet and the plug. Make sure that the power supply plug is pushed completely into the outlet.**
If there is dust, clogging, or loose parts on the power supply plug or the outlet, it could cause electric shock or fire. If loose parts are found on the power supply plug, replace it.
- **Attach the electrical cover to the indoor unit and the service panel to the outdoor unit securely.**
If the electrical cover of the indoor unit and/or the service panel of the outdoor unit are not attached securely, it could result in a fire or an electric shock due to dust, water, etc.
- **When installing, relocating, or servicing the unit, make sure that no substance other than the specified refrigerant (R410A) enters the refrigerant circuit.**
Any presence of foreign substance such as air can cause abnormal pressure rise and may result in explosion or injury. The use of any refrigerant other than that specified for the system will cause mechanical failure, system malfunction, or unit breakdown. In the worst case, this could lead to a serious impediment to securing product safety.
- **Do not discharge the refrigerant into the atmosphere. If refrigerant leaks during installation, ventilate the room.**
If refrigerant comes in contact with a fire, harmful gas could be generated. Refrigerant leakage may cause suffocation. Provide ventilation in accordance with EN378-1.
- **Check that the refrigerant gas does not leak after installation has been completed.**
If refrigerant gas leaks indoors, and comes into contact with the flame of a fan heater, space heater, stove, etc., harmful substances will be generated.
- **Use appropriate tools and piping materials for installation.**
The pressure of R410A is 1.6 times more than R22. Not using appropriate tools or materials and incomplete installation could cause the pipes to burst or injury.
- **When pumping down the refrigerant, stop the compressor before disconnecting the refrigerant pipes.**
If the refrigerant pipes are disconnected while the compressor is running and the stop valve is open, air could be drawn in and the pressure in the refrigeration cycle could become abnormally high. This could cause the pipes to burst or injury.
- **When installing the unit, securely connect the refrigerant pipes before starting the compressor.**
If the compressor is started before the refrigerant pipes are connected and when the stop valve is open, air could be drawn in and the pressure in the refrigeration cycle could become abnormally high. This could cause the pipes to burst or injury.
- **Fasten a flare nut with a torque wrench as specified in this manual.**
If fastened too tight, a flare nut may break after a long period and cause refrigerant leakage.
- **The unit shall be installed in accordance with national wiring regulations.**

⚠ CAUTION (Could lead to serious injury in particular environments when operated incorrectly.)

- **Install an earth leakage breaker depending on the installation place.**
If an earth leakage breaker is not installed, it could cause electric shock.
- **Perform the drainage/piping work securely according to the installation manual.**
If there is defect in the drainage/piping work, water could drop from the unit, soaking and damaging household goods.
- **Do not touch the air inlet or the aluminum fins of the outdoor unit.**
This could cause injury.
- **Do not install the outdoor unit where small animals may live.**
If small animals enter and touch the electric parts inside the unit, it could cause a malfunction, smoke emission, or fire. Also, advise user to keep the area around the unit clean.

1-2. SELECTING THE INSTALLATION LOCATION

INDOOR UNIT

- Where airflow is not blocked.
- Where cool air spreads over the entire room.
- Where it is not exposed to direct sunshine. Do not expose to direct sunshine also during the period following unpacking to before use.
- Where easily drained.
- At a distance 1 m or more away from your TV and radio. Operation of the air conditioner may interfere with radio or TV reception. An amplifier may be required for the affected device.
- In a place as far away as possible from fluorescent and incandescent lights (so the infrared remote control can operate the air conditioner normally).
- Where the air filter can be removed and replaced easily.

REMOTE CONTROLLER

- Where it is easy to operate and easily visible.
- Where children cannot touch it.
- Select a position about 1.2 m above the floor and check that signals from the remote controller are surely received by the indoor unit from that position ('beep' or 'beep beep' receiving tone sounds). After that, attach remote controller holder to a pillar or wall and install wireless remote controller.

Note:

In rooms where inverter type fluorescent lamps are used, the signal from the wireless remote controller may not be received.

Note:

Avoid the following places for installation where air conditioner trouble is liable to occur.

- Where flammable gas could leak.
- Where there is much machine oil.
- Where oil is splashed or where the area is filled with oily smoke (such as cooking areas and factories, in which the properties of plastic could be changed and damaged).
- Salty places such as the seaside.
- Where sulfide gas is generated such as a hot spring.
- Where there is high-frequency or wireless equipment.
- Where there is emission of high levels of VOCs, including phthalate compounds, formaldehyde, etc., which may cause chemical cracking.

1-3. SPECIFICATIONS

Model	Power supply *1		Wire specifications *2	Pipe size (thickness *3)		Insulation thickness *7, *8
	Rated Voltage	Frequency		Gas	Liquid	
MLZ-KA25/35VA	230 V	50 Hz	4-core 1.5 mm ²	ø9.52 mm (0.8 mm)	ø6.35 mm (0.8 mm)	14 mm
MLZ-KA50VA				ø12.7 mm (0.8 mm)		

*1 Connect to the power switch which has a gap of 3 mm or more when open to interrupt the source power phase. (When the power switch is shut off, it must interrupt all phases.)

*2 Use wires in conformity with design 60245 IEC 57.

*3 Never use pipes with thickness less than specified. The pressure resistance will be insufficient.

*4 Use a copper pipe or a copper-alloy seamless pipe.

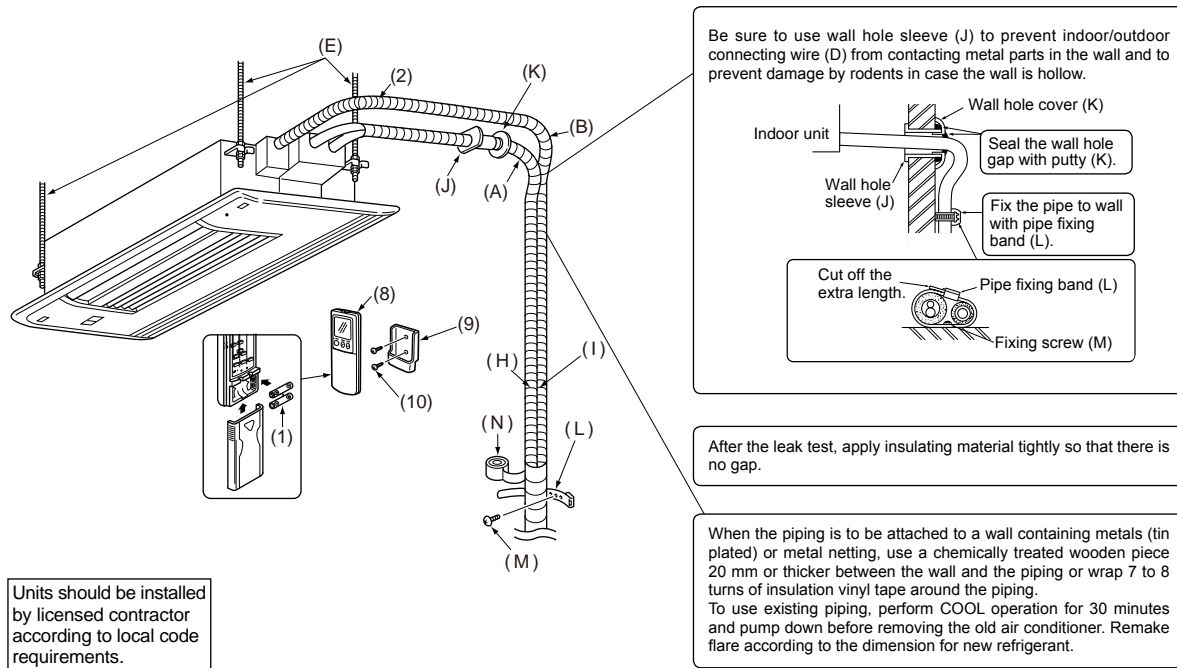
*5 Be careful not to crush or bend the pipe during pipe bending.

*6 Refrigerant pipe bending radius must be 100 mm or more.

*7 Insulation material : Heat resisting foam plastic 0.045 specific gravity

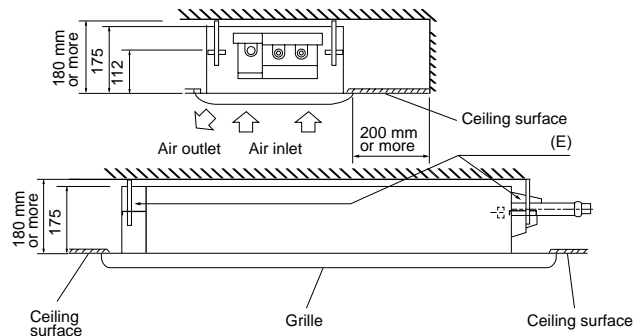
*8 Be sure to use the insulation of specified thickness. Excessive thickness may cause incorrect installation of the indoor unit and insufficient thickness may cause dew drippage.

1-4. INSTALLATION DIAGRAM



Service space

- The dimensions of ceiling opening can be regulated within the range shown in following diagram; 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.



ACCESSORIES

Check the following parts before installation.

(1) Alkaline battery (AAA) for (8)	2
(2) Drain hose (with insulation)	1
(3) Special washer (with cushion, 4 pcs)	8
(4) Installation template	1
(5) Fixing screw for (4) M5 × 30 mm	4
(6) Band	1
(7) Fixing screw for (6) 4 × 16 mm	2
(8) Remote controller	1
(9) Remote controller holder	1
(10) Fixing screw for (9) 3.5 × 16 mm (Black)	2

PARTS TO BE PROVIDED AT YOUR SITE

(A) Refrigerant pipe	1
(B) Drain pipe VP20 (O.D. 26)	1
(C) Installation tools (See 1-3)	1
(D) Indoor/outdoor unit connecting wire*	1
(E) Suspension bolt (M10)	4
(F) Nut with flange (M10)	8
(G) Nut (M10)	4
(H) Insulating material for (A) (Heat resistant foamed polyethylene, specific gravity 0.045, thickness more than 14 mm)	1
(I) Insulating material for (B) (Foamed polyethylene, specific gravity 0.03, thickness more than 10 mm)	1

(J) Wall hole sleeve	1
(K) Parts for mending wall hole (putty, cover)	1
(L) Pipe fixing band	2 to 7
(M) Fixing screw for (L)	2 to 7
(N) Piping tape	1 to 5

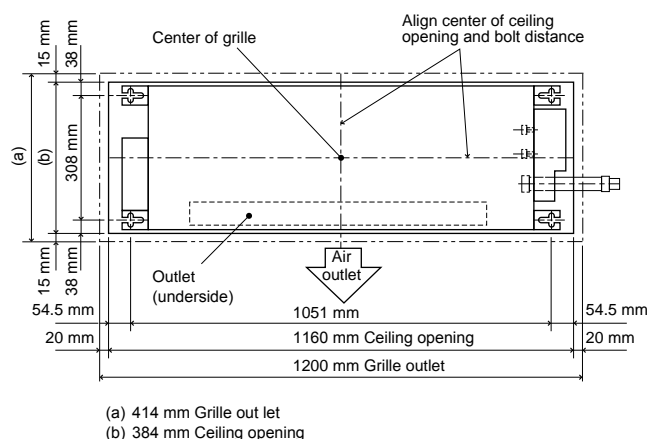
* Note:

Place indoor/outdoor unit connecting wire (D) at least 1 m away from the TV antenna wire.

2. INDOOR UNIT INSTALLATION

2-1. CEILING OPENINGS AND SUSPENSION BOLT INSTALLATION LOCATIONS

- Make an opening in the ceiling 384 mm × 1160 mm in size. This functions as a check window and will be needed later during servicing.
- If the dimensions are not accurate, when the grille is installed there may be gaps between it and the indoor unit. This may result in dripping water or other problems.
- When deciding on placement, consider carefully the space around the ceiling and make your measurements generous.
- Ceiling types and building construction differ. Therefore you should consult with the builder and decorator.
- Using the installation template (4) (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 are shown.)
- Use M10 suspension bolts (E).
- After suspending the indoor unit, you will have to connect the pipes and wiring above the ceiling. Once the location has been fixed and the direction of the pipes has been determined, place the refrigerant and drainage pipes, and the wiring that connects the indoor and outdoor units in their desired locations before suspending the indoor unit. This is especially important in cases where the ceiling is already in existence.

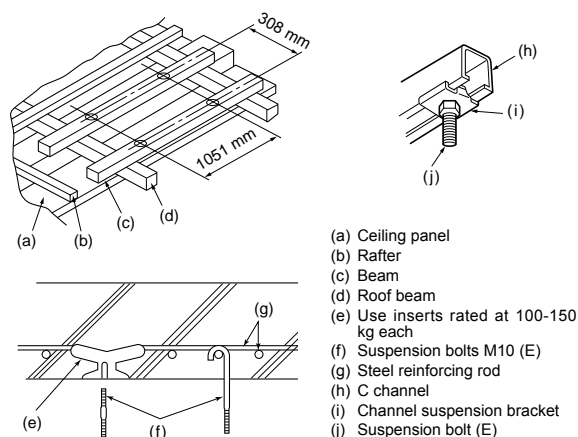


1) Wooden structures

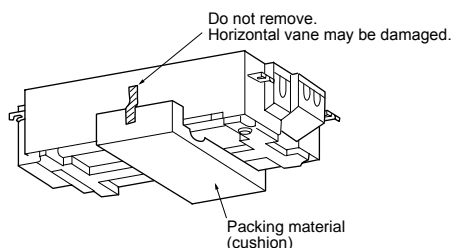
- Use tie beams (single storied houses) or second floor beams (two story houses) as reinforcing members.
- Wooden beams for suspending air conditioners must be sturdy and their sides must be at least 60 mm long if the beams are separated by not more than 900 mm and their sides must be at least 90 mm long if the beams are separated by as much as 1800 mm.
- Use channel, duct and other parts procured locally to suspend the indoor 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 (4).
- When the unit is put down with its lower surface facing down, place packing material (cushion) underneath to prevent horizontal vane damage.

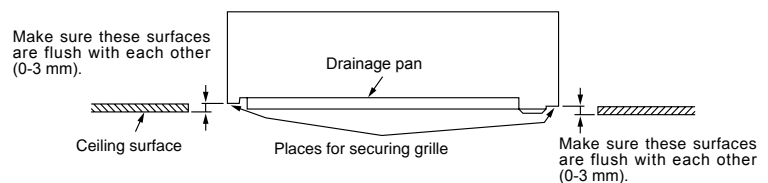
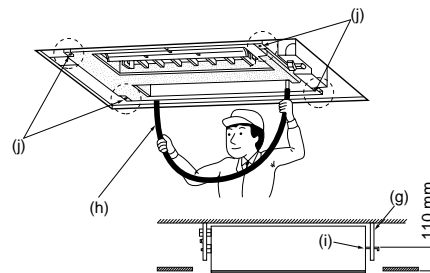
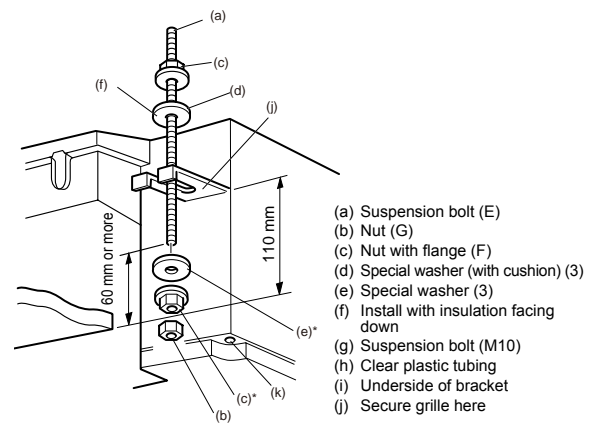


- The packing material (cushion) is taped to the unit. When using the packing material, do not remove it from the unit to prevent horizontal vane damage.



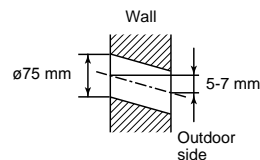
Unit suspension procedures

- Adjust the length of the bolt's protrusion from the ceiling surface beforehand.
 - Check the pitch of the suspension bolt (E). (308 mm × 1051 mm)
- Install special washer (3) and their nuts (F) onto the suspension bolt (E) in advance.
 - Do this in the following order (from the top): nut (F), special washer with cushion (3), special washer (3), nut (F), nut (G).
 - Position special washer, with cushion (3) with the insulated surface pointing down, as in the figure.
 - Lift the unit into place, aligned properly with suspension bolt (E). Pass the bracket between special washer, with cushion (3) and special washer (3), which are already in place, and secure it. Do the same in all four places.
 - Make sure the suspension bolt (E) extends 20 mm or more from the surface of the ceiling. Otherwise you will not be able to install the grille (optional).
 - If the points for securing the grille are not flush with the ceiling surface, water may condense, or the panel may not open/close.**
 - If the long opening in the bracket and opening in the ceiling do not align, adjust them until they do.
 - Check that the four corners are all level, using a spirit level or clear plastic tubing with water in it.
 - Water may drip from the unit if it is not installed horizontally.**
 - Tighten all the nuts.



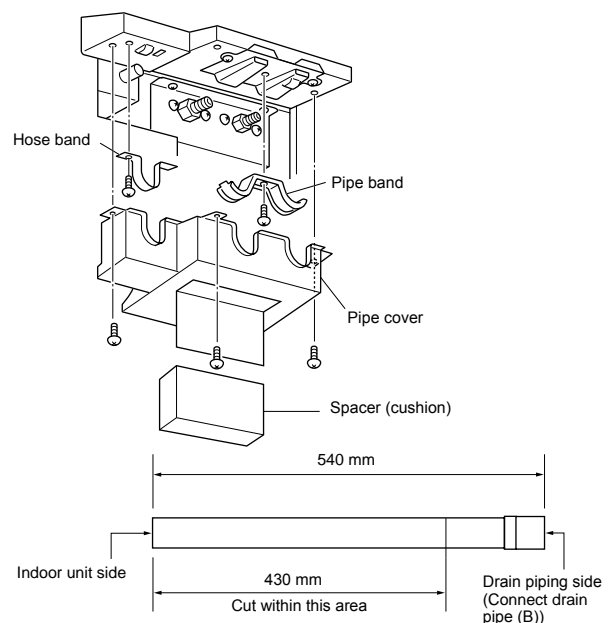
2-2. HOLE DRILLING

- Determine the wall hole position.
- Drill a dia. 75 mm hole. The outdoor side should be 5 to 7 mm lower than the indoor side.
- Insert wall hole sleeve (J).

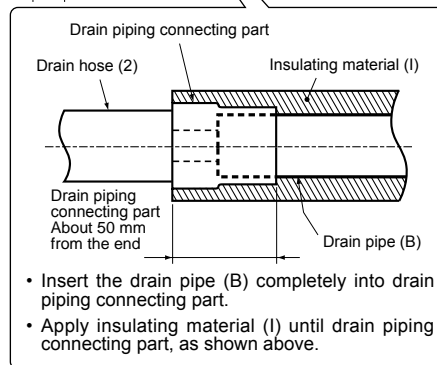
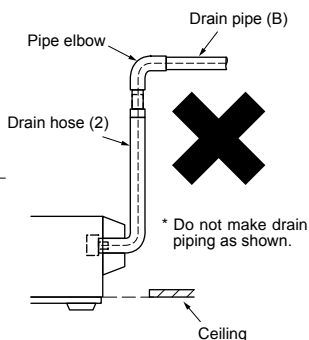
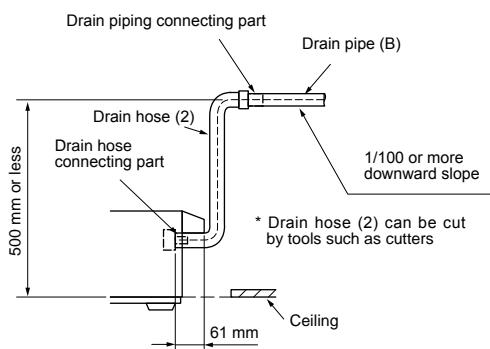


2-3. DRAIN PIPING

- Use drain pipe (B) for drain piping. Be sure to connect the piping joints using adhesive of polyvinyl chloride family to prevent leakage.
- Before drain piping work, remove the pipe cover, hose band, pipe band, and spacer (cushion). Dispose of the spacer (cushion), as it will not be needed.
- Drain hose (2) is 540 mm long, so that drain piping exit can be moved up. Cut drain hose (2) into appropriate length before connecting.

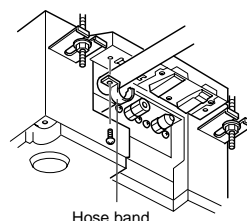


- Connect drain pipe (B) directly to drain piping connecting part (socket side) of drain hose (2).
- Be sure to connect drain hose (2) to the indoor unit side as shown in the illustration on the right. Be sure to connect the drain hose connecting part using adhesive of polyvinyl chloride family to prevent leakage.
- To bring up the drain exit, first arrange drain hose (2) to go upward vertically, and then provide 1/100 or more downward slope, as shown in the illustration below.

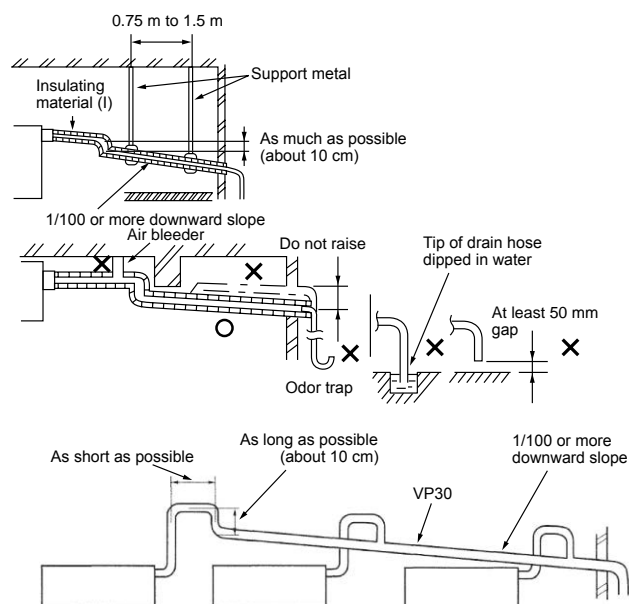


- If the drain piping pass indoor, be sure to apply insulating material (I) (Foamed polyethylene, specific gravity 0.03, thickness more than 10 mm).

Connect drain hose connecting part using adhesive of polyvinyl chloride family before installing the hose band.

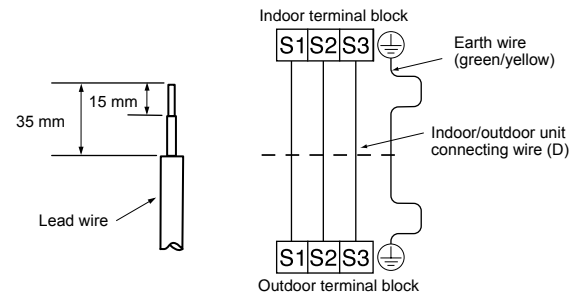
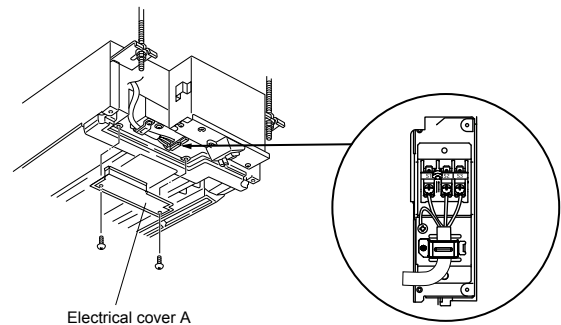


- Apply insulating material (I) until drain piping connecting part, as shown in the upper right illustration.
- Drain piping should form a downward slope (1/100 or more) to the outdoor drain exit. Do not form trap or raise the pipe.
- Do not arrange the pipe horizontally for more than 20 m. When the drain piping is too long, use support metal to prevent the drain pipe from forming an up or down curve. Be sure not to install a air bleeder. (Since drain lift-up mechanism is built-in, drain may blow out.)
- Odor trap for drain outlet is not necessary.
- For grouped piping, arrange piping so that the grouped piping is about 10 cm lower than the unit drain exit, as shown in the figure. Use about VP 30 piping for grouped piping, and arrange it so that it forms about 1/100 or more downward slope.
- Do not place drain piping directly into a place where ammonia gas or sulfuric gas is formed, such as sewage tanks or septic tanks.



2-4. CONNECTING WIRES FOR INDOOR UNIT

- 1) Remove electrical cover A.
- 2) Remove cord clamp.
- 3) Pass indoor/outdoor unit connecting wire (D) process the end of the wire.
- 4) Loosen terminal screw, and connect first the earth wire, then indoor/outdoor unit connecting wire (D) to the terminal block. Be careful not to make mis-wiring. Fix the wire to the terminal block securely so that no part of its core is appeared, and no external force is conveyed to the connecting section of the terminal block.
- 5) Firmly tighten the terminal screws to prevent them from loosening. After tightening, pull the wires lightly to confirm that they do not move.
- 6) Secure indoor/outdoor unit connecting wire (D) and the earth wire with the cord clamp. Never fail to hook the left claw of the cord clamp. Attach the cord clamp securely.



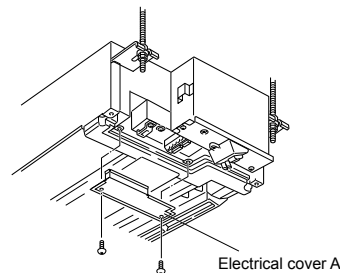
- Make earth wire a little longer than others. (More than 55 mm)
- For future servicing, give extra length to the connecting wires.

When the ceiling is above 2.4 m and 2.7 m or below

Switch down the Dip switch (SW3) to increase airflow volume.

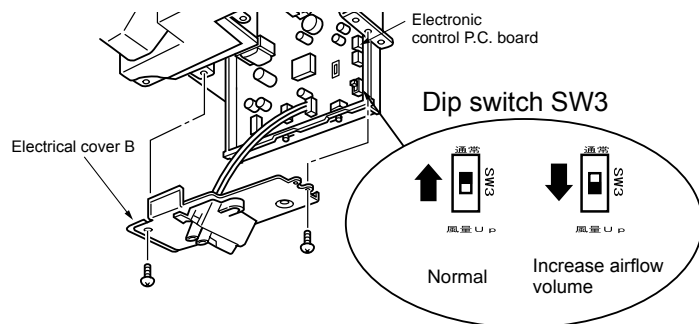
* When the ceiling is above 2.7 m, airflow volume may be insufficient even with the Dip switch (SW3) set to "increase airflow"

- 1) Make sure that the breaker for air conditioner is turned OFF.
- 2) Remove electrical cover A and B of the indoor unit.
- 3) Slide out the electronic control P.C. board, and switch up the Dip switch (SW).
- 4) Put the electronic control P.C. board back to the original position, and install electrical cover A and B.



Note:

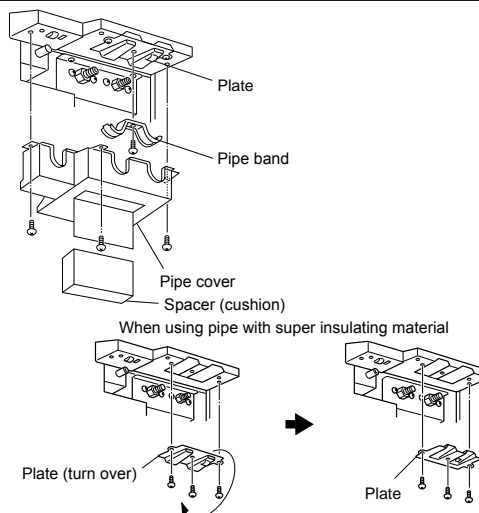
- Perform static elimination before setting.
- Default setting is Normal.



3. FLARING WORK AND PIPE CONNECTION

3-1. PIPING WORK

- 1) Remove the pipe cover, hose band, pipe band, and spacer (cushion) of the indoor unit. Dispose of the spacer (cushion), as it will not be needed.
- 2) When using pipe with super insulating material (about $\phi 48$ mm liquid pipe, $\phi 51$ mm gas pipe) for indoor connecting pipe, remove plate and turn it over so that the concave part faces upward.



3-2. FLARING WORK

- 1) Cut the copper pipe correctly with pipe cutter. (Fig. 1, 2)
- 2) Completely remove all burrs from the cut cross section of pipe. (Fig. 3)
 - Put the end of the copper pipe to downward direction as you remove burrs in order to avoid to let burrs drop in the piping.
- 3) Remove flare nuts attached to indoor and outdoor units, then put them on pipe having completed burr removal. (Not possible to put them on after flaring work.)
- 4) Flaring work (Fig. 4, 5). Firmly hold copper pipe in the dimension shown in the table. Select A mm from the table according to the tool you use.
- 5) Check
 - Compare the flared work with Fig. 6.
 - If flare is noted to be defective, cut off the flared section and do flaring work again.

Pipe diameter (mm)	Nut (mm)	A (mm)			Tightening torque	
		Clutch type tool for R410A	Clutch type tool for R22	Wing nut type tool for R22	N•m	kgf•cm
ø6.35 (1/4")	17	0 to 0.5	1.0 to 1.5	1.5 to 2.0	13.7 to 17.7	140 to 180
ø9.52 (3/8")	22			2.0 to 2.5	34.3 to 41.2	350 to 420
ø12.7 (1/2")	26			-	49.0 to 56.4	500 to 575
ø15.88 (5/8")	29			-	73.5 to 78.4	750 to 800

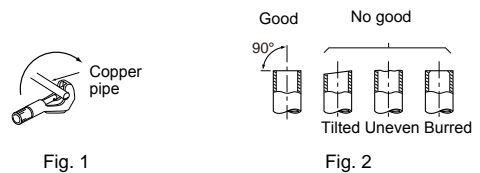


Fig. 1

Fig. 2

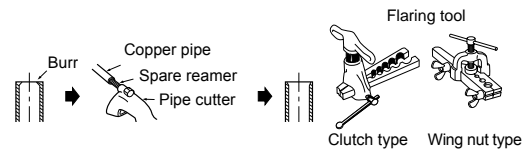


Fig. 3

Fig. 4

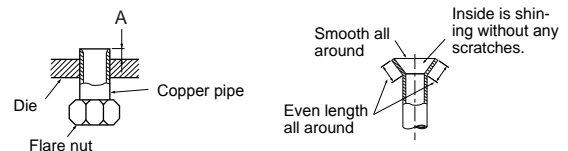


Fig. 5

Fig. 6

3-3. PIPE CONNECTION

- Fasten flare nut with a torque wrench as specified in the table.
- When fastened too tight, flare nut may brake after a long period and cause refrigerant leakage.
- Be sure to wrap insulation around the piping. Direct contact with the bare piping may result in burns or frostbite.

Indoor unit connection

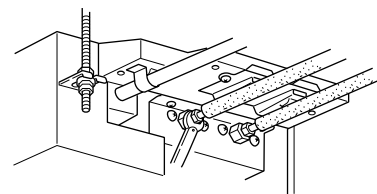
Connect both liquid and gas pipings to indoor unit.

- Apply a thin coat of refrigeration oil on the seat surface of pipe.
- For connection, first align the center, then tighten the first 3 to 4 turns of flare nut.
- Use tightening torque table above as a guideline for indoor unit side union joint section, and tighten using two wrenches. Excessive tightening damages the flare section.

Outdoor unit connection

Connect pipes to stop valve pipe joint of the outdoor unit in the same manner applied for indoor unit.

- For tightening, use a torque wrench or spanner and use the same tightening torque applied for indoor unit.



WARNING

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

3-4. INSTALLING THE PIPE COVER

Make sure to install the pipe cover. Incorrect installation results in water leakage.

- No insulation is needed on the pipe connecting part of the indoor side for this unit. The pipe cover gathers the water condensed around the pipe connecting part.

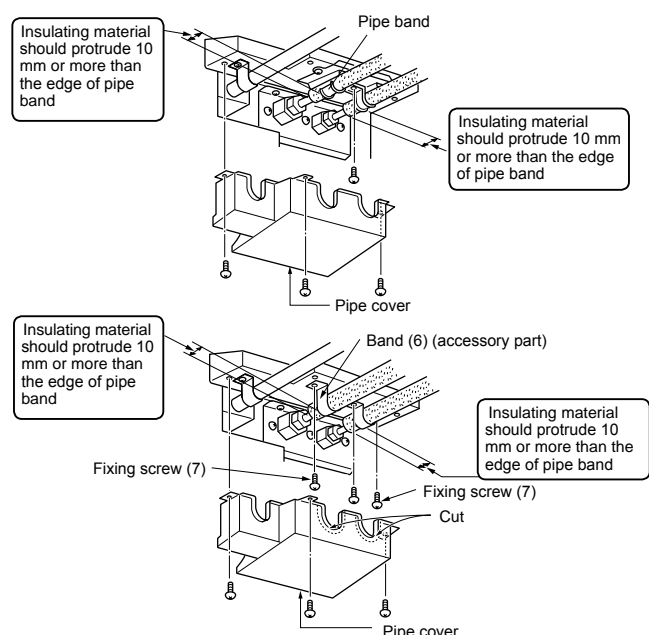
- 1) Install the pipe band removed in 2-5. to secure the connecting pipes.
 - * The pipe band should hold down the insulating material of connecting pipe. Insulating material should protrude 10 mm or more than the pipe band, as shown in the illustration on the right.
- 2) Install pipe cover.

When using pipe with super insulating material (about ø48 mm liquid pipe, ø51 mm gas pipe)

- 1) Make sure that the plate is turned over, and the concave part is facing upward. (Refer to 2-5)
- 2) Use band (6) provided with the unit. (Do not use the pipe band attached to the unit)
- 3) Connecting pipe exit of pipe cover is pre-cut. Cut it along the line.
- 4) Install pipe cover.

Note:

Install pipe cover and pipe band securely. Incomplete installation will cause water to drip from the unit, soaking and damaging household goods.



4. TEST RUN

4-1. TEST RUN

- Do not operate the unit for long periods at places such as building under construction. This may cause dust or odor to adhere to the unit.
- Perform test run with the attendance of user, as much as possible.

- 1) Press the E.O. SW once for COOL, and twice for HEAT operation. Test run will be performed for 30 minutes. If the left lamp of the operation indicator blinks every 0.5 seconds, inspect the indoor/outdoor unit connecting wire (D) for mis-wiring. After the test run, emergency mode (set temperature 24°C) will start.
- 2) To stop operation, press the E.O. SW several times until all LED lamps turn off. Refer to operating instructions for details.

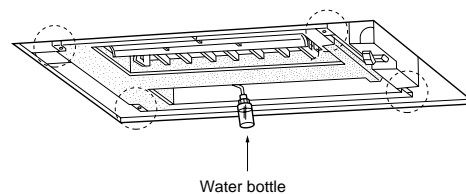
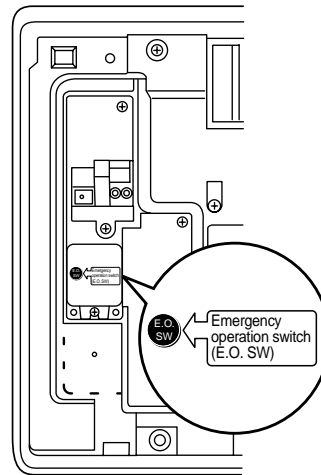
Checking the remote (infrared) signal reception

Press the ON/OFF button on the remote controller (8) and check that an electronic sound is heard from the indoor unit. Press the ON/OFF button again to turn the air conditioner off.

- Once the compressor stops, the restart preventive device operates so the compressor will not operate for 3 minutes to protect the air conditioner.

Water drainage check

- 1) Fill the drainage pan with about 0.5 liters of water. (Don't pour water directly into the drain pump.)
- 2) Make a test run of the unit (in Cooling mode).
- 3) Check for water drainage at the outlet of the drainage pipe.
- 4) Stop the test run. (Don't forget to turn off the power.)



4-2. AUTO RESTART FUNCTION

This product is equipped with an auto restart function. When the power supply is stopped during operation, such as during blackouts, the function automatically starts operation in the previous setting once the power supply is resumed. (Refer to the operating instructions for details.)

Caution:

- After test run or remote signal reception check, turn off the unit with the E.O. SW or the remote controller before turning off the power supply. Not doing so will cause the unit to start operation automatically when power supply is resumed.

To the user

- After installing the unit, make sure to explain the user about auto restart function.
- If auto restart function is unnecessary, it can be deactivated. Consult the service representative to deactivate the function. Refer to the service manual for details.

4-3. EXPLANATION TO THE USER

- Using the OPERATING INSTRUCTIONS, explain to the user how to use the air conditioner (how to use the remote controller, how to remove the air filters, how to remove or put the remote controller in the remote controller holder, how to clean, precautions for operation, etc.)
- Recommend the user to read the OPERATING INSTRUCTIONS carefully.

5. GRILLE (OPTION) INSTALLATION

Refer to the procedures indicated in the installation manual of the Grille (option).

6. PUMPING DOWN

Refer to the procedures indicated in the installation manual of the outdoor unit.

⚠ WARNING

When pumping down the refrigerant, stop the compressor before disconnecting the refrigerant pipes. The compressor may burst if air etc. get into it.

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

The product at hand is based on	2006/95/EC: Low Voltage Directive
the following EU regulations:	2006/42/EC: Machinery Directive
	2004/108/EC: Electromagnetic Compatibility Directive
	2009/125/EC: Energy-related Products Directive

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