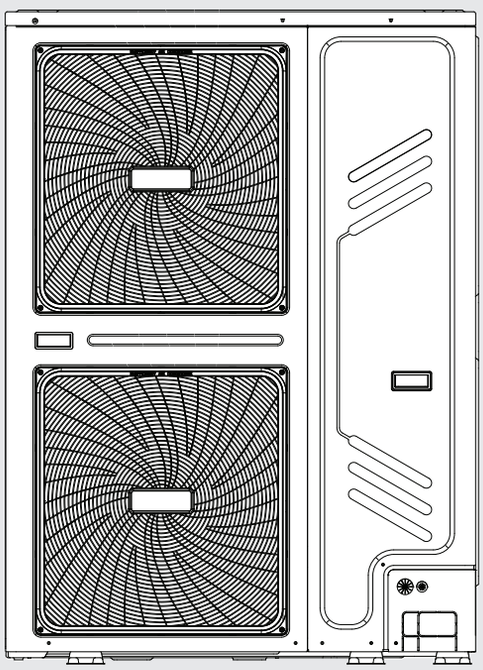
MODEL
Outdoor
MVRFON6H20

REFRIGERANT
R410A



VRF Multi Split Type Air Conditioner - Outdoor Unit

Operation Installation Manual

Rinnai

IMPORTANT

Read this manual and SAFETY MANUAL (if any) carefully before installing or operating your new air conditioning unit. Make sure to save this manual for future reference.

Please check the applicable models, technical data and manufacturer information from the "Operation Manual" in the packaging of the outdoor unit.

This appliance must be installed in accordance with:

- Manufacturer's Installation Instructions
- Current AS/NZS 3000, AS/NZS 5149, AS/NZS 5141
- Local regulations, including local OH&S requirements, and Municipal Building Codes including the National Construction Code (NCC)

This appliance must be installed, maintained and removed only by an Authorised Person.

For continued safety of this appliance it must be installed and maintained in accordance with the manufacturer's instructions.

The design and specifications are subject to change without prior notice for product improvement. Consult with the Dealer or manufacturer for details.

Any updates to the manual will be uploaded to the service website, please check for the latest version.

IMPORTANT

PLEASE REFER TO ANY OPERATING MANUALS AND USER OPERATING GUIDES ACCOMPANYING ANCILLARY EQUIPMENT (WHERE FITTED)

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WARNINGS AND IMPORTANT INFORMATION

IMPORTANT

READ ALL INSTRUCTIONS BEFORE USING THE APPLIANCE

Always comply with the following precautions to avoid dangerous situations and to ensure optimum performance.

Failure to carefully read and follow all instructions in this manual can result in equipment malfunction, property damage, personal injury and/or death.

WARNINGS: WHEN IGNORED, CAN RESULT IN SERIOUS INJURY OR DEATH.

CAUTIONS: WHEN IGNORED, CAN RESULT IN MINOR INJURY OR PRODUCT DAMAGE.

WARNING

REGULATORY / INSTALLATION

This appliance shall be installed in accordance with:

- **Manufacturer's Installation Instructions.**
- **Current AS/NZS 3000, AS/NZS 5141, AS/NZS 5149, AS/NZS 3500 National Plumbing & Drainage, HB276 - A Guide to good practice for energy efficient installation.**
- **Local Regulations and Municipal Building Codes including local OH&S requirements.**
- **This appliance must be installed, maintained and removed by an Authorised Person.**

For continued safety of this appliance it must be installed and maintained in accordance with the manufacturers instructions.

This appliance uses R410A refrigerant.

This appliance is heavy, use 2 people or mechanical lifting device. Improper lifting may result in serious injury.

Take care when opening or unpacking this appliance. Failure to do so may result in serious injury or product failure.

DO NOT modify the electrical wiring of this appliance. If the control power wiring is damaged or deteriorated then it must be replaced by an authorised person. Failure to do so may result in electric shock, fire, serious injury or product failure.

DO NOT install the air conditioner on an unstable or non level surface or where there may be a danger of it falling. It may result in death, serious injury, or product failure.

DO NOT install the outdoor unit where noise may cause nuisance.

DO NOT install the outdoor unit where it will be exposed to sea wind (salt spray) as this will reduce durability.

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision. Refer to AS/NZS Standards and regulations.

This appliance is not intended for use by persons(including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

IMPORTANT

MANDATORY INSPECTION PRIOR TO INSTALLATION

Immediately report any damage or discrepancies to the Supplier of the appliance. This appliance was inspected and tested at the time of manufacture and packaging, and released for transportation without known damage. Upon receipt, inspect the exterior for evidence of rough handling in shipment. Ensure that the appliance is labelled correctly for the gas and electrical supply, and/or other services it is intended to be connected to.

For safety and warranty purposes, appliances that may be damaged or incorrect MUST NOT be installed or operated under any circumstances. Installation of damaged or incorrect appliances may contravene local government regulations. Rinnai disclaims any liability or responsibility whatsoever in relation to the installation or operation of damaged or incorrect appliances.

WARNING

WARNINGS FOR PRODUCT USE

- **If an abnormal situation arises (like a burning smell), immediately turn off the unit and disconnect the power. Call your dealer for instructions to avoid electric shock, fire or injury.**
- **DO NOT insert fingers, rods or other objects into the air inlet or outlet. This may cause injury, since the fan may be rotating at high speeds.**
- **DO NOT use flammable sprays such as hair spray, lacquer or paint near the unit. This may cause fire or combustion.**
- **DO NOT operate the air conditioner in places near or around combustible gases. Emitted gas may collect around the unit and cause explosion.**
- **DO NOT operate your air conditioner in a wet room such as a bathroom or laundry room. Too much exposure to water can cause electrical components to short circuit.**
- **DO NOT expose your body directly to cool air for a prolonged period of time.**
- **DO NOT allow children to play with the air conditioner. Children must be supervised around the unit at all times.**
- **If the air conditioner is used together with burners or other heating devices, thoroughly ventilate the room to avoid oxygen deficiency.**
- **In certain functional environments, such as kitchens, server rooms, etc., the use of specially designed air-conditioning units is highly recommended.**

WARNING

ELECTRICAL WARNINGS

- **If any electrical cables are damaged, they MUST be replaced by a suitably qualified and trained service person in order to avoid any potential hazards.**
- **The product MUST be properly earthed at the time of installation, or electrical shock may occur.**
- **For all electrical work, follow all local and national wiring standards, regulations, and the Installation Manual. Connect cables tightly, and clamp them securely to prevent external forces from damaging the terminal. Improper electrical connections can overheat and cause fire, and may also cause shock. All electrical connections must be made according to the Electrical Connection Diagram located on the panels of the indoor and outdoor units.**
- **Appropriately specified and sized cables MUST be used, ensure all connections are tight. Clamp all cables sufficiently so that they cannot be pulled loose or disconnected.**
- **All wiring MUST be properly arranged to ensure that the control board cover can close properly. If the control board cover is not closed properly, it can lead to corrosion and cause the connection points on the terminal to heat up, catch fire, or cause electrical shock.**
- **A correctly specified and sized circuit breaker MUST be installed in accordance with all local and national wiring standards. A dedicated, independent electrical circuit is required for the system.**
- **DO NOT share the electrical outlet with other appliances. Improper or insufficient power supply can cause fire or electrical shock.**
- **If connecting power to fixed wiring, an all-pole disconnection device which has at least 3mm clearances in all poles, and have a leakage current that may exceed 10mA, the residual current device (RCD) having a rated residual operating current not exceeding 30mA, and disconnection must be incorporated in the fixed wiring in accordance with wiring rules.**

CAUTION

Turn off the air conditioner and switch mains power off if you are not going to use it for a long time.

- **Turn off and unplug the unit during storms.**
- **Make sure that water condensation can drain unhindered from the unit.**
- **Do not operate the air conditioner with wet hands. This may cause electric shock.**
- **Do not use device for any other purpose than its intended use.**
- **Do not climb onto or place objects on top of the outdoor unit.**
- **Do not allow the air conditioner to operate for long periods of time with doors or windows open,or if the humidity is very high.**

SAFETY PRECAUTIONS

PRODUCT INSTALLATION WARNINGS

WARNING

- **Installation must be performed by an authorised dealer or specialist. Defective installation can cause water leakage, electrical shock, or fire.**
- **Installation must be performed according to the installation instructions and installed by an Authorised Person only. Improper installation can cause water leakage, electrical shock, or fire.**
- **Contact an authorised service technician for repair or maintenance of this unit. This appliance shall be installed in accordance with current wiring regulations.**
- **Only use the included accessories, parts, and specified parts for installation. Using non-standard parts can cause water leakage, electrical shock, fire, and can cause the unit to fail.**
- **Install the unit in a firm location that can support the unit's weight. If the chosen location cannot support the unit's weight, or the installation is not done properly, the unit may drop and cause serious injury and damage.**
- **Install drainage piping according to the instructions in this manual. Improper drainage may cause water damage to your home and property.**
- **For units that have an auxiliary electric heater, do not install the unit within 1 metre of any combustible materials.**
- **DO NOT install the unit in a location that may be exposed to combustible gas leaks. If combustible gas accumulates around the unit, it may cause fire.**
- **DO NOT install the indoor unit under a floor or beneath a deck, to be installed in a roof space only.**
- **DO NOT turn on the power until all work has been completed.**
- **When moving or relocating the air conditioner, consult experienced service technicians for disconnection and reinstallation of the unit.**
- **How to install the appliance to its support, please read the information for details in "indoor unit installation" and "outdoor unit installation" sections.**

FLUORINATED GASES

NOTE

- **This air-conditioning unit contains fluorinated greenhouse gases. For specific information on the type of gas and the amount, please refer to the relevant label on the unit itself or the "Owner's Manual" in the packaging of the outdoor unit.**
- **Installation, service, maintenance and repair of this unit must be performed by a certified technician.**
- **Product uninstallation and recycling must be performed by a certified technician.**
- **For equipment that contains fluorinated greenhouse gases in quantities of 5 tonnes of CO_2 equivalent or more, but less than 50 tonnes of CO_2 equivalent, if the system has a leak- detection system installed, it must be checked for leaks at least every 24 months.**
- **When the unit is checked for leaks, proper record-keeping of all checks is strongly recommended**

FUSE SPECIFICATIONS

NOTE

The air conditioner's circuit board (PCB) is designed with a fuse to provide overcurrent protection. The specifications of the fuse are printed on the circuit board, such as:

- **T5A/250VAC, T10A/250VAC, etc.**
- **T20A/250VAC(<=7kW units), T30A/250VAC(>7kW units)**

NOTE: For the units with R32, only the blast-proof ceramic fuse can be used.

A NOTE ON ILLUSTRATIONS

NOTE

The illustrations used in this manual are for explanatory purposes only and the shape of your indoor unit may vary slightly from that which is shown in this manual.

REFRIGERANT

WARNING

This appliance uses R410A and must be handled by a refrigeration mechanic with an appropriate Australian refrigerant handling licence.

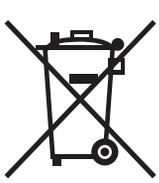
Read the OPERATING INSTRUCTIONS carefully before operation.

Service personnel are required to carefully read the OPERATING INSTRUCTIONS and INSTALLATION MANUAL before operation.

Further information is available in the OPERATING INSTRUCTIONS, INSTALLATION MANUAL, and the like.

Certain levels of refrigerant require minimum room sizes. Please ensure that these minimum room sizes are adhered to for standard installations (up to 15m pipe length). If larger refrigerant charges than standard are used then please consult AS/NZS 60335.2.40 to determine the safe minimum floor area for the installation.

DISPOSAL GUIDELINES



This appliance contains refrigerant and other potentially hazardous materials. When disposing of this appliance, the law requires special collection and treatment. **DO NOT** dispose of this product as household waste or unsorted municipal waste.

CLEANING AND MAINTENANCE WARNINGS

WARNING

- **Turn off the device and switch the mains power off before cleaning. Failure to do so can cause electric shock**
- **DO NOT clean the air conditioner with excessive amounts of water.**
- **DO NOT clean the air conditioner with combustible cleaning agents. Combustible cleaning agents can cause fire or deformation**

BEFORE OPERATION

WARNING

- **This unit consists of electrical components and hot parts (danger of electric shock and scalding).**
- **Before you operating this unit, make sure that the installation personnel have installed it properly.**
- **This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.**
- **Children should be supervised to ensure that they do not play with the appliance.**

CAUTION

- **The air outlet must not be directed at any human body as it is not conducive to the person's health to be exposed to long periods of moving cold/hot air.**
- **If the air conditioner is used together with a device that comes with a burner, make sure the room is fully ventilated to prevent anoxia (oxygen insufficiency).**

CAUTION

- **Do not operate the air conditioner when applying fumigated insecticide in the room. This may cause chemicals to be deposited inside the unit, and pose a danger to the health of people allergic to chemicals. This unit should only be serviced and maintained by a professional air conditioning service engineer. Incorrect servicing or maintenance can cause electric shock, fire or leakage of water. Contact your dealer for servicing and maintenance.**
- **The appliance shall be installed in accordance with national wiring regulations.**
- **This appliance is intended to domestic and used by expert or trained users in shops, in light industry and on farms, or for commercial use by lay persons.**

Operation Range

Indoor unit type	Common indoor unit	
Mode	Cooling	Heating
Outdoor temperature	-5 °C to 55 °C	-15 °C to 27 °C
Indoor temperature	17 °C to 32 °C	15 °C to 27 °C
Indoor humidity	≤80%(a)	
(a) Condensate might form on the unit's surface if the humidity is above 80%		

NOTE

The safety device will be triggered if temperature or humidity exceeds these limits, and the air conditioner may not run.

OPERATING THE SYSTEM

System operation

The operating program varies with different combinations of outdoor unit and controller.

To protect this unit, turn on the main power supply 12 hours before operation.

If there is a power outage while the unit is running, the unit will automatically restart its operation when the power supply resumes.

Cooling, heating, fan only and auto operations

The indoor units in the air conditioner can be controlled separately. However the indoor units in the same system cannot operate heating and cooling modes simultaneously.

When cooling and heating modes conflict, the mode is determined based on outdoor unit " Menu mode".

Automatic priority mode	Automatic selection of heating or cooling priority based on the ambient temperature.
Cooling priority mode	When the cooling mode is selected as priority, the heating operations in the indoor unit ceases, while the cooling mode will operate as usual;
VIP priority mode or voting priority mode	If the VIP indoor unit has been set and turned on, the operating mode of VIP indoor unit will be regarded as the priority operating mode of the system. If the VIP indoor unit has not been set or not turned on, the mode adopted by most indoor units at the same time will be the priority operating mode of the system.
In response to heating mode only	Indoor units with the heating mode will operate normally, while indoor units in the cooling or fan mode will display the "dd".
In response to cooling mode only	Indoor units in the cooling and fan modes will operate normally, while indoor units in the heating mode will display the "dd".
Heating priority mode	Indoor units in the cooling or fan mode will stop running, while indoor units in the heating mode will run as usual.
First on priority mode	The operating mode of the first running Indoor unit will be regarded as the priority operating mode of the system.

Heating Operation

It may take longer to reach the set temperature for general heating operation than for cooling operation.

The following operation is performed in order to prevent the heating capacity from dropping or cold air from blowing

Defrost Operation

In the heating operation, as the outdoor temperature decreases, frost may be formed on the heat exchanger in the outdoor unit, making it more difficult for the heat exchanger to heat up the air. The heating capacity decreases, and a defrosting operation needs to be performed on the system in order for the system to provide sufficient heat to the indoor unit. At this point, the indoor unit will show “dF” on the display screen.

The indoor fan motor will automatically stop running so as to prevent cold air from coming out of the indoor unit when the heating operation starts. This process will take some time. This is not a malfunction.

NOTE

- **In heating mode, the air-conditioning system absorbs heat from the outdoor air and releases heat to the indoor side. When the outdoor temperature is low, less heat is released. This is the principle of heat pump.**
- **When the outdoor temperature is extremely low, the heating capacity of the air conditioner decreases, and other heating equipment may need to be added.**

Operating the System

Press the operation mode selector button on the user interface and select the operation mode.

Press the ON/OFF button on the user interface.

Result: The running light turns on and the system starts to run.

Press the ON/OFF button on the user interface.
Result: The running light is off, and the system stops running.

NOTE

Once the unit has stopped running, do not disconnect the power immediately. Wait for at least 10 minutes.

Refer to the user manual for the controller on how to set the required temperature, fan speed and air flow direction.

DRY PROGRAM

System operations

The function in this program uses the minimum temperature drop (minimum indoor cooling) to bring about a drop in humidity in the room.

The temperature and fan speed cannot be set.

MAINTENANCE AND SERVICE

NOTE **All service work and inspection should be performed by qualified and licensed personnel**

WARNING **Never replace a fuse with a fuse of a wrong ratings or other wires when a fuse blows out. Use of wire may cause the unit to break down or cause a fire.**

CAUTION **Do not insert fingers or other objects into the air inlet or outlet. Do not remove the fan guard. When the fan is rotating at high speed, it will cause injury.**

WARNING

- **It is dangerous to check the unit when the fan is rotating.**
- **Ensure the main power switch is offbefore any maintenance work begins.**
- **Check the supporting and base structure of the unit for any damages after a long period of use. The unit may drop and cause personal injury if there is any damage.**

REFRIGERANT

This product contains fluorinated greenhouse gases as stipulated in the Kyoto Protocol. Do not discharge the gas into the atmosphere.

Refrigerant Type: R410A

GWP Value: 2 088

Based on the applicable law, the refrigerant must be checked regularly for leakages. Please contact the installation personnel for more information.

WARNING **The refrigerant in the air conditioner is safe, and usually does not leak.**

If the refrigerant leaks, and comes in contact with burning objects in the room, it will produce harmful gases. Shut down any flammable heating device, ventilate the room and contact the dealer immediately.

Do not use the air conditioner again until the maintenance personnel has confirmed that the refrigerant leakage has been sufficiently resolved.

AFTER SALES SERVICE AND WARRANTY

This product contains the warranty card that was completed by the dealer during installation. The customer must check the completed warranty card and keep it properly.

If the unit requires repair during the warranty period, please contact the dealer and provide the card details.

NOTE **The warranty does not cover the damage caused by dismantling or cleaning of the internal components by unauthorised persons.**

RECOMMENDED MAINTENANCE

As the use of the unit for many years will eventually lead to a dust layer, the performance of the unit will degenerate to a certain extent.

As professional skills are needed to dismantle and clean the unit, and for the optimal maintenance effects of this unit, please contact your dealer for more details.

When you requesting assistance, please remember to state:

- Complete model name of the air conditioner.
- Date of installation.
- Details on the fault symptoms or errors, and any defects.

MAINTENANCE BEFORE LONG SHUTDOWN

For example, at the end of winter and summer.

- Run the indoor unit in the fan mode for about half a day to dry the internal parts of the unit.
- Turn off the power supply.
- Clean the air filter and external shell of the unit. Please contact the installation or maintenance personnel to clean the air filter and external shell of the indoor unit. The installation/operation manual of the specialized indoor unit includes maintenance tips and cleaning procedures. Make sure that the clean air filter is installed in its original position.

MAINTENANCE AFTER LONG SHUTDOWN

For example, in early summer or winter.

- Check and remove all objects that may clog the air inlets and outlets of the indoor and outdoor units.
- Clean the air filter and external shell of the unit. Please contact the installation or maintenance personnel. The installation/operation manual of the indoor unit includes maintenance tips and cleaning procedures. Make sure that the clean air filter is installed in its original position.
- Turn on the main power supply 12 hours before this unit is operated in order to ensure that the unit runs smoothly. The user interface is displayed once the power is turned on.

WARNING

- **Do not attempt to modify, dismantle, remove, reinstall or repair this unit, as the improper dismantling or installation may result in electric shock or fire. Please contact the dealer.**
- **If the refrigerant accidentally leaks, make sure that there is no fire around the unit. The refrigerant itself is completely safe, non-toxic and non-flammable, but it will produce toxic gases when it accidentally leaks and comes in contact with flammable substances generated by existing heaters, and burning devices in the room.**
- **Qualified maintenance personnel must verify that the point of leakage has been repaired or rectified before operation of the unit.**

TROUBLESHOOTING

WARNING

When any unusual situations arises (burning odour, etc.), stop the unit immediately and turn off the power.

As a result of a certain situation, the unit has caused damage, an electric shock, or a fire. Please contact the dealer.

The system maintenance must be carried out by a qualified maintenance personnel:

Symptom	Measures
If a safety device, such as a fuse, circuit breaker or a leakage circuit breaker is triggered frequently or the ON/OFF switch is not working properly.	Turn off the main power switch.
The operating switch is not functioning normally.	Turn off the power supply.
The operating indicator is flickering, and an error code is shown on the screen as well.	Notify the installation personnel and report the error code.

Other than the above-mentioned situations, and where the fault is not obvious, if the system continues to malfunction, carry out the following steps to investigate.

Symptom	Measures
The system does not run at all.	Check if there is a power failure. Wait for the power supply to be restored. If a power failure occurs when the unit is still running, the system will restart automatically once the power is restored. Check if the fuse is broken or if the circuit breaker is working. If necessary, replace the fuse or reset the circuit breaker.
The system works fine in the fan-only operating mode but stop running once it enters the heating or cooling operation modes.	Check if the air inlets or outlets of the outdoor or indoor units are blocked by any obstacles. Remove the obstacles, and maintain good ventilation in the room.
The system is running but there is insufficient cooling or heating.	Check if the air inlets or outlets of the outdoor or indoor units are blocked by any obstacles. Remove the obstacles, and maintain good ventilation in the room. Check if the filter is blocked (please refer to the "Maintenance" section in the manual of the indoor unit). Check the temperature settings. Check the fan speed settings on the user interface. Check if the doors and windows are open. Close the doors and windows to shut out wind from the external environment. Check if there are too many people in the room when the cooling mode is in operation. Check if the heat source of the room is too high. Check if there is direct sunlight into the room. Use curtains or blinds. Check if the air flow angle is proper.

ERROR CODES

CAUTION **All corrective must be performed by adequately qualified personnel.**

Error Code	
HF	Wrong type of indoor units are connected in the system
H0	Communication failure between the main control and motor drive module
H4	L (L0/L1) fault occurs three times in one hour
H7	Number of indoor units detected by outdoor unit is increased or decreased compared to the setting number
E2	Indoor units and outdoor unit communication failure
E3	T6A or T6B temperature sensor error
E4	T3 or T4 temperature sensor error
E5	Input voltage protection
E6	DC fan protection
Eb	E6 fault occurs more than six times in an hour
E.9.	Compressor parameters mismatch
EF	PFC fault
EH	Refrigerant radiator temperature sensor error
PL	Radiator surface temperature protection
P1	System high pressure protection
P2	System low pressure protection
P3	Overcurrent protection
P4	Discharge temperature T5 protection
P5	Outdoor condenser temperature T3 protection
P8	Typhoon protection
P9	Poor reversing of four-way valve
PE	Indoor unit evaporator temperature T2 protection
L0	IPM module protection
L1	DC bus low voltage protection
L2	DC bus high voltage protection
L4	Software overcurrent protection
L5	Zero speed protection
L7	Compressor phase sequence error
L8	Protection for compressor speed change >15 Hz
L9	Protection for the difference between the setting speed and the running speed of the compressor >15 Hz
F1	DC bus voltage (PN voltage) continuously below 200 VDC for 5 seconds after power-on
PF	Outdoor unit locking
PH	Refrigerant radiator temperature sensor / low temperature protection

FAULT FINDING GUIDE

The following fault symptoms are not caused by the air conditioning:

System does not run

Air conditioner does not start immediately after pressing the switch button on the controller. If the operating indicator lights up, the system is working normally. In order to prevent overloading of the compressor, the compressor will start after 3-5 minutes. The same start-up delay occurs after the mode selector is pressed.

Fan speed is not consistent with the setting

Even if the fan speed regulation button is pressed, the fan speed does not change. During heating, when the indoor temperature reaches the set temperature, the outdoor unit will shut down, and the indoor unit switches to the quiet fan speed mode. This prevents cold air from blowing directly at the user. The fan speed will not change even when another indoor unit is in heating operation, if the button is pressed.

Fan direction is not consistent with the setting

The air direction is not consistent with the user interface display. The air direction does not swing. This is because the unit is controlled by the centralized controller.

Unit is emitting white smoke (indoor unit)

When humidity is high during cooling mode, white mist may appear due to the humidity and the temperature difference between the air inlet and outlet.

When the air conditioner is switched to heating mode after defrosting, the indoor unit discharges the moisture generated from defrosting as steam.

Unit is emitting white smoke (indoor or outdoor)

After the defrosting operation, switch the system to the heating mode. The moisture produced by the defrosting operation becomes steam and discharges from the system.

The air conditioner is noisy (indoor unit)

A continuous low "hissing" sound is heard when the system is in "Auto", "Cool", "Dry", and "Heat" modes. This is the refrigerant gas flowing through both indoor and outdoor

A "hissing" sound is heard at the start or immediately after stopping operation or defrost operation. This is the noise of refrigerant caused by flow change.

A "zeen" sound is heard immediately after the power supply is turned on. The noise is from the electronic expansion valve inside an indoor unit. It will reduce in about one minute.

A continuous low "shah" sound is heard when the system is in cooling mode, dry mode or at a stop. This is the drain pump (optional accessories) is in operation.

A "pishi-pishi" squeaking sound is heard when the system stops after heating operation.

Expansion and contraction of plastic parts caused by temperature change make this noise.

A low "sah", "choro-choro" sound is heard while the indoor unit is stopped. When another indoor unit is in operation, this noise is heard. A small amount of refrigerant is kept flowing.

Noise from air conditioner (indoor / outdoor unit)

A soft, continuous hissing sound can be heard when the system is in cooling or defrosting operation. This is the sound of the refrigerant gas flowing in the indoor and outdoor units.

A hissing sound is heard the moment the system starts or stops operation or after the defrosting operation has been completed. This is the noise produced when the refrigerant flow is stopped or changed.

Noise from air conditioner (outdoor unit)

When the tone of the operating noise changes. This noise is caused by frequency changes.

The indoor unit blows dust

When filter is very dirty, dust may enter the indoor unit and be blown out.

The indoor unit emits odor

The indoor unit absorbs the odors of rooms, furniture or cigarettes, etc., and disperses the odors during operation.

It is advised to have the air conditioner cleaned and maintained regularly by professional technicians.

Outdoor unit fan does not run

In the course of operation. Control speed of fan motor to optimize the product operations.

Hot air is felt when the indoor unit stops

Several indoor units operating in the same system. When another unit is running, part of the refrigerant will still flow through this unit.

GENERAL SAFETY

WARNING

- **Make sure the installation, testing and materials used comply with the applicable law.**
- **Plastic bags should be disposed of properly. Avoid contact by children. Potential risk: Asphyxia.**
- **Do not touch the refrigerant piping, water piping or internal parts during operations, and when the operation has just been completed. This is because the temperature may be too high or too low. Let them recover to the normal temperature first. Wear protective gloves if you must come in contact with these.**
- **Do not touch any refrigerant that has accidentally leaked.**

CAUTION

- **Please wear the appropriate personal protective tools during installation, maintenance or repair of the system (protective gloves, safety glasses, etc.).**
- **Do not touch the air inlet or aluminum fin of the unit.**

NOTE

- **Improper installation or connection of equipment and accessories may cause electric shocks, short circuits, leaks, fires, or other damage to the equipment. Use only accessories, equipment and spare parts made or approved by manufacturer.**
- **Take appropriate measures to prevent small animals from entering the unit. Contact between small animals and electrical components may cause system malfunction, leading to smoke or fire.**
- **Do not place any object or equipment on top of the unit.**
- **Do not sit, climb, or stand on the unit.**
- **Operation of this equipment in a residential environment could cause radio interference.**

WARNING

- **During the test, do not exert a force greater than the maximum allowed pressure on the product (as shown on the nameplate).**

WARNING

- **Take appropriate precautions to prevent refrigerant leakage. If the refrigerant gas leaks, ventilate the area immediately. Possible risk: An excessively high concentration of refrigerant in an enclosed area can lead to anoxia (oxygen deficiency). The refrigerant gas may produce a toxic gas if it comes in contact with fire.**
- **Refrigerant must be recovered. Do not release it to the environment. Use the vacuum pump to draw the refrigerant out from the unit.**

NOTE

- **Make sure the refrigerant piping is installed in accordance with the applicable law. In Europe, EN378 is the applicable standard.**
- **Make sure the piping and connections are not placed under pressure.**
- **After all the piping connections have been completed, check to make sure there is no gas leak. Use nitrogen to conduct the leak check for gas.**
- **Do not charge refrigerant before the wiring layout is completed.**
- **Only charge the refrigerant after the leak tests and vacuum drying have been completed.**
- **Do not charge more than the specified amount of refrigerant. This is to prevent the compressor from malfunctioning.**
- **The refrigerant type is clearly marked on the nameplate.**
- **The unit is charged with refrigerant when it is shipped from the factory. But depending on the piping dimensions and length, the system require additional refrigerant.**
- **Only use tools specific to the type of system refrigerant to make sure the system can withstand the pressure, and prevent foreign objects from entering the system.**

ELECTRICAL SAFETY

WARNING

- Make sure you switch off the power of the unit before you open the electric control box, and access any circuit wiring or components inside. At the same time, this prevents the unit from being accidentally powered up during installation or maintenance work.
- Once you open the cover of the electric control box, do not let any liquid spill into the box, and do not touch the components in the box with wet hands.
- Cut off power supply more than 10 minutes prior to access the electrical parts. Measure the voltage of the main circuit capacitor or electrical component terminals to make sure the voltage is less than 36 V before you touch any circuit component. Refer to the connections and wiring on the nameplate for the master circuit terminals and connections.
- The installation must be completed by professionals, and must comply with local laws and regulations.
- Make sure the unit is earthed, and the earthing must conform to the local law.
- Use only copper core wires for installation.
- Wiring must be carried out in accordance with what is stated in the nameplate.
- The unit does not include a safety switch device. Make sure a safety switch device that can completely disconnect all polarities is included in the installation, and that the safety device can be completely disconnected when there is excessive voltage (such as during a lightning strike).
- Make sure the wiring ends are not subjected to any external force. Do not pull or squeeze the cables and wires. At the same time, make sure the wiring ends are not in contact with the piping or sharp edges of the sheet metal.
- Do not connect the earth wire to public pipes, telephone earth wires, surge absorbers and other places that are not designed for earthing. A gentle reminder that improper earthing may cause electric shock.
- Use a dedicated power supply cord for the unit. Do not share the same power source with other equipment.
- A fuse or circuit breaker must be installed, and these must conform to the local law.
- Make sure an electric leakage protection device is installed to prevent electric shocks or fire. The model specifications and characteristics (anti high-frequency noise characteristics) of the electric leakage protection device are compatible with the unit to prevent frequent tripping.
- Make sure a lightning rod is installed if the unit is placed on the roof or other places that can be easily struck by lightning.

WARNING

- Make sure all terminals of the components are firmly connected before you close the cover of the electric control box. Before you power on and start the unit, check that the cover of the electric control box is tight and secured properly with screws.
- Do not let any liquid spill into the electric control box.
- The appliance shall be installed in accordance with national wiring regulations.
- If the supply cord is damaged, it must be replaced by the manufacturer or its service dealer or a similarly qualified person in order to avoid a hazard.
- An all-pole disconnection switch having a contact separation of at least 3 mm in all poles should be connected in fixed wiring.
- The dimensions of the space necessary for correct installation of the appliance including the minimum permissible distances to adjacent structures.
- The temperature of refrigerant circuit will be high, please keep the interconnection cable away from the copper tube.

CAUTION

- Do not install the power cord near equipment that is susceptible to electromagnetic interference, such as TV, and radios to prevent interference.
- Use a dedicated power supply cord for the unit. Do not share the same power source with other equipment. A fuse or circuit breaker must be installed, and these must conform to the local law.

NOTE

The installation manual is only a general guide on the wiring and connections, and is not specifically designed to contain all information regarding this unit.

WARNING

To prevent electric shock or fire:

- Do not wash the electric box of the unit.
- Do not operate the unit with wet hands.
- Do not place any items that contain water on the unit.

CAUTION

Do not sit, climb, or stand on the unit.

PACKING BOX

This chapter mainly introduces the subsequent operations after the outdoor unit has been delivered to site and unpacked.
This specifically includes the following information:

- Unbox and handling the outdoor unit.
- Take out the accessories of the outdoor unit.
- Dismantle the transport rack.

Remember the following:

- At the time of delivery, check the unit for any damage. Report any damage immediately to the carrier's claim dealer.
- As far as possible, transport the packaged unit to its final installation site to prevent damage during the handling process.
- Take note of the following items when transporting the unit:

Fragile. Handle with care.

Keep the unit with its front facing upwards so as not to damage the compressor.

Select the unit transportation path in advance.

TRANSPORTING THE UNIT

Lifting method

NOTE

Do not remove any packaging during lifting. Where the unit is not packed or the package is damaged, use a gasket or package to protect the unit.

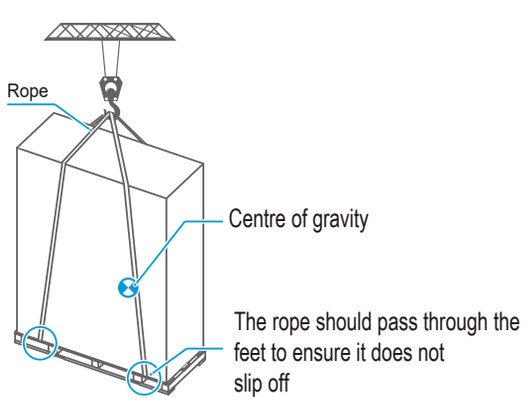
Use a strap that can adequately support the weight of the unit, and has a width ≥20 mm.

Images are for reference only. Please refer to the actual product.

The strap must have enough strength to bear the weight of the unit; keep the machine balanced and ensure the unit is lifted safely and stably.

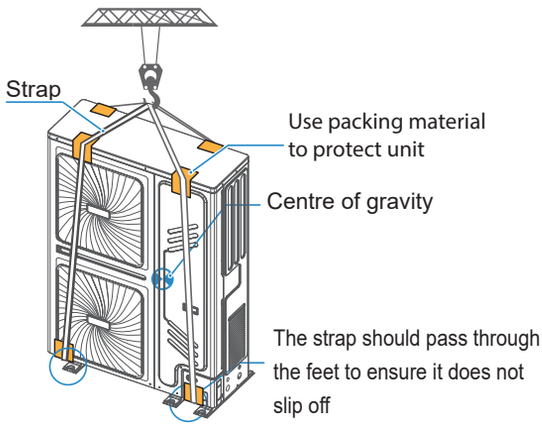
Packaged

Please lift in packaged or protected condition, and do not remove any packaging before lifting.



Unpacked

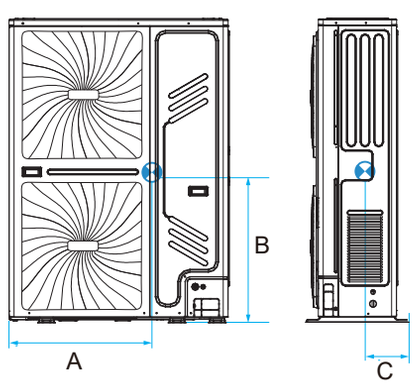
The unit should be protected by sub-plate showing as Fig.2.2, when the package is damaged.



Centre of gravity position is shown in the diagram below:

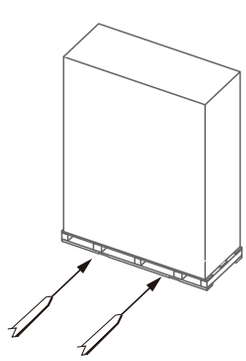
Unit: mm

Model	A	B	C
20 kW	770	775	195



Forklift method

To move the unit with a forklift, insert the forks into the opening at the bottom of the unit, as shown below.



UNPACKING THE UNIT

Take the unit out from the packing materials:

- Be careful not to damage the unit when you use a cutting tool to remove the wrapping film.
- Remove the six nuts on the wooden back stand.

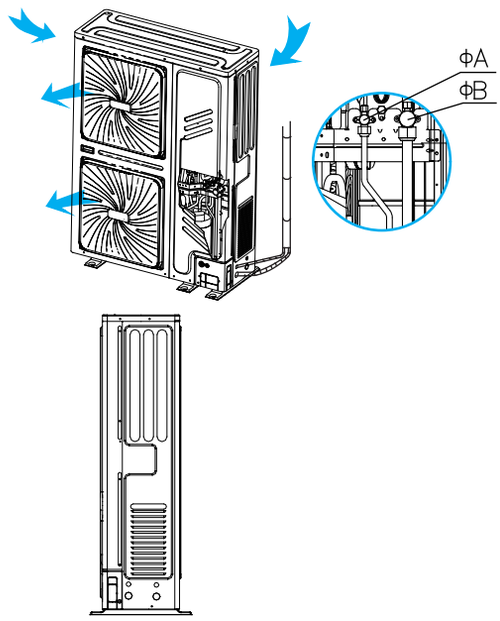
WARNING **Plastic film should be disposed of properly. Avoid contact by children.**

UNPACKING ACCESSORIES

The accessories for the unit are stored in two plastic bags. One bag contains documents including manuals and the other contains the accessories. They are located inside the unit, near the compressor. The accessories are as follows:

Name	Qty.	Outline	Function
Owner's and installation manual	1		——
Water outlet pipe	1		For drainage
Matching resistor	2		To improve communication stability
Magnet ring	1		/
Drain pipe	1		/
L-shaped pipe connection	1		/

LAYOUT



No.	Name	Function
A	Liquid pipe connection port	To connect liquid pipes
B	Gas pipe connection port	To connect gas pipes

Size / Model	ΦA(OD) (Liquid side)	ΦB(OD) (Gas side)
20 kW	Φ9.52 mm	Φ19.1 mm

RECOMMENDED OUTDOOR UNIT COMBINATION

CAUTION

- **The total capacity of indoor unit MUST be between 60%–130% of the combined capacity of outdoor unit.**
- **When all indoor units are running simultaneously, total capacity of the indoor units should be less than or equal to the combined capacity of the outdoor unit to prevent overloading.**
- **The total capacity of the indoor units can be up to a maximum of 130% of the combined capacity of the outdoor unit for a system when not all the indoor units are operating at the same time.**
- **If the system is in a cold region (ambient temperature -10 °C or below) or a very hot, high load environment, otal capacity of the indoor units should be less than the capacity of the outdoor unit.**

Maximum number of indoor units

Model	Max Qty. of indoor units
20 kW	6

PREPARING THE INSTALLATION SITE

Site requirements

- Provide sufficient space around the unit for maintenance and air circulation.
- Make sure the installation site can bear the weight of the unit and vibrations.
- Make sure the area is well ventilated.
- Make sure the unit is stable and level.
- Choose a place where the rain can be avoided as much as possible.
- Install in a location where the noise generated by the unit will not cause any inconveniences.
- Choose a site that will comply with the applicable law.

Do not install the unit in the following locations:

- Where there is a potential risk of explosions.
- Where there are equipment emitting electromagnetic waves. Electromagnetic waves may disrupt the control system, and cause the unit to malfunction.
- Where there are existing fire hazards like leakage of flammable gases, carbon fibers, and combustible fumes (such as petrol).
- Where corrosive gases are present. Corrosion of pipes or welds may lead to refrigerant leakage.
- Where mineral oil mist, spray, or steam may exist in the atmosphere. Plastic parts may be damaged.
- Where there is a high salt content in the air

CAUTION

An excessively high concentration of refrigerant in an enclosed area can lead to anoxia (oxygen deficiency).

NOTE

This is a class A product. This product may cause radio interference in the home environment.

The unit conforms to the design specifications and provides reasonable protection to prevent such interference. However, there is no guarantee that there will be no interference.

Install the units and wires at an appropriate distance from devices like sound equipment and personal computers.

- Take into considerations adverse environmental conditions such as strong winds as improper installation may cause the unit to fall over.
- Take precautions to make sure the water will not damage the installation space and environment in the event of a water leakage.
- If the unit is installed in a small room, refer to section 4.2.3 “Caution for refigerant leaks” to make sure the refrigerant concentration does not exceed the permissible safety limit when there is a refrigerant leak.
- Make sure the air inlet of the unit is not directed at the main wind direction. Incoming wind will disrupt the operations of the unit. If necessary, use a deflector as an air baffle.
- Add water drain piping on the base to prevent damage from condensed water.

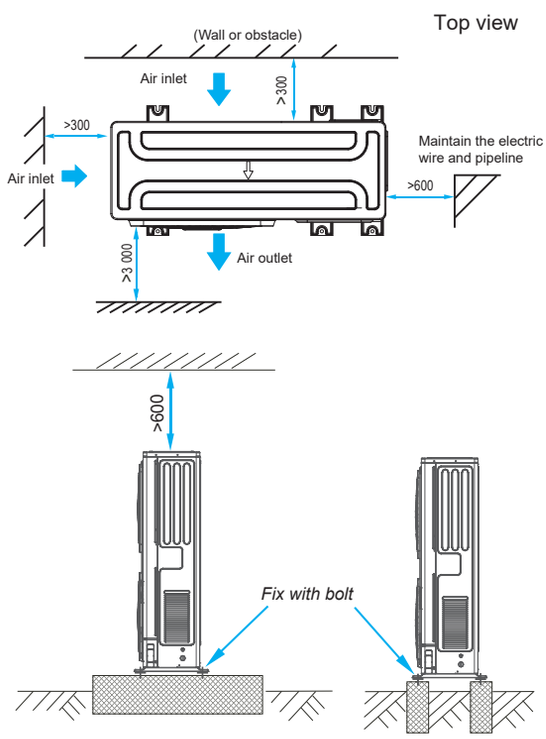
Site requirements for cold regions

NOTE

- **Snow protection facilities must be installed in areas with snowfall. Refer to the following figure, (malfunctions are more common when there is insufficient snow protection facilities). In order to protect the unit from accumulated snow, increase the height of the rack, and install a snow shield at the air inlets and outlets.**
- **Do not obstruct the air flow of the unit when you install the snow shield.**

Make note of the following when installing the unit in areas affected by cold weather or snow:

- Avoid direct wind blowing to the air outlet or air inlet



REFRIGERANT SAFETY

Safety measures

The installation personnel must make sure the safety measures to prevent leaks comply with local regulations or standards. If the local regulations do not apply, the following criteria can be applied.

The system uses R410A as the refrigerant. R410A itself is a completely non-toxic, and non-combustible refrigerant.

However, do ensure that the air conditioning unit is installed in a room with sufficient space. This is so that when there is a serious leak in the system, the maximum concentration of the refrigerant gas in the room will not exceed the stipulated concentration, and is consistent with the relevant local regulations and standards.

About the maximum concentration level

The calculation for the maximum concentration of the refrigerant is directly related to the occupied space that the refrigerant may leak to and the charging amount of the refrigerant.

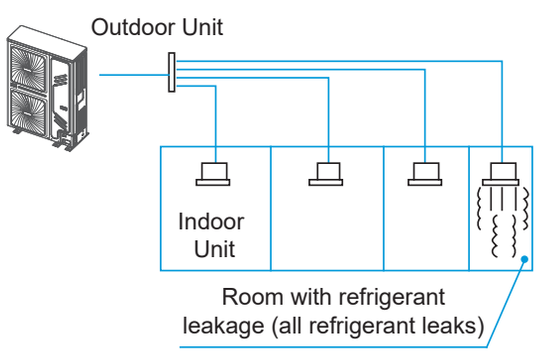
The measurement unit for concentration is kg/m3 (weight of gaseous refrigerant that has a volume of 1 m3 in the occupied space).

The highest level of permissible concentration must comply with the relevant local regulations and standards.

Based on the applicable European standards, the maximum permissible concentration level of R410A in the space occupied by humans is limited to 0.44 kg/m^3. If this limit is exceeded, necessary measures shall be taken.

Please confirm as follows:

a. Calculate the total refrigerant charging amount.Total refrigerant charging amount = refrigerant charging amount of the unit itself + charging amount calculated according to the pipe length.
b. Calculate the indoor volume (based on the minimum volume).
c. Calculated refrigerant concentration = (total charging amount / indoor volume).



Countermeasures when exceeding the limit concentration

a. Please install a mechanical ventilation device.
b. If it is impossible to change air frequently, please install a leak detection alarm device connected with the mechanical ventilation device.

PREPARING THE REFRIGERANT PIPING

Refrigerant piping requirements

NOTE

The R410A refrigerant pipeline system must be kept strictly clean, dry and sealed.

- **Cleaning and drying: prevent foreign objects (including mineral oil or water) from mixing into the system.**
- **Seal: R410A does not contain fluorine, does not destroy the ozone layer, and does not deplete the ozone layer that protect the earth from harmful ultraviolet radiation. But if it is released, R410A can also cause a slight greenhouse effect. Therefore, you must pay special attention when you check the sealing quality of the installation.**
- **The piping and other pressure vessels must comply with the applicable laws and suitable for use with the refrigerant. Use only phosphoric acid deoxidized seamless copper for the refrigerant piping.**
- **Foreign objects in the pipes (including lubricant used during pipe bending) must be ≤ 30 mg/10m.**
- **Calculate all piping lengths.**

Allowable length and height difference for refrigerant piping

NOTE

The equivalent length of each elbow and U-shape branch joint is 0.5m, the equivalent length of each branch header is 1 m.

As much as possible, install the indoor units such that they are equidistant on both sides of the U-shape branch joint.

The allowable length of the farthest indoor unit to the first branch joint in the system should be equal to or less than 40m unless specified conditions are met. In this case the permitted length is 90m. Please refer to requirement 2.

Special-purpose branch joints from dealer for all branch joints should be used. Failing to do so may lead to severe system malfunction.

TYPICAL SYSTEM LAYOUT

CAUTION

Gas/liquid branch pipes of IDUs 1/2/3/4 must correspond to the gas/liquid pipe screw joints marked with E1/E2/E3/E4 on the branch box. Connecting these incorrectly will cause errors in the electronic expansion valve controlling IDU refrigerant flow, frosting or freezing of the IDU, refrigerant noise, and other errors.

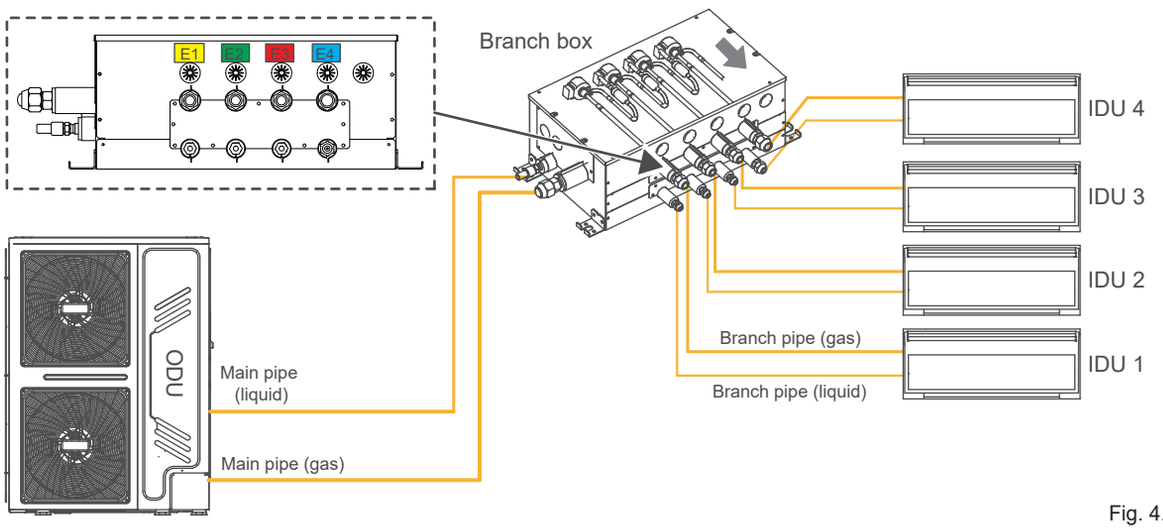


Fig. 4.3

Number	Corresponding branch pipe connector	Branch Box Pipe Connector Size (mm)			
		BBMVRF03	BBMVRF04	BBMVRF05	BBMVRF06
E1	Branch pipe (liquid/gas side) connector 1	Φ 6.35/Φ 12.7	Φ 6.35/Φ 12.7	Φ 6.35/Φ 12.7	Φ 6.35/Φ 12.7
E2	Branch pipe (liquid/gas side) connector 2	Φ 6.35/Φ 12.7	Φ 6.35/Φ 12.7	Φ 6.35/Φ 12.7	Φ 6.35/Φ 12.7
E3	Branch pipe (liquid/gas side) connector 3	Φ 6.35/Φ 12.7	Φ 6.35/Φ 12.7	Φ 6.35/Φ 12.7	Φ 6.35/Φ 12.7
E4	Branch pipe (liquid/gas side) connector 4	-	Φ 9.52/Φ15.9	Φ 6.35/Φ 12.7	Φ 6.35/Φ 12.7
E5	Branch pipe (liquid/gas side) connector 5	-	-	Φ 9.52/Φ15.9	Φ 6.35/Φ 12.7
E6	Branch pipe (liquid/gas side) connector 6	-	-	-	Φ 9.52/Φ15.9

CAUTION

IDU Capacity range(external EXVs) compatible with Φ 6.35/Φ 12.7 branch pipe connectors: 1.5 ≤ kW ≤ 5.6;
IDU Capacity range (external EXVs) compatible with Φ 9.52/Φ 15.9 branch pipe connectors: 5.6 < kW ≤ 9.0.

ALLOWABLE LENGTHS FOR REFRIGERANT PIPING

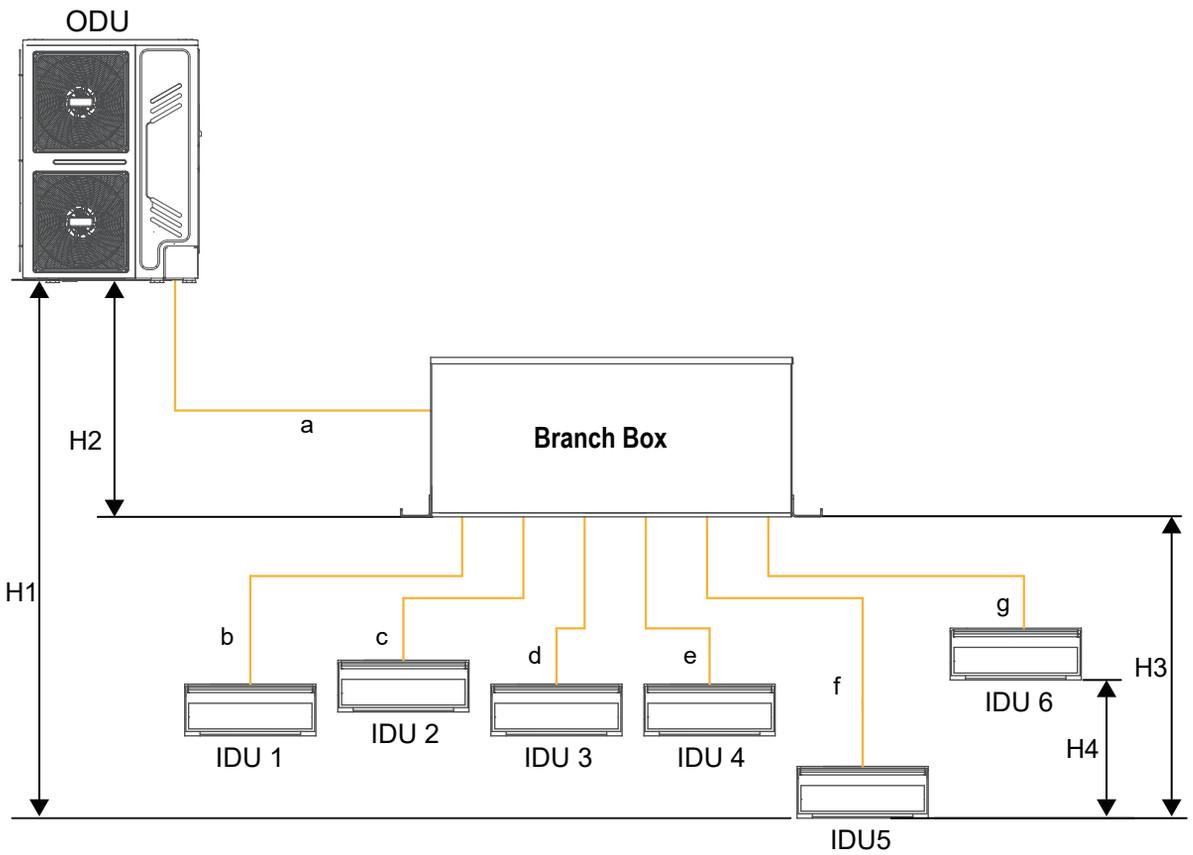


Fig. 4.4

Maximum allowable length (Liquid side or gas side)	Piping length	Between Branch box and IDU 1~IDU 6	b, c, d, e, f, g ≤ 15 m
	Total piping length	Between ODU and Branch box (Branch joint)	a ≤ 55 m
		Between Branch box and IDU 1~IDU 6	b + c + d + e + f + g ≤ 60 m
Allowable height difference (Liquid side or gas side)		Between ODU and IDU 1~IDU 6	H1 ≤ 30 m(ODU is above);
			H1 ≤ 20 m(ODU is below)
		Between ODU and Branch box	H2 ≤ 2 0 m
		Between Branch box and IDU 1~IDU 6	H3 ≤ 15 m
		Between IDU 1~IDU 6 and IDU 1~IDU 6	H4 ≤ 8 m

Calculating additional refrigerant charge

1) The additional refrigerant charge required depends on the lengths and diameters of the outdoor and indoor liquid pipes.
（a, b, c, d, e, f, g,）

2) Refer to page 32 for the calculation method of additional refrigerant charge.

If the size of the branch joint pipe selected according to the above table is larger than that of the main pipe according to Table below, the size of the branch joint pipe should be reduced to make it the same as the main pipe.

The pipe thickness of the refrigerant piping shall comply with the applicable legislation.
The minimal pipe thickness for R410A piping must be in accordance with the table below.

Piping outer diameter (mm)	Minimum thickness (mm)	Temper grade
Φ6.35	0.80	M-type
Φ9.52	0.80	
Φ12.7	1.00	
Φ15.9	1.00	
Φ19.1	1.00	

Material: Only seamless phosphorus-deoxidized copper piping that complies with all applicable legislation should be used.
Thicknesses: Temper grades and minimum thicknesses for different diameters of piping should comply with local regulations.
Design pressure of R410 refrigerant is 4.2 MPa (42 bar).

PREPARING THE ELECTRICAL WIRING

Safety Device Requirements

1. Prepare the cable for connection following current electrical standards AS/NZS 3000.
2. Maximum allowable voltage range variation between phases is 2%.
3. Select circuit breaker that having a contact separation in all poles not less than 3 mm providing full disconnection, where MFA is used to select the current circuit breakers and residual current operation breakers:

System	Outdoor Unit				Power Current			Compressor		Fan Motor	
	Voltage (V)	Frequency (Hz)	Min. (V)	Max. (V)	MCA (A)	TOCA (A)	MFA (A)	MSC (A)	RLA (A)	Output Power (kW)	FLA (A)
20 kW	220-240	50	198	264	33	33	40	-	30.5	0.1+0.1	0.71+0.71

IMPORTANT

Phase and frequency of power supply system: 50 Hz, Voltage: 220-240 V

Abbreviations:
MCA: Minimum Circuit Amps; TOCA: Total Over-current Amps; MFA: Maximum Fuse Amps; MSC: Maximum Starting Current (A); RLA: Rated Load Amps; FLA: Fan Load Amps.

- Units are suitable for use on electrical systems where voltage supplied to unit terminals is not below or above listed range limits. Maximum allowable voltage variation between phases is 2%.
- Select wire size based on the value of MCA.
- TOCA indicates the total overcurrent amps value of each OC set.
- MFA is used to select overcurrent circuit breakers and residual-current circuit breakers.
- MSC indicates the maximum current on compressor start-up in amps.
- RLA is based on the following conditions: indoor temperature 27 °C DB, 19 °C WB; outdoor temperature 35 °C DB.

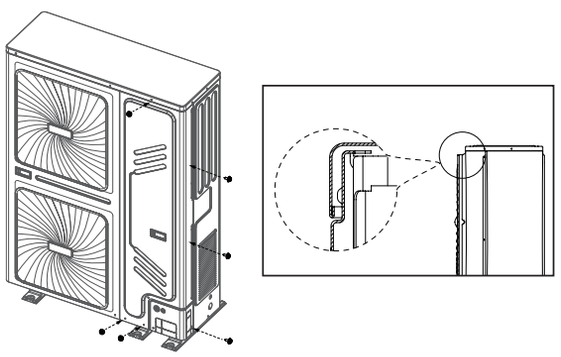
Explanation of harmonic current short-circuit radio

NOTE

We declare the model MVRFON6H20 complies with IEC 61000-3-12 provided that the short-circuit power Ssc is greater than or equal to 7969500W at the interface point between the user's supply and the public system. It is the responsibility of the installer or user of the equipment to ensure, by consultation with the distribution network operator if necessary, that the equipment is connected only to a supply with a short-circuit power Ssc greater than or equal to 7969500W.

OPENING THE UNIT

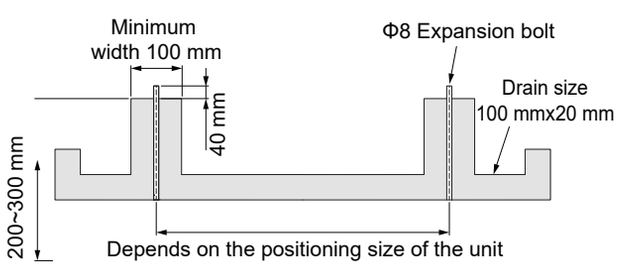
- Removal of all screws on the right front side plate; Place the left hand into the handle to prevent the right front side plate from falling;
- Press the right hand on the corner of the right front side plate and pull it down, and pull the left hand outward at the same time;
- After the top rib comes out of the top cover, take out the right front side plate.



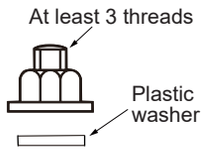
MOUNTING THE OUTDOOR UNIT

Preparing the Structure for Installation

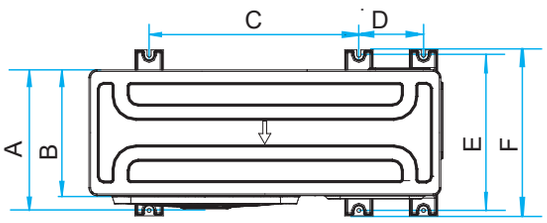
- The base of the outdoor unit must use the solid concrete surface or steel beam frame.
- The base must be completely level to ensure that every point of contact is even.
- During installation, ensure the base supports the vertical folds of the front and back chassis plates of the where the support for the unit load is.
- No gravel layer is required when the base is built on the roof surface, however the sand and cement on the concrete surface must be level, and the base should be chamfered along the edge.
- A water drainage ditch should be set around the base to drain the water around the equipment.
- Check the load-bearing capacity of the roof to make sure it can support the load.
- When installing the piping from the bottom, the base height should be above 200 mm.
- Ensure the base where the unit is installed is strong enough to prevent vibrations and noise.



Use six bolts (M8) to secure the unit in place. Best is to screw in the ground bolt until it is embedded in the base surface by at least 3 threads.The purpose of using plastic washers is to prevent rusting.



Please refer to the figure below for the installation position of bolts.



Unit: mm

Model / Size	A	B	C	D	E	F
20 kW	440	400	668	206	494	528

Outdoor Unit Installation Space

Make sure there is sufficient space around the unit for maintenance work, and the minimum space for air inlet and air outlet is reserved.

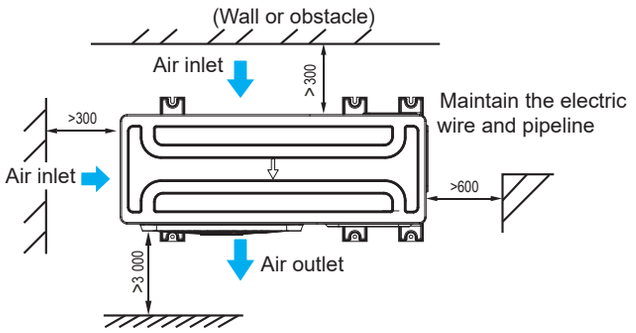
NOTE

- **In all installation examples in this chapter, the direction of connecting pipe for outdoor unit installation is forward or downward.**
- **When the rear pipe is connected and installed, the installation space on the right side of the outdoor unit shall be at least 250 mm;**
- **When two or more outdoor units are installed side by side, the distance between two adjacent outdoor units must be greater than 200 mm;**
- **For the installation space of the unit, the maintenance space and smooth ventilation of the unit shall be considered, and an installation method shall be selected according to the actual situation.**

PIPE CONNECTION

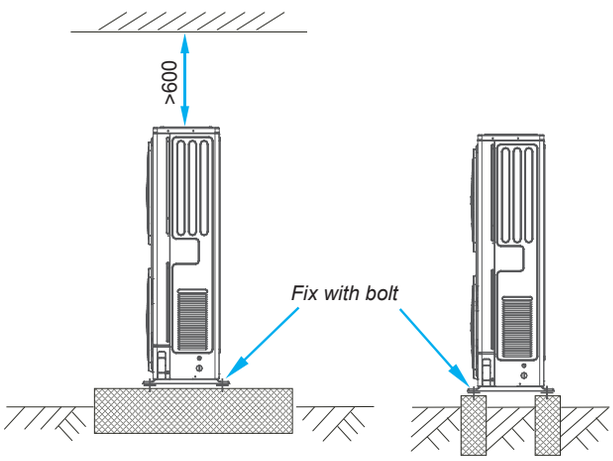
There are Obstacles on the air inlet side but no obstacles on the air outlet side:

Unit:mm



There are obstacles above the outdoor unit:

Unit:mm



NOTE

When the outdoor unit is installed in the space with three ring walls or walls above at the same time, the length of the left and right walls of the machine shall not exceed 1 000 mm, otherwise the flexible air duct shall be added to guide the air.

PIPE CONNECTION

When connecting the refrigerant piping

Make sure the refrigerant piping is installed in accordance with the applicable law.

Make sure the piping and connections are not placed under pressure.

Connect Refrigerant Piping

CAUTION

Clean and new pipes shall be used for refrigerant piping, water and foreign matters shall not enter the pipe during construction; If water and foreign matters enter, be sure to flush the pipeline with nitrogen.

Be careful when the pipeline passes through the wall. Please cover both ends of the pipeline with adhesive tape or rubber plug to prevent foreign matter.

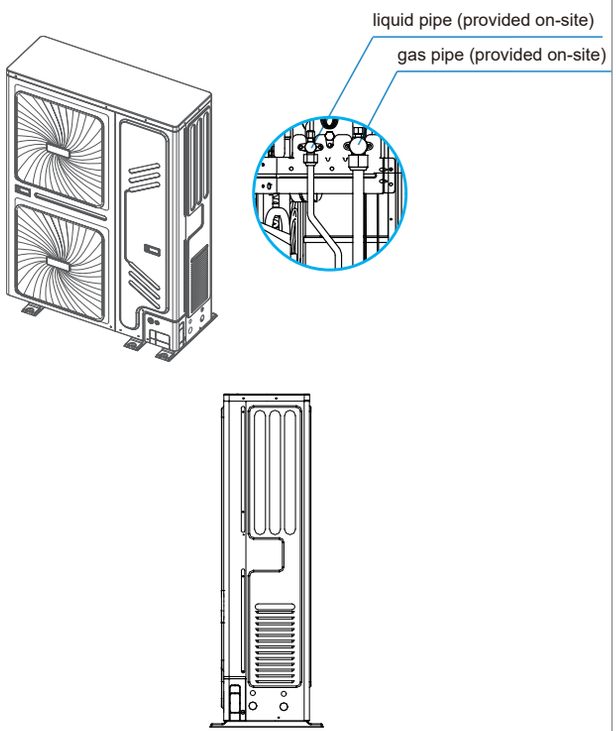
The pipe connection shall follow the following principles: the shorter the connected pipe, the smaller the height difference between indoor and outdoor units, the less the pipe bending angle, and the larger the bending radius as much as possible.

When laying according to the predetermined route, the pipe shall not be flattened. The bending radius of the bending part must be greater than 200 mm. The connecting pipe cannot be stretched or bent frequently. One pipe cannot be bent at the same place for more than 3 times at most.

Before the refrigerant piping is connected, make sure the indoor units and outdoor units are installed properly. Connecting refrigerant piping include:

- Connect refrigerant piping to outdoor unit
- Connect refrigerant piping to indoor unit (refer to the installation manual of the indoor unit)
- Connecting branch joints

Outdoor refrigerant connecting pipe position



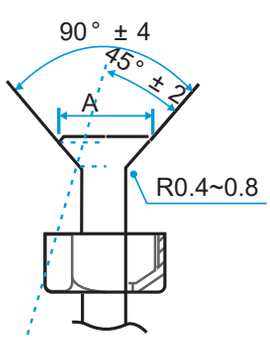
Connecting refrigerant piping to outdoor unit

NOTE

- **Be sure that the field installed piping does not touch other pipes, the bottom panel or side panel.**
- **Ensure to protect the piping with suitable insulation for the bottom and side connection, to prevent it from coming into contact with the casing.**

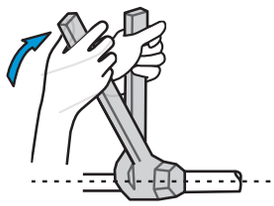
Connecting Nut Flare Specifications

OD (mm)	A (mm)	
	maximum	minimum
Φ6.35	8.7	8.3
Φ9.52	12.4	12.0
Φ12.7	15.8	15.4
Φ15.9	19.0	18.6
Φ19.1	23.3	22.9



Tightening Nut

Align the connecting pipe, tighten connecting nuts by hand, and then tighten with a wrench as shown below.



NOTE

- **When welding refrigerant piping, in order to prevent internal oxidation of the piping, nitrogen filling must be used. This prevents oxidation chips blocking the refrigeration circulation system.**
- **Excessive torque can damage the horn mouth, while insufficient torque can cause air leakage. Please refer to the table below to determine the correct torque.**

Tightening Torque

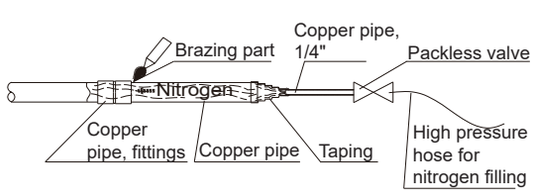
piping size	Tightening torque N.m
Φ6.35	14.2~17.2 N.m (144~176 kgf.cm)
Φ9.52	32.7~39.9 N.m (333~407 kgf.cm)
Φ12.7	49.5~60.3 N.m (504~616 kgf.cm)
Φ15.9	61.8~75.4 N.m (630~770 kgf.cm)
Φ19.1	97.2~118.6 N.m (990~1 210 kgf.cm)

Brazing

CAUTION

During the test, do not exert a force greater than the maximum allowed pressure on the product (as shown on the nameplate).

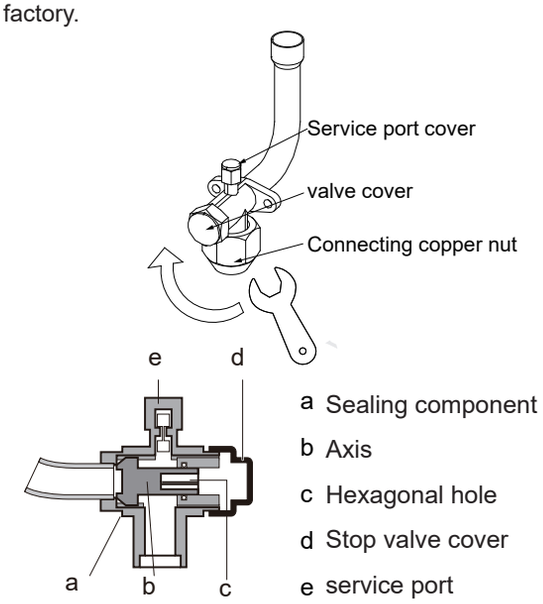
- During brazing, use nitrogen as protection to prevent the formation of a large amount of oxide film in the pipes. This oxide film may have adverse effects on the valves and compressors in the cooling system.
- Use the pressure reducing valve to set the nitrogen pressure to 0.02~0.03 MPa



- Do not use antioxidants when brazing the pipe joints.
- Use copper-phosphorus alloys (BCuP) when brazing copper and copper, and no flux is required. When brazing copper and other alloy, flux is required.
- Flux produces an extremely harmful effect on the refrigerant piping system.

STOP VALVES

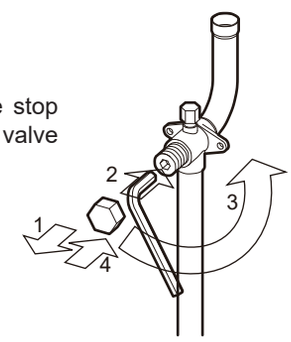
- The following figure shows the names of all parts required for the installation of the stop valves.
- Stop valves are closed when unit is shipped from the factory.



Opening Stop Valve

1. Remove the stop valve cover.

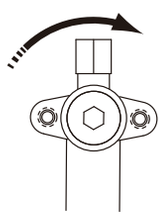
2. Insert the hex wrench into the stop valve, and rotate the stop valve counter-clockwise.



Closing the Stop Valve

1. Remove the stop valve cover.

2. Insert the hex wrench into the stop valve, and rotate the stop valve clockwise.



Fastening Torque

Stop valve size (mm)	Tightening torque / N.m (turn clockwise to close)
	Axis
	Valve body
Φ12.7	9~30
Φ15.9	12~30
Φ19.1	
Φ22.2	16~30
Φ25.4	24~30
Φ28.6	
Φ31.8	25~35
Φ35.0	

FLUSHING PIPES

To remove dust, other particles and moisture, which could cause compressor malfunction if not flushed out before the system is run, the refrigerant piping should be flushed using nitrogen.

Pipe flushing should be performed once the piping connections have been completed with the exception of the final connections to the indoor units. That is, flushing should be performed once the outdoor units have been connected but before the indoor units are connected.

CAUTION **Only use nitrogen for flushing. Using carbon dioxide risks leaving condensation in the piping. Oxygen, air, refrigerant, flammable gases and toxic gases must not be used for flushing. Use of such gases may result in fire or explosion.**

The liquid and gas sides must be flushed simultaneously.

The flushing procedure is as follows:

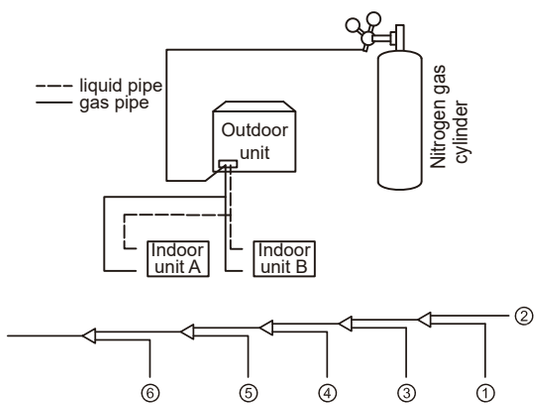
1. Cover the inlets and outlets of the indoor units to prevent dirt getting blown in during pipe flushing. (Pipe flushing should be carried out before connecting the indoor units to the system.)
2. Attach a pressure reducing valve to a nitrogen cylinder.
3. Connect the pressure reducing valve outlet to the inlet on the liquid (or gas) side of the outdoor unit.
4. Use blind plugs to block all liquid (gas) side openings, except for the opening at the indoor unit which is furthest from the outdoor units.
5. Start to open the nitrogen cylinder valve and gradually increase the pressure to 0.5MPa.
6. Allow time for nitrogen to flow as far as the opening at indoor unit A.
7. Flush the first opening:

a) Using suitable material, such as a bag or cloth, press firmly against the opening at indoor unit A.

b) When the pressure becomes too high to block with your hand, remove your hand.

c) Repeatedly flush until no further dirt or moisture is emitted from the piping. Use a clean cloth to check. Seal the opening once it has been flushed.

8. Flush the other openings in the same manner, working in sequence from indoor unit A towards the outdoor units.
9. Once flushing is complete, seal all openings to prevent dust and moisture from entering.



GAS TIGHTNESS TEST

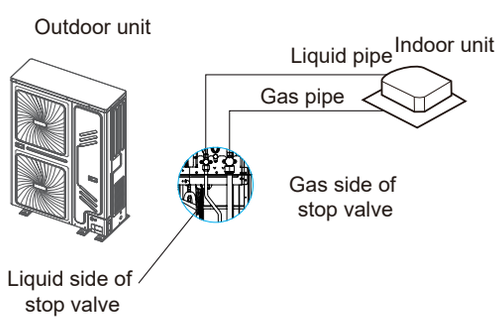
To prevent faults caused by refrigerant leakage, a gas tightness test should be performed before system commissioning.

NOTE

- **Only dry nitrogen should be used for gas tightness testing. Oxygen, air, flammable gases and toxic gases must not be used for gas tightness testing. Use of such gases may result in fire or explosion.**
- **Make sure that all the outdoor unit stop valves are firmly closed.**
- **Make sure all piping connections are complete before the tightness test begins.**

The gas tightness test procedure is as follows:

1. Charge the indoor piping with nitrogen at 0.3 MPa through the needle valves on the liquid and gas stop valves and leave for at least 3 minutes (do not open the valves). Observe the pressure gauge. If there is a large leakage, the pressure gauge will drop quickly.
2. If there are no large leakages, charge the piping with nitrogen at 1.5 MPa and leave for at least 3 minutes. Observe the pressure gaugeIf there is a small leakage, the pressure gauge will drop distinctly.
3. If there are no small leakages, charge the piping with nitrogen at 4.2 MPa and leave for at least 24 hours to check for micro leakages. To check for micro leakages, allow for any change in ambient temperature over the test period by adjusting the reference pressure by 0.01 MPa per 1 °C of temperature difference. Adjusted reference pressure = Pressure at pressurization + (temperature at observation – temperature at pressurization) x 0.01 MPa. Compare the observed pressure with the adjusted reference pressure. If they are the same, the piping has passed the gas tightness test. If the observed pressure is lower than the adjusted reference pressure, the piping has a micro leakage.
4. If the leakage is detected, refer to following part “Leak detection”. Once the leak has been found and fixed, the gas tightness test should be repeated.
5. If not continuing straight to vacuum drying once the gas tightness test is complete, reduce the system pressure to 0.5-0.8 MPa and leave pressurised.



Leak Detection

The general methods for identifying the source of a leak are as follows:

1. Relatively large leaks are audible.
2. Place your hand at joints to feel for escaping gas.
3. Small leaks can be detected by the formation of bubbles when soapy water is applied to a joint.

VACUUM DRYING

Vacuum drying should be performed in order to remove moisture and non-condensable gases from the system. Removing moisture prevents ice formation and oxidization of copper piping or other internal components. The presence of ice particles in the system would cause abnormal operation, whilst particles of oxidized copper can cause compressor damage. The presence of non-condensable gases in the system would lead to pressure fluctuations and poor heat exchange performance.

Vacuum drying also provides additional leak detection (in addition to the gas tightness test).

CAUTION

Before performing vacuum drying, make sure that all the outdoor unit stop valves are firmly closed.

Once the vacuum drying is complete and the vacuum pump is stopped, the low pressure in the piping could suck vacuum pump lubricant into the air conditioning system. The same could happen if the vacuum pump stops unexpectedly during the vacuum drying procedure. Mixing of pump lubricant with compressor oil could cause compressor malfunction. Therefore a check valve should be used to prevent vacuum pump lubricant seeping into the piping system.

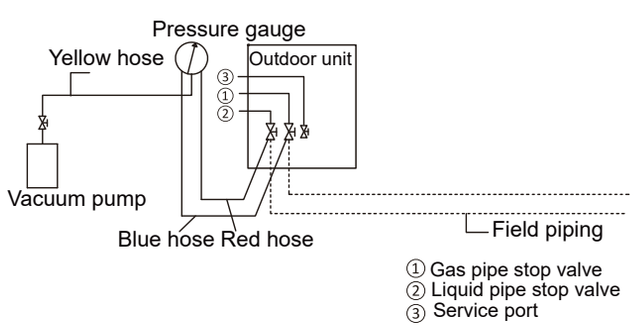
During vacuum drying, a vacuum pump is used to lower the pressure in the piping to the extent that any moisture present evaporates. At 5 mm Hg (755 mm Hg below typical atmospheric pressure) the boiling point of water is 0 °C. Therefore a vacuum pump capable of maintaining a pressure of -756 mm Hg or lower should be used. Using a vacuum pump with a discharge in excess of 4 L/s and a precision level of 0.02 mm Hg is recommended. The vacuum drying procedure is as follows:

1. Connect the vacuum pump through a manifold with a pressure gauge to the service port of all stop valves.

2. Start the vacuum pump and then open the manifold valves to start vacuuming the system.

3. Continue vacuum drying for at least 2 hours and until a pressure difference of -0.1 MPa or more has been achieved. Once the pressure difference of at least -0.1 MPa has been achieved, continue vacuum drying for 2 hours. Close the manifold valves and then stop the vacuum pump. After 1 hour, check the pressure gauge. If the pressure in the piping has not increased, the procedure is finished. If the pressure has increased, repeat the steps 1 to 3 until all moisture has been remove.

4. After vacuum drying, keep the manifold connected to the master unit stop valves, in preparation for refrigerant charging.



PIPING INSULATION

After the leak test and the vacuum drying are completed, the pipe must be insulated. Considerations:

- Make sure the refrigerant piping and branch joints are completely insulated.
- Make sure the liquid and gas pipes (for all units) are insulated.
- Use heat-resistant polyethylene foam for the liquid pipes (able to withstand temperature of 70 °C), and polyethylene foam for the gas pipes (able to withstand temperature of 120 °C).
- Reinforce the insulation layer of the refrigerant piping based on the installation environment.

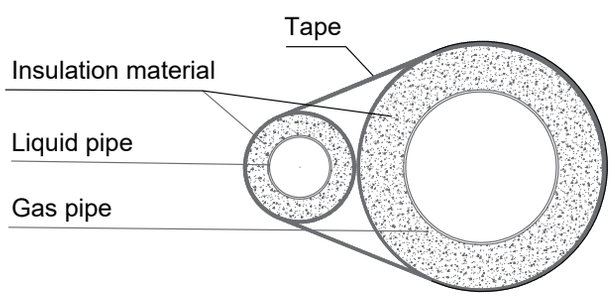
Selection of Insulation Material Thickness

Condensed water may form on the surface of the insulation layer.

Piping size	Humidity<80%RH Thickness	Humidity≥80%RH Thickness
Φ6.35~38.1 mm	≥ 15 mm	≥ 20 mm
Φ41.3~54.0 mm	≥ 20 mm	≥ 25 mm

Pipe Wrapping

To avoid condensation and water leakage, the connecting pipe must be wrapped with tape to ensure isolation from the air.



When wrapping insulation tape, each circle should press half of the previous circle of tape. Do not wrap the tape too tightly to avoid reducing the thermal insulation effect.

After completing the pipe insulation work, seal the holes in the wall with sealing material.

Pipe Protection

The refrigerant pipe will swing, expand or shrink during operations. If the pipe is not fixed, the load will be concentrated in a certain part, which may cause the deformation or rupture of the refrigerant pipe.

The suspended connecting pipes shall be well supported, and the distance between supports shall not exceed 1 m.

The outdoor pipes shall be protected against accidental damage. If the length of the pipe exceeds 1 m, a gusset plate must be added for protection.

REFRIGERANT CHARGING

WARNING

- **Use only R410A as the refrigerant. Other substances may cause explosions and accidents.**
- **R410A contains fluorinated greenhouse gases, and the GWP value is 2 088. Do not discharge the gas into the atmosphere.**
- **When charging the refrigerant, make sure you wear protective gloves and safety glasses. Be careful when opening the refrigerant piping.**

NOTE

- **If the power supply of some units is off, the charging program cannot be completed normally.**
- **If this is a multi-unit outdoor system, the power supply for all outdoor units should be turned on.**
- **Make sure the power supply is turned on 12 hours before operations so that the crankcase heater is properly energized. This is also to protect the compressor.**
- **Make sure all connected indoor units have been identified.**
- **Charge the refrigerant only after vacuum drying.**
- **Volume of refrigerant charged must not exceed the designed amount.**

Calculating Additional Refrigerant Charge

The additional refrigerant charge required depends on the lengths and diameters of the outdoor and indoor liquid pipes.

Table below shows additional refrigerant charge required per meter of equivalent pipe length for different diameters of pipe. The total additional refrigerant charge is obtained by summing the additional charge requirements for each of the outdoor and indoor liquid pipes, as in the following formula, where T1 to T8 represent the equivalent lengths of the pipes of different diameters.

Assume 0.5 m for equivalent pipe length of each branch joint.

Liquid piping Diameter (mm OD)	Additional refrigerant charge per meter of equivalent length of liquid piping (kg)
Φ6.35	0.022
Φ9.52	0.054
Φ12.7	0.110
Φ15.9	0.170

Additional refrigerant charge R (kg) = (T1@Φ6.35) × 0.022 + (T2@Φ9.52) × 0.057 + (T3@Φ12.7) × 0.110 + (T4@Φ15.9) × 0.170

When the number of indoor units is ≥ 10, an additional 0.025 kg of refrigerant is required for each indoor unit.

For example, when paired with 12 internal units, an additional 12 * 0.025=0.3 kg of refrigerant is required.

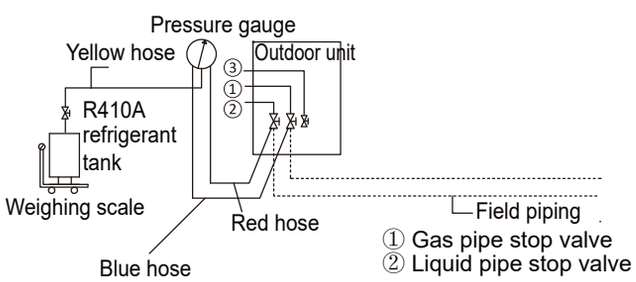
NOTE

- **Strictly follow the refrigerant charging calculation method shown above, and do not exceed the maximum additional refrigerant amount shown in the table below. If the calculated value of additional refrigerant exceeds the limits shown in the table below, the total length of the piping must be shortened and the refrigerant charging amount recalculated to meet the requirements shown in the table below.**
- **The maximum additional refrigerant addition in the table below is based on the recommended combination.**

Model	Maximum refrigerant addition (kg)
20 kW	9.6

Adding Refrigerant

1. Calculate additional refrigerant charge R (kg).
2. Place a tank of R410A refrigerant on a weighing scale. Turn the tank upside down to ensure refrigerant is charged in a liquid state. (R410A is a blend of two different chemicals compounds. Charging gaseous R410A into the system could mean that the refrigerant charged is not of the correct composition).
3. After vacuum drying, the blue and red pressure gauge hoses should still be connected to the pressure gauge and to the master unit stop valves.
4. Connect the yellow hose from the pressure gauge to the R410A refrigerant tank.
5. Open the valve where the yellow hose meets the pressure gauge, and open the refrigerant tank slightly to let the refrigerant eliminate the air. Caution: open the tank slowly to avoid freezing your hand.
6. Set the weighing scale to zero.
7. Open the three valves on the pressure gauge to begin charging refrigerant.
8. When the amount charged reaches R (kg), close the three valves. If the amount charged has not reached R (kg) but no additional refrigerant can be charged, close the three valves on the pressure gauge, run the outdoor units in cooling mode, and then open the yellow and blue valves. Continue charging until the full R (kg) of refrigerant has been charged, then close the yellow and blue valves.
9. Before running the system, be sure to complete all the pre-commissioning checks and be sure to open all stop valves as running the system with the stop valves closed would damage the compressor.



ELECTRICAL WIRING

WARNING

- **Take note of the risk of electric shocks during installation.**
- **All the electric wires and components must be installed by installation personnel with the proper certification, and the installation process must comply with the applicable regulations.**
- **Use only wires with copper cores.**
- **A main switch or safety device that can disconnect all polarities must be installed, and the switching device can be completely disconnected when the excessive voltage situation arises.**
- **Wiring must be carried out in strict accordance with the product nameplate.**

WARNING

- **Do not squeeze or pull the unit connection Ensure the wiring is not in contact with any sharp edges.**
- **Ensure earthing connection is safe and reliable. Do not connect the earth wire to public pipes, telephone earth wires, surge absorbers and other places that are not designed for earthing. Improper earthing may cause electric shock.**
- **Ensure fuses and circuit breakers meet corresponding specifications.**
- **Make sure an electric leakage protection device is installed to prevent electric shocks or fires.**
- **The model specifications and characteristics (anti high-frequency noise characteristics) of the electric leakage protection device are compatible with the unit to prevent frequent tripping.**
- **Before power on, make sure the connections between the power cord and terminals of the components are secure, and the metallic cover of the electric control box is closed tightly.**

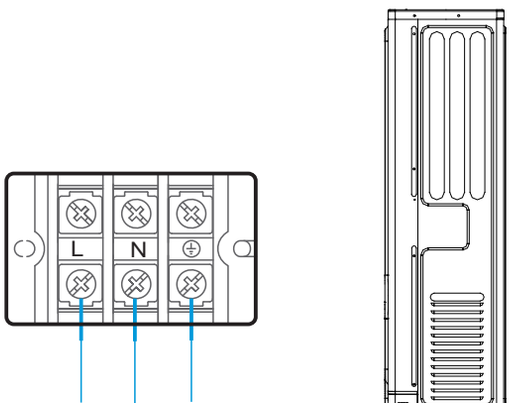
CAUTION

- **If the power supply lacks N phase or there is an error in the N phase, the device will malfunction.**
- **Some power equipment may have reverse-phase phase or intermittent phase eg a generator). For this type of power source, a reverse-phase protection circuit must be installed, as operating in the inverted phase may damage the unit.**
- **Do not share the same power supply line with other devices.**
- **The power cord may produce electromagnetic interference. Maintain a distance from equipment that may be susceptible to such interference.**
- **Separate power supply for the indoor and outdoor units.**
- **For systems with multiple units, ensure a different address is set for each.**

WARNING **To remove the electric control box as a whole, first release the refrigerant in the system, weld and disconnect the connecting pipe of the refrigerant radiator at the right rear of the electric control box, and remove all cables connected between the electric control box and the air conditioner.**

Wiring Layout

The wiring layout comprises the power cords and communication wiring between the indoor and outdoor units. These include the earth wires, and the shielded layer of the earth wires of the communication wiring. See below.



CAUTION

- **Power cords and communication wiring must be laid out separately, they cannot be placed in the same conduit. Use a power supply conduit to isolate if the current of the power supply is less than 10 A. If the current is greater than 10 A but less than 50 A, the spacing must exceed 50 mm at all times.**
- **Arrange the refrigerant piping, power cords and communication wiring in parallel, but do not tie together.**
- **Power cords and communication wiring should not contact the internal piping to prevent the high temperature piping from damaging the wires.**

CONNECTING THE WIRING

CAUTION

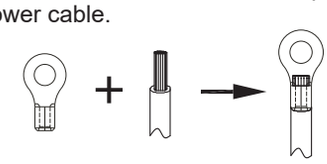
- **Do not connect the power supply to the communication terminal block..**
- **Turn off the power supply first.**
- **Connect the earth wires, earth wires must use yellow-green wire.**
- **Tighten the terminal with an appropriate screwdriver.**

CAUTION

- **The power supply cable diameter must comply with the specified specification.**
- **The power supply cable must be clamped to prevent external force being applied to the terminal.**

1. Fit terminals to wiring

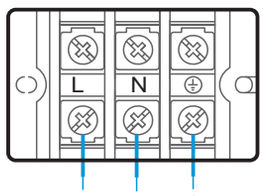
Use round-type terminals of the correct specifications to connect the power cable.



WARNING **Use rubber cable grommet in knockout holes to avoid power supply cable and communication wiring wear.**

2. Connect the power cord.

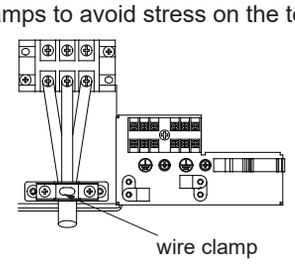
Connect the appropriate wire to the connector block which are marked L,N and with the symbol "⏚" earth wire



WARNING **Terminals must be used for connection. Use round terminals to connect the power cables. Do not directly connect the cable ends.**

3. Fasten and fix the cables

Use the wire clamps to avoid stress on the terminals.



WARNING

- **Select a proper torque according to the screw size.**
- **Too small torque may cause poor contact, resulting in heating of the terminals and fire. Too large torque may damage the screws and power supply terminals.**

The size of the screws and recommended torque are as follows:

Screw size	Standard value (kgf.cm)/(Nm)
M4	12.2/1.2

CAUTION

During installation, the earth wire must be longer than the current carrying conductor to ensure that if the fixing device is loose, the earth wire is still not stressed and can be reliably earthed.

When inserting the strong-current cables and communication wiring into the wiring holes, they must be equipped with wiring across rings. Otherwise, they may be worn out by the sheet mental and cause electric leakage or short circuit.

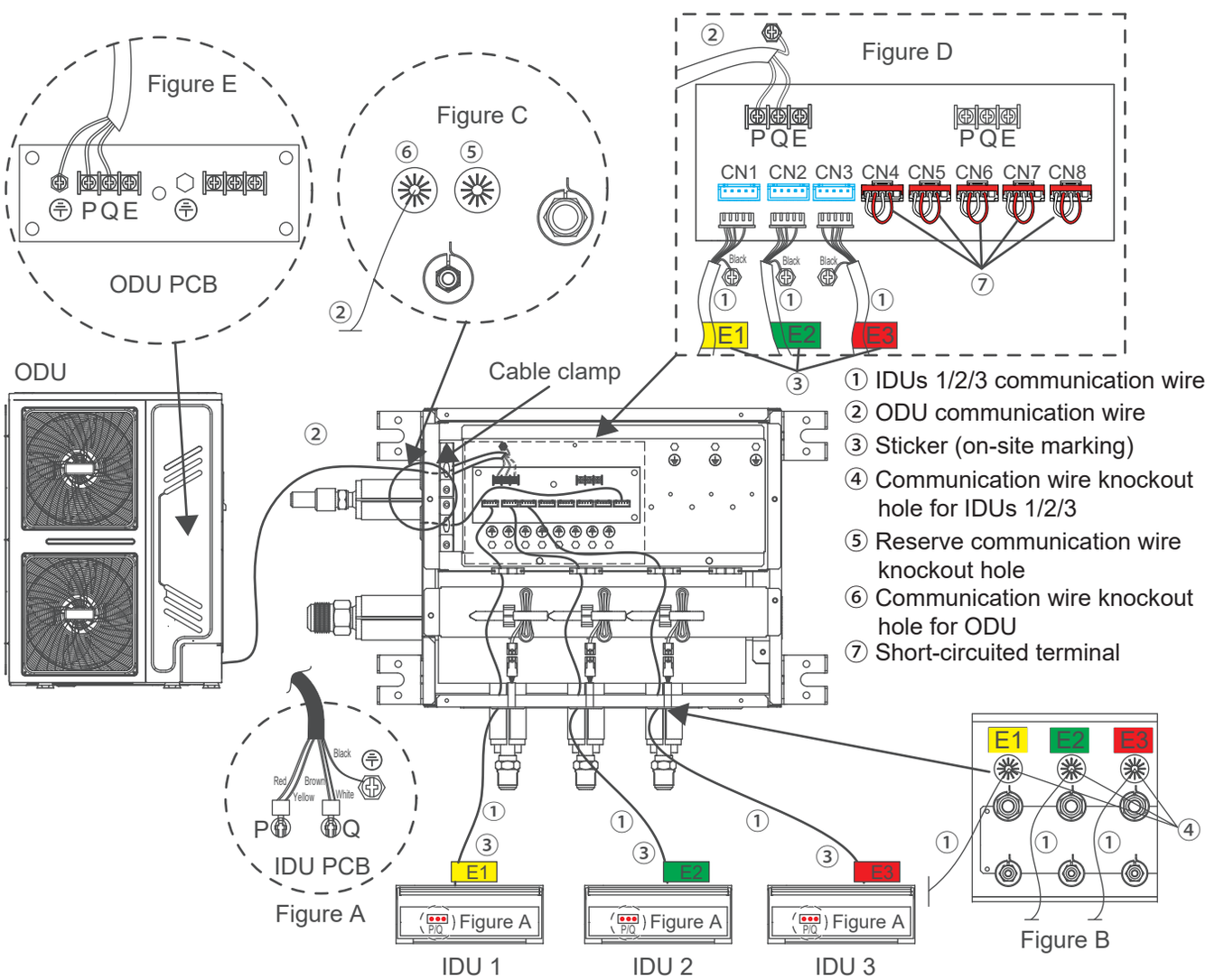
4. Connect the communication wires

1. Remove number stickers ③ from the accessory kit, and attach the number stickers (E1-E6, indicating connection to IDUs 1-6 of the branch box) to both ends of the ① extension cable of the electronic expansion valve coil
2. Figure A: Connect the U-shaped plugins of the ① IDUs 1/2/3 communication wires (with number stickers) to the P/Q ports of the IDUs 1/2/3 main control board PCB.
   Figure B: Pass the other terminal of the ① IDUs 1/2/3 communication wires through the ④ knockout hole. The stickers numbered E1, E2, and E3 indicate that the knockout hole, branch pipe joint (liquid-side), and branch pipe joint (gas-side) correspond to IDUs 1/2/3, respectively.
   Figure C: Pass the other terminal of the ② ODU communication wire through the ⑥ knockout hole.
   Figure D: Insert ① IDUs 1/2/3 communication wires to CN1/CN2/CN3 ports of corresponding PCB , and connect ② ODU communication terminal to P/Q port of corresponding PCB
   Figure E: Connect the other terminal of the ② ODU communication wire to the P/Q port of the ODU PCB

NOTE **The adhesive side of the stickers should be pressed firmly onto the cable after both ends are folded.**

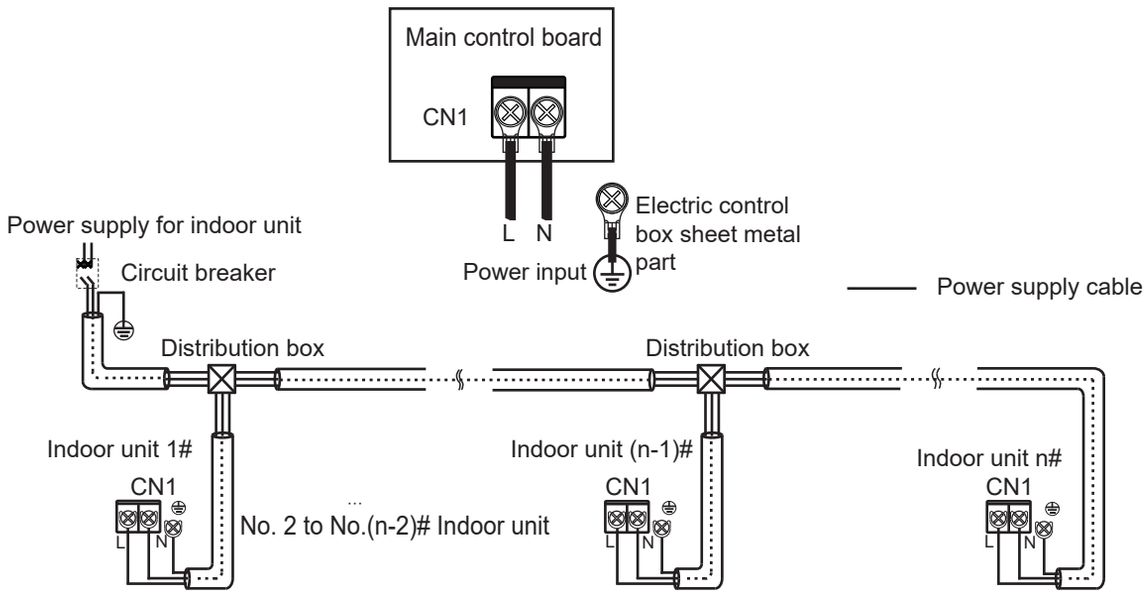
CAUTION

- **The IDU and ODU communication wires must have their shielded layer earthed.**
- **The CN1/CN2/CN3/CN4/CN5/CN6 ports on the PCB shown in Figure D are for connecting the communication wires of the IDUs with external electronic expansion valves in the branch box.**



5. Connect the Power Supply Cables

The power supply terminal of the indoor unit is fixed on the main control board, the power supply cable is connected to the power supply terminal labeled "CN1" on the main control board. The live and neutral wires are connected according to themain control board logos "L" and "N", and the earth wires is directly connected to the electric control box sheet metal part. Connection between the power supply cable and power supply terminal.



WARNING

Do not connect the earth wire of the lightning rod to the unit shell. The earth wires of the lightning rod and the power cable must be configured separately.

Each unit MUST be equipped with a circuit breaker for short circuits and overload protection. In addition, the indoor and outdoor units MUST each be equipped with a main circuit breaker to connect or disconnect the main power supply.

TEST RUN

After installation, and once the field settings have been defined, the installation personnel is obliged to verify the correctness of the operations. Follow the steps below to perform the test run.

The test run usually includes the following stages:

1. Review the "Checklist Before Test Run".
2. Implement the test run.
3. Correct the errors before the test run.
4. Run the system.

Precautions

WARNING

During the test run, the outdoor unit operates at the same time with indoor units connected to it. It is very dangerous to commission indoor units during the test run.

Do not insert fingers, sticks, or other items into the air inlet or outlet. Do not remove the fan mesh cover.

NOTE

The required input power may be higher when this unit is run for the first time. Make sure the power supply is turned on 12 hours before operations so that the crankcase heater is properly energised. This is also to protect the compressor.

Correcting Issues after Test Run

The test run is complete when no error code is shown on the user interface or the outdoor unit. If an error code is displayed, correct the operation based on the description in the error code table. Conduct the test again to check it has been corrected.

NOTE

Refer to the installation manual of the indoor unit for details on other error codes related to the indoor unit.

Operating the Unit

Once the installation of the unit is completed, and the test run of the outdoor and indoor units is finished, the system can be run The indoor unit user interface should be connected to facilitate the operations of the indoor unit.

COMMISSIONING CHECKLIST

Once this unit is installed, check the following items first. After all the following checks have been completed.

☐	**Installation** Check if the unit is installed correctly to prevent strange noises and vibrations when the unit starts.
☐	**Field wiring** Based on the wiring schematic and the relevant regulations, make sure the field wiring is based on the instructions described in section 5.10 on connecting wires.
☐	**Earth wirings** Make sure the earth wirings is connected correctly, and the earthing terminal is tight.
☐	**Insulation test of main circuit** Use the megameter of 500 V, apply a voltage of 500 V DC between the power terminal and the earth terminal. Check that the insulation resistance is above 2 MΩ. Do not use the megameter on the transmission line.
☐	**Fuses, circuit breakers, or protection devices** Check that the fuses, circuit breakers, or locally installed protection devices comply with the size and type specified in section 4.4.2 on the requirements for safety devices. Make sure you use fuses and protection devices.
☐	**Internal wiring** Visually inspect if the connections between the electrical component box and the interior of the unit is loose, or if the electrical components are damaged.
☐	**Piping dimensions and insulation** Make sure the installation piping dimensions are correct, and the insulation work can be carried out normally.
☐	**Stop valve** Make sure the stop valve is open on both the liquid, low pressure and high pressure gas sides.
☐	**Equipment damage** Check for damaged components and extruded piping inside the unit.
☐	**Refrigerant leak** Check for refrigerant leaks inside the unit. If there is a refrigerant leak, try to repair the leak. If the repair is not successful, please call the local dealer. Do not come in contact with the refrigerant leaking from the refrigerant piping connections. It may cause frostbite.
☐	**Oil leak** Check if there is oil leaking from the compressor. If there is an oil leak, try to repair the leak. If the repair is not successful, please call the local dealer.
☐	**Air inlet/outlet** Check for paper, cardboard or any other material that may obstruct the air inlet and outlet of the equipment.
☐	**Add additional refrigerant** The amount of refrigerant to be added to this unit should be marked on the "Confirmation Table" which is placed at electrical control box front cover.
☐	**Installation date and field settings** Make sure the installation date is recorded on the label of the electric control box cover, and the field settings are recorded as well.

MAINTENANCE PRECAUTIONS

NOTE **Arrange for maintenance to be performed yearly.**

Safety Precautions

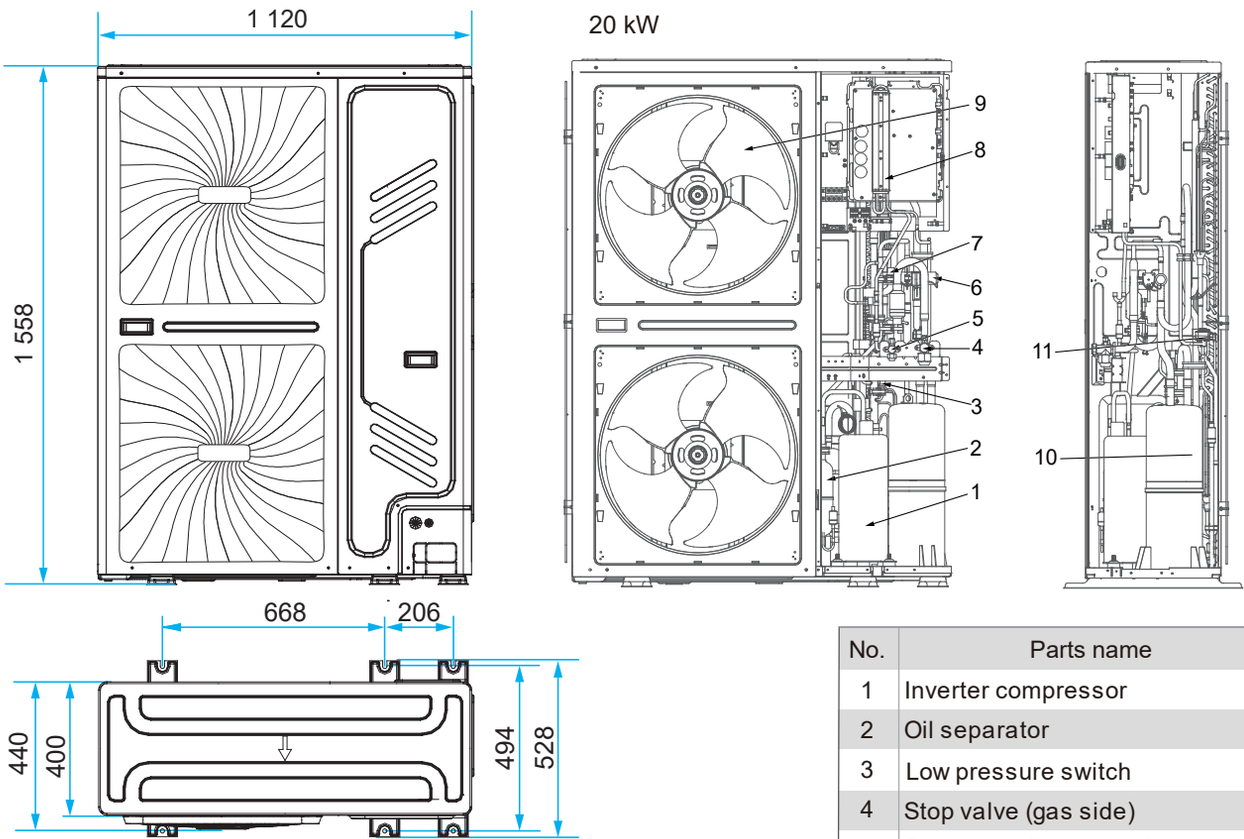
NOTE **Before carrying out maintenance or repair work, touch the metal parts of the unit to dissipate static electricity to protect the PCB.**

Prevent Electrical Hazards

When maintaining and repairing the inverter module

1. Do not open the cover of the electrical component box within 5 minutes after the power is switched off.
2. Verify that the power supply is switched off before you use the measuring instrument to measure the voltage between the main capacitor and the main terminal ensure that the capacitor voltage in the main circuit is less than 36 VDC. the position of main terminal have be shown in the Wiring nameplate (The port of CN38 on the inverter module board).
3. Pull out the plug connecting to the power cord of the fan to prevent the fan from rotating when it is windy outside. The strong winds will cause the fan to rotate and generate electricity which can charge the capacitor or terminals, leading to an electric shock. At the same time, do take note of any mechanical damage. The blades of a high speed rotating fan are very dangerous and cannot be operated by one person alone.
4. Once the maintenance or repair is completed, remember to reconnect the plug to the terminal; otherwise, a fault will be recorded.
5. When the unit is power on, the fan of the unit with auto snow-blowing function will run periodically. Ensure the power supply is off before touching the unit.
6. Please refer to the wiring schematic on the unit.

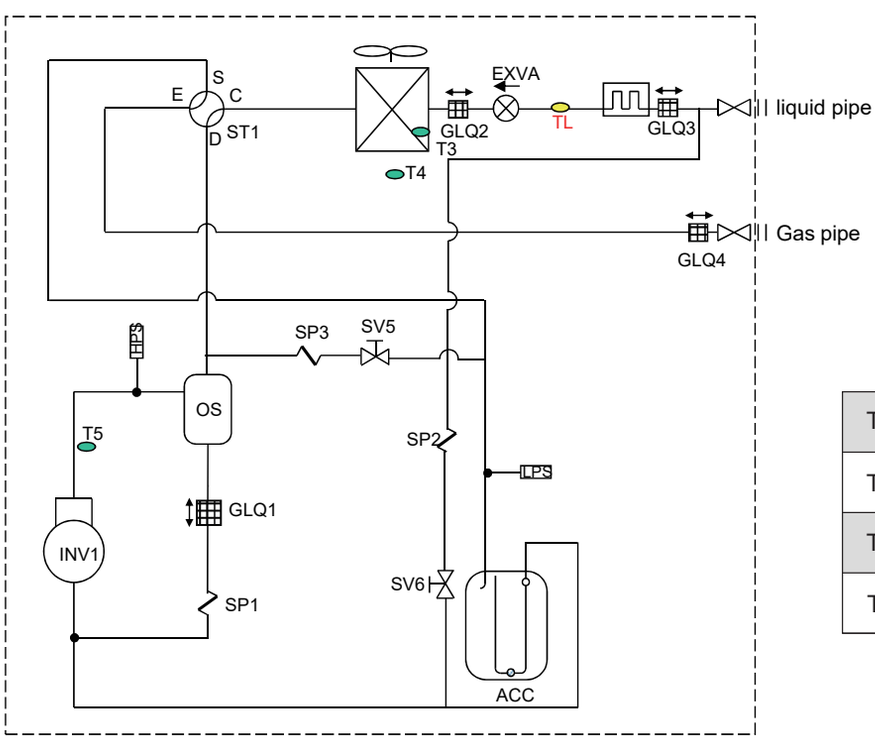
DIMENSIONS AND COMPONENT LAYOUT



No.	Parts name
1	Inverter compressor
2	Oil separator
3	Low pressure switch
4	Stop valve (gas side)
5	Stop valve (liquid side)
6	4-way valve
7	High pressure switch
8	Heat exchanger
9	Inverter fan
10	Gas-liquid separator
11	Electronic expansion valve (EEVA)

NOTE **Product dimension may vary slightly (tolerance range ±30 mm), Check actual dimensions before purchasing.**

REFRIGERANT CIRCUIT



T3	Main heat exchanger pipe temperature sensor
T4	Outdoor ambient temperature sensor
T5	Compressor discharge temperature sensor
TL	Condenser outlet temperature sensor

WARRANTY

TERMS OF WARRANTY – AUSTRALIA

Rinnai Australia Pty. Ltd. ABN 74 005 138 769, 82-88 Mills Road, Braeside, Victoria, 3195.

1 DEFINITIONS

The terms listed below shall have the following meanings:

1 **"Authorised Service Representative"** means an independent service contractor authorised by Rinnai or Rinnai service personnel.

2 **"Rinnai"** means Rinnai Australia Pty Ltd (ABN 74 005 138 769) and any related company.

3 **"Certificate(s) of Compliance"** means certificate(s) issued by licensed personnel (including plumbers, refrigeration mechanics, electricians or other relevant tradespeople) to certify that any prescribed works comply with applicable regulatory requirements.

4 **"Certificate(s) of Occupancy"** means certificate(s) issued by the local government authority (or similar organisation) which certifies that a home can be occupied.

5 **"Installation Site"** means the site at which the Product is originally installed.

6 **"Normal Business Hours"** means 8:30am to 5:00pm Monday to Friday, excluding public holidays.

7 "Operating/Installation Instructions" means the user manual or other documentation which provides detailed instructions on the proper operation and maintenance of the Product.

8 **"Other Applications"** means any Product used for purposes other than Residential & Light Commercial Applications. Other Applications may include but are not limited to factory, IT/Server room, telephone exchange, processing area (e.g. bakery, kitchen, warehouse, swimming pool, agricultural facilities such as a nursery). Any Product which has been installed, for whatever purpose, as a retrofit component to an existing system, will also be classed as being part of an "Other Application" regardless of the purpose of use of the existing system into which such product has been installed.

9 **"Purchaser"** means the end user of the Product, the person named as owner in the Warranty certificate, the holder of the Proof of Purchase or the holder of a property transfer document where the Product is included as part of the chattels.

10 **"Product"** means the equipment purchased by the Purchaser and described in Section 2 of this document.

11 **"Proof of Purchase"** means a Tax Invoice or Receipt in respect of the Product. In the case of new constructions, a Certificate of Occupancy or a Certificate of Compliance that details the date of installation or commissioning will suffice.

12 **"Qualified Installer"** means the qualified installation contractor who is responsible for performing the installation work in the manner prescribed by local and statutory regulations, including compliance with any relevant and to Rinnai specifications, including Australian Standards.

13 **"Residential & Light Commercial Applications"** means any Product for use in residential or light commercial applications where

a) the Product is solely used for the purpose of human comfort; and
b) the ambient temperature of the space the Product is intended to heat or cool is influenced solely or primarily by natural exterior weather conditions rather than by man-made or mechanical heat sources.

Examples of Residential & Light Commercial Applications include, homes, offices, hotels, apartments, nursing homes, hospitals, health care premises, shopping centres, and retail stores.

2 TERMS OF WARRANTY

2.1 Subject to the terms of warranty set out in this document, and effective from the date of completion of installation, the product is warranted to be free from defects in materials & factory workmanship for the period set out in the table below:

	PRODUCT GROUPS	PARTS	LABOUR
Residential and Light Commercial	Evaporative Coolers & Ducted Gas Heaters (excluding Compact Classic Series)	5 Years *Extended 4 Years Option	5 Years *Extended 4 Years Option
	Ducted Gas Heaters - Compact Classic Series	3 Years	3 Years
	Refrigerated Air Conditioning Products	7 Years	7 Years
	VRF Air Conditioning Products	5 Years	5 Years
	Ducted Gas Heaters - Heat Exchangers and Burners Evaporative Coolers - Structural components only	10 Years	N/A
	Portable Air conditioning (1) / Dehumidifier (1) / Air Purifier (1)	2 Years	N/A
	Electric Panel Heaters (1)	7 Years	N/A
	Electric Fire Heater	5 Years	5 Years
	Outdoor Radiant Heater	3 Years	1 Year
	Wi-Fi Devices	1 Year	1 Year
Other Applications	All Product Groups	2 Years	1 Year
After Market	Spare Parts	1 Year	N/A
*Extended Warranty Option	Up to 4 year extended warranty (in addition to the standard warranty period listed above) applies on selected products when you opt in to the Rinnai Service Advantage program. This program has terms and conditions, including the requirement for scheduled servicing of the product by Rinnai. To participate in the program you must register your product online at: www.rinnai.com.au/ support-resources/ warranty-registration/ within the first 12 months of the product being installed.		

(1) *To make a claim under this warranty, please contact your place of purchase within the warranty period.*

2.2 Rinnai will determine in its sole discretion, which classification the Product fits into and the corresponding Warranty that shall apply.

2.3 An Authorised Service Representative will repair or replace, at its option, the Product or any part of the Product that its examination shows to be defective. The repair or replacement shall be performed during Normal Business Hours by an Authorised Service Representative. Repair by persons other than an Authorised Service Representatives may void the Warranty.

2.4 Alternatively to clause 2.3 above, Rinnai can at its discretion elect to pay you an amount equivalent to the cost of repairing or replacing the Product.

2.5 If Rinnai provides you with either the replacement costs or replacement product, ownership of the original Product shall immediately transfer to Rinnai.

2.6 Rinnai is responsible for reasonable costs associated with legitimate warranty claims, including call-out of an Authorised Service Representative to inspect the Product. Rinnai is not responsible for:

a) costs for tradespeople engaged by you that are not Rinnai Authorised Service Representatives.
b) any costs, including call out costs for a Rinnai Authorised Service Representatives, associated with a Product which is determined upon inspection not to be covered by this warranty.

2.7 Rinnai will reimburse any reasonable costs associated with making a legitimate warranty claim against Rinnai which are not otherwise specified above.

2.8 The Warranty of the Product requires that, in addition to all other conditions, the Purchaser conducts regular and/or preventative maintenance as may be specified by the Operating/Installation Instructions or otherwise directed by Rinnai and required by the level of usage and the usage environment, including the use of correct and uncontaminated refrigerants and lubricants. Refrigeration, plumbing and electrical works must be undertaken by licensed personnel.

2.9 Where a Product or failed component is replaced under warranty, the time remaining on the original Product warranty period will continue to apply and the replacement product or part will be subject to the original warranty period only.

3 CONDITIONS OF WARRANTY

3.1 The Purchaser may only obtain the benefit of the Warranty if the Purchaser:
- a) maintains and has the Product serviced in accordance with the instructions set out in the service section of the relevant Service or Owner's Manual;
- b) complies with clause 7 "Purchaser's Responsibilities" on page 22;
- c) notifies Rinnai within 30 days of a defect occurring or, in the case of a latent defect, becoming apparent, that a claim is being made under this Warranty; and
- d) provides, in support of the claim made under this Warranty, a proof of date of completion of installation.

3.2 This document (and any statutory consumer guarantees) represents the only Warranty given by Rinnai in respect of the Product. No other person or organisation is authorised to offer any alternative warranty on behalf of Rinnai.

3.3 If the date of completion of installation cannot be established to Rinnai's satisfaction, the date shall be deemed to be 2 months after the date of manufacture or date of sale by Rinnai, whichever is the latter.

3.4 This warranty applies to Products which are manufactured on or after the date of publication of this warranty but before the next date of publication of this warranty.

4 EXCLUSIONS

4.1 This Warranty **DOES NOT** cover:
- a) damage, problems or failure resulting from improper operation and/or inadequate maintenance by the Purchaser (refer Purchaser's Responsibilities section below);
- b) damage, problems or failure resulting from improper or faulty installation. The Product must be installed by a Qualified Installer in accordance with applicable regulations. Where applicable, Certificate(s) of Compliance must be obtained by the purchaser from the Qualified Installer and presented to the Authorised Service Representative;
- c) damage, problems or failure caused by factors external to the Product including, but not limited to, faulty or poor external electrical wiring, incorrect or faulty power supply, voltage fluctuations, over voltage transients or electromagnetic interference, inadequate or faulty gas, drainage services, or water services, including water pressure, and non-potable water;
- d) damage, problems or failure caused by acts of God, fire, wind, lightning, flood, storm, hail storm fallout, vandalism, earthquake, war, civil insurrection, misuse, abuse, negligence, accident, pests, animals, pets, vermin, insects, spiders/bugs or entry of foreign objects or matter into the Product such as dirt, debris, soot or moisture;
- e) damage, problems or failure caused by environmental conditions including, but not limited to, excessive moisture, salt or other corrosive substances or atmospheric conditions;
- f) Product which has been installed in a portable or mobile building, structure or application including, but not limited to, a caravan, boat or trailer;
- g) Product which has been re-installed at a location other than the original site;
- h) any consumable item supplied with the Product including, but not limited to, an air filter, battery, fan belt, igniter or cooler pad;
- i) installation of third-party components that may be attached to the Product. These include, but are not limited to, control wiring, ducting, return air filter(s) grille, register, diffuser, zone motors, controls/ thermostats, pipe work and fabricated or added components. These items remain solely the responsibility of the Qualified Installer;
- j) installations where electrics/electronics may be subjected to moisture/chemicals (e.g. swimming pools or nurseries);
- k) any repair, which is needed as a result of an accident, misuse, abuse or negligence;
- l) Product that is utilised in an environment (indoor and outdoor) outside its specified operating range; and
- m) fair wear and tear to the Product.
- n) On-site labour warranty on portable (non-fixed installation) Products – In respect of such Products the Purchaser must return the Product to the supplier for repair or replacement).

5 LIMITATIONS

5.1 Third parties are often involved in providing advice to consumers about the climate control solutions best suited to the consumer's needs. Any advice or recommendations given by such parties, including advice about Product fitness for purpose and overall system design, sizing and application are not the responsibility of Rinnai. This includes but is not limited to the heat load calculations, airflow and system balancing.

5.2 This Warranty does not apply to any Product installed at an Installation Site which is outside Australia.

5.3 Except where inconsistent with the purchaser's statutory rights and the rights given by this Warranty, all liabilities of Rinnai for any direct, special, indirect or consequential loss or damage, any damage or expense for personal injury or any loss or destruction of property, arising directly or indirectly from the use or inability to use the Product or any of its parts and/or servicing the Product, are expressly excluded.

6 TRAVEL, TRANSPORT & ACCESS COSTS

6.1 The Purchaser must pay freight charges, in-transit insurance expenses and travelling costs for repairs/replacements under this Warranty, that are required to be performed 50km from the nearest Rinnai branch or Authorised Service Representative.

6.2 Subject to clause 6.3, Rinnai will pay freight charges, in-transit insurance expenses and travelling costs for repairs/replacements that are required to be performed less than 50km from the nearest Rinnai branch or Authorised Service Representative, subject to the following:

a) Rinnai will arrange for such repairs/replacements and make any payment directly to the third party to provide the freight, in-transit insurance or travel services; or

b) if Rinnai considers appropriate, it will authorise the Purchaser in writing to pay for the relevant freight charges, in-transit insurance expenses or travelling costs and then, upon provision by the Purchaser to Rinnai of a tax invoice showing those costs have been incurred, reimburse the Purchaser for such costs which are within the terms of the authorisation. If the Purchaser pays for the relevant freight charges, in-transit insurance expenses or travelling costs without written authorisation from Rinnai, Rinnai will not reimburse the Purchaser for such costs.

6.3 The Purchaser must pay all costs and expenses in respect of:

a) any service call out fee if the Product is not accessible for service

b) making the Product accessible for service, for example, restricted access or working at heights, or the labour cost for an additional person due to OHS requirements.

c) providing a safe working environment for installation, service, maintenance or repair of the Product;

d) any surcharge applicable in respect of supplying replacement parts outside Normal Business Hours; and

e) any other costs and expenses in relation to claiming the Warranty that is not covered by clause 6.2.

7 PURCHASER'S RESPONSIBILITIES

7.1 The Purchaser must operate and maintain the Product in accordance with the Operating Instructions and service maintenance schedule, including conducting an appropriate number of services to the unit during the Warranty period, based on usage and the usage environment including but not limited to;

a) regularly cleaning the air filter(s) and replacing them where necessary;

b) replacing expired batteries or other consumables as required;

c) ensuring that the condensate drain is kept clean and clear of obstructions.

HOW TO MAKE A WARRANTY CLAIM:

If you wish to make a warranty claim in respect of any Portable Product, please return it to the place of purchase, or if that is not possible, contact Rinnai to enquire about alternative arrangements.

If you wish to make a warranty claim in respect of any fixed Product, please contact Rinnai on the details set out below to make arrangements for an Authorised Service Representative to inspect the product.

As per clause 2.6 of the Terms and Conditions of Warranty, purchasers are responsible for the costs of any repair and/or call out fee where, on inspection, the alleged defect is found by Rinnai's Authorised Service Representative not to be covered by this warranty or any statutory consumer guarantee applicable to the Product.

The Terms and Conditions of Warranty contain important information about your rights and obligations under this warranty. Please read them fully and carefully before making a claim.

NOTICE TO CONSUMERS UNDER AUSTRALIAN CONSUMER LAW

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

Our services come with guarantees that cannot be excluded under the Australian Consumer Law. For a major failure with the service, you are entitled to cancel your service contract with us and obtain a refund for the unused portion, or to compensation for its reduced value. You are also entitled to be compensated for any other reasonably foreseeable loss or damage. If the failure does not amount to a major failure you are entitled to have problems with the service rectified in a reasonable time and, if this is not done, to cancel your contract and obtain a refund for the unused portion of the contract.

The benefits provided by this Warranty are in addition to any other rights and remedies available to a consumer under the Australian Consumer Law and any other law which may apply to the goods and or services.

Rinnai Australia Pty Ltd

ABN 74 005 138 769 | AU45204

82-88 Mills Road, Braeside, Victoria 3195
P.O. Box 460, Braeside, Victoria 3195
Tel: (03) 9271 6625

Customer Support
Tel: 1300 555 545*
Monday to Friday, 8.00 am to 5.00 pm EST.

**Cost of a local call may be higher from a mobile phone. (National calls from public phones in Australia are free.)*

For further information visit **www.rinnai.com.au** or email **enquiry@rinnai.com.au**

Rinnai has a Service and Spare Parts network with personnel who are fully trained and equipped to give the best service on your Rinnai appliance. If your appliance requires service, please call our National Help Line. Rinnai recommends that this appliance be serviced once a year.

With our policy of continuous improvement, we reserve the right to change, or discontinue at any time, specifications or designs without notice.