Panasonic

INSTALLATION INSTRUCTIONS INDOOR UNIT

Model No.: S-180ME** S-224ME** S-280ME**

⚠ CAUTION

R410A
REFRIGERANT

This Air Conditioner contains and operates with refrigerant R410A.

THIS PRODUCT MUST ONLY BE INSTALLED OR SERVICED BY QUALIFIED PERSONNEL.

Refer to Commonwealth, State, Territory and local legislation, regulations, codes, installation & operating instructions, before the installation, maintenance and/or service of this product.

Refer to the outdoor unit installation instruction manual for the outdoor unit installation.

Note: Ensure to hand over this installation instruction manual to the person performing the installation and inform the customer to keep it properly stored.

Required tools for Installation Works

1	Phillips screw driver	7	Pipe cutter	15	Torque wrench 18 N•m (1.8 kgf•m) 42 N•m (4.3 kgf•m) 55 N•m (5.6 kgf•m) 65 N•m (6.6 kgf•m) 100 N•m (10.2 kgf•m)
2	Flathead screw driver	8	Reamer		
3	Level gauge	9	Knife		
4	Electric drill, hole core drill (ø70 mm)	10	Gas leak detector		
		11	Measuring tape		
5	Hexagonal wrench (4 mm)	12	Thermometer		
		13	Megohmmeter	16	Vacuum pump
6	Spanner	14	Multimeter	17	Gauge manifold

Explanation of symbols displayed on the indoor unit or outdoor unit.

CAUTION	This symbol shows that the Operating Instructions should be read carefully.
CAUTION	This symbol shows that a service personnel should be handling this equipment with reference to the Technical Manual.

SAFETY PRECAUTIONS

- Read the following "SAFETY PRECAUTIONS" carefully before installation.
- Electrical work must be installed by a licensed electrician. Be sure to use the correct rating of the power plug and main circuit for the model to be installed.
- The caution items stated here must be followed because these important contents are related to safety. The meaning of each indication used is as below. Incorrect installation due to ignoring of the instruction will cause harm or damage, and the seriousness is classified by the following indications.

⚠ WARNING	This indication shows the possibility of causing death or serious injury.
⚠ CAUTION	This indication shows the possibility of causing injury or damage to properties only.

The items to be followed are classified by the symbols:

⃠	Symbol with white background denotes item that is PROHIBITED.
❗ ⏚	Symbol with dark background denotes item that must be carried out.

- Carry out test running to confirm that no abnormality occurs after the installation. Then, explain to user the operation, care and maintenance as stated in instructions. Please remind the customer to keep the operating instructions for future reference.

⚠ WARNING

- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer. Any unfit method or using incompatible material may cause product damage, burst and serious injury.
- Do not install outdoor unit near handrail of veranda. When installing air-conditioner unit on veranda of a high rise building, child may climb up to outdoor unit and cross over the handrail causing an accident.
- Do not use unspecified cord, modified cord, joint cord or extension cord for power supply cord. Do not share the single outlet with other electrical appliances. Poor contact, poor insulation or over current will cause electrical shock or fire.
- Do not tie up the power supply cord into a bundle by band. Abnormal temperature rise on power supply cord may happen.
- Do not insert your fingers or other objects into the unit, high speed rotating fan may cause injury.
- Do not sit or step on the unit, you may fall down accidentally.
- Keep plastic bag (packaging material) away from small children, it may cling to nose and mouth and prevent breathing.
- When installing or relocating air conditioner, do not let any substance other than the specified refrigerant, eg. air etc mix into refrigeration cycle (piping). Mixing of air etc. will cause abnormal high pressure in refrigeration cycle and result in explosion, injury etc.
- Do not pierce or burn as the appliance is pressurized. Do not expose the appliance to heat, flame, sparks, or other sources of ignition. Else, it may explode and cause injury or death.
- Do not add or replace refrigerant other than specified type. It may cause product damage, burst and injury etc.
- ● For R410A model, use new piping, flare nut and tools which is specified for R410A refrigerant. Using of existing (R22) piping, flare nut and tools may cause abnormally high pressure in the refrigerant cycle (piping), and possibly result in explosion and injury. For R32 and R410A, the same flare nut on the outdoor unit side and pipe can be use.
  ● Since the working pressure for R32/R410A is higher than that of refrigerant R22 models, replacing conventional piping and flare nuts on the outdoor unit side are recommended.
  ● Thickness for copper pipes used with R410A must meet the requirement. Refer to ① **GENERAL** piping thickness table in outdoor unit installation manual.
  ● It is desirable that the amount of residual oil less than 40 mg/10 m.
- Engage authorized dealer or specialist for installation. If installation done by the user is incorrect, it will cause water leakage, electrical shock or fire.
- For refrigeration system work, install according to this installation instructions strictly. If installation is defective, it will cause water leakage, electrical shock or fire.
- Use the attached accessories parts and specified parts for installation. Otherwise, it will cause the set to fall, water leakage, fire or electrical shock.
- Install at a strong and firm location which is able to withstand weight of the set. If the strength is not enough or installation is not properly done, the set will drop and cause injury.
- For electrical work, follow the national regulation, legislation and this installation instruction. An independent circuit and single outlet must be used. If electrical circuit capacity is not enough or defect found in electrical work, it will cause electrical shock or fire.
- Do not use joint cable for indoor / outdoor connection cable. Use the specified indoor/outdoor connection cable, refer to instruction ③ **ELECTRICAL WIRING** and connect tightly for indoor/outdoor connection. Clamp the cable so that no external force will have impact on the terminal. If connection or fixing is not perfect, it will cause heat up or fire at the connection.
- Wire routing must be properly arranged so that control board cover is fixed properly. If control board cover is not fixed perfectly, it will cause fire or electrical shock.
- This equipment is strongly recommended to be installed with Earth Leakage Circuit Breaker (ELCB) or Residual Current Device (RCD). Otherwise, it may cause electrical shock and fire in case of equipment breakdown or insulation breakdown.
- During installation, install the refrigerant piping properly before running the compressor. Operation of compressor without fixing refrigeration piping and valves at opened position will cause suck-in of air, abnormal high pressure in refrigeration cycle and result in explosion, injury etc.
- During pump down operation, stop the compressor before removing the refrigeration piping. Removal of refrigeration piping while compressor is operating and valves are opened will cause suck-in of air, abnormal high pressure in refrigeration cycle and result in explosion, injury etc.
- Tighten the flare nut with torque wrench according to specified method. If the flare nut is over-tightened, after a long period, the flare may break and cause refrigerant gas leakage.
- After completion of installation, confirm there is no leakage of refrigerant gas. It may generate toxic gas when the refrigerant contacts with fire.
- Ventilate if there is refrigerant gas leakage during operation. It may cause toxic gas when the refrigerant contacts with fire.
- Be aware that refrigerants may not contain an odour.
- This equipment must be properly earthed. Earth line must not be connected to gas pipe, water pipe, earth of lightning rod and telephone. Otherwise, it may cause electrical shock in case of equipment breakdown or insulation breakdown.

⚠ CAUTION

- Do not install the unit at place where leakage of flammable gas may occur. In case gas leaks and accumulates at surrounding of the unit, it may cause fire.
- Prevent liquid or vapor from entering sumps or sewers since vapor is heavier than air and may form suffocating atmospheres.
- Do not overcharge the unit, refer to gas charge specification in Outdoor Installation manual. Overcharge will cause over current and damage to compressor.
- Do not release refrigerant during piping work for installation, re-installation and during repairing a refrigeration parts. Take care of the liquid refrigerant, it may cause frostbite.
- Do not install this appliance in a laundry room or other location where water may drip from the ceiling, etc.
- Do not touch the sharp aluminium fin, sharp parts may cause injury.
- Carry out drainage piping as mentioned in installation instructions. If drainage is not perfect, water may enter the room and damage the furniture.
- Select an installation location which is easy for maintenance. Incorrect installation, service or repair of this air conditioner may increase the risk of rupture and this may result in loss damage or injury and/or property.
- Power supply connection to the room air conditioner. Use power supply cord type designation 60245 IEC 57 or heavier cord. Connect the power supply cord of the air conditioner to a circuit breaker for the permanent connection. It must be a double pole switch with a minimum 3.0mm contact gap. Power supply point should be in easily accessible place for power disconnection in case of emergency.
- Installation work. It may need two people to carry out the installation work.
- Keep any required ventilation openings clear of obstruction.

PRECAUTION FOR USING R410A REFRIGERANT

- The basic installation work procedures are the same as conventional refrigerant (R32, R22) models. However, pay careful attention to the following points:

- Do not perform flare connection inside a building or dwelling or room, when joining the heat exchanger of indoor unit with interconnecting piping. Refrigerant connection inside a building or dwelling or room must be made by brazing or welding. Joint connection of indoor unit by flaring method can only be made at outdoor or at outside of a buidling or dwelling or room. Flare connection may cause gas leak and flammable atmosfere.
- The appliance shall be stored, installed and operated in a well ventilated room with indoor floor area larger than A_{min} (m²) [Refer to Check of Density Limit] and without any continuously operating ignition source. Keep away from open flames, any operating gas appliances or any operating electric heater. Else, it may explode and cause injury or death.
- Refer to "PRECAUTION FOR USING R410A REFRIGERANT" in outdoor unit installation manual for other precautions that need to pay attention to.

INDOOR UNIT

Check of Density Limit

⚠ WARNING	**Always check the gas density limit for the room in which the unit is installed.**
⚠ CAUTION	**Pay special attention to any location, such as a basement, etc., where leaking refrigerant can accumulate, since refrigerant gas is heavier than air.**

When installing an air conditioner in a room, it is necessary to ensure that even if the refrigerant gas accidentally leaks out, its density does not exceed the limit level for that room.
If the density could exceed the limit level, it is necessary to provide an opening between the unit and the adjacent room, or to install mechanical ventilation which is interlocked with a leak detector.

(Total refrigerant charged amount: kg)

(Min. indoor volume where the indoor unit is installed: m³)

≤ Limit density 0.44 (kg/m³)

The limit density of refrigerant R410A which is used in this unit is 0.44 kg/m³ (ISO 5149).
The shipped outdoor unit comes charged with the amount of refrigerant fixed for each type, so add it to the amount that is charged in the field.
(For the refrigerant charge amount at shipment, refer to the unit's nameplate.)
Minimum indoor volume & floor area as against the amount of refrigerant is roughly as given in the following table.

Checking of limit density
Density limit is determined on the basis of the size of a room using an indoor unit of minimum capacity.
For instance, when an indoor unit is used in a room (floor area 15 m² × ceiling height 2.7 m = room volume 40.5 m³), the graph at right shows that the maximum overall refrigerant charge amount of limit density (0.44 kg/m³) that is not required to install a ventilation fan should be calculated as follows.

Due to the room volume,
Maximum overall refrigerant charge amount
= (room volume) × (limit density)
= 40.5 (m³) × 0.44 (kg/m³)
= 17.82 kg

Overall refrigerant charge amount for this system is 72.709 (kg).
The formula for the minimum room volume should be determined as follows.

Required minimum room volume
= (overall refrigerant charge amount) ÷ (limit density)
= 72.709 (kg) ÷ 0.44 (kg/m³)
= 165.25 (m³)
Required minimum floor area
= (minimum room volume) ÷ (ceiling height)
= 165.25 (m³) ÷ 2.7 (m)
= 61.2 (m²)

Therefore an opening for ventilation is required.

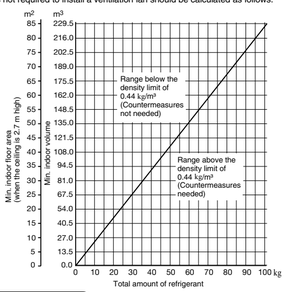
< Formula for computation >
Overall refrigerant charge amount for the air conditioner: kg

(Minimum room volume for indoor unit: m³)

= 72.709 (kg) / 40.5 (m³)

= 1.80 (kg/m³) > 0.44 (kg/m³)

Accordingly, it is necessary to install a ventilation fan for this room.



ACCESSORIES SUPPLIED WITH INDOOR UNIT

Part Name	Figure	Q'ty	Remarks	Part Name	Figure	Q'ty	Remarks
Special washer		8	For indoor unit suspension	Hose band		1	For securing drain hose
Drain hose		1	For drain hose connection	Clamper		2	For power supply cord / control wiring

1 SELECT THE INDOOR UNIT INSTALLATION LOCATION

1-1. Indoor Unit

Provide a check port on the piping side ceiling for repair and maintenance.
● Install the indoor unit once the following conditions are satisfied and after receiving the customer approval.
1. The indoor unit must be within a maintenance space.
2. The indoor unit must be free from any obstacles in path of the air inlet and outlet, and must allow spread of air throughout the room.

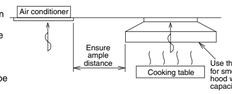
● If the height from the floor to ceiling exceeds three meters, air flow distribution deteriorates and the effect is decreased.

⚠ WARNING

3. The installation position must be able to support a load four times the indoor unit weight.
4. The indoor unit must be away from heat and sources of steam, but avoiding installation near an entrance.
5. The indoor unit must allow easy draining.
6. The indoor unit must allow easy connection to the outdoor unit.
7. The indoor unit must be at least 3 m away from any noise-generating equipment. The electrical wiring must be shielded with a steel conduit.
8. If the power supply is subject to noise generation, add a suppressor.
9. Do not install the indoor unit in a laundry. Electric shocks may result.
10. Installation height is more than 2.5m.

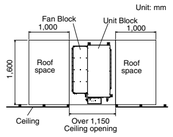
NOTE ● Thoroughly study the following installation locations

1. In such places as restaurants and kitchens, considerable amount of oil steam and flour adhere to the fan, the fin of the heat exchanger, resulting in heat exchange reduction, spraying, dispersing of water drops, etc.
   In these cases, take the following actions:
   ● Make sure that the ventilation fan for smoke-collecting hood on a cooking table has sufficient capacity so that it draws oily steam which should not flow into the suction of the air conditioner.
   ● Make sure there is enough distance from the cooking room to install the air conditioner in such place where it may not suck in oily steam.
2. Avoid installing the air conditioner in such circumstances where cutting oil mist or iron powder exist, especially in factories, etc.
3. Avoid places where inflammable gas is generated, flows-in, contaminated, or leaked.
4. Avoid places where sulphurous acid gas or corrosive gas can be generated.
5. Avoid places near high frequency generators.



1-2. When transporting the indoor unit to the roof space through the ceiling opening

Transport is possible without separation with a ceiling opening dimension of over 500 × 1,150 mm and a roof space dimension as shown below. After transporting the unit, see section "2. HOW TO INSTALL THE INDOOR UNIT"



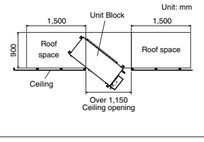
Criteria for ceiling opening dimension and height of roof space

Width of ceiling opening	Height of roof space	Necessity of separating indoor unit
1,150	1,600	Unnecessary
1,150	900	Necessary
700	1,600	Necessary

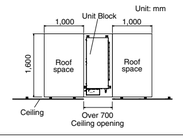
Unit: mm

It is possible to separate the indoor unit into Fan Block and Unit Block.
Separated transport if necessary

<Case 1>
If a ceiling opening dimension is over 500 × 1,150 mm and a roof space dimension is shown below, the indoor unit can be separated to fit through the space. For separating procedure, see section "1-3. How to separate the indoor unit".



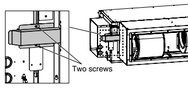
<Case 2>
If a ceiling opening dimension is over 500 × 700 mm and a roof space dimension is shown below, the indoor unit can be separated to fit through the space. For separating procedure, see section "1-3. How to separate the indoor unit".



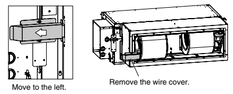
1-3. How to separate the indoor unit

(1) Remove the wire cover.

1. Loosen two screws.

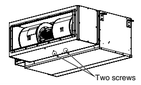


2. Move to the left and remove the wire cover through the round hole.

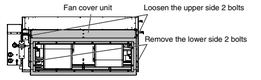


(2) Remove the fan cover unit.

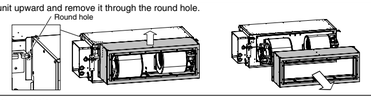
1. Remove two screws (Type 180 only)



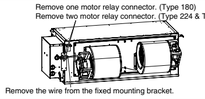
2. Move the fan cover unit upward and remove it through the round hole.



3. Move the fan cover unit upward and remove it through the round hole.



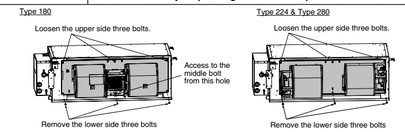
(3) Remove the motor relay connector.



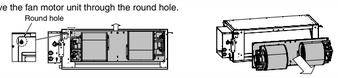
(4) Separate the fan motor unit and heat exchanger unit.

1. Loose the upper side three bolts and remove the lower side three bolts.

⚠ WARNING	**Do not remove the upper side three bolts.** **The motor unit may drop during work of unit separation and can lead to personal injury or death.**



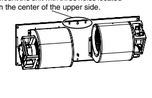
2. Move upward and remove the fan motor unit through the round hole.



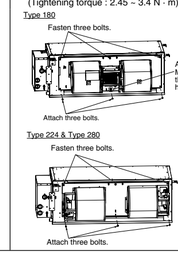
1-4. How to assemble the indoor unit

(1) Attach the fan motor unit.

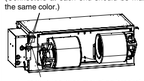
1. Pass the bolts for the heat exchanger unit through the round holes.



2. Attach three bolts in the lower side and then fasten three bolts in the upper side.
(Tightening torque : 2.45 ~ 3.4 N · m)



3. Attach the motor wire.

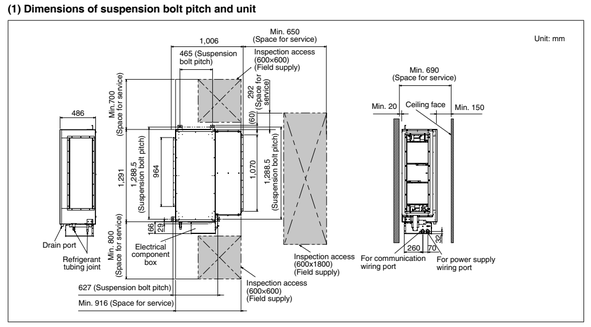


(2) Attach the fan cover unit and wire cover.
Attach the fan cover unit and wire cover in reverse order of separating unit.

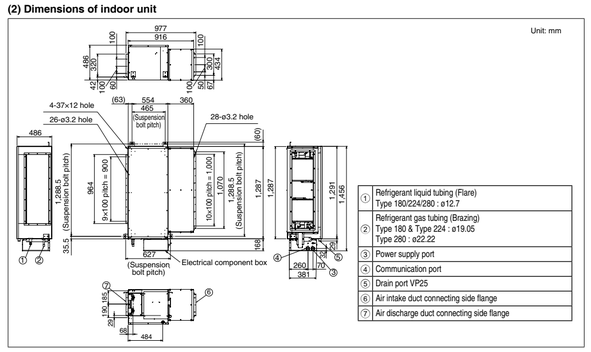
2 HOW TO INSTALL THE INDOOR UNIT

2-1. Required Minimum Space for Installation and Service

(1) Dimensions of suspension bolt pitch and unit



(2) Dimensions of indoor unit



①	Refrigerant liquid tubing (Flare) Type 180/224/280 : ø12.7
②	Refrigerant gas tubing (Brazing) Type 180 & Type 224 : ø19.05 Type 280 : ø22.22
③	Power supply port
④	Communication port
⑤	Drain port VP25
⑥	Air intake duct connecting side flange
⑦	Air discharge duct connecting side flange

2-2. Suspending the Indoor Unit

Depending on the ceiling type:
(1) Check the suspension bolt pitch.
(2) Ensure that the ceiling is strong enough to support the weight of the unit.
(3) To prevent the unit from dropping, firmly fasten the suspension bolts as shown in the figure below.

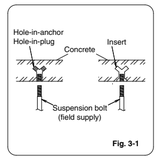


Fig. 3-1

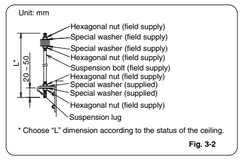


Fig. 3-2

NOTE

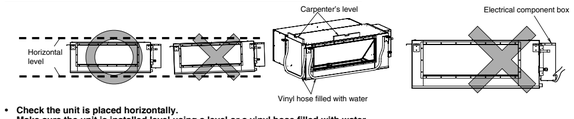
Suspension bolt (field supply)	M10 or 3/8"

⚠ **WARNING**

It is important that you use extreme care in supporting the indoor unit inside the ceiling.
Ensure that the ceiling is strong enough to support the weight of the unit.
Before suspending the unit, test the strength of each attached suspension bolt.

(1) When placing the unit inside the ceiling, determine the pitch of the suspension bolts referring to the dimensional data given previously.
Tubing must be laid and connected inside the ceiling when suspending the unit.
If the ceiling is already constructed, lay the tubing into position for connection to the unit before placing the unit inside the ceiling.
(2) Screw in the suspension bolts allowing them to protrude from the ceiling as shown in Fig. 3-1.
(Cut the ceiling material, if necessary.)
(3) Suspend and fix the indoor unit using the 2 hexagonal nuts (field supply) and special washers (supplied with the unit) as shown in Fig. 3-2.

⚠ CAUTION	**The top of the unit must be installed horizontally.**



- **Check the unit is placed horizontally.**
  Make sure the unit is installed level using a level or a vinyl hose filled with water.
  In using a vinyl hose instead of a level, adjust the top surface of the unit to the surface of the water at both ends of the vinyl hose and make horizontal adjustment on all 4 corners of the unit.
  If the air discharge side of the unit is installed downward, splashing water or water leak may occur.
  Also, the dust may accumulate inside the drain pan caused by draining residual water.
- **When lifting the unit, do not attempt to hold the electrical component box in hand.**

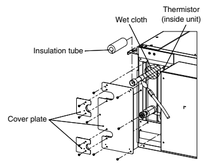
2-3. Installing the Refrigerant Tubing

The size of the refrigerant tubing is as shown in the table below.
Table 2-1

Type	180/224	280
Gas tube	ø19.05 (~ 100 m) (Brazing connection)	ø22.22 (~ 100 m) (Brazing connection)
Liquid tube	ø12.7 (Flare connection) Tightening torque (approximate) : 49 ~ 55 N • m Thickness of connecting tube : 0.8 mm	

NOTE

To fasten the flare nuts, apply specified torque.
- When brazing, must be cool the pipe by wet cloths after removing the insulation tube and the cover plate.
- When brazing the gas tubing, cool the tubing with dampened shopcloths as you work, as shown in the figure below, to protect the unit's thermistor from the heat generated by brazing.
- When brazing, be careful not to heat the electrical component box. Doing so may cause the unit to be damaged.
- Pipe insulation must be made after leak detection for tubing connection area was performed.
- Be sure to insulate both the gas tubing and liquid tubing.
- In addition, wrap the insulation material (field supply) around the tubing joints, and fasten in place with vinyl tape or other means.
  Failure to insulate the tubing may result in water leakage from condensation.
- Plug all gaps at tube through-holes in the unit with insulation or a similar substance to prevent air leakage.

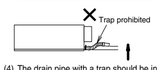


2-4. Installing the Drain Piping

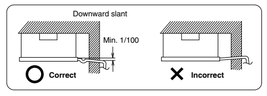
2-4-1. Before Performing the Installation Drain Piping

(1) (Prepare standard hard PVC pipe (O.D. 32 mm) for the drain and use the supplied drain socket to prevent water leaks.
The PVC pipe must be purchased separately.
When doing this, apply adhesive for the PVC pipe at the connection point.
See section "2-4-2. Installing the Drain Pipe".
(2) Limitations of Drain Hose Connection

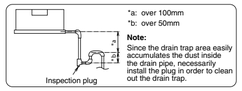
⚠ CAUTION	Do not make a trap in the middle of the supplied drain pipe. Doing so will cause abnormal sound.



(3) Ensure the drain pipe has a downward slant (1/100 or more).



(4) The drain pipe with a trap should be installed away from the indoor unit.
(5) Do not attach any air purge equipment.
If attached, drain water may result in splashing out of the drain pipe.
(6) When the drain piping is completed, perform the water leak test and check for a water leak.
If detected, it may result in water leakage or condensation.
(7) When the drain piping is completed, perform the drainage test if the water drains smoothly.
If not draining smoothly, it may result in water leakage or condensation.
(8) When the drain piping work is finished securely, wrap the insulation material around the indoor side drain pipe.
At this time, do not wrap together with the refrigerant tubing.
If wraped together, the drain pipe is lifted and water drainage will not be operated.
Consequently, the water comes out of the drain pan and it can lead to water leakage.

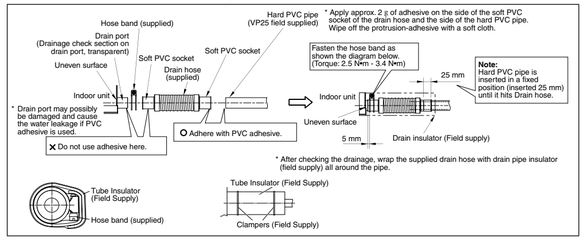


2-4-2. Installing the Drain Pipe

⚠ **CAUTION**

(1) How to Connect Drain Port and Drain Hose
- First insert the supplied hose band into the drain port pipe. Then make sure the head of the screw is facing toward a technical engineer when placing the screw of the hose band at an upward angle.
- Insert the soft PVC socket of the supplied drain hose to the drain port pipe.
  Never apply the adhesive to the both ends of the soft PVC socket and the drain port pipe.
- Insert the drain hose to the point where there is a difference in level as shown in the figure below and fasten it with the hose band 5 mm away from that position.
- Tightening torque must be 2.5 ~ 3.4 N•m.
- Tightening position of the hose band must be upward.

(2) How to Install the Drain Pipe
- Connect the hard PVC pipe (O.D. 32 mm) to the side of the soft PVC socket of the drain hose.
- Apply approx. 2 g of adhesive on the side of the soft PVC socket of the drain hose and the side of the hard PVC pipe.
- Do not apply force to the drain port when connecting the drain pipe. Install and fix it near the indoor unit as close as possible.



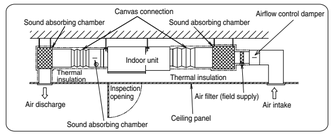
(3) Insulating the Drain Hose
- Selection of heat insulation materials for drain hose (Drain insulator). When using the heat insulation materials (field supply), kindly use the same size and performance as refrigerant tubes. Check for its size as below table.

Insulation Material	Thermal insulation thickness
Polyethylene foam (same as heat insulators for refrigerant tubes)	Insulation thickness must 10mm or greater

CONTINUE TO THE NEXT PAGE

2-5. Caution for Ducting Work

- This unit has high static pressure. In case of small pressure resistance (for instance, a short duct), install an airflow control damper (field supply) for adjusting airflow volume as airflow volume / airflow noise increases.
- If the air conditioner is to be installed in a room such as an office or meeting room which needs a low sound level, provide a supply and return sound absorption chamber with an acoustic liner.
- Use a flexible canvas connection or vibration isolation hanger (field supply) to break transmission of mechanical vibration of the unit.



⚠ CAUTION

- Use incombustible duct materials.
- Use thermal insulation to prevent duct condensation.
- An air filter (field supply) must be installed at the air intake side. If not installed, the heat exchanger will get dirty and the unit will reduce the quality.
- Obtain and install an air filter (field supply) which can easily wash away the dust by lukewarm, soapy water or suck up with a vacuum cleaner.
- Clean the air filter periodically to collect dust and other particles from the air.
- Use duct static pressure within a range of specification value.

3 ELECTRICAL WIRING

As to main power source and cable size of outdoor unit, read the installation manual attached to the outdoor unit.

3-1. General Precautions on Wiring

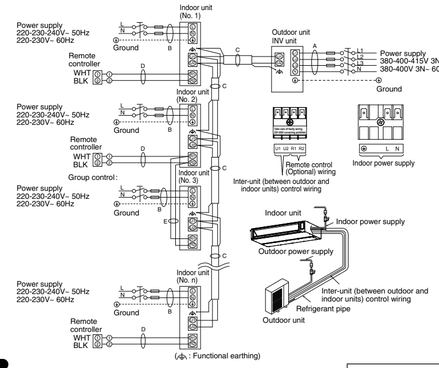
⚠ WARNING	● This air conditioner must be installed in accordance with national wiring regulations.
	● Cables connected to indoor unit must be approved polychloroprene sheathed type 60245 IEC 57 or heavier.
	● The units must be connected to the supply cables for fixed wiring by qualified technician. Circuit breaker must be incorporated in the fixed wiring in accordance with the national wiring regulations. The circuit breaker must be approved, suitable for the voltage and current ratings of equipment and have a contact separation by 3mm in all poles. When the supply cable is damaged, it must be replaced by qualified technician.
	● Be sure to install a current leakage breaker, main switch and fuse to the main power supply, otherwise electric shocks may result.
	● Be sure to connect the unit to secure earth connection. If the earthing work is not carried out properly, electric shocks may result. ⏚
	● Wiring shall be connected securely by using specified cables and fix them securely so that external force of the cables may not transfer to the terminal connection section. Imperfect connection and fixing leads to fire, etc.

(1) Select a power source that is capable of supplying the current required by the air conditioner.
(2) Feed the power source to the unit via a distribution switch board designed for this purpose, the switch should disconnect all poles with a contact separation of at least 3 mm.
(3) Always ground the air conditioner with a grounding wire and screw to meet the LOCAL REGULATIONS.
(4) Be sure to connect the indoor/outdoor unit connection wires correctly to terminal board.
(5) Be sure to turn off the main power before installing and connecting the remote controller.
(6) Each wiring connection must be done in accordance with the wiring system diagram. Wrong wiring may cause the wires overloaded and overheated.

NOTE

If momentarily turning on the power supply for both the indoor and outdoor units, do not turn the power off after at least 1 minute has passed. (For the system's automatic setting.) Turning off the power supply on the way may cause an abnormal operation.

3-2. Wiring System Diagrams



NOTE

(1) See the section "3-3. Recommended Wire Length and Wire Diameter for Power Supply System" for explanation of "A", "B", "C", "D", and "E" in the above diagram.
(2) The basic connection diagram of the indoor unit shows the 6P terminal board, so the terminal boards in your equipment may differ from the diagram.
(3) Attach the terminal cover after fixing the wires at the terminal board.

⚠ WARNING Make sure that screws of the terminal are securely tightened.

3-3. Recommended Wire Length and Wire Diameter for Power Supply System

Indoor unit

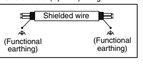
Model	(B) Power Supply Cable										Time Delay Fuse or Circuit Capacity (A)
	Power Supply	Min. Wire Size (mm²)	Recommended Wire Length and Wire Diameter for Power Supply Cable								
			Wire Size (mm²)	Max. Length (m)	Wire Size (mm²)	Max. Length (m)	Wire Size (mm²)	Max. Length (m)	Wire Size (mm²)	Max. Length (m)	
S-180ME3H	220-230-240V~	1.5	1.5	26	2.5	43	4.0	69	6.0	104	10
S-224ME3H	220-230-240V~	1.5	1.5	23	2.5	39	4.0	62	6.0	93	10
S-280ME3H	220-230-240V~	1.5	1.5	23	2.5	39	4.0	62	6.0	93	10

Control wiring

(C) Inter-unit (between outdoor and indoor units) control wiring	(D) Remote control wiring	(E) Control wiring for group control
0.75 mm² (AWG #18) **Use shielded wiring***	0.75 mm² (AWG #18)	0.75 mm² (AWG #18)
Max. 1,000 m	Max. 500 m	Max. 200 m (Total)

Inter-unit (between outdoor and indoor units) control wiring & Remote control (Optional) wiring

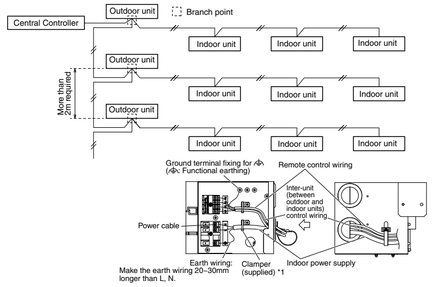
Use shielded wires for integrated control system wiring and ground the shield on both sides, otherwise misoperation from noise may occur. Connect wiring as shown in Section 3-2 Wiring System Diagrams.



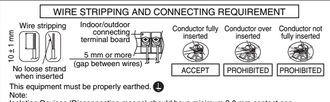
NOTE

- For outdoor unit wire length and wire diameter for power supply system (A), refer to the installation instruction manual that comes with that outdoor unit.
- For Optional Parts connecting wiring size, refer to Installation Manual of the Optional Parts.

If branching in the inter-unit control wiring, the number of branch points should be 16 or fewer



WIRE STRIPPING AND CONNECTING REQUIREMENT



This equipment must be properly earthed.

Note:
Isolating Devices (Disconnecting means) should have minimum 3.0 mm contact gap.
Earth wire shall be Yellow/Green (Y/G) in colour and longer than other AC wires for safety reasons.
● Earth lead wire shall be longer than other lead wires as shown in the figure for the electrical safety in case of the cord slipping out of anchorage.

4 REFRIGERANT PIPING

Must ensure mechanical connections be accessible for maintenance purposes. The liquid tubing side is connected by a flare nut, and the gas tubing side is connected by brazing.

4-1. Connecting the Refrigerant Tubing

Cautions During Brazing

- **Replace air inside the tube with nitrogen gas to prevent copper oxide film from forming during the brazing process. (Oxygen, carbon dioxide and Freon are not acceptable.)**
- **Do not allow the tubing to get too hot during brazing. The nitrogen gas inside the tubing may overheat, causing refrigerant system valves to become damaged. Therefore allow the tubing to cool when brazing.**
- **Use a reducing valve for the nitrogen cylinder.**
- **Do not use agents intended to prevent the formation of oxide film. These agents adversely affect the refrigerant and refrigerant oil, and may cause damage or malfunctions.**

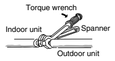
4-2. Connecting Tubing Between Indoor and Outdoor Units

(1) Tightly connect the indoor-side refrigerant tubing extended from the wall with the outdoor-side tubing.

Indoor Unit Tubing Connection

Indoor unit type	180/224	280
Gas tubing (mm)	ø19.05	ø22.22
Liquid tubing (mm)	ø12.7	

(2) To fasten the flare nuts, apply specified torque.
- When removing the flare nuts from the tubing connections, or when tightening them after connecting the tubing, be sure to use a torque wrench and a spanner. If the flare nuts are over-tightened, the flare may be damaged, which could result in refrigerant leakage and cause injury or asphyxiation to room occupants.
- For the flare nuts at tubing connections, be sure to use the flare nuts that were supplied with the unit, or else flare nuts for R410A, R32 (type 2). The refrigerant tubing that is used must be of the correct wall thickness as shown in the table below.



Tube diameter	Flare nut tightening torque (approximate)	Min. tube thickness
ø12.7 (1/2")	55±6 N•m {550±60 kgf•cm}	0.8 mm (Material Temper - O)
ø19.05 (6/8")	–	1.2 mm (Material Temper - O)
ø22.22 (7/8")	–	1.0 mm (Material Temper - 1/2 H • H)

- Because the pressure is approximately 1.6 times higher than conventional refrigerant R22 pressure, the use of ordinary flare nuts (type 1) or thin-walled tubes may result in tube rupture, injury, or asphyxiation caused by refrigerant leakage.
- In order to prevent damage to the flare caused by over-tightening of the flare nuts, use the table above as a guide when tightening.
- When tightening the flare nut on the liquid tube, use an adjustable wrench with a nominal handle length of 200 mm.

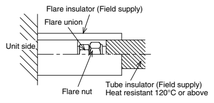
4-3. Insulating the Refrigerant

⚠ CAUTION Be sure to perform heat insulation on the drain, liquid and gas piping. Imperfection in heat insulation work leads to water leakage.

(1) Selection of heat insulation materials for refrigerant tube. When using heat insulation materials (field supply), kindly check for its sizes and performance.
- Material for insulation material: Polyethylene foam.
- Heat transfer rate: less than 0.051W/m•K.
- Material withstand temperature: 120°C or above (gas tubing). For other tubing 80°C or above
- Must be easy to use, age resistance and not easily absorb moisture.
- Be sure to match the below insulation material size with tube sizes.

Piping size, mm (In)	Thermal insulation size (I.D.)	Thermal insulation Thickness
12.7 (1/2")	14 ~ 16 mm	Insulation thickness must be 10mm or greater
19.05 (3/4")	20 ~ 24 mm	
ø22.22 (7/8")	22 ~ 25 mm	

(2) Taping the flare nuts
- Wind the white insulating tape around the flare nuts at the gas tube connection.
- Then cover up the tubing connection with tube insulator (field supply) and fill in the gap with black insulation tape.
- Finally fasten with clampers (field supply)



NOTE

If noise bothers you from the area between indoor and outdoor units' connection pipes, it is effective to wind the soundproofing materials (field supply) to reduce noise.

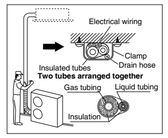
⚠ CAUTION After a tube has been insulated, never try to bend it into a narrow curve because it can cause the tube to break or crack. Never grasp the drain or refrigerant connecting outlets when moving the unit.

(3) Taping the tubes
- Refrigerant tubes (and electrical wiring if local permit) should be taped together with armouring tape in 1 bundle. Keep the drain hose separate from refrigerant tube to prevent condensation.
- Wrap the armouring tape from bottom of the outdoor unit to the tubing here it enters the wall. Overlap half of each previous turn.
- Clamp the tubing to the wall, using 1 clamp approx. per each meter apart.

NOTE

Do not wind the armouring tape too tightly since this will decrease the heat insulation effect. Also ensure that the condensation drain hose splits away from the bundle and drips clear of the unit and the tubing.

⚠ CAUTION If the exterior of the outdoor unit valves has been finished with a square Duct covering, make sure you allow sufficient space to access the valves and to allow the panels to be attached and removed.



(4) Finishing the Installation
- After finishing insulating and taping over the tubing, use sealing putty to seal off the hole in the wall to prevent rain and draft from entering.

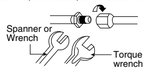
(5) Precautions in high humidity circumstances
- This air-conditioner has been tested according to the "JIS Standard Conditions with Mist" and have been confirmed that there are no faults. However, if it is operated for a long time in high humid atmosphere (dew point temperature: more than 23 °C), water drops are liable to fall. In this case, add heat insulation material according to the following procedures:
  1. Heat insulation material to be prepared. Adiabatic glass wool with thickness 10~20mm
  2. Stick the wool on all air-conditioners that are located in the ceiling atmosphere
  3. In addition to the normal heat insulation (thickness: more than 10mm) refrigerant piping, add a further of 10~30 mm thickness material.

4-4. Additional Precautions for R410A models

For connection joint of all models

Please make flare after inserting flare nut (locate at joint portion of tube assembly) onto the copper pipe. (In case of using long piping)

Connect the piping
- Align the center of piping and sufficiently tighten the flare nut with fingers.
- Further tighten the flare nut with torque wrench in specified torque as stated in the table.



(1) Vacuum Drying
- After completing the piping connection, execute vacuum drying for the connecting piping and the indoor unit. The vacuum drying must be carried out by using the service ports of both the liquid and gas side valves.

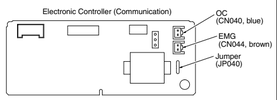
5 HOW TO INSTALL THE TIMER REMOTE CONTROLLER OR HIGH-SPEC WIRED REMOTE CONTROLLER (OPTIONAL PART)

NOTE

Refer to the Installation Instructions attached to the optional Timer Remote Controller or optional High-spec Wired Remote Controller.

6 PRECAUTIONS ON TEST RUN

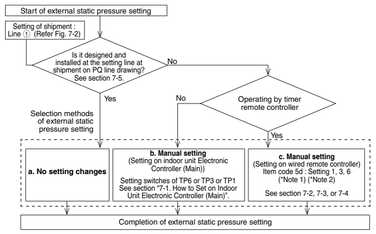
- Request that the customer be present when the test run is performed. At this time, explain the operation manual and have the customer perform the actual steps.
- Check that the 220-230-240 VAC power is not connected to the U1 & U2 terminal board terminal.
  * If 220-230-240 VAC is accidentally applied, the Fuse on indoor unit Electronic Controller (Communication) will blow in order to protect the PCB.
  In this case, recover the connection by disconnect 2P connector wires that originally connected to the indoor unit Electronic Controller (Communication) OC connector and shift the connector wires to EMG connector on same indoor unit Electronic Controller (Communication). If operation is still not possible after shift to EMG connector, cut the jumper JP040 on the same indoor unit Electronic Controller (Communication).



7 EXTERNAL STATIC PRESSURE SETTING

Choose one of the methods (selection of "a", "b", "c" within the range of dotted line as shown in the flowchart below) and make settings.
a. No setting changes: When using as it is factory preset at shipment. (If resetting after external static pressure setting once, it might be different from factory preset.)
b. Manual setting (on indoor unit Electronic Controller (Main)): This is static pressure setting excepting factory preset at shipment. Dip switch select method.
c. Manual setting (by wired remote controller): Static pressure setting excepting factory preset at shipment.

Flow of External Static Pressure



NOTE

(1) Refer to Tables 7-2, 7-3, 7-4 and Fig. 7-2 for details on the relationship between the value of item code "5d" and the external static pressure.
(2) (When set in group control (connecting multiple indoor units with one timer remote controller), set each indoor unit to item code "5d".
When amending the setting after selecting [b. Manual setting] (due to airflow path changes, etc.), it is necessary to cancel [b. Manual setting] (switching OFF positions).
When [b. Manual setting] has not been cancelled, [c. Manual setting] will be activated if selected, but [b. Manual setting] takes precedence when the power is switched back on after power outages, etc.

⚠ CAUTION

- **Make sure the external static pressure is in a range of specifications. Then proceed the external static pressure setting. Improper settings can cause noise, a shortage of airflow volume and water leakage. Refer to Fig. 7-2 for the external static pressure setting range.**
- **Be sure to set the [External Static Pressure Setting] once again after amending the airflow path for the duct or air outlet after setting the external static pressure.**

7-1. How to Set on Indoor Unit Electronic Controller (Main)

(1) Turn off the power breaker to halt the supply of electricity to the indoor unit Electronic Controller (Main).
(2) Open the lid of the electrical component box and confirm the location where the Select switch on the indoor unit Electronic Controller (Main) is placed. (Fig. 7-1)
(3) Set the On/Off switches in the Off position which are now set in the On position.
Select the positions of the Select SW001 switches respectively to make the desired external static pressure settings referring to the Table 7-1.

Table 7-1 External static pressure SW setting

External static pressure at the time of rated airflow volume		SW001		
180	224/280	TP6	TP3	TP1
180Pa	200Pa	ON 1	2	3
120Pa	130Pa	1	ON 2	3
75Pa	75Pa	1	2	ON 3

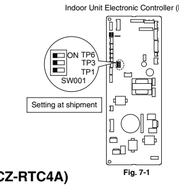


Fig. 7-1

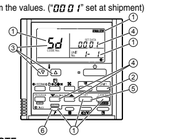
7-2. Operating the Timer Remote Controller (CZ-RTC4/CZ-RTC4A)

How to set the external static pressure

(1) Press and hold down the [ ], [ ] and [ ] buttons simultaneously for 4 or more seconds. (SETTING: the Unit No., Item Code and Detailed Data will blink on the LCD display.)
(2) The indoor unit numbers in the group control will be sequentially displayed whenever the Unit Select button is pressed.
Only the fan motor for the selected indoor unit will operate during this time.
(3) Specify the "5d" item code by pressing the [▽] / [△] buttons for the temperature setting buttons and confirm the values. ("0006", "0003" or "0001" set at shipment)
(4) Press the [ ] / [ ] buttons for the time to amend the values for the set data.
Refer to Table 7-2 and Fig. 7-2 and select a value "0006", "0003" or "0001".
(5) Press the [ ] button.
The display will stop blinking and remain illuminated.
(6) Press the [ ] button. The fan motor will stop operating and the LCD display will return to the normal stop mode.

Table 7-2 Setting the external static pressure

Indoor unit		Item code
180	224/280	5d
External static pressure of the rated air flow volume		
180 Pa	200 Pa	0006
120 Pa	130 Pa	0003
75 Pa	75 Pa	0001

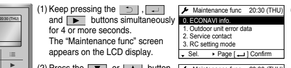


NOTE:
Failure to set this parameter may result in decreased airflow and condensation.

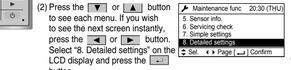
7-3. Operating the High-spec Wired Remote Controller (CZ-RTC5B)

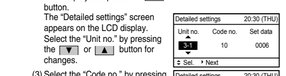
How to set the external static pressure

(1) Keep pressing the [ ], [ ] and [ ] buttons simultaneously for 4 or more seconds.
The "Maintenance func" screen appears on the LCD display.

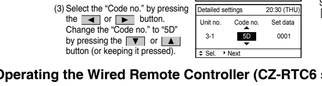


(2) Press the [▼] or [▲] button to see each menu. If you wish to see the next screen instantly, press the [◀] or [▶] button. Select "8. Detailed settings" on the LCD display and press the [ ] button.
The "Detailed settings" screen appears on the LCD display.
Select the "Unit no." by pressing the [▼] or [▲] button for changes.





(3) Select the "Code no." by pressing the [◀] or [▶] button.
Change the "Code no." to "5D" by pressing the [▼] or [▲] button (or keeping it pressed).



(4) Select the "Set data" by pressing the [◀] or [▶] button.
Select one of the "Set data" among "0006", "0003" or "0001" according to the desired external static pressure setting by pressing the [▼] or [▲] button.
(See Table 7-3 and Fig. 7-2.)
Then press the [ ] button.

Table 7-3 Setting the external static pressure

Indoor unit		Item code
180	224/280	5d
External static pressure of the rated air flow volume		
180 Pa	200 Pa	0006
120 Pa	130 Pa	0003
75 Pa	75 Pa	0001

(5) Select the "Unit no." by pressing the [◀] or [▶] button and press the [ ] button.
The "Exit detailed settings and restart?" (Detailed setting-end) screen appears on the LCD display.
Select "YES" and press the [ ] button.

7-4. Operating the Wired Remote Controller (CZ-RTC6 series)

Stop the system before performing these steps.
How to set the external static pressure

(1) Keep pressing the [ ], [ ] and [ ] buttons simultaneously for 4 or more seconds.
The "Maintenance func" screen appears on the LCD display.

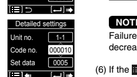
(2) Press the [ ] or [ ] button to see each menu.
Select "Detailed settings" on the LCD display and press the [ ] button.

The "Detailed settings" screen appears on the LCD display.

(3) Select the "Unit no." by pressing the [ ] or [ ] button.
After selecting "Unit no.", press the [ ] button and proceed to Step 4.
If the [ ] button is pressed, proceed to Step 6.

(4) Keep pressing the [ ] button for 2 seconds or more during selecting "Code no.".

Change the "Code no." one digit at a time so that it becomes [00005D] along with the following procedures.



Change the value by pressing the [ ] or [ ] button.
After changing the value, press the [ ] button and set the next digit.

Fig. A

Change the value by pressing the [ ] or [ ] button.
After changing the value, press the [ ] button and set the next digit.

Fig. B

Change the value by pressing the [ ] or [ ] button.
After changing all digits, press the [ ] button and proceed to Step 5.

Fig. C

(5) Select one of the "Set data" among "0006", "0003" or "0001" according to the desired external static pressure setting by pressing the [ ] or [ ] button. (See Table 7-4.)
After selecting "Set data", press the [ ] button.
(If setting continuously, follow the procedures from **Fig. A**.)
If you wish to change the selected indoor unit or finish setting, press the [ ] button twice (the display returns to Step 3).

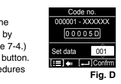


Fig. D

Table 7-4 Setting the external static pressure

Indoor unit		Item code
180	224/280	5d
External static pressure of the rated air flow volume		
180 Pa	200 Pa	0006
120 Pa	130 Pa	0003
75 Pa	75 Pa	0001

NOTE

Failure to set this parameter may result in decreased airflow and condensation.

(6) If the [ ] button is pressed under the display Step 3, the following display (Detailed setting-end screen) appears.Then select "YES" by pressing the [ ] or [ ] button and press the [ ] button.

7-5. Indoor Fan Performance

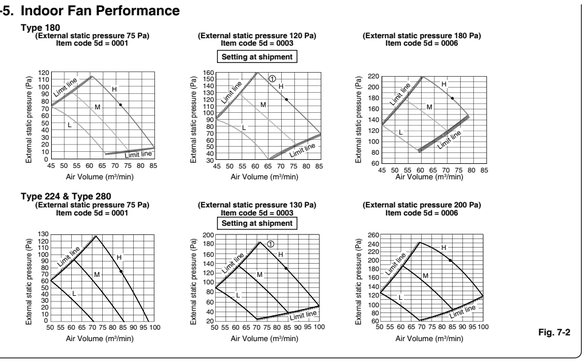
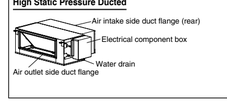


Fig. 7-2

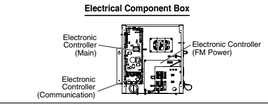
8 APPENDIX

■ Name of Parts

High Static Pressure Ducted



Electrical Component Box



■ Care and Cleaning

⚠ WARNING

- **Engage authorized dealer or specialist for cleaning.**
- **For safety, be sure to turn the air conditioner off and also to disconnect the power before cleaning.**
- **Do not pour water on the indoor unit to clean it. This will damage the internal components and cause an electric shock hazard.**

⚠ CAUTION

- **Never use solvents or harsh chemicals when cleaning the indoor unit. Do not wipe plastic parts using very hot water. Some metal edges and the fins are sharp and may cause injury if handled improperly; be especially careful when you clean these parts.**
- **The internal coil and other components of outdoor unit must be cleaned regularly. Consult your dealer or service center.**

Air intake and outlet side (Indoor unit)

Clean the air intake and outlet side of the indoor unit with a vacuum cleaner brush, or wipe them with a clean, soft cloth.
If these parts are stained, use a clean cloth moistened with water. When cleaning the air outlet side, be careful not to force the vanes out of place.

Air filter

- **In case of Installing the Duct (field supply)**

Period	(Depends on filter's specifications)	When cleaning the air filter, consult your dealer or service center.

⚠ CAUTION

- **Certain metal edges and the condenser fins are sharp and may cause injury if handled improperly; special care should be taken when you clean these parts.**
- **The internal coil and other components must also be cleaned periodically. Consult your dealer or service center.**

Care: After a prolonged idle period

Check the indoor and outdoor unit air intakes and outlets for blockage; if there is a blockage, remove it.

Care: Before a prolonged idle period

- Operate the fan for half a day to dry out the inside.
- Disconnect the power supply and also turn off the circuit breaker.
- Clean the air filter and replace it in its original position.

NOTE

Should the power fail while the unit is running

If the power supply for this unit is temporarily cut off, the unit will automatically resume operation once power is restored using the same settings before the power was interrupted.

Important Information Regarding The Refrigerant Used

NOTE

Refer to the Installation Instructions attached to the outdoor unit.

CHECK THE FOLLOWING ITEMS WHEN INSTALLATION IS COMPLETE

● After completing work, be sure to measure and record trial run properties, and store measuring data, etc.
● Measuring items are room temperature, outside temperature, suction temperature, blow out temperature, wind velocity wind volume, voltage, current, presence of abnormal vibration and noise, operating pressure, piping temperature, compressive pressure, airtight pressure.
● As to the structure and appearance, check the following items.

- [ ] Is circulation of air adequate?
- [ ] Is draining smooth?
- [ ] Is heat insulation complete (refrigerant and drain piping)?
- [ ] Is there any leakage of refrigerant?
- [ ] Is remote controller switch operated?
- [ ] Is there any faulty wiring?
- [ ] Are the terminal screws loosened?

M3...69-98N•cm {7-10kgf•cm}
M4...157-196N•cm {16-20kgf•cm}
M5...196-245N•cm {20-25kgf•cm}

HAND OVER

● Teach the customer the operation and maintenance procedures, using the operation manual (air filter cleaning, temperature control, etc.)

Optional Parts

● Refer to Installation manual of optional parts (sold separately).

As for work specifications of the outdoor unit, read the OUTDOOR UNIT INSTALLATION MANUAL attached to the outdoor unit.

ENGLISH
The English text is the original instructions.
Other languages are translation of original instructions.