

Installation Instruction

Required tools for Installation Works

- Phillips screw driver
- Flathead screwdriver
- Level gauge
- Electric drill, hole core drill (ø70 mm)
- Hexagonal wrench (4 mm)
- Spanner
- Pipe cutter
- Reamer
- Knife
- Electric drill, hole core drill (ø70 mm)
- Thermometer
- Megohmmeter
- Multimeter
- Torque wrench
- 18 Nm (1.8 kgf·m)
- 42 Nm (4.3 kgf·m)
- 55 Nm (5.6 kgf·m)
- 65 Nm (6.6 kgf·m)
- Vacuum pump
- Vacuum manifold

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

- WARNING**: This symbol shows that this equipment uses a flammable refrigerant. If the refrigerant is leaked, together with an external ignition source, there is a possibility of ignition.
- CAUTION**: This symbol shows that the Installation Manual should be read carefully.
- CAUTION**: This symbol shows that a service personnel should be handling this equipment with reference to the Installation Manual.
- CAUTION**: This symbol shows that there is information included in the Operation Manual and/or Installation 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 be sure to use the operation, care and maintenance as stated in instructions. Please remind the customer to keep the operating instructions for future reference.

- 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 R32 model, use new piping, flare nut and tools which is specified for R32 refrigerant. Using of existing (R22) piping, flare nut and tools may cause abnormally high pressure in the refrigeration 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 used.
- 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.
- If reuse piping is unavoidable, refer to instruction ③ REFRIGERANT INSTALLATION (IN CASE OF REUSING EXISTING REFRIGERANT PIPING) in outdoor unit installation manual.
- Thickness for copper pipes used with R32 must be more than 0.8 mm. Never use copper pipes thinner than 0.6 mm. For copper pipe ø15.88 or more use copper pipe thickness 0.8 mm and above.
- 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 ⑦ 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), with sensitivity of 30mA at 0.1 sec or less. 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. Outdoor or 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.
- Indoor outdoor connection cable. Use power supply cord 4 x 2.5 mm² (2.0 - 6.0HP) type designation 60245 IEC 57 or heavier cord.
- Installation work. It may need two people to carry out the installation work.
- Keep any required ventilation openings clear of obstruction.

PRECAUTION FOR USING R32 REFRIGERANT

- The basic installation work procedures are the same as conventional refrigerant (R410A, 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 building or dwelling or room. Flare connection may cause gas leak and flammable atmosphere.
- The appliance shall be stored, installed and operated in a well ventilated room with indoor floor area larger than Amin (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 R32 REFRIGERANT" in outdoor unit installation manual for other precautions that need to pay attention to.

Check of Density Limit

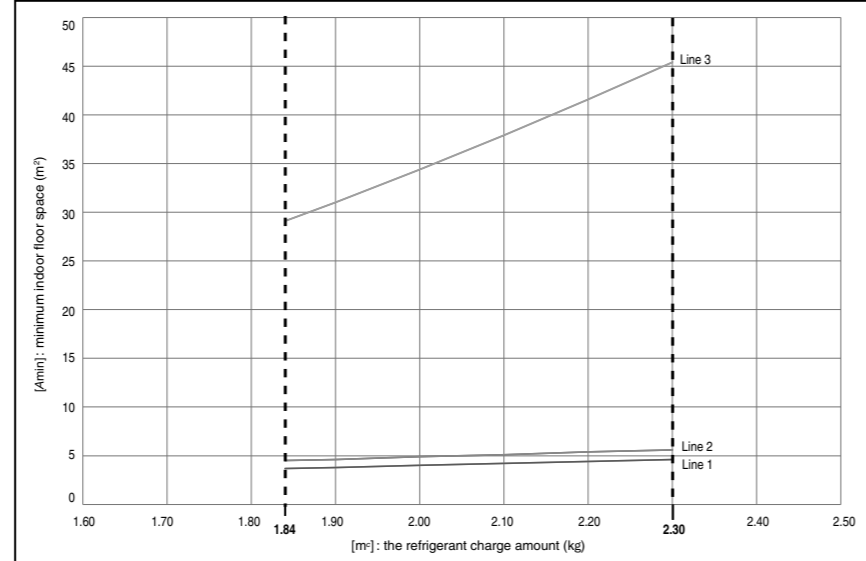
The refrigerant (R32), which is used in the air conditioner, is a flammable refrigerant. So the requirements for installation space of appliance are determined according to the refrigerant charge amount [m] used in the appliance.

Regarding the refrigerant charge amount [m] used in the appliance, refer to the installation instructions for the outdoor unit.

The minimum indoor floor space compared with the amount of refrigerant is roughly as follows:

Installation height of Indoor Unit (h _{int})	Indoor Unit Type	Density Limit Line
h _{int} ≥ 2.2 m	Duct units (Horizontal installation)	Line 1
1.8 m ≤ h _{int} < 2.2 m	Duct units (Horizontal installation)	Line 2
h _{int} < 1.8 m	Duct units (Vertical installation)	Line 3

Line 1	Line 2	Line 3	[m ²] kg		
			Line 1	Line 2	Line 3
1.84	3.7	4.5	29.1		
1.9	3.8	4.6	31.0		
2.0	4.0	4.9	34.4		
2.1	4.2	5.1	37.9		
2.2	4.4	5.4	41.6		
2.3	4.6	5.6	45.4		



$A_{min} = (m_i / (2.5 \times LFL))^{0.75} \times h_{i0}$ ** not less than safety factor margin

A_{min} = Required minimum room area, in m²
 m_i = Refrigerant charge in appliance, in kg
 LFL = Lower flammability limit (0.307 kg/m³)
 h_{i0} = Installation height of the appliance : (Line 1: 2.2 m; Line 2: 1.8 m; Line 3: 0.6 m)

** The required minimum room area, Amin, shall also be governed by the safety factor margin formula below:

$A_{min} = m_i / (SF \times LFL \times h_{i0})$

The higher value shall be taken when determining the room area.

m_i ≤ 1.84 : Can be installed
 1.84 < m_i ≤ m_{max} : Can be installed above "Density Limit Line" *1
 *1 Refer to table and the installation instructions of indoor unit when deciding "Density Limit Line".

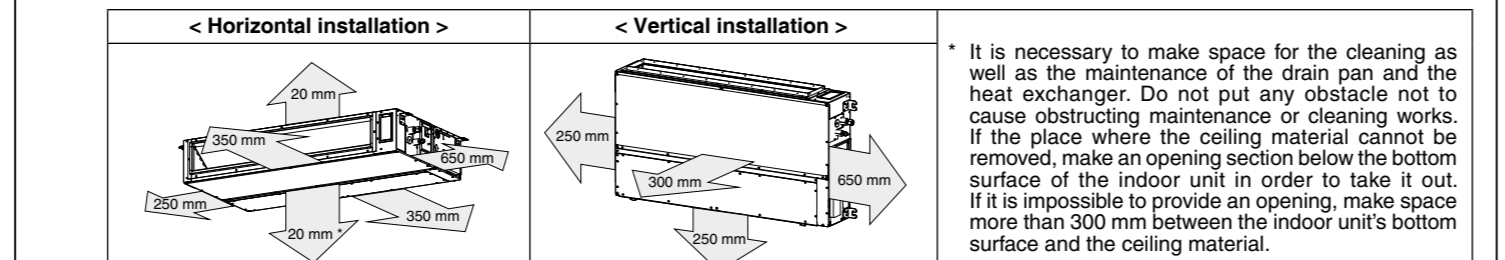
ACCESSORIES PACKED IN THE INDOOR UNIT CONTAINER

Part Name	Figure	Q'ty	Remarks	Part Name	Figure	Q'ty	Remarks
Washer	1	8	For suspending indoor unit from ceiling	Filter	1	-	When not connecting the air intake, be sure to install the filter.
Hose band	1	1	For securing drain hose	Screw	1	-	-
Drain hose	1	1	For main unit + PVC pipe joints	Short-circuit connection	1	-	For vertical installation (Located on the back of the electrical component box lid.)
Clamper	1	2	For electrical wiring				

* S-1821PF** : 1 Q'ty S-2430PF** : 2 Q'ty S-3448PF** : 2 Q'ty

1 SELECTING THE LOCATION FOR THE 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.
 - The indoor unit must be within a maintenance space.
 - 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.

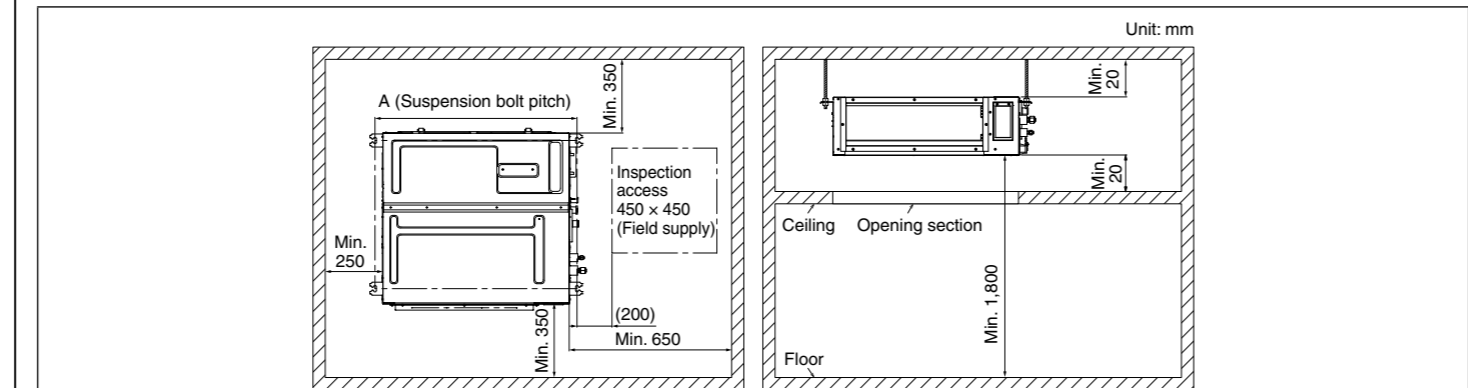


- For horizontal installation, if the height from the floor to ceiling exceeds three meters, air flow distribution deteriorates and the effect is decreased.
- WARNING**: The installation position must be able to support a load four times the indoor unit weight (For Horizontal Installation Standard installation).
- The indoor unit must be away from heat and sources of steam, but avoiding installation near an entrance.
- The indoor unit must allow easy draining.
- The indoor unit must allow easy connection to the outdoor unit.
- Place the indoor unit according to the height from the ceiling shown in the illustration under the section Horizontal Installation below.
- 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.
- The power supply is subject to noise generation, add a suppressor.
- Do not install the indoor unit in a laundry. Electric shocks may result.
- Check "Required Minimum Space for Installation and Maintenance Services" for minimum installation height.

- Note**: Thoroughly study the following installation locations
- In such places as restaurants and kitchens, considerable amount of oil steam and food adhere to the turbo fan, the fin of the heat exchanger and the drain pump, resulting in heat exchange reduction, spraying, dispersing of water drops, drain pump malfunction, 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.
- Avoid installing the air conditioner in such circumstances where cutting oil mist or iron powder exist, especially in factories, etc.
- Avoid places where inflammable gas is generated, flows-in, contaminated, or leaked.
- Avoid places where sulphurous acid gas or corrosive gas can be generated.
- Avoid places near high frequency generators.

HOW TO INSTALL THE INDOOR UNIT

- Middle Style Pressure Duct Type**
- Required Minimum Space for Installation and Maintenance Services**
- Horizontal installation**
 - This air conditioner is usually installed above the ceiling so that the indoor unit and ducts are not visible. Only the air intake and air outlet ports are visible from below.
 - The minimum space for installation and maintenance services is shown in the figure.

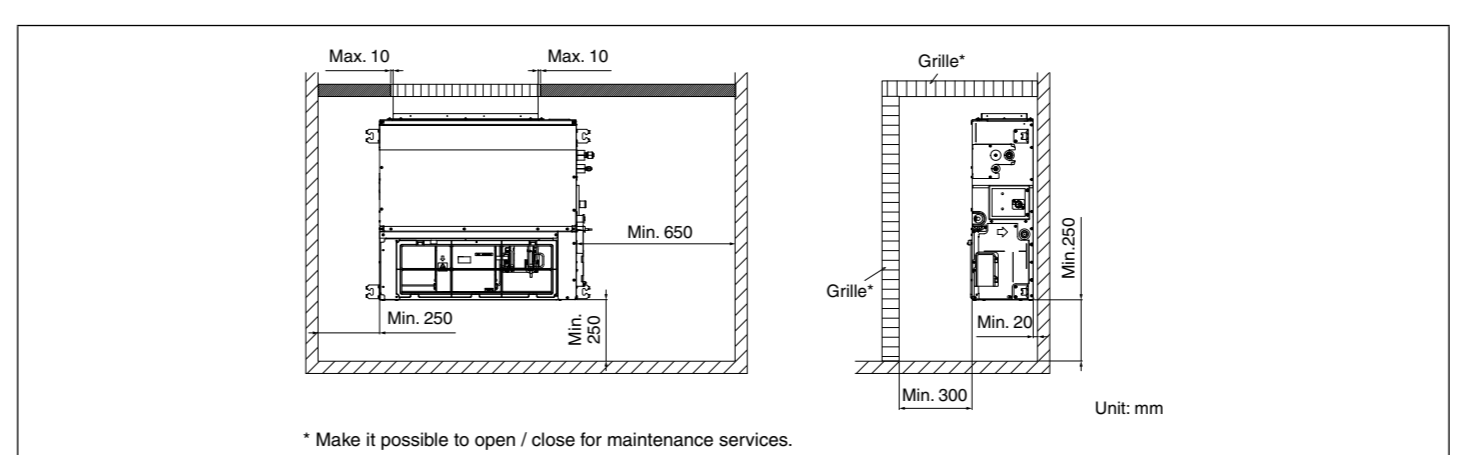
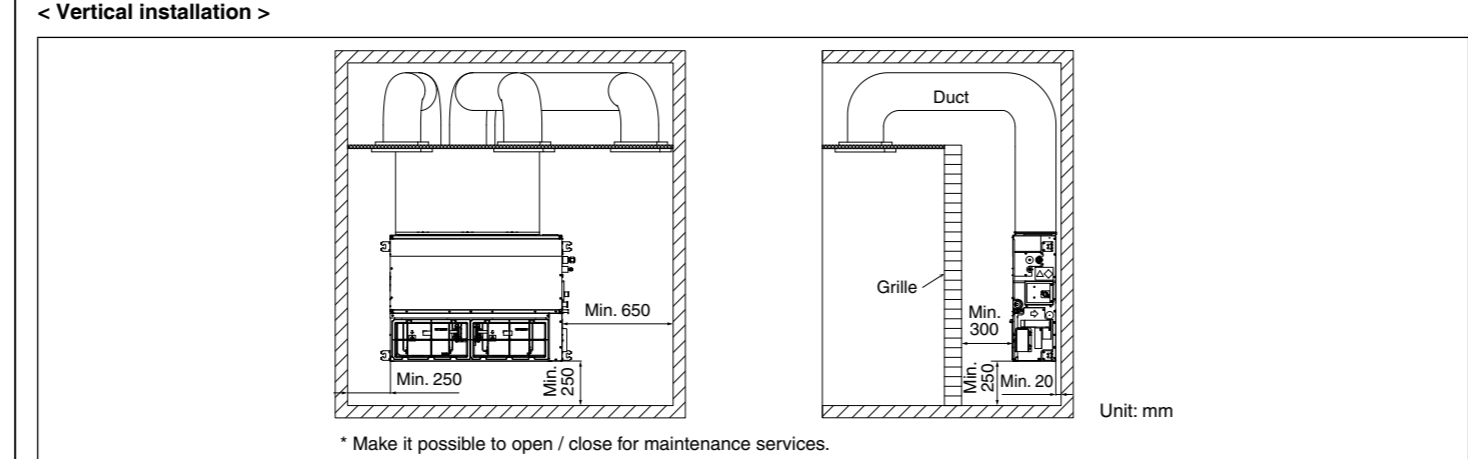


* It is necessary to make space for the cleaning as well as the maintenance of the drain pan and the heat exchanger. Do not put any obstacle to cause obstructing maintenance or cleaning works. If the place where the ceiling material cannot be removed, make an opening section below the bottom surface of the indoor unit in order to take it out. If it is impossible to provide an opening, make space more than 300 mm between the indoor unit's bottom surface and the ceiling material.

Minimum space for installation and maintenance services

Type	S-1821PF**	S-2430PF**	S-3448PF**
A (Length)	867	1,067	1,467

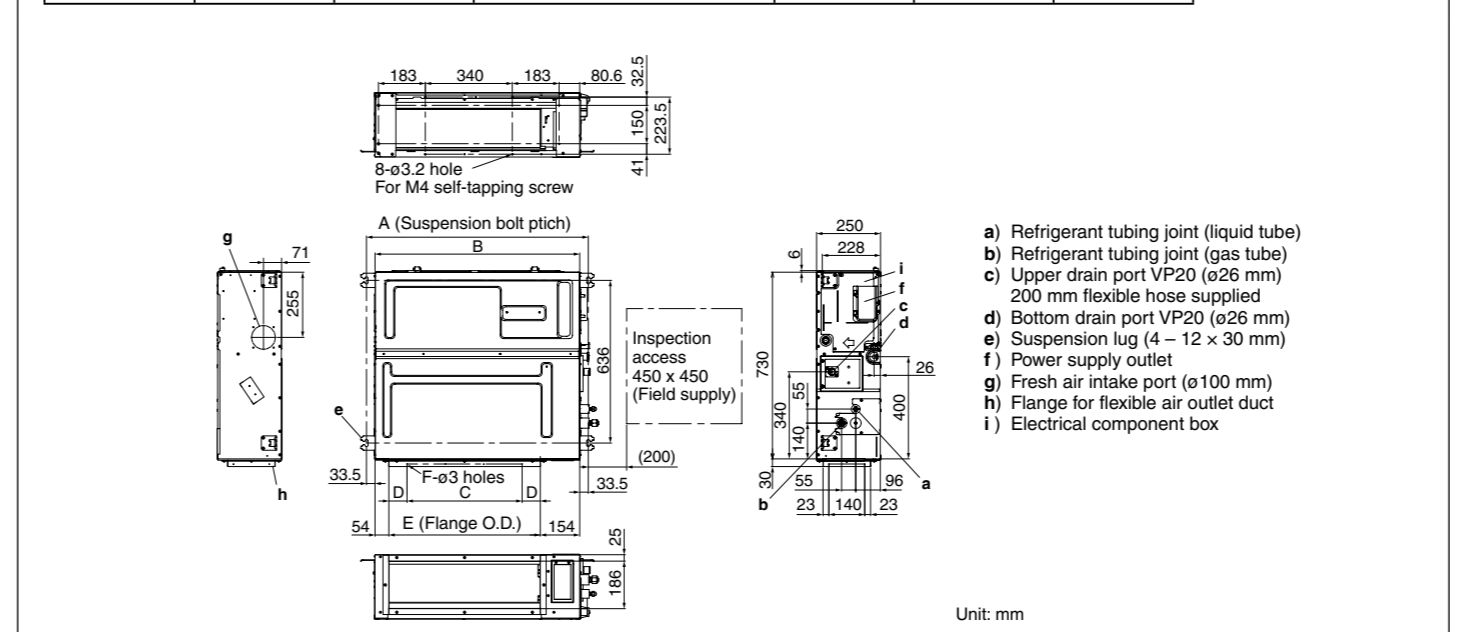
Vertical installation



It is recommended that space be provided (450 x 450 mm) for checking and servicing the electrical system.

Detailed dimensions of indoor unit

Type	A	B	C	D	E	F
S-1821PF**	867	800	450 (Pitch 150 x 3)	71	592	12
S-2430PF**	1,067	1,000	750 (Pitch 150 x 5)	21	792	16
S-3448PF**	1,467	1,400	1,050 (Pitch 150 x 7)	71	1,192	20



2 INSTALLATION OF INDOOR UNIT

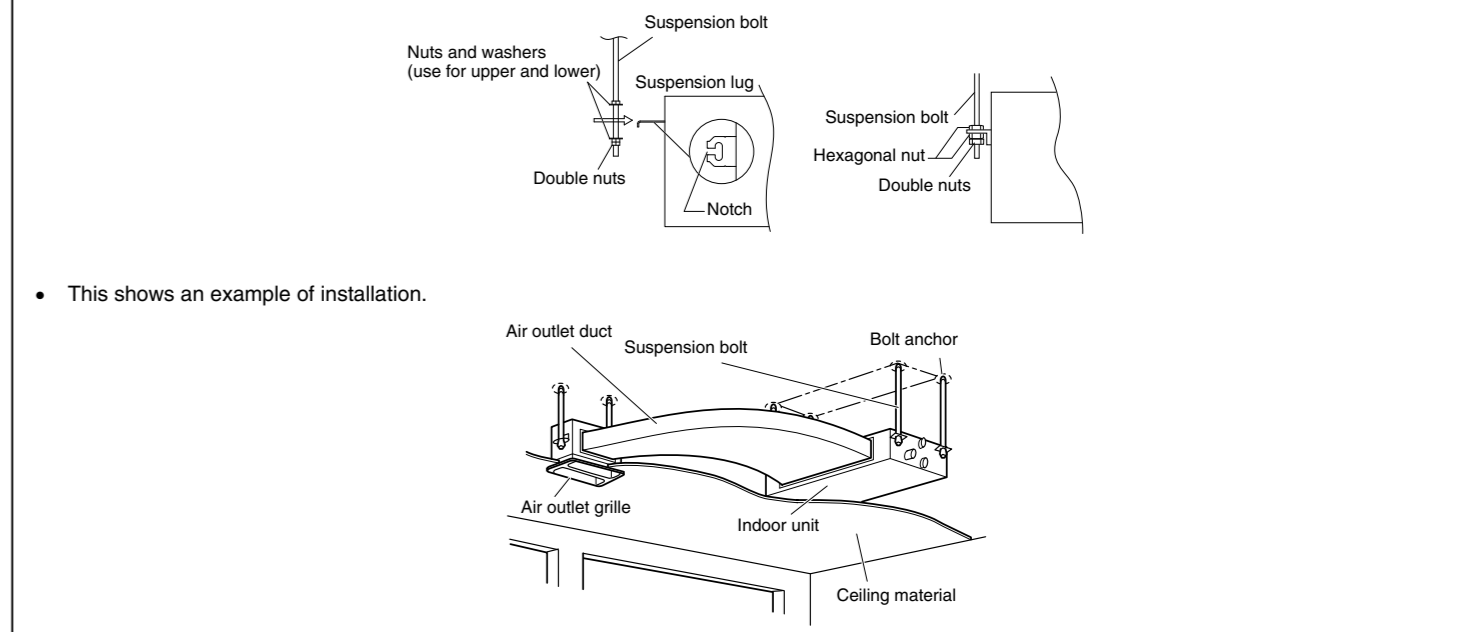
- Preparation Before Installation**
- Main Types of Installation
- Case A (Standard installation)**: Horizontal installation in the ceiling, rear side air intake.
 - Case B**: Horizontal installation in the ceiling, lower side air intake.
 - Case C**: Vertical installation on the sidewall, lower side air intake.
 - Case D**: Vertical installation on the sidewall, front side air intake.

- Install the Filter**
- When not connecting the air intake duct, be sure to install the filters (Accessories). Case A and Case C are shown below.
- Type S-1821PF****: Shows the filter being attached to the main unit with screws.
- Type S-2430PF**, S-3448PF****: Shows the filter being attached to the main unit while pushing the tip of the latches in the direction of the arrow.
- Attach the filters (accessories) in the manner shown in the figure. Securely fix the filters with the screws.

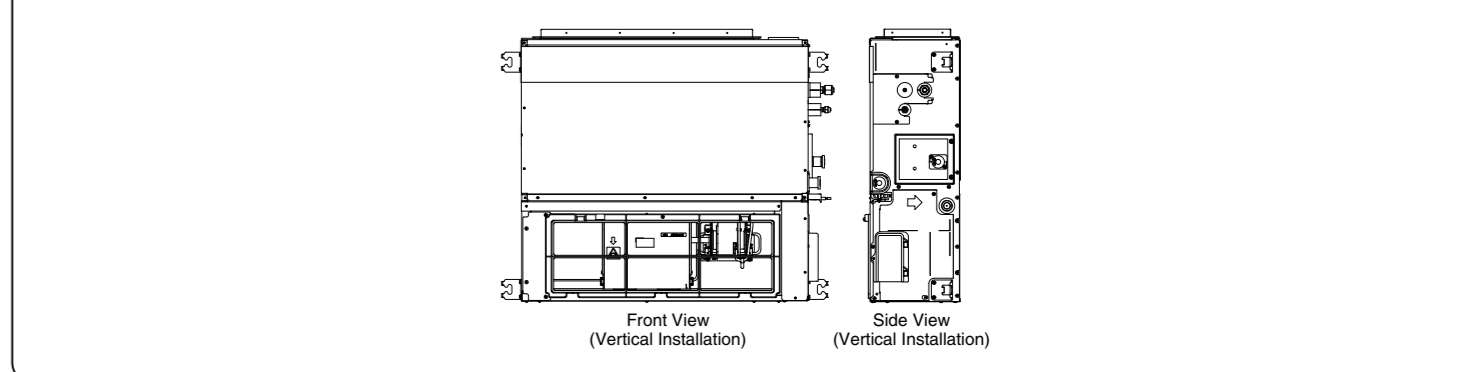
- Case B and Case D are shown below. For Case B and Case D, replace the cover plates in the procedure shown in the figure.
- Type S-1821PF****
- Remove the cover plates (2 pcs).
 - Attach the cover plates removed in step 1 and filter (accessory) in the direction shown in the figure below.
- Type S-2430PF**, S-3448PF****
- Remove the cover plate and the support plate (Type S-3448PF** only).
 - Attach the cover plate and the support plate removed in step 1 and filters (accessories) in the direction shown in the figure below.
 - Attach the filters (accessories) in the manner shown in the figure. Securely fix the filters with the screws.

- Fix the Indoor Unit**
- Depending on the ceiling type:
- a) Insert suspension bolts
 - b) Use existing ceiling supports or construct a suitable support
- 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 hanging the unit, test the strength of each attached suspension bolt.

- When placing the unit inside the ceiling, determine the pitch of the suspension bolts referring to the dimensional data as shown in the tables and diagrams under the section Required Minimum Space for Installation and Maintenance Services. 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.
- Screw in the suspension bolts allowing them to protrude from the ceiling. (Cut the ceiling material, if necessary.)
- Thread the 3 hexagonal nuts and 2 washers (field supply) onto each of the 4 suspension bolts. Use 1 nut and 1 washer for the upper part, and 2 nuts (double nuts) and 1 washer for the lower part, so that the unit will not fall off the suspension lugs.



- This shows an example of installation.
- To prevent overturning, fasten the unit to the wall securely.
- Check to make sure the wall can endure 5 times of weight of the unit. Ensure to fix the unit.
- In order to suppress vibrations, provide the spacer between the unit and the wall.
- Fasten the hanging brackets and bolts using by the hexagon nuts and washers.
- Check to make sure the unit is installed in a horizontal position by using a level. Water leakage may occur if the unit is not installed horizontally.



3 REFRIGERANT PIPING

- CONNECTING THE PIPING TO INDOOR**
- 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)
- Additional Precautions For R32 Models when connecting by flaring at indoor side**
- Ensure to do re-flaring of pipes before connecting to units to avoid leaking pipe.
 - Seal sufficiently the flare nut (both gas and liquid sides) with neutral cure (Alkoxy type) & ammonia-free silicone sealant and insulation material to avoid the gas leak caused by freezing.
 - Use of silicon containing ammonia can lead to stress corrosion on the joint & can cause leakage.
 - Neutral cure (Alkoxy type) & ammonia-free silicone sealant is only to be applied after pressure testing and cleaning up by following instructions of sealant, only to the outside of the connection. The aim is to prevent moisture from entering the connection joint and possible occurrence of freezing. Curing sealant will take some time. Make sure sealant will not peel off when wrapping the insulation.

- Brazing for piping.
 - Execute brazing before tightening the flare nut.
 - Brazing must be executed while blowing nitrogen gas. (This prevents generation of oxidized scale in copper pipe.)
 - When there is a lot of brazings for long piping, install a strainer midway of the piping. (The strainer is field supplied.)
 - Use clean copper pipe with inner wall surface free from mist and dust. Blow nitrogen gas or air to blow off dust in the pipe before connection.
 - Form the piping according to its routing. Avoid bending and bending back the same piping point more than three times. (This will result in hardening of the pipe.)
 - After deforming the pipe, align centers of the union fitting of the indoor unit and the piping, and tighten them firmly with wrenches.
 - Connect pipe to the service valve or ball valve which is located below the outdoor unit.
 - After completing the piping connection, be sure to check if there is gas leakage in indoor and outdoor connection.
- Confirm the union (thin side) is always at lower direction after connecting piping.

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.

	S-1821PF**	S-2430PF**	S-3448PF**
Liquid	ø6.35 mm (1/4)	ø9.52 (3/8)	ø15.88 (5/8)
Gas	ø12.70 (1/2)		

CONTINUE TO THE NEXT PAGE

4 INDOOR UNIT DRAIN PIPING

Horizontal Installation

Note
Make sure the drain pipe has a downward gradient (1/100 or more) and that there are no water traps.

CAUTION

- Do not install an air bleeder as this may cause water to spray from the drain pipe outlet.

If it is necessary to increase the height of the drain pipe, the section directly after the connection port can be raised a maximum of 500 mm. Do not raise it any higher than 500 mm, as this could result in water leaks.

Do not install the pipe with an upward gradient. This will cause the drain water to flow backward and leak when the unit is not operating.

Do not apply force to the piping on the unit side when connecting the drain pipe. The pipe should not be allowed to hang unsupported from its connection to the unit. Fasten the pipe to a wall, frame, or other support as close to the unit as possible.

Vertical Installation

Replace the drain cap

The drain cap can be inserted easily by using a screwdriver or similar tool to push the drain cap into the drain port on the main unit. Push the drain cap into the main unit's drain port until it reaches the end-stop.

Replace the connectors

When installing the unit vertically, disconnect the connector of the drain pump (3-pin) CN068 and the float switch (2-pin) CN034 from the PCB.

Insert the supplied short-circuit connector to the place where the connectors were removed.

Pay attention to the type of connector.

After switching on the power, invalidate the drain pump and change the heating intake temperature by setting the remote controller. (For details, see next section How to make drain pump ineffective and changing heating intake temperature.)

How to make drain pump ineffective and changing heating intake temperature

Operating the High-speed Wired Remote Controller (CZ-RTCSB)

After completing the address setting under the Section "8. TEST RUN", carry out the following procedure.

- Press the **Power**, **Mode**, and **OK** buttons simultaneously for 4 or more seconds. The "Maintenance func" screen appears on the LCD display.
- Press the **Up** or **Down** button to see each menu. If you wish to see the next screen instantly, press the **Left** or **Right** button. Select "4. Detailed settings" on the LCD display and press the **OK** button. The "Detailed settings" screen appears on the LCD display. Change the "Unit no." by pressing the **Up** or **Down** button for changes.
- Select the "Code no." by pressing the **Up** or **Down** button. Change the "Code no." to "3F" by pressing the **Up** or **Down** button (or keeping it pressed).
- Select the "Set data" by pressing the **Up** or **Down** button. Change the Setting Data "0001" by pressing the **Up** or **Down** button. Then press the **OK** button.
- Select the "Code no." by pressing the **Up** or **Down** button. Change the "Code no." to "06" by pressing the **Up** or **Down** button (or keeping it pressed).
- Select the "Set data" by pressing the **Up** or **Down** button. Change the Setting Data "0000" by pressing the **Up** or **Down** button. Then press the **OK** button.
- Select the "Unit no." by pressing the **Up** or **Down** button and press the **OK** button. The "Ext detailed settings and restart?" (Detailed setting-end) screen appears on the LCD display. Select "YES" and press the **OK** button.

Operating the Timer Remote Controller (CZ-RTCA)

Setting Item Code "3F" and "06"

Optional Parts

Checking the Drainage

Horizontal Installation Only

After wiring and drain piping are completed, use the following procedure to check that the water will drain smoothly. For this, prepare a bucket and wiping cloth to catch and wipe up spilled water.

- Connect power to the power terminal board (1, 2 terminals) inside the electrical component box.
- Remove the tube cover and slowly pour about 1,200 cc of water through the opening into the drain pan to check the water flow through the transparent upper drain port and see if there is any leakage.
- Short the check pin (CHK) (6P: 1-4) on the indoor unit control PCB and operate the drain pump. Check the water flow through the transparent upper drain port and see if there is any leakage. If the check pin (CHK) (6P: 1-4) is shorted, the fan starts rotating at high speed and could cause injury.
- When the drainage check is complete, open the check pin (CHK) (6P: 1-4) and remount the insulator and the cap onto the drain inspection port.

Vertical Installation Only

After wiring and drain piping are completed, use the following procedure to check that the water will drain smoothly. For this, prepare a bucket and wiping cloth to catch and wipe up spilled water.

- Connect power to the power terminal board (1, 2 terminals) inside the electrical component box.
- Remove the tube cover and slowly pour about 1,200 cc of water through the opening into the drain pan to check the water flow through the transparent upper drain port and see if there is any leakage.
- Short the check pin (CHK) (6P: 1-4) on the indoor unit control PCB and operate the drain pump. Check the water flow through the transparent upper drain port and see if there is any leakage. If the check pin (CHK) (6P: 1-4) is shorted, the fan starts rotating at high speed and could cause injury.
- When the drainage check is complete, open the check pin (CHK) (6P: 1-4) and remount the insulator and the cap onto the drain inspection port.

Checking the Drainage

Horizontal Installation Only

After wiring and drain piping are completed, use the following procedure to check that the water will drain smoothly. For this, prepare a bucket and wiping cloth to catch and wipe up spilled water.

- Connect power to the power terminal board (1, 2 terminals) inside the electrical component box.
- Remove the tube cover and slowly pour about 1,200 cc of water through the opening into the drain pan to check the water flow through the transparent upper drain port and see if there is any leakage.
- Short the check pin (CHK) (6P: 1-4) on the indoor unit control PCB and operate the drain pump. Check the water flow through the transparent upper drain port and see if there is any leakage. If the check pin (CHK) (6P: 1-4) is shorted, the fan starts rotating at high speed and could cause injury.
- When the drainage check is complete, open the check pin (CHK) (6P: 1-4) and remount the insulator and the cap onto the drain inspection port.

Vertical Installation Only

After wiring and drain piping are completed, use the following procedure to check that the water will drain smoothly. For this, prepare a bucket and wiping cloth to catch and wipe up spilled water.

- Connect power to the power terminal board (1, 2 terminals) inside the electrical component box.
- Remove the tube cover and slowly pour about 1,200 cc of water through the opening into the drain pan to check the water flow through the transparent upper drain port and see if there is any leakage.
- Short the check pin (CHK) (6P: 1-4) on the indoor unit control PCB and operate the drain pump. Check the water flow through the transparent upper drain port and see if there is any leakage. If the check pin (CHK) (6P: 1-4) is shorted, the fan starts rotating at high speed and could cause injury.
- When the drainage check is complete, open the check pin (CHK) (6P: 1-4) and remount the insulator and the cap onto the drain inspection port.

5 HEAT INSULATION

HEAT INSULATORS FOR REFRIGERANT TUBES

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

Selection of heat insulation materials for refrigerant tube. When using the heat insulation materials (field supply), kindly check for its sizes and performance.

- Material for insulation material: Polyethylene foam.
- Heat transfer rate: less than 0.051 W/mK.
- Material withstand temperature: up to 110°C Max.
- Must be easy to use, age resistance and not easily absorb moisture.
- Be sure to match the above insulation material size with tube sizes.

Piping size, mm (in)	Thermal insulation size (I.D.)	Thermal insulation Thickness
6.35 (1/4")	8 - 10 mm	12 - 15 mm
9.52 (3/8")	12 - 15 mm	14 - 16 mm
12.70 (1/2")	14 - 16 mm	16 - 20 mm
15.88 (5/8")	16 - 20 mm	Insulation thickness must 10 mm or greater

2. Taping the flare nuts

3. Taping the tubes

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

Note If the exterior of the outdoor units valve 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.

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 humidity atmosphere (dew point temperature more than 22°C), water drops are liable to fall. In this case, add heat insulation material according to the following procedures:

- Heat insulation material to be prepared. Adiabatic glass wool with thickness 10 to 20 mm.
- Stick the wool on all air-conditioners that are located in ceiling atmosphere.
- In addition to the normal heat insulation (thickness: more than 10 mm) refrigerant piping (gas piping; thick piping) and drain piping, add a further of 10 mm to 30 mm thickness material.

HEAT INSULATORS FOR DRAIN PIPING & DRAIN PIPE INSTALLATION

Selection of heat insulation materials for drain piping and drain pipe. When using the heat insulation materials (field supply), kindly use the same size and performance as refrigerant tubes. Check for its sizes as below table:

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

1. Prepare standard hard PVC pipe (O.D. 26 mm) for the drain and use the supplied hose band to prevent water leaks. The PVC pipe must be purchased separately. The transparent drain part of the unit allows you to check drainage.

2. Installing the drain hose

- First insert the drain hose (supplied) to the hose band (supplied) and then secure it tightly with the hose band.
- Insert until the drain hose bumps to the end.
- Do not use the supplied drain hose bent at a 90° angle. (The maximum permissible bend is 45°.)
- Tighten the hose clamps so their locking nuts face upward.

3. After connecting the drain pipe securely, wrap the packing (field supply) and drain pipe insulator (field supply) around the pipe, then secure it with the clampers.

WALL SEAL

- When the outdoor unit is installed in a higher position than the indoor unit, install the trap so as not to install rain water into the wall by transferring it piping.
- Stuff the space among piping, the electric wire, and the drain hose with "Putty" and seal the penetration wall hole. Make sure that rain water does not install into the wall.

6 CONNECTING DUCT TO AIR INTAKE PORT SIDE

1. Install the duct (field supply). See the figure for the dimension of the installation hole. Use M4 self-tapping screws for installation.

Note To get clean air and to extend the service life of the air conditioner, an air filter must be installed in the air intake. For installation and cleaning the air filter, consult your dealer or service center.

WALL SEAL

- When the outdoor unit is installed in a higher position than the indoor unit, install the trap so as not to install rain water into the wall by transferring it piping.
- Stuff the space among piping, the electric wire, and the drain hose with "Putty" and seal the penetration wall hole. Make sure that rain water does not install into the wall.

7 ELECTRICAL 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 H05RN-F (H07RN-F) 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.

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.

CAUTION Make sure that screws of the terminal are securely tightened.

Note For Optional Parts connecting wiring size, refer to Installation Manual of the Optional Parts

CAUTION Make sure that screws of the terminal are securely tightened.

Indoor unit wiring

Use this screw when connecting the shield for the integrated control system wiring to ground. (Functional earthing)

Earth wiring: Make the earth wiring 25 - 30 mm longer than connecting wires 1, 2, 3.

Wired remote control wiring

Clampers (supplied) Stamping Clip

Integrated control system wiring

To integrated control system (Optional Parts)

To outdoor unit (1, 2, 3) (Optional Parts)

Connection cable between outdoor and indoor unit

Terminal Block

1 Fasten tightly.

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 Indoor Unit Wiring.

After all of the wires are connected, close the lid of the electrical component box. Make the distance between two cables (1) and (2) as shown in the figure to the right.

1) Power supply cable / Connection cable between outdoor and indoor unit

2) Inter-unit (between outdoor and indoor units) control wiring / Remote control wiring / Integrated control wiring

CAUTION When linking the outdoor units in a network, it is necessary to install the terminating resistance. The installation method of the terminating resistance is different according to the connecting procedure of the inter-unit control wiring in the link.

Set the terminating resistance on the indoor unit control PCB. The setting of the terminating resistance at shipment is OPEN side (inoperative). If the shorting socket is replaced as shown below, the terminating resistance is SHORT side (operative). Change the setting of the terminating resistance at the nearest indoor unit and farthest indoor unit from the integrated control system to SHORT side (operative). The setting of 2 or more terminating resistances to SHORT side (operative) is prohibited.

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

WIRE STRIPPING AND CONNECTING REQUIREMENT

Wire stripping: 10-15 mm

Indoor/outdoor connecting terminal board: 5 mm or more (gap between wires)

Conductor fully inserted

Conductor over inserted

Conductor not fully inserted

No loose strand when inserted

ACCEPT PROHIBITED PROHIBITED

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 wires 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.

8 TEST RUN

Precautions

- 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 - 240 VAC power is not connected to the inter-unit control wiring connector terminal. If 220 - 240 VAC is accidentally applied, the indoor unit control PCB fuse will blow in order to protect the PCB. In this case, make the wiring correctly. Then disconnect the 2P connectors (OC) that are connected to the indoor unit control PCB, and replace them with 2P connectors (EMG). If operation is still not possible after changing the brown connectors, cut the jumper on the indoor unit control PCB. (Be sure to turn the power OFF before performing this work.)
- Be sure to set the external static pressure before performing the test run (check Technical Data Manual).

Test Run Procedure

- Check the items to check before the test run. (Check ① Items to Check Before the Test Run & ② Check the Wiring of Indoor & Outdoor Unit)
- Address Setting
- Check ③ Checking the Indoor Unit Addresses
- Check ④ Test Run Using the Remote Controller
- Check "Contents of Remote Controller Switch Alarm Display" & alarm contents from the Operating Instructions
- Check the indoor-side drainage.

Note When first time Power on, the unit requires around 5 minutes for program initialization. The unit will respond to remote controller after the program initialization.

8 TEST RUN

1 Items to Check Before the Test Run

- Turn the wired remote power switch ON at least 5 hours in advance in order to energize.
- Fully open the closed valves on the liquid tubing and gas tubing sides.
- Check the wiring of indoor and outdoor unit.

2 Check the Wiring of Indoor and Outdoor Unit

- Separate the power supply and connection cable between outdoor and indoor unit

3 Address Setting

Note The displays of the earth, outdoor unit power supply wiring and earth leakage circuit breaker are omitted.

System connection

- When turning on all indoor and outdoor units, the auto address will start. It takes maximum 10 minutes.
- When the auto address setting is completed, wait at least 1 minute and 30 seconds. Then start the operation.

4 Checking the Indoor Unit Addresses

Use the wired remote controller to check the indoor unit address.

CZ-RTCSB (High-speed wired remote controller)

Optional Parts

- Keep pressing the **Power**, **Mode**, and **OK** buttons simultaneously for 4 or more seconds. The "Maintenance func" screen appears on the LCD display.
- Press the **Up** or **Down** button to see each menu. If you wish to see the next screen instantly, press the **Left** or **Right** button. Select "7. Simple settings" on the LCD display and press the **OK** button.
- The "Simple settings" screen appears on the LCD display. Select the "Unit no." by pressing the **Up** or **Down** button for changes. The initial display is "ALL". The indoor unit fan operates only at the selected indoor unit. Press the **OK** button and select "YES" to restart.

CZ-RTCA (Timer remote controller)

Optional Parts

- Press and hold the **Power** button and **Mode** button for 4 seconds or longer (simple settings mode). The address is displayed for the indoor unit that is connected to the wired remote controller. (Only the address of the indoor unit that is connected to the wired remote controller can be checked.)
- Press the **Power** button again to return to normal wired remote controller mode.

Number changes to indicate which indoor unit is currently selected.

CZ-RTCS series (Wired Remote Controller)

Optional Parts

- Keep pressing the **Power**, **Mode**, and **OK** buttons simultaneously for 4 or more seconds. The "Maintenance func" screen appears on the LCD display.
- Press the **Up** or **Down** button to see each menu. Select "Simple settings" on the LCD display and press the **OK** button.
- The "Simple settings" screen appears on the LCD display. Select the "Unit no." by pressing the **Up** or **Down** button for changes. The initial display is "ALL". The indoor unit fan operates only at the selected indoor unit. Press the **OK** button and select "YES" to restart.

5 Test Run Using the Remote Controller

CZ-RTCSB (High-speed wired remote controller)

Optional Parts

This mode places a heavy load on the machines. Therefore use it only when performing the test run.

- Keep pressing the **Power**, **Mode**, and **OK** buttons simultaneously for 4 or more seconds. The "Maintenance func" screen appears on the LCD display.
- Press the **Up** or **Down** button to see each menu. If you wish to see the next screen instantly, press the **Left** or **Right** button. Select "4. Test run" on the LCD display and press the **OK** button. Change the display from "OFF" to "ON" by pressing the **Up** or **Down** button. Then press the **OK** button.
- Press the **OK** button. "TEST" will be displayed on the LCD display.
- Press the **OK** button. Test run will be started. Test run setting mode screen appears on the LCD display. The test run can be performed using the HEAT, COOL, or FAN operation mode. The temperature cannot be adjusted when in test run mode. If correct operation is not possible, a code is displayed on the remote controller LCD display. (Regarding the alarm contents, check the Operating Instructions.) To prevent continuous test run, this remote controller includes a timer function that cancels the test run after 60 minutes.

Note

- The outdoor units will not operate for approximately 3 minutes after the power is turned ON and after operation is stopped.

CZ-RTCA (Timer remote controller)

Optional Parts

This mode places a heavy load on the machines. Therefore use it only when performing the test run.

- Press the wired remote controller **Power** button for 4 seconds or longer. Then press the **OK** button. "TEST" appears on the LCD display while the test run is in progress. The test run can be performed using the HEAT, COOL, or FAN operation mode. The temperature cannot be adjusted when in test run mode. If correct operation is not possible, a code is displayed on the remote controller LCD display. (Regarding the alarm contents, check the Operating Instructions.) To prevent continuous test run, this wired remote controller includes a timer function that cancels the test run after 60 minutes.
- After the test run is completed, proceed from Step (1) and change to "OFF" at Step (2).

Note

- The outdoor units will not operate for approximately 3 minutes after the power is turned ON and after operation is stopped.

CZ-RTCS series (Wired Remote Controller)

Optional Parts

This mode places a heavy load on the machines. Therefore use it only when performing the test run.

- Keep pressing the **Power**, **Mode**, and **OK** buttons simultaneously for 4 or more seconds. The "Maintenance func" screen appears on the LCD display.
- Press the **Up** or **Down** button to see each menu. If you wish to see the next screen instantly, press the **Left** or **Right** button. Change the display from "OFF" to "ON" by pressing the **Up** or **Down** button. Then press the **OK** button.
- Press the **OK** button. "TEST" will be displayed on the LCD display.
- Press the **OK** button. Test run will be started. Test run setting mode screen appears on the LCD display. The test run can be performed using the HEAT, COOL, or FAN operation mode. The temperature cannot be adjusted when in test run mode. If correct operation is not possible, a code is displayed on the remote controller LCD display. (Regarding the alarm contents, check the Operating Instructions.) To prevent continuous test run, this wired remote controller includes a timer function that cancels the test run after 60 minutes.

Note

- The outdoor units will not operate for approximately 3 minutes after the power is turned ON and after operation is stopped.

CZ-RTCA (Timer Remote Controller)

Optional Parts

This mode places a heavy load on the machines. Therefore use it only when performing the test run.

- Keep pressing the **Power**, **Mode**, and **OK** buttons simultaneously for 4 or more seconds. The "Maintenance func" screen appears on the LCD display.
- Press the **Up** or **Down** button to see each menu. If you wish to see the next screen instantly, press the **Left** or **Right** button. Change the display from "OFF" to "ON" by pressing the **Up** or **Down** button. Then press the **OK** button.
- Press the **OK** button. "TEST" will be displayed on the LCD display.
- Press the **OK** button. Test run will be started. Test run setting mode screen appears on the LCD display. The test run can be performed using the HEAT, COOL, or FAN operation mode. The temperature cannot be adjusted when in test run mode. If correct operation is not possible, a code is displayed on the remote controller LCD display. (Regarding the alarm contents, check the Operating Instructions.) To prevent continuous test run, this remote controller includes a timer function that cancels the test run after 60 minutes.

Note

- The outdoor units will not operate for approximately 3 minutes after the power is turned ON and after operation is stopped.

CARE AND CLEANING

WARNING

- 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.

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 causes out of place.

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 filter

The air filter collects dust and other particles from the air and should be cleaned at regular intervals or when the filter indicator () on the display of the remote controller (wired type) shows that the filter needs cleaning. If the filter gets blocked, the efficiency of the air conditioner drops greatly.

Period: 2 weeks

After Cleaning

- After the air filter is cleaned, reinstall it in its original position. Be sure to reinstall in reverse order.
- In the case of Timer Remote Controller: Press the Filter reset button. The Filter indicator on the display goes out.

How to clean the filter?

Use a vacuum cleaner to remove light dust. If there is sticky dust on the filter, wash the filter in lukewarm, soapy water, rinse it in clean water, and dry it.

How to remove the filter?

Remove the filter in reverse order of the section "Install the Filter".

In case of installing the Duct (field supply)

Period: 20 days (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.
- Periodically check the outdoor unit to see if the air outlet or air intake is clogged with dirt or soot.
- 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.
- Outdoor unit internal components must be checked and cleaned periodically. Contact your local dealer for this service.

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, static pressure, low out temperature, wind velocity wind volume, voltage, current, presence of abnormal vibration and noise, operating pressure, piping temperature, compressive pressure, airleak pressure.
- As to the structure and appearance, check the following items.

<input type="checkbox"/> Is circulation of air adequate?	<input type="checkbox"/> Is there any leakage of refrigerant?	<input type="checkbox"/> Are the terminal screws loosened?
<input type="checkbox"/> Is draining smooth?	<input type="checkbox"/> Is remote controller switch operated?	M3...68-98Ncm (7~10kgf/cm)
<input type="checkbox"/> Is heat insulation complete (refrigerant and drain piping)?	<input type="checkbox"/> Is there any faulty wiring?	M4...157-196Ncm (16~20kgf/cm)
		M5...196-245Ncm (20~25kgf/cm)

HAND OVER

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

OPTIONAL PARTS

CAUTION Make sure that screws of the terminal are securely tightened.

CAUTION Make sure that screws of the terminal are securely tightened.