



YMGI: Engineered Comfort Products for An Efficient and Sustainable Green World!

INSTALLATION INSTRUCTIONS & USER'S MANUAL

DC Inverter Multi Variable Refrigerant Flow (VRF) System VRF Heat Pump Ultra Heating 8, 10 & 12 Ton Top Discharge Outdoor Unit



For Model Numbers:

- VRFO-72VP-U2C(55)5
- VRFO-96VP-U2C(55)5
- VRFO-120VP-U2C(55)5

Thank you for choosing this YMGI product. Please read the user's manual carefully before installation/operation and retain for your records and future reference. If you need a replacement copy, please contact your local agent or visit www.ymgigroup.com to download a current electronic version.

NOTICE

This product is designed and manufactured to be free from any defects in material and workmanship during normal use and maintenance. Installation, operation, maintenance and repairs must follow all standards and professional practices for regular cooling and heating equipment, such as NEC, State, or Local Codes and all related documents/manuals provided by YMGI. Failure to follow and adhere to all codes and documentation can cause damage to equipment, property or even personal injury.

Installer: Must be currently licensed/certified HVAC technicians only. Must Read the manual and all provided documents prior to installation. Complete and fill out all required information on the **Warranty Registration Card**.

User: Retain this manual and all supplied documents for your records and future reference.

Service: Use this manual for information concerning servicing and maintenance of this product.

SAFETY WARNING

Only qualified technicians should install and service this equipment. The installation, startup, operation and servicing of this equipment can be hazardous and requires a HVAC professional who has been trained, licensed and certified. Installations, adjustments or any equipment alterations done by an unqualified person could result in serious injury and even death. When working on the equipment, observe all precautions in the provided documents, on the tags, stickers, and labels that are attached to or placed on the equipment.



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Introduction

Read this manual carefully, making sure you understand all the instructions, practices and procedures contained in this manual. Be sure you are familiar with all the safety advisories that appear throughout this manual. Your personal safety depends upon your observance of all precautions contained in this manual.

The 3 types of advisories are defined in the following table:

⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in serious injury or even death.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It is also used to alert against unsafe practices.
NOTICE	Indicates a situation that could result in equipment or property-damage only. It can also be used to call attention to important details within this manual.

Important Environmental Concerns

Studies have shown that certain man-made chemicals can affect the earth's stratospheric ozone layer when released into the atmosphere. Refrigerants that contain Chlorine, Fluorine and Carbon (CFCs) and those containing Hydrogen, Chlorine, Fluorine and Carbon (HCFCs), may affect the ozone layer. Not all refrigerants have the same potential impact on the environment. YMGI Group advocates for the responsible handling of all refrigerants including industry replacements for CFCs such as HCFCs and HFCs.

Responsible Refrigerant Practices

YMGI Group believes that responsible refrigerant practices are important to our customers, the HVAC/R industry and the environment. All HVAC/R technicians who handle refrigerants must be certified. The Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering and recycling of certain refrigerants, the equipment and tools necessary to perform these service procedures. In addition, some states or municipalities may have additional requirements that must also be adhered to for responsible management of refrigerants. HVAC/R technicians must know the applicable laws and follow them.

Disposal Notice

Do not dispose of this product or its components as unsorted municipal waste, as they contain items that may require special treatment. Contact your local waste management company for details.

⚠ WARNING

Proper Field Wiring and Grounding Required!

Failure to follow established electrical codes can result in death, serious personal injury and property damage. All field wiring **MUST** be performed by qualified personnel, such as a currently licensed electrician. Improperly installed and grounded field wiring poses **FIRE** and **ELECTROCUTION** hazards. To avoid these hazards, you **MUST** follow the requirements for field wiring installation and grounding as described in this manual, by NEC and your state/local electrical codes.

⚠ WARNING

Personal Protective Equipment (PPE) Required!

Failure to wear proper PPE for the job being undertaken could result in serious injury or even death. Technicians must take the necessary precautions to protect themselves from potential electrical, mechanical, and chemical

hazards and MUST follow all precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- Before installing or servicing this unit, technicians MUST put on all PPE recommended for the work being undertaken. ALWAYS refer to appropriate Material Safety Data Sheets (MSDS) and Occupational Safety and Health Administration (OSHA) guidelines for proper PPE.
- When working with or around hazardous chemicals, ALWAYS refer to the appropriate MSDS sheets and OSHA guidelines for information on allowable personal exposure levels, proper respiratory protection, and handling recommendations. If there is a risk of arc or flash, technicians MUST put on all PPE in accordance with NFPA 70E or other country-specific requirements for arc flash protection, PRIOR to servicing the unit.

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This document and the information contained therein are the sole property of YMGI Group and shall not be used or reproduced in whole or in part, without the written permission of YMGI Group. YMGI Group reserves the right to revise this manual at any time and to make changes to its content without obligation to notify anyone about any modifications, revisions or changes.

⚠ WARNING

- Instructions for installation and use of this product are provided by the manufacturer.
- Installation must be performed by authorized and licensed personnel only and in accordance with all the requirements of this manual, the NEC, CEC and any state/local codes.
- For safe operation of this unit, please read and follow all instructions carefully.
- The total operation capacity of the indoor units should not exceed 120% of the total capacity of the outdoor units if all indoor units must operate at their peak capacities all the time. Otherwise, the heating and cooling operation will be diminished and less efficient which could damage the units.
- Any person responsible for system operation or system maintenance should retain this manual for reference.
- If the unit fails to operate normally, please contact your authorized system installer or HVAC professional as soon as possible and provide the following information:
 - Data on the unit (model number, serial number and owner's name).
 - A detailed description of the unit's problem before and after the problem occurred.
- To avoid personal injury or property damage, do not disassemble the unit yourself. If disassembly is required to check the unit, contact your authorized system installer or HVAC professional as they have the experience and training necessary to perform this task.

Note: Each unit has been thoroughly tested to ensure it operates correctly before leaving the factory.

Basic Cautions and Warnings

⚠ CAUTION

All units shall be installed by an experienced HVAC licensed contractor or technician. Read all manuals before installation, startup and operation.

⚠ CAUTION

All NEC, state, local codes and installation instructions must be followed for all units, otherwise, the unit warranty will be void and could result in serious damage to people or property.

⚠ WARNING

YMGI Group is not responsible for any damage or loss due to Do-It-Yourself (DIY), self-installation or any improper installation, operation, service or natural disasters of any kind.

⚠ WARNING

Do not connect power to the unit until all wiring, tubing and all unit inspections and tests have been completed. Ground the unit according to the instructions and adhering to NEC, state and local codes.

⚠ WARNING

All wiring connections must be correct and secure. Loose wire(s) or improper contacts may cause arcs or overheating which can result in a fire hazard.

Note From YMGI – **Must Read**

Dear Customers, Installers, and Contractors

Thank you for choosing a YMGI product.

All YMGI's products are fully tested and have passed rigorous safety, performance and manufacturing standards before being packed and shipped. YMGI only uses suppliers that meet our strict standards for high quality and performance for all parts. YMGI also recognizes a quality installation is equally important therefore your system must be installed by a licensed HVAC professional. A quality installation ensures your unit will operate at its highest efficiency and peak performance for many years of worry free comfort; while a poor installation can result in unit failure and cause the unit to operate inefficiently, either immediately or over time, resulting in costly repairs.

Because a quality installation is so critical, YMGI provides detailed information in our manuals which will aid the installing technician and the owner of the unit(s).

At YMGI our goal is to ensure that your YMGI units are installed properly and correctly from the beginning.

The YMGI equipment you purchased is either a split-type or a self-contained cooling/heating system. These types of systems require a certified and licensed HVAC professional technician for proper installation. Only a certified and licensed HVAC professional technician will have the knowledge, experience, and attention for all required details to perform a complete and successful installation. This equipment is different from a window or portable type air conditioners you can purchase from local big box and retail stores which the manufacturer may not require certified and licensed personnel to install.

Reading and following YMGI Group recommendations and requirements contained in the following pages and other documents, is the first step to help ensure a smooth installation and proper operation of your unit for many years.

⚠WARNING

YMGI does not recommend nor allow any Do-It-Yourself (DIY) installation (partially or fully). Due to the complexity of the installation of this product most DIY installations usually have problems, either immediate or in the near future. These problems can cost more to fix than any upfront savings. **YMGI warranty does not cover any DIY units.**

If you have any questions about your unit or if the unit has a problem, you should first check the manual. If you can't find a solution, then contact your local installer or service technician to schedule a service appointment. The technician can physically inspect the unit. If at the time of inspection, the installer or service technician has any questions about the unit, they can contact YMGI technical support division directly at:

Toll Free Number: (866)833-3138 or Email: techsp@ymsgigroup.com

IMPORTANT: YMGI Group is the MEDIA AUTHORITY:

YMGI Group, located in O'Fallon, MO 63366 is the author of all media produced for its products and is the only party able to give any additional explanation for any data, definitions and or descriptions found within any of its media, including but not limited to YMGI product brochures, manuals, pamphlets, catalogs, and videos. YMGI's distributors, installers, dealers, agents, customers or any other third parties will not supersede YMGI in anyway concerning YMGI published materials and their meaning. Any concerns or questions arising from YMGI distributors, installers, dealers, agents, customers or any other third parties, should be presented directly to YMGI. YMGI will respond to any concerns or questions, if necessary, about any of its media in writing.



NOTICE

- Be sure to only hire a certified and currently licensed HVAC Company to complete 100% of the installation so that all details of the installation are performed correctly and completely.
- Factory Warranty will be void if any portion of the installation is not performed by a licensed HVAC contractor/technician. DIY or partial DIY will also void ALL factory warranties.
- Hiring an HVAC technician that is offering their services as a "side job" rather than a licensed HVAC company may pose possible risk. This may result in an incomplete or unsatisfactory installation, no guarantee for workmanship, maintenance or further service to your unit.
- Have the installation technician read in full the installation manual and all supplied documents for the product model you purchased. Details within the provided documentation contributes greatly to the success and quality of the installation. Experience with other manufacturers may not be applied fully to another manufacturer, although there will be similarities there will also be differences. Ignoring the provided installation procedures is an act of negligence and may cause unit failure or damage which could be permanent.
- It is possible for a licensed contractor/technician to make a mistake during the installation. YMGI does not supervise nor is able to control the contractor/technician's installation. It is critical that the installer take each variable into account during the initial installation. This will ensure a complete and professional installation and that all units work properly.

⚠WARNING

The following will damage the unit and its key components resulting in loss of factory warranty:

1. Any foreign substances introduced into the system because of failure to seal the ends of the refrigeration piping before pulling the piping through any structures at time of installation.
2. Not installing an oil P-trap in the copper suction line where the indoor unit is located 18 feet or more below the outdoor unit.
3. Cross piping and/or cross wiring of any units including more than one single zone or a multi zone system.
4. Not conducting a positive leak check by charging the system with dry-nitrogen and performing soap bubble testing.
5. Not conducting a negative leak check by evacuating the copper lines for 30 minutes. The vacuum must be held at 500 microns or better for at least 5 minutes, starting a 5-minute timer after the vacuum pump is turned off.
6. Not conducting a positive leak check prior to the negative leak check.
7. Not selecting the correct size wire or circuit breaker.
8. Not answering ALL questions in the technician's checklist located inside the warranty registration form.

⚠WARNING

The following may be overlooked, ignored, or considered unimportant during your installer's installation, but will cause your unit to underperform and may cause unit failure.

1. Any kinks in or improper bending of the copper piping.
2. Any poorly formed flares, not centering the flare with the flare nut, or not tightening all connections.
3. Not trial testing each indoor unit individually.
4. Not reading technical data (temp/time/pressure/current) after the system is stabilized (normally the compressor needs to run at least 10 minutes before reading the data). If the data is read too early, it may lead to inaccurate assessments about the unit.

In an effort to help protect our customers from possible faulty installations that can lead to premature unit failure, YMGI provides the above information for you (the owner) and the technician. You can observe while your system is being installed, even though your observation is not a guarantee your system is being or has been installed properly and professionally. With the information provided above, you will know some things to look for and questions you can ask. If at any time you feel there may be an issue with the installation, please have your technician contact YMGI at (866)833-3138 x 703 with any questions, issues or concerns you may have.

INSTALLING TECHNICIAN/CONTRACTOR'S RESPONSIBILITIES

1. Discuss with the customer detailed information about the structure to be conditioned, local weather (typical design, extreme temperature/humidity conditions, cooling and heating hours), previous and existing HVAC equipment (if any), usage and dependence on new HVAC equipment or YMGI products.
2. Performing a cooling/heating load calculation by using commercially available professional programs/methods such as Right-J (Manual J) for residential HVAC applications and Right-CommLoad (ASHRAE RTS/CLTD) for light commercial and commercial HVAC applications.
3. Contact your YMGI distributor/sales department or contact YMGI directly to obtain additional information to fully understand your YMGI products, including but not limited to product features, cooling/heating performance at standard ratings/conditions and extreme conditions, allowed indoor and outdoor temperature and humidity ranges, installation, operation, maintenance, service, warranty, parts and any other issues pertaining to YMGI products.
4. Select the correct (most suitable) YMGI product unit models and accessories necessary for your HVAC applications and list them in the proposal/quote, in writing, on company's quotation form or letter head, based upon the information you collected from 1, 2 and 3 listed above.
5. List your currently valid HVAC license number and EPA number in your proposal/quote.
6. Make sure you are the only party to perform the entire installation and you will not sub-contract any part of the installation to any unlicensed parties or persons. You will be solely responsible for the entire installation that you have been contracted.
7. Make sure you have all the materials you need to properly, completely and correctly finish the installation. The YMGI units and accessories may be just a portion of what you will need for the project. When support issues arise, remember YMGI employees and YMGI distributors/sales, dealers and agents are not installers and may only provide suggestions. You are the only one qualified to determine what other materials you need to complete the installation.
8. When connecting electrical wires, follow all NEC, state and local codes and ensure the installation of all YMGI units and accessories meet these requirements.
9. Connect the unit to a correctly sized electrical power source. If the unit is installed in an area where lightning or storms occur frequently, a correctly sized and type of power surge protector must be installed between the outdoor unit and the power source.
10. Select the correct types and sizes of HVAC circuit breakers, disconnect switch boxes, wires and conduit from circuit breaker to disconnect box and then from disconnect box to outdoor unit.
11. Select the proper location for installing indoor units and outdoor units with all factory requirements being followed (cooling/heating air inlets and outlets are not blocked, or restricted, mounting structure is secure, installation for convenience is considered, allow adequate clearance for maintenance/service and all applicable codes are met).
12. Cap/tape the two ends of every copper line before running them through any structure to keep any foreign substances from entering the copper line causing contamination. Label the copper lines A-A, B-B, C-C, D-D, or any other identifying marks on each pair of copper lines and wiring cable sets to keep from cross-piping or cross-wiring in multiple zone installations or where pipes for different single zone systems are close to one another.
13. Secure the wiring cables that connect between the indoor unit and outdoor unit, following all applicable NEC, state and local codes for your installation. If there are no special NEC, state or local codes to govern how these wires are to be installed, you can tape/cable tie them along with insulated copper line.
14. Tighten all pipe and wire connections ensuring there is no leakage or false/loose connections.
15. Conduct a positive pressure leakage test, checking each of the inter-connecting copper lines between each indoor unit and outdoor unit by charging with dry-nitrogen at the outdoor unit's service port (**NOTE: do not back-seat stopping valve**). A liquid soap solution shall be applied at all pipe connections to check for leakage. A 1/4" - 5/16" hose/valve adaptor may be needed if you have a 1/4" traditional manifold hose connection.
16. If there is no positive leaking, then conduct a negative pressure leakage test, checking all inter-connecting copper lines between each indoor unit and outdoor unit by pulling vacuum at the outdoor unit's service port (**NOTE: do not back-seat stopping valve**) and checking that a vacuum level of 500 Microns can be held for at least 20 minutes.
17. If there is no leakage found at any of the refrigeration pipe connections, flip up the indoor unit's face panel and remove its filter, carefully pour some clear water onto the up-right aluminum coil surface to test if the water can drain freely out of each of the indoor unit's without finding any leakage.
18. If there is water leakage found, locate the source of the leak and correct it. Only after everything is clear and all the necessary inspections made, engage the correct electrical power to the system.
19. Then back-seat stopping valves of the outdoor unit to release refrigerant from the outdoor unit into the inter-connecting pipes and the indoor unit.
20. Make sure both the indoor unit and outdoor unit are powered on correctly, operating the indoor unit in fan mode first. Then move on to test cooling, dehumidifying/drying, heating and other modes.
21. Read refrigerant pressures and pipe/valve temperatures only after the system is stabilized (normally 10 minutes after cooling/heating mode is started successfully). Record this data into the technician checklist in the lower half section of the Limited Product Warranty Registration Card/Form.
22. Adjust refrigerant charging level (remove refrigerant if pipe is shorter, the temperature is colder; add refrigerant if pipe is longer the temperature is warmer), following the manufacturer's instructions. If the average pipe length is shorter or longer than 25' and pressure/temperature readings at the outdoor unit service valves are not falling into normal ranges.
23. Explain to the user/owner about proper unit operation and maintenance. Leave your contact information to allow them to reach you. If the customer finds the unit does not work properly and cannot resolve the issue themselves, check the customer's units/parts/accessories and correct the issue if there is one. Communicate with YMGI-technical support line at (866)833-3138 x 703, if further help is necessary.

Following these requirements will aid in ensuring that the units to be installed meet general HVAC practicing standards and necessary factory requirements. Finding any possible problems early and preventing any further damage to the unit will help to ensure a properly working unit for many years.



LIMITED PRODUCT WARRANTY

Once the installation and successful testing of the system has been completely performed by a qualified licensed/certified HVAC technician/contractor, the registration card/form is filled out completely and correctly, mailed and filed along with a valid installation invoice from the contractor within 7 days of the original installation, the following standard **Limited Product Warranty** is qualified: **10-years** on the **compressor** and **5-year** on **PARTS ONLY**. There is **no labor coverage**.

YMGI products are designed and manufactured free from defects in workmanship, and materials for normal use. However, if for any reason, including occasionally transporting between YMGI factories/warehouses and your delivery location, you discover the unit has issues, YMGI Group will help field a solution by following YMGI's established warranty procedures:

Compressor: YMGI will warrant the compressor of a YMGI-validated and approved warranty filing, for a period of 10 years from the date of successful installation at its original installation location.

Parts: YMGI will warrant parts of a YMGI-validated and approved warranty filing, for 5 years from the date of successful installation at original installation location.

All warranty compressors and parts replaced will become the sole property of YMGI Group and must be returned upon request. Warranty parts may be new or refurbished. All parts are tested and approved before shipping. **At no time does YMGI Group warrant labor cost of any type. Warranty will start from the date of a successful installation at the original installation location, or 90 days as of original shipping date from YMGI Group, whichever comes first.**

This is a standard limited liability warranty and DOES NOT cover the following:

- Any damage or repairs to properties, or persons as an incident of or consequence of improper faulty transportation, installation, operation, maintenance or service.
- Any damage caused by frozen or broken water hoses or refrigeration pipes in the event of equipment failure.
- Any damage due to floods, fire, wind, lightening, accidents, corrosive atmosphere.
- Any damage due to interruption or inadequate electrical service to equipment.
- Any products that are installed outside the US or Canada.
- Any unit that has been moved from its original installation address.
- Any labor costs associated with the installation or service of the unit.
- Poor unit performance due to improper unit selection (SEER, Unit size).

To validate the above warranties, ALL of the following conditions must all be fulfilled:

1. The unit was fully (100%) and successfully installed by a licensed or certified HVAC technician.
2. The unit was installed following all NEC, state and local codes.
3. The unit was installed following all the information within the Instructions and User Manuals provided by YMGI Group.
4. ALL fields, especially the technician-checklist, of the **Limited Warranty Registration Card/Form** were filled out completely by the installing technician and signed by both the installing company's technician and the unit owner.
5. The **Limited Warranty Registration Card/Form** and a copy of the original installing company's invoice have been received by YMGI Group-Warranty Dept., POB 1559, O'Fallon, MO 63366, within 7 days of successful installation.

No warranty filing will be validated or approved, if any one of the above conditions are not met. Product registration does not guarantee the validity of this limited warranty statement.



Steps to follow for warranty part replacement:

1. The installing or service technician must contact YMGI tech support at 1-866-833-3138 ext. 703 from the installation location to check and confirm with YMGI Technical support the exact part(s) needed to fix the problem(s).
2. YMGI will check the customer's warranty filing. There will be no charge for Parts with a validated and approved warranty. Any Parts needed for warranties that have not been validated and approved or have an invalid warranty filing (resulting in an unapproved warranty request), will be charged accordingly.
3. YMGI will ground ship the parts ASAP. Expedited shipping is available at the customer's expense.
4. Replacement parts that have an approved warranty registration are to be warrantied for the remainder of the 5year on parts and a 10-year compressor warranty. Purchasing of replacement parts without a valid warranty filing or unapproved warranty request, will be sold as is and are not covered by any warranty.
5. YMGI is continually improving products with various engineering changes and these changes are made without prior notice. Such improvements or changes include but are not limited to product specification, appearance, functionality, size, packaging, etc. These improvements or changes will not void the limited warranty stated herein. YMGI is the final authority concerning this warranty policy.





YMGI GROUP

Innovative, Competitive, Efficient & Convenient

LIMITED PRODUCT WARRANTY REGISTRATION CARD / FORM

YMGI to Fill Top Portion, at Shipping, and Keep Copy A; Center Copy B for Installer to Fill and Mail back to YMGI; Bottom Copy C for Customer to Fill and Keep

For YMGI Use Only	The Company the Unit Was Sold Through: _____	Shipping Packing List Number: _____	Registration Card Serial No. _____
	Did the Company Pay to YMGI: _____	HVAC Contractor/Technician--Name _____	Date the Filled Registration Card YMGI Received: _____
	Installation Invoice Attached to the Registration Card _____	Hired YMGI-Recommended HVAC Contractor/Technician? _____	Unit(s) Work Successfully (Yes/No): _____

Outdoor Serial Number (One Outdoor Unit, One Registration Card/Form): _____	Indoor Serial Number: _____	For Multi Zone Units	Unit #1 _____	Unit #5 _____
			Unit #2 _____	Unit #6 _____
			Unit #3 _____	Unit #7 _____
			Unit #4 _____	Unit #8 _____

Contact Where the Units are Installed:
 Name: _____ Phone: _____ Fax: _____
 Address: _____ Email: _____
 City: _____ State (Province): _____ Country: _____

Contact of the Installing HVAC Contractor/Technician: Technician Full Name (Print): _____ HVAC Technician's Company Name: _____ Address: _____ Currently Licensed or Certified HVAC Technician License or Certification Number: _____ Official Phone # to Check the License Validity: _____	YMGI-Recommended Contractor/Technician: Phone/Fax: _____ Email: _____ City/State (Province): _____ License Approved or Certified by: _____
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List for Installing HVAC Technician to Double Check Installation Quality, and Warranty Processing Purpose (if not filled by technician, or not filled fully, warranty will void)

- Are you the only one to install whole system? If not, % of installation done by you (HVAC technician).
- What had been done, prior to your arrival?
- Did you read the User Manual and Installation Instruction, before you started the installation?
- Who unpacked the unit and accessory boxes to check for damage?
- Supply electrical power V/Ph/Hz measured at wiring terminal block of indoor unit: _____ outdoor unit: _____
- Incoming electrical power V/Ph/Hz measured at terminal blocks of indoor unit: _____ outdoor unit: _____
- Wire gauge, length and terminal colors between circuit breaker/disconnect switch to outdoor unit: _____
- Wire gauge, length and terminal colors between each indoor and outdoor unit: Unit A _____ Unit B _____ Unit C _____ Unit D...
- The size of HVAC circuit breaker/fuse or disconnect switch to the outdoor unit: _____
- Are the inter-connecting wires and copper lines between indoor and outdoor units installed/covered/protected by line set covers, or anything else?
- What is the refrigerant pipe length between each indoor unit and the outdoor unit? Unit A _____ Unit B _____ Unit C _____ Unit D...
- Where is/are the indoor unit(s) located? Unit A _____ Unit B _____ Unit C _____ Unit D...
- What is the elevation difference between each indoor unit and the outdoor unit? Unit A _____ Unit B _____ Unit C _____ Unit D... (indoor unit above outdoor unit +, below -)
- Did you check the indoor unit for condensate leakage and refrigerant leakage, before and after connecting them?
- Where is the outdoor unit located? Is the outdoor unit anchored to Ground wall balcony roof other ground or secured onto wall location or pad bracket?
- Have you checked to make sure there is no cross-piping and no cross-wiring between any two indoor units (zones)? How did you do it, who was with you?
- Were the refrigerant pipe ends capped or taped seal, prior to running them through structures to keep debris from entering the copper lines?
- Have you checked and run cooling or heating, one unit by one unit, all working fine?
- Did you charge the inter-connection copper pipes and indoor unit with nitrogen to check for positive leakage (pressures 150-200PSI), before conducting vacuuming leakage check?
- Did you vacuum correctly to check the connecting pipes and indoor unit for leakage, what was the micron gauge reading, for how many minutes?
- Did you check if the compressor can be started and stopped in a correct (design) manner?
- If copper length were not made to the supplied or recommended refrigerant pipe length, how much refrigerant added or deducted?
- Measured refrigerant pressures at outdoor service suction valve, when unit was st. Heat pump (PSI): _____ Cooling (PSI): _____ Outdoor Ambient Temp. (°F): _____
- What were the measured temperatures (probe not touching any metal): At cooling: indoor return air °F, discharge air °F, and outdoor °F At heating: indoor return air °F, discharge air °F, and outdoor °F
- Have you checked all unit functions, with customer's witness, and all functions are correct?
- Did you show the user how to operate the unit? Did he/she understand you?
- Do you provide regular one-year free technical service for this installation?
- Do you list the working details in the invoice and leave a copy to the customer?

Installation Finished and Unit Works Successfully. Print Name of Installation HVAC Technician: Signature: _____	Installation Finished and Unit Works Successfully. Print Name of Owner: Signature: _____
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Date and time: _____ Date and time: _____

By signing above, I acknowledge the liability and responsibility for any false statement or not telling all the facts, and I authorize YMGI to check the details of the filled above, and make its decision on warranty. I understand our filing or filling the warranty card/form DOESN'T mean automatic warranty approval, because warranty is approved only to those qualified and successful installations by qualified HVAC technician. I know the warranty, if approved, is a standard 5-year compressor and 1-year other parts only, without any labor coverage. I agree to and will follow all the contents contained in the Limited Product Warranty Policy that YMGI, not other entity, stated in public, including but not limited to manuals, web site, email, etc.

Important Note: A copy of the installing HVAC company's invoice to show all their work details, your payment proof, center copy B of this registration card filled after a successful installation, all three (3) MUST be mailed together to Warranty Dept., **YMGI Group, POB 1559, O'Fallon, MO 63366**, for warranty processing. Customer keeps bottom copy C. YMGI will check against copy A that was kept at YMGI.



WHY DOES YMGI GROUP REQUIRE INSTALLATION AND SERVICE TO BE PERFORMED 100% BY CURRENTLY LICENSED OR CERTIFIED HVAC TECHNICIANS/CONTRACTORS?

1. Expertise and Safety:

They have the training and experience to accurately and safely install and service your equipment. The equipment runs with high-pressure refrigerant, oil and electrical current. The copper lines must be installed properly to prevent leakage and foreign substances from contaminating the refrigerant system.

2. You will save money in the long run:

If any problem occurs with the unit that has been fully installed by a currently licensed or certified technician/contractor, contact the original licensed or certified HVAC technician to evaluate the unit as they have the training and experience to correct the problem quickly and efficiently. A technician may be unwilling to repair an issue on a unit that they did not install. If you do find a technician willing to perform this service, there is an increased possibility of higher service fees, increased service visits, or delayed service from that technician.

3. It's the law!

The federal, state and/or local government and authorities have various governing laws or regulations, guidelines, ordinances, etc. These laws may require only licensed or certified professionals can install and service this type of high pressure HVAC equipment.

SUGGESTIONS TO AID YOU IN HIRING AN HVAC CONTRACTOR:

1. Hire a currently practicing, licensed/certified HVAC professional technician/contractor. Technicians, who are no longer practicing (retired, etc.) in this field, may not have current technical knowledge or may lack experience on the equipment you have purchased.
2. Hiring a licensed technician to install your unit as a "side job" rather than a licensed HVAC company may pose possible risk. This may result in an incomplete or unsatisfactory installation, no guarantee for workmanship and lack of maintenance and further service to your unit.
3. Hire a technician/contractor who services customers in your local area and one you are familiar with. Local contractors have a faster response time and it will be easier for you to determine if they are reputable.
4. Use only a reputable licensed/certified HVAC installation professional to prevent any unexpected charges because of unethical business practices.
5. Check their references, verify they provide professional service for their customers. N.A.T.E or A.C.C.A certified technicians are strongly recommended.
6. Some contractors/technicians may not feel comfortable installing equipment that has been purchased by someone other than themselves. You can contact YMGI directly to check and see if there are contractors in your area who have installed our products or any similar products.
7. Ask for a detailed quote for the complete installation project. A flat rate quote is the safest contract for both you and the contractor.
8. Local HVAC technicians may charge you on a project basis or on an hourly basis. It has been our general experience; **a full single head installation normally can cost \$800 to \$1500**. These costs are estimates, and your actual costs may differ due to your specific job requirements and installation location.
9. Number of hours can vary depending upon each individual situation, some factors are, but not limited to:
 - Difficulty or complexity of securely installing the indoor unit.
 - Difficulty or length of the inter-connecting pipes and wires to be installed.
10. A successful installation is dependent on all these suggestions and necessary steps are followed.
11. If the contractor(s)/technician(s) are experienced with the systems/brands you purchased. **You might save on the installation cost but remember to always ask for and verify references.**
12. The contracts should list and detail all work to be performed and the standards they will follow. Some contractors are willing to include a 1-year installation/service warranty at no extra charge. Check to see if this is an available option. If available, make sure it is included in the contract.
13. Verify and confirm the installation is completed and all the unit functions have been tested and working properly. All items on the checklist should be checked and clearly marked in the warranty registration card/form, prior to paying the contractor in full.

The cost of not having your unit professionally installed can be more expensive than the additional cost of hiring a certified contractor. Protect your investment and warranty eligibility by doing it right the first time.

⚠WARNING

Safety Precautions

1. Follow these instructions to complete the necessary installation process. Carefully read this manual before installation and unit startup or servicing.
2. Wire size of power cord should be properly sized to meet the required electrical loads. Should the power cord get damaged, the power cord should be replaced with a manufacturer approved cable.
3. After connecting the power cord, attach the electric box cover and secure properly.
4. Always meet the nitrogen charge requirements when welding pipes.
5. Never short-circuit or cancel the pressure switch as this will result in damage to the unit.
6. Connect the wired controller before energizing, otherwise the wired controller cannot be used.
7. Before using the unit, verify the piping and wiring are correct. This will avoid water leakage, refrigerant leakage, electric shock, fire, etc.
8. Do not insert fingers or objects into the air outlet or inlet grille.
9. Open a door or window for ventilation for allowing fresh air to enter the room to avoid depleting the oxygen while gas/oil supplied heating equipment is used during the installation.
10. Never start up or shut off the unit by means of directly plugging into or unplugging the power cord from the power outlet.
11. Turn off the unit after it runs at least five minutes, otherwise it will influence the oil return of the compressor.
12. Do not allow children to operate this unit.
13. Do not operate this unit with wet hands.
14. Turn off the unit or disconnect the power supply before cleaning the unit. This will avoid possible electric shock or personnel injury.
15. Never spray or splash water towards the unit. This can cause a malfunction in the unit or can result in electric shock.
16. Do not expose the unit to moist or corrosive environments.
17. While operating in cooling mode, do not set the indoor unit room temperature too low. Keeping the temperature difference between indoor and outdoor unit within 41°F (5°C).
18. YMGI Group recommends that only properly trained and authorized personnel be allowed to repair or service the unit. Improper repairs or servicing can result in electric shock or fire hazards. Please contact YMGI Group if you need help locating a qualified repair or service technician.
19. Before installation, check the power supply to ensure it is sufficient to meet and is in accordance with the requirements specified on the nameplate of the unit. Ensure the power overload is functioning correctly and make sure it is properly maintained.
20. Installation must be performed only by an authorized installer or HVAC professional in accordance with the requirements set by the NEC and CEC. Do not attempt to install the unit yourself. Improper handling may result in water leakage, electric shock, fire, and voiding of the warranty.
21. Be sure to use only approved accessories and parts to prevent water leakage, electric shock and fire.
22. Make sure the unit is grounded properly prior to connecting to power source, to avoid electric shock. Do not connect the ground wire to a gas pipe, water pipe, lightning rod or telephone line.
23. Energize the unit for 8 hours before operation. Turn off or disconnect the power within 24 hours to prevent shortcycling (to protect the compressor).
24. If refrigerant leakage happens in a confined space during installation, ventilate immediately. Poisonous gases can occur if the refrigerant gas is exposed to fire.
25. Volatile liquids, (such as paint thinners or solvents) if exposed to the unit's surface will damage to the surface finish. Only use a soft cloth along with a mild non-abrasive detergent to clean the outer casing of the unit.
26. If the unit does not operate normally or if you notice any type of burning odor, power off the unit and turn off the main power supply, then immediately contact your YMGI authorized repair service center or HVAC professional.

Product Introduction

YMGI Multi VRF Modular System adopts inverter compressor technology. According to changes in the displacement of the compressor, stepless capacity regulation within range of 10%-100% can be realized. Various product configurations are provided with capacity range from 72kBTu/h to 360kBTu/h, which can be widely used in working area and especially applicable to the place with variable load change. YMGI air conditioners are your best choice.

Names of Main Parts

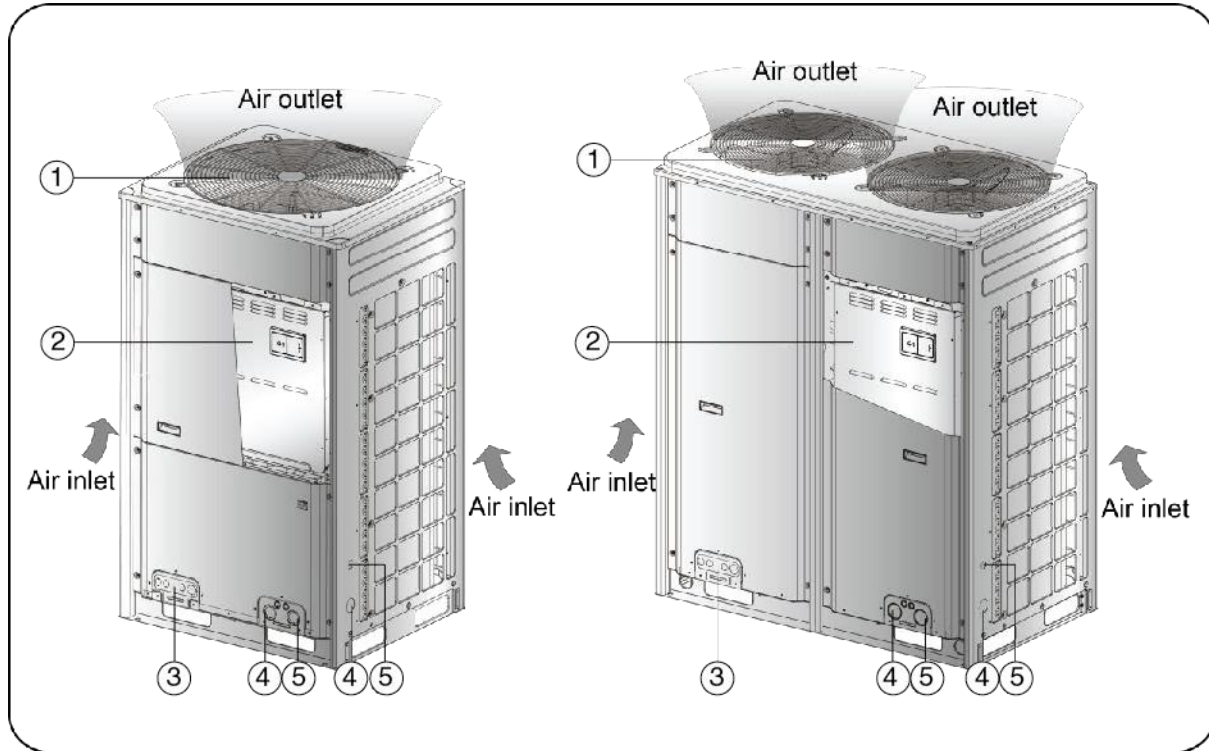


Fig.1

No.	1	2	3	4	5
Name	Fan, Motor	Electric Box Assembly	Valve interface	Power cord through-hole	Communication code through-hole

Combinations of Outdoor Units

Model (Single)	VRFO-144VP-U2C(55)5	VRFO-168VP-U2C(55)5	VRFO-192VP-U2C(55)5
Model (Combined)	VRFO-72VP-U2C(55)5 + VRFO-72VP-U2C(55)5	VRFO-72VP-U2C(55)5 + VRFO-96VP-U2C(55)5	VRFO-96VP-U2C(55)5 + VRFO-96VP-U2C(55)5
Model (Single)	VRFO-216VP-U2C(55)5	VRFO-240VP-U2C(55)5	VRFO-264VP-U2C(55)5
Model (Combined)	VRFO-96VP-U2C(55)5 + VRFO-120VP-U2C(55)5	VRFO-120VP-U2C(55)5 + VRFO-120VP-U2C(55)5	VRFO-72VP-U2C(55)5 + VRFO-96VP-U2C(55)5 + VRFO-96VP-U2C(55)5
Model (Single)	VRFO-288VP-U2C(55)5	VRFO-312VP-U2C(55)5	VRFO-336VP-U2C(55)5
Model (Combined)	VRFO-96VP-U2C(55)5 + VRFO-96VP-U2C(55)5 + VRFO-96VP-U2C(55)5	VRFO-96VP-U2C(55)5 + VRFO-96VP-U2C(55)5 + VRFO-120VP-U2C(55)5	VRFO-96VP-U2C(55)5 + VRFO-120VP-U2C(55)5 + VRFO-120VP-U2C(55)5
Model (Single)	VRFO-360VP-U2C(55)5		
Model (Combined)	VRFO-120VP-U2C(55)5 + VRFO-120VP-U2C(55)5 + VRFO-120VP-U2C(55)5		

Combinations of Indoor and Outdoor Units

Model	Max number of connectable IDU (unit)	ODU Model	Max number of connectable IDU (unit)
VRFO-72VP-U2C(55)5	12	VRFO-240VP-U2C(55)5	41
VRFO-96VP-U2C(55)5	16	VRFO-264VP-U2C(55)5	45
VRFO-120VP-U2C(55)5	20	VRFO-288VP-U2C(55)5	49
VRFO-144VP-U2C(55)5	25	VRFO-312VP-U2C(55)5	53
VRFO-168VP-U2C(55)5	29	VRFO-336VP-U2C(55)5	58
VRFO-192VP-U2C(55)5	33	VRFO-360VP-U2C(55)5	61
VRFO-216VP-U2C(55)5	37		

The total capacity of indoor units should be within 50%~135% of that of outdoor units.

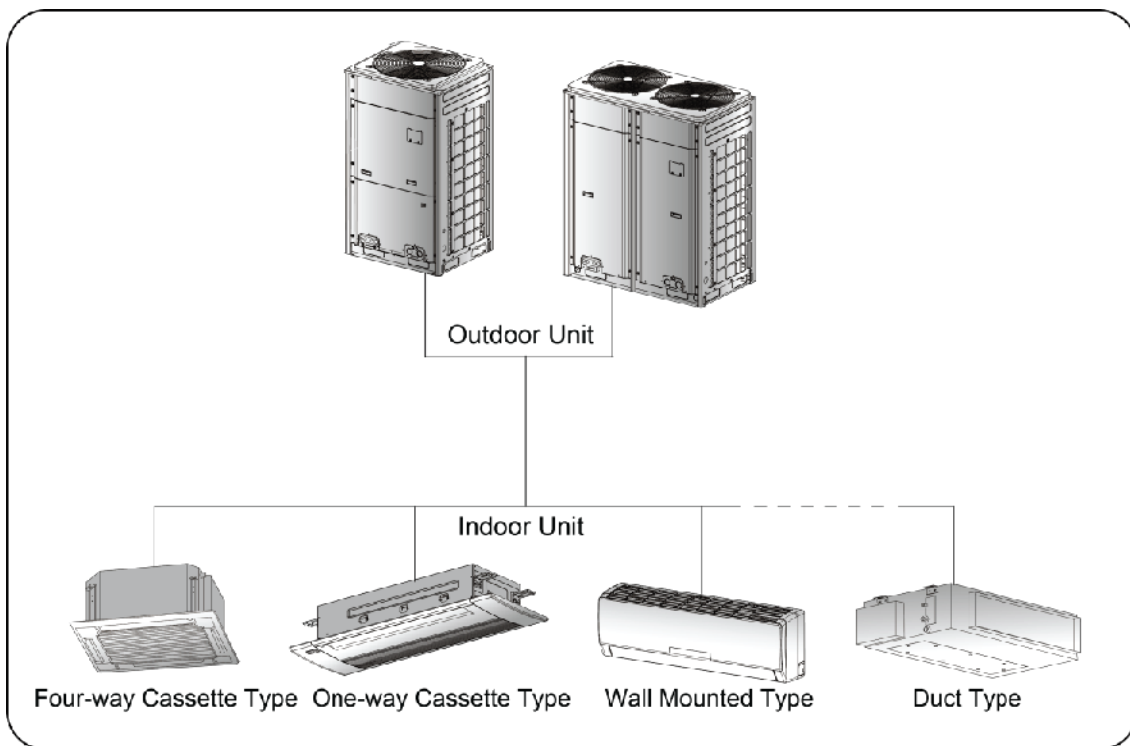


Fig.2

Fig.2 is the combination view of the ODU of Modular DC Inverter Multi VRF System and the IDU of Multi VRF System. IDU can be cassette type, one-way cassette type, wall-mounted type, duct type, etc. When any one IDU receives operation signal, ODU will start to work according to the capacity; when all IDUs stop, ODU will also stop.

The Range of Production Working Temperature

Cooling	Ambient temperature: -5°C(23°F)~52°C(125.6°F)
Heating	Ambient temperature: -20°C (-4°F)~24°C (75.2°F)

NOTICE

Running this system outside of the working temperature range may damage the unit and will invalidate the warranty.


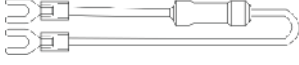

Preparation before Installation

NOTICE

The picture is only used for reference and the actual product prevails. Unit: mm (in.).

Standard Parts

Please use the following standard parts supplied by YMGI.

Number	Name	Picture	Remarks
1	Owner's Manual		
2	Wiring (match with resistance)		Must be connected to the last IDU of communication connection
3	Mark (Master)		Attach on the wired controller of master IDU or on the front panel

Installation Site

⚠WARNING

1. Install the unit in a location where the floor is adequate and can withstand the weight of the unit, and ensure the unit will not shake or fall off.
2. Never expose the unit under direct sunshine and rainfall. Install the unit at a place where it is protected against dust, typhoons and earthquakes.
3. Try to keep the unit away from combustible, flammable, and corrosive gas or exhaust gas.
4. Leave some space for heat exchanging and servicing so as to guarantee unit normal operation.
5. Keep the indoor and outdoor units close to each other as much as possible so as to decrease the pipe length and bends.
6. Never allow children to approach to the unit and take measures to prevent children touching the unit.

When the outdoor unit is totally surrounded by walls, please refer to following figures for space dimension.

Space dimension for single-module unit

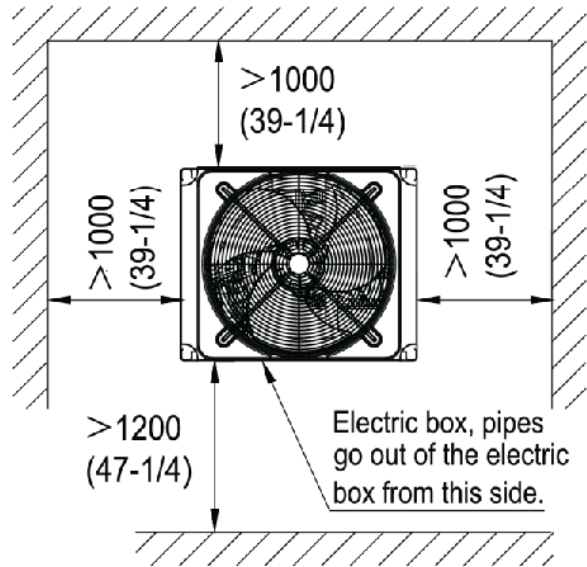
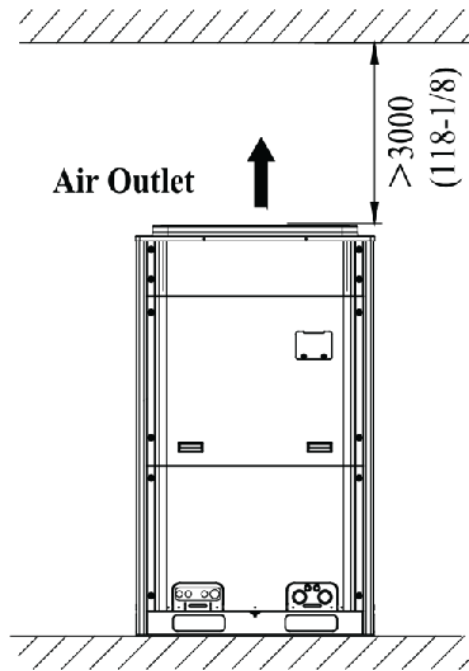


Fig.3

Space dimension for dual-module unit

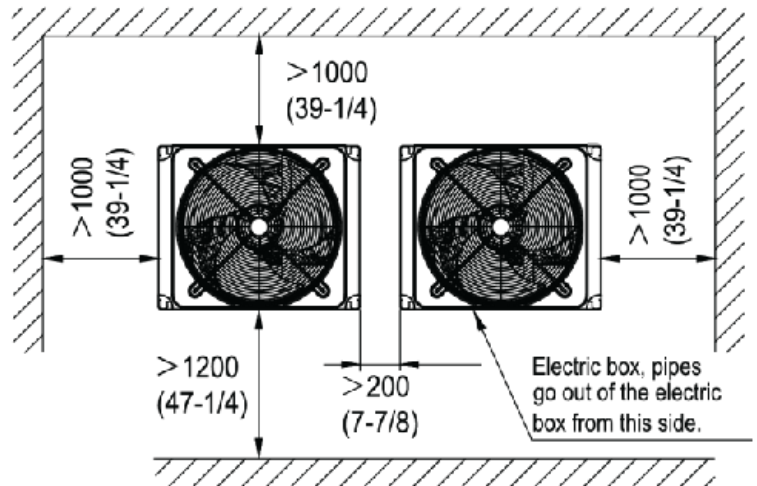
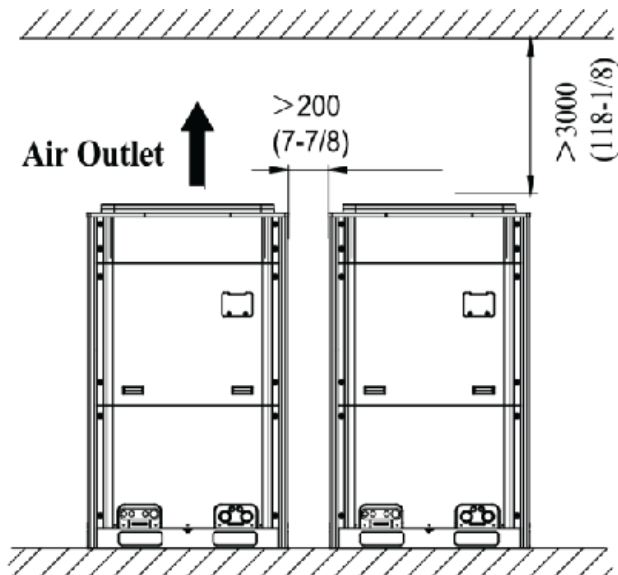


Fig.4

Space dimension for three-module unit

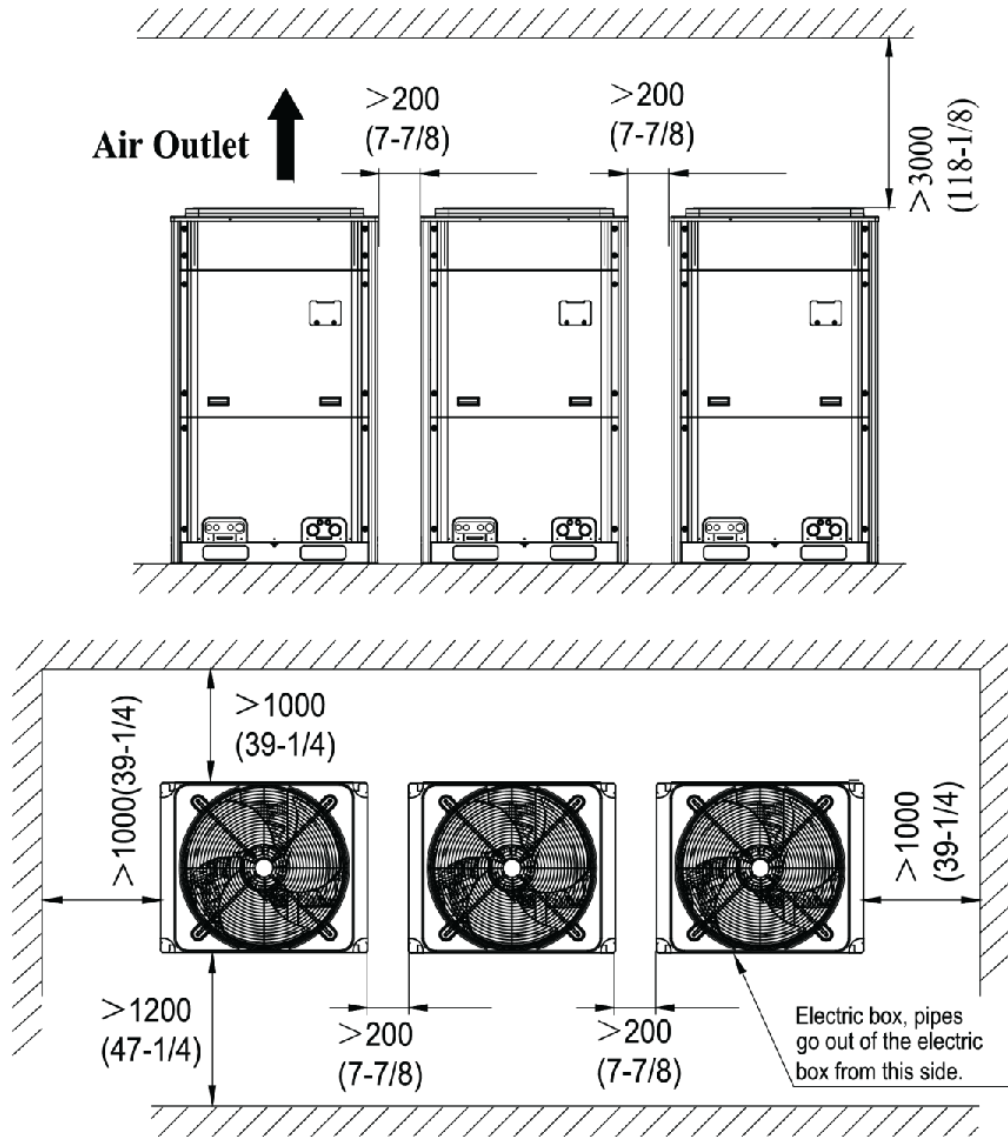


Fig.5

When there is a wall (or similar obstruction) above the unit, keep the distance between the unit top and the wall at least 3000mm (118-1/8in.) or above. When the unit is located in a totally open space with no obstructions in four directions, keep the distance between the unit top and wall at least 1500mm (59in.) or above (See Fig.6). When space is limited within 1500mm (59in.) or the unit is not set in an open space, air return pipe is required to be installed in order to keep good ventilation (See Fig.7).

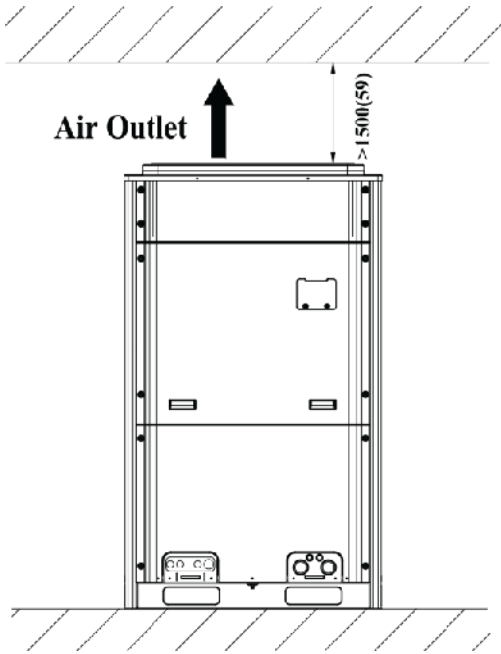


Fig.6

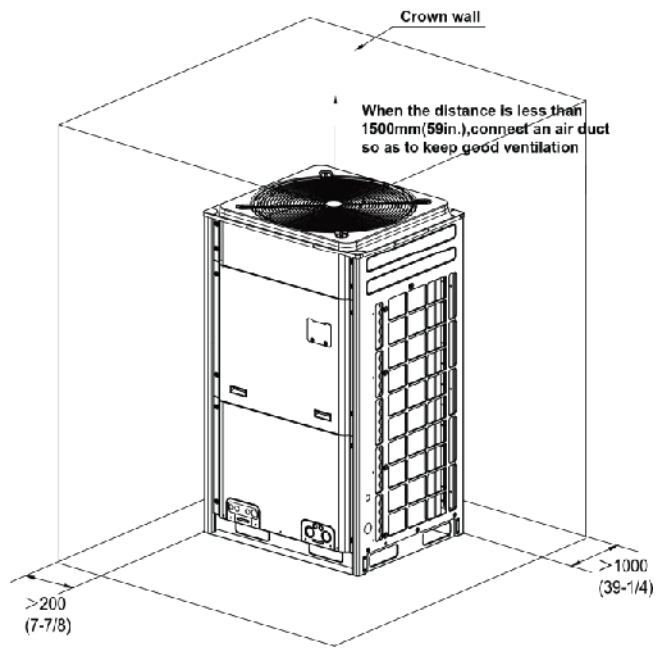


Fig.7

Space dimension for multiple-module unit

To ensure good ventilation, make sure there is no obstruction above the unit. When the unit is located in a half-open space (front and left/right side is open), install the unit as per the same or opposite direction.

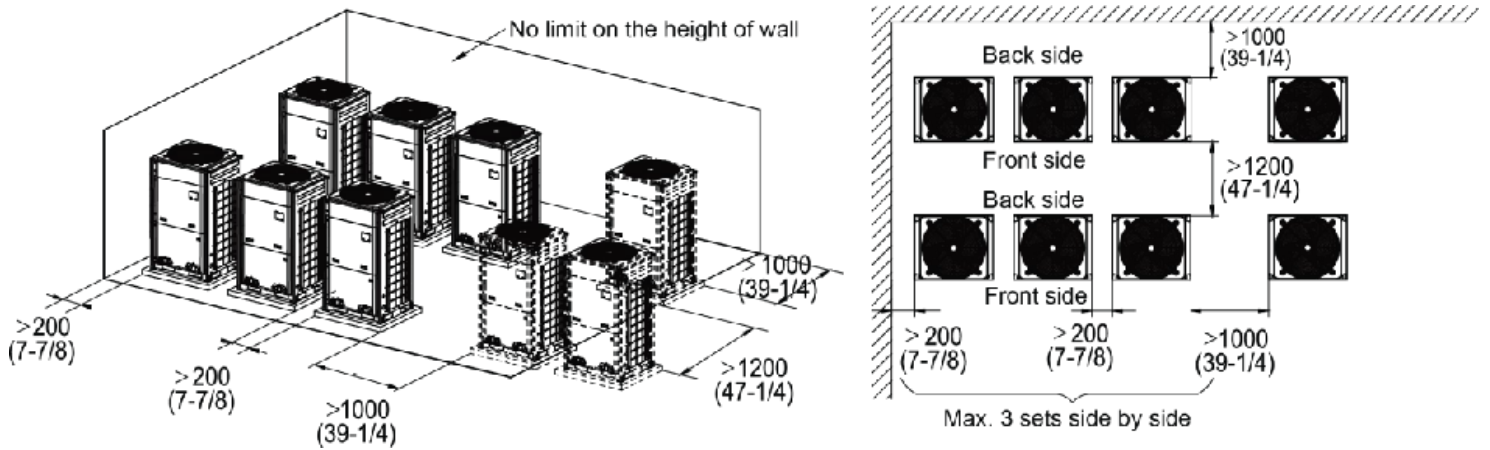


Fig.8

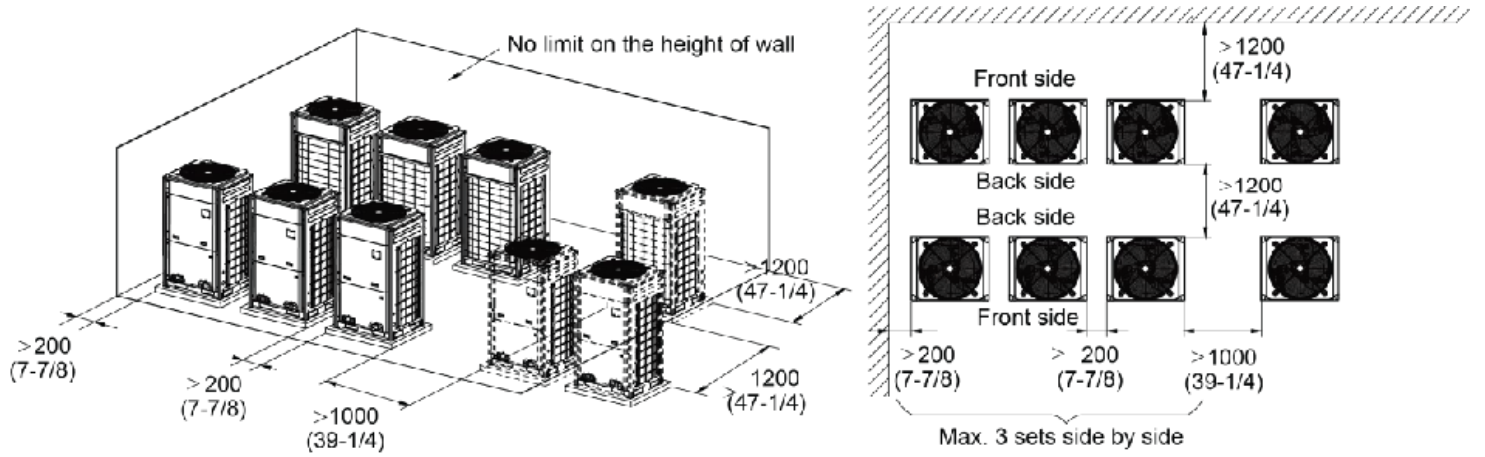


Fig.9

Considering the seasonal wind in outdoor unit installation

Anti-monsoon installation requirements for unit not connecting exhaust duct

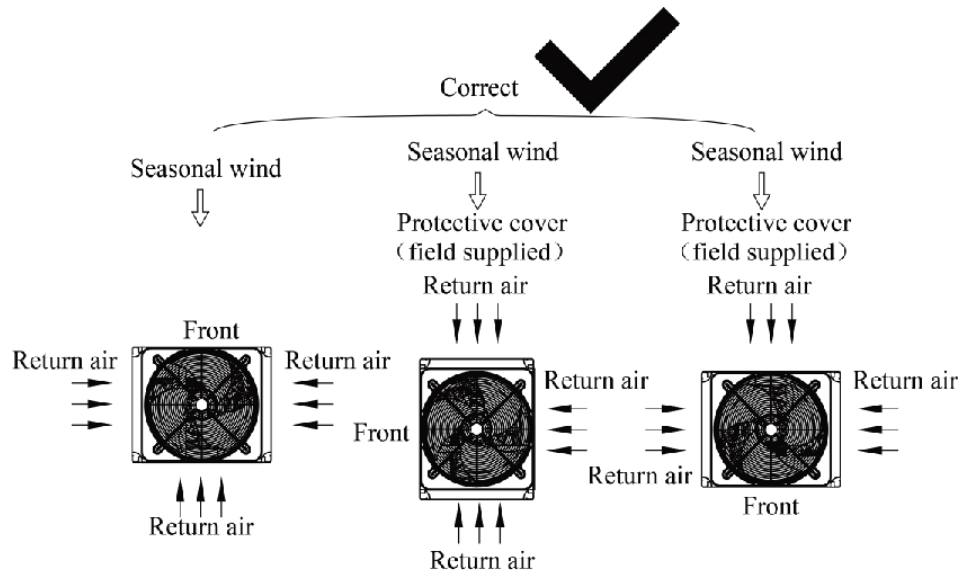


Fig.10

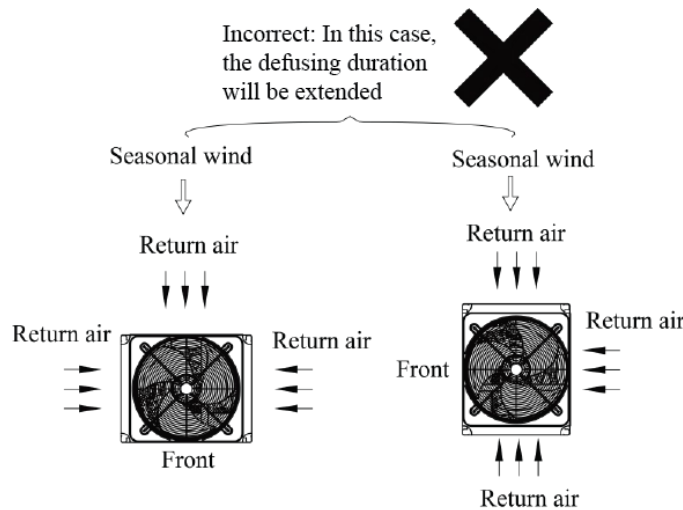


Fig.11

Anti-monsoon installation requirement for unit connecting exhaust duct

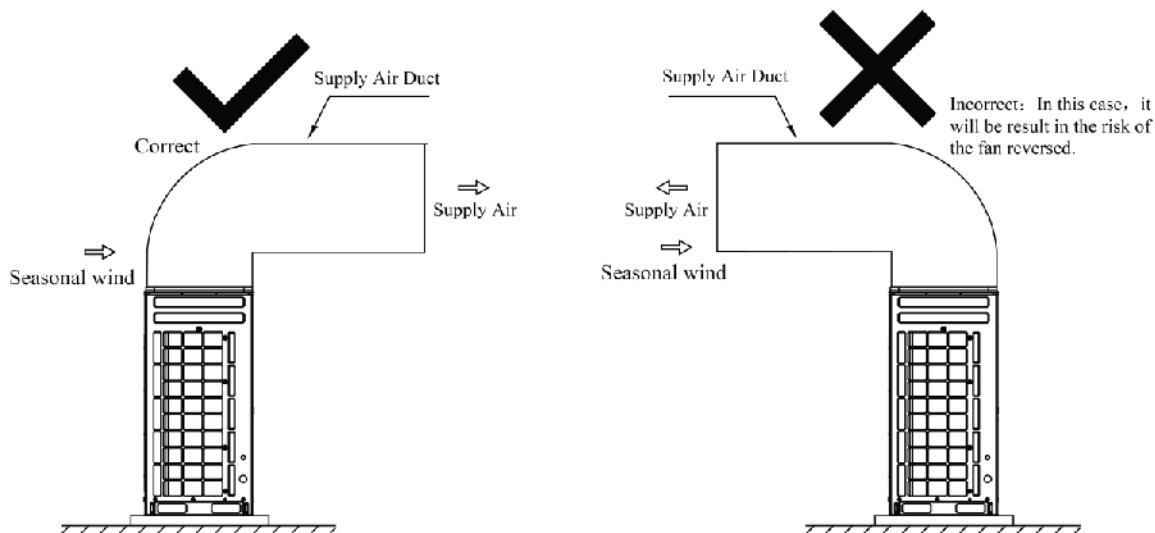


Fig. 12

Considering snow in outdoor unit installation

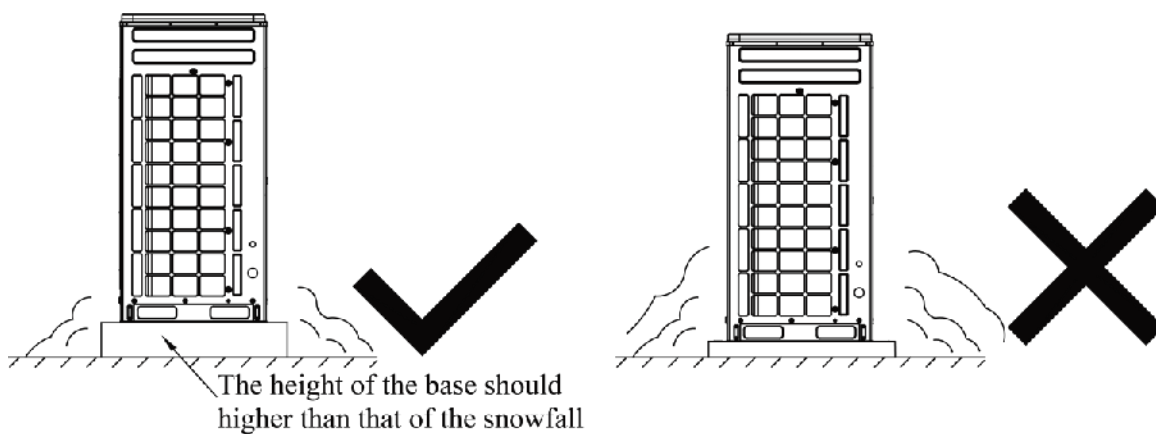


Fig. 13

Piping Work Requirements

There should be no fall among outdoor modules. Refer to the table below for piping work requirements.

R410A Refrigerant System		
Outer Diameter mm(in.)	Wall Thickness mm(in.)	Type
Φ6.35mm (1/4")	≥0.8mm (1/32")	0
Φ9.52mm (3/8")	≥0.8mm (1/32")	0
Φ12.7mm (1/2")	≥0.8mm (1/32")	0
Φ15.9mm (5/8")	≥1.0mm (3/76")	0
Φ19.05mm (3/4")	≥1.0mm (3/76")	1/2H
Φ22.2mm (7/8")	≥1.2mm (1/21")	1/2H
Φ28.6mm (1-1/8")	≥1.2mm (1/21")	1/2H
Φ34.9mm (1-3/8")	≥1.3mm (2/39")	1/2H
Φ41.3mm (1-5/8")	≥1.5mm (1/17")	1/2H

Installation Instructions

Physical Dimension of the Outdoor Unit and Mounting Hole

Outline and Physical Dimensions of VRFO-72VP-U2C(55)5.

Unit: mm(in.)

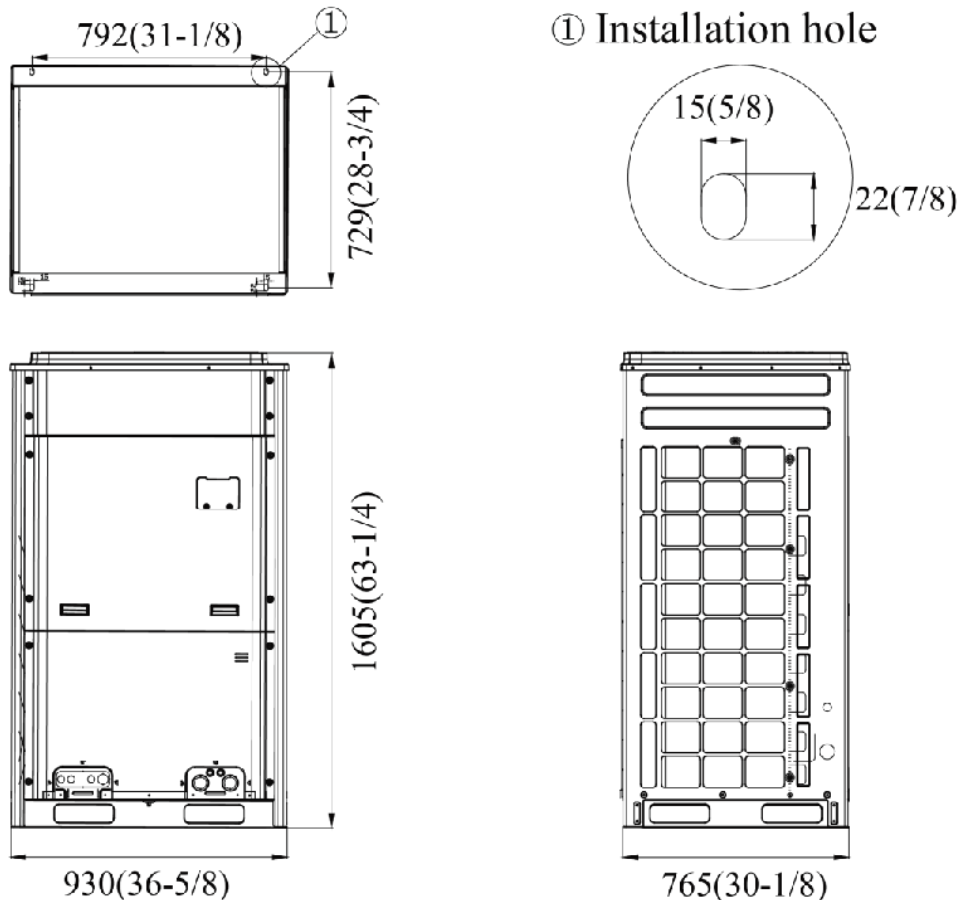


Fig. 14

Outline and Physical Dimension of VRFO-96VP-U2C(55)5 and VRFO-120VP-U2C(55)5 unit.

Unit: mm(in.)

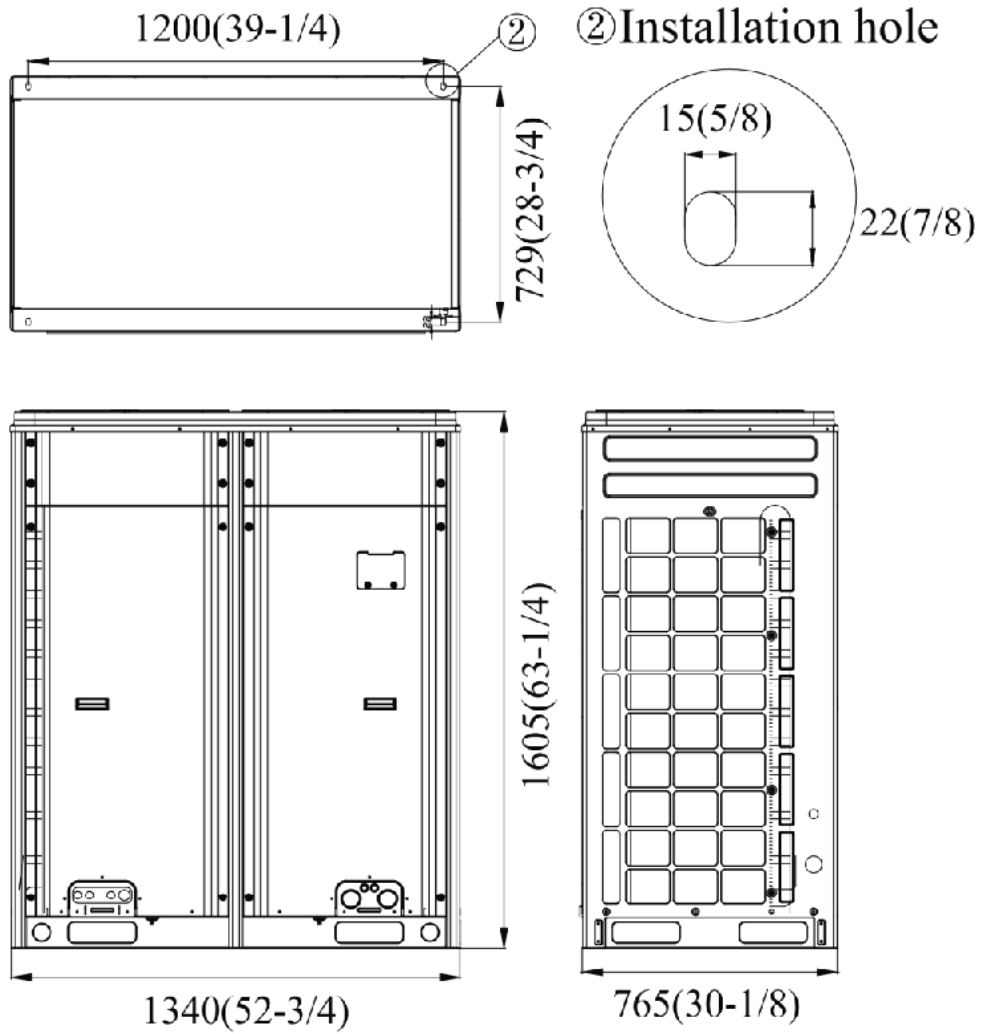


Fig. 15

Connection Pipes

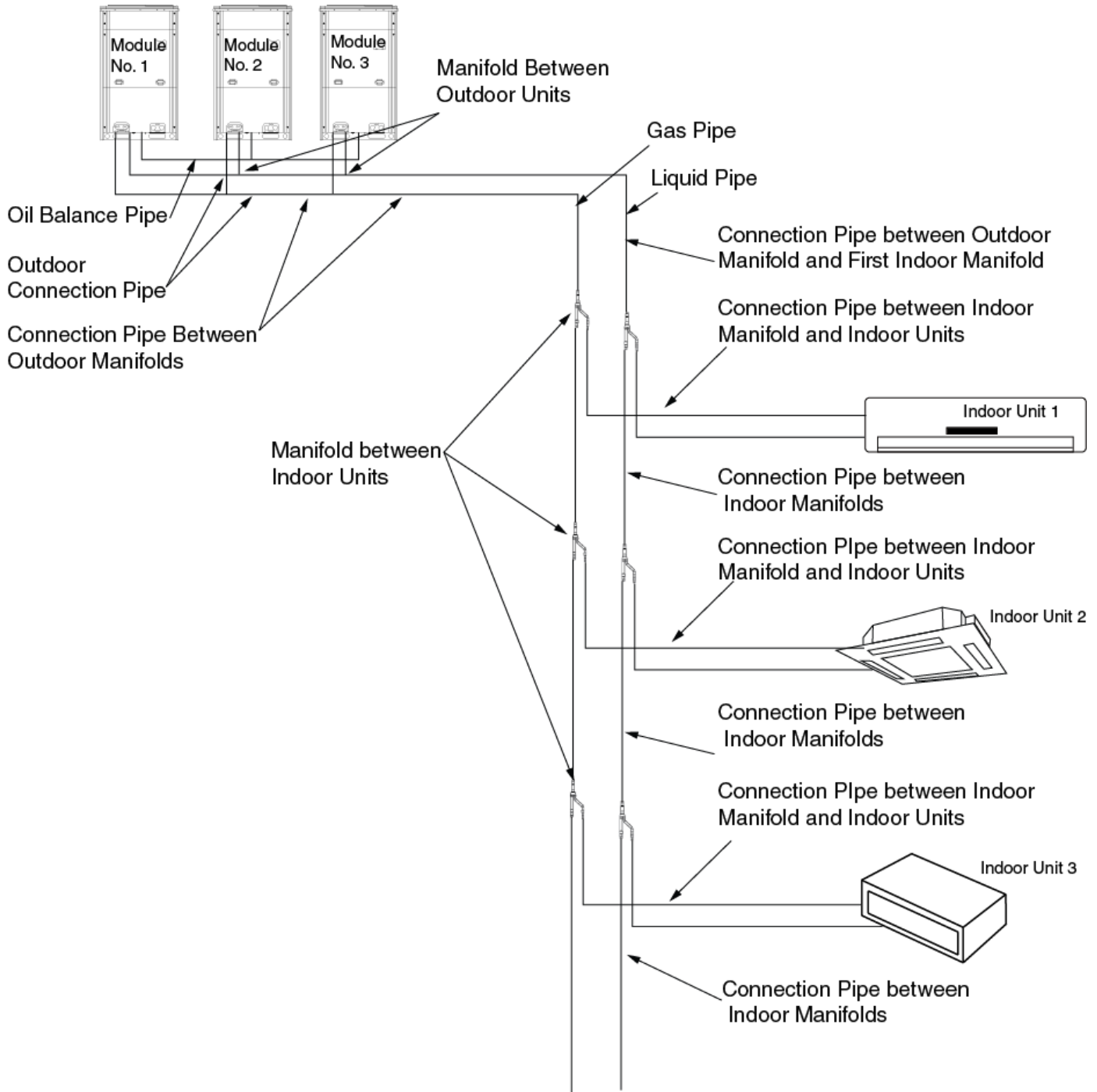


Fig. 16

Schematic Diagram of Piping Sequence

VRFO-72VP-U2C(55)5

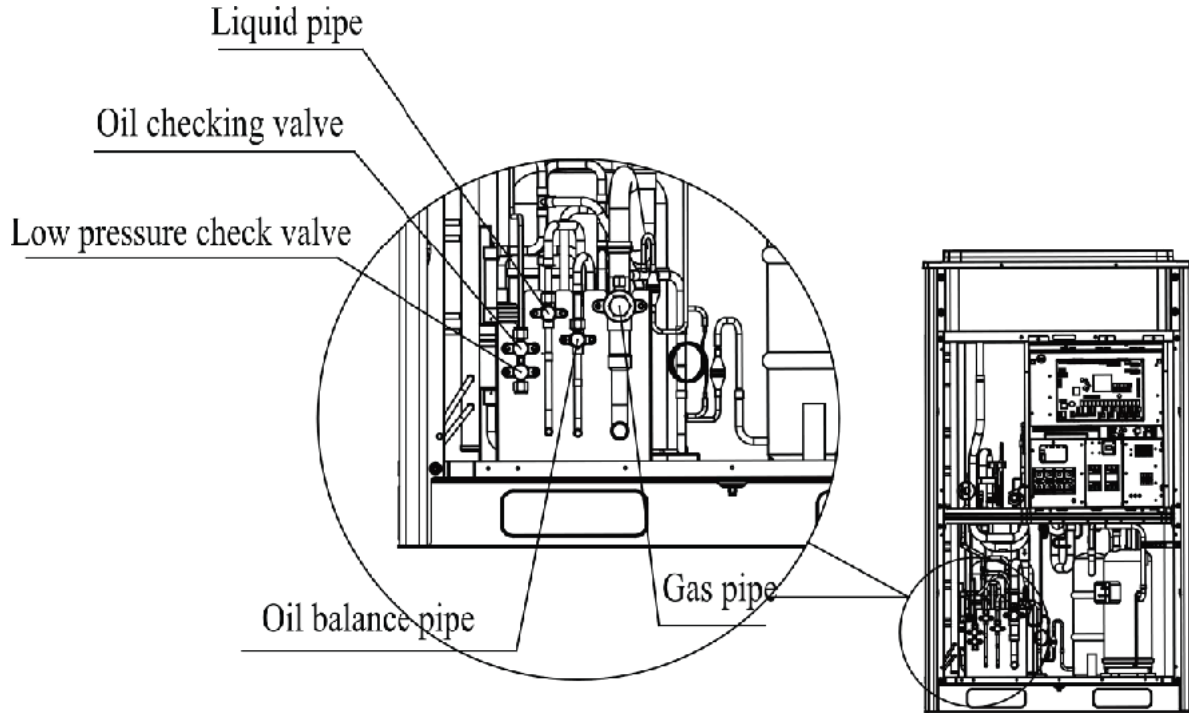


Fig. 17

VRFO-96VP-U2C(55)5 and VRFO-120VP-U2C(55)5

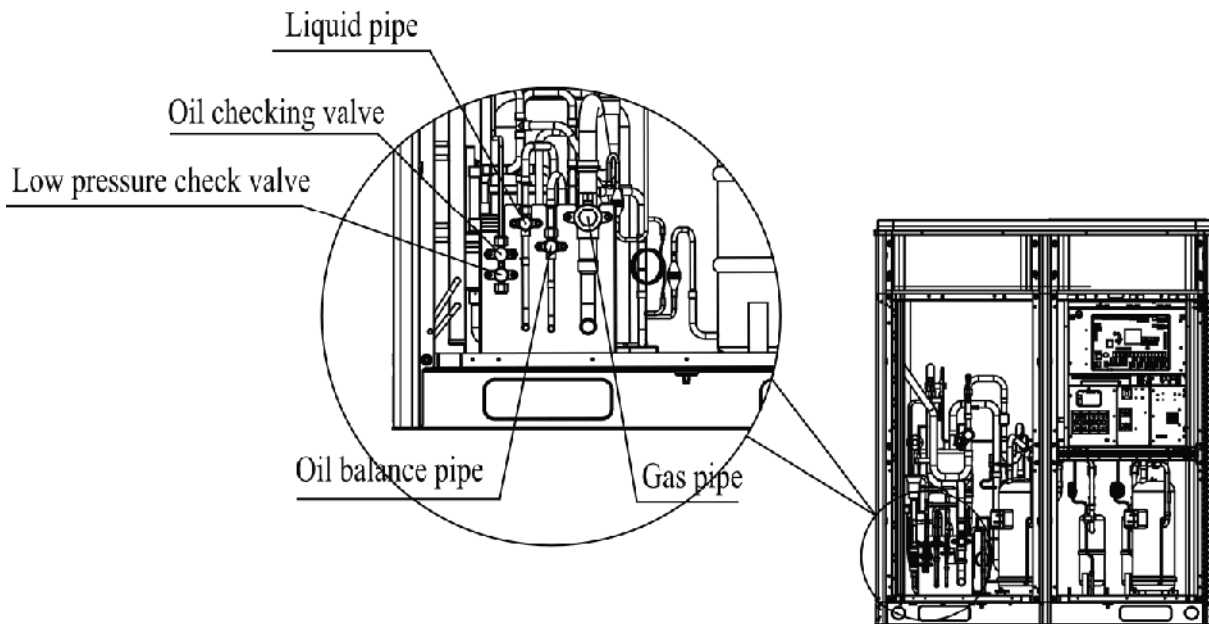


Fig. 18

Allowable pipe length and drop height among indoor and outdoor units

Y type branch joint is adopted to connect indoor and outdoor units. Connecting method is shown in the figure below.
 Remark: Equivalent length of one Y-type manifold is about 0.5 m (1-3/4ft.).

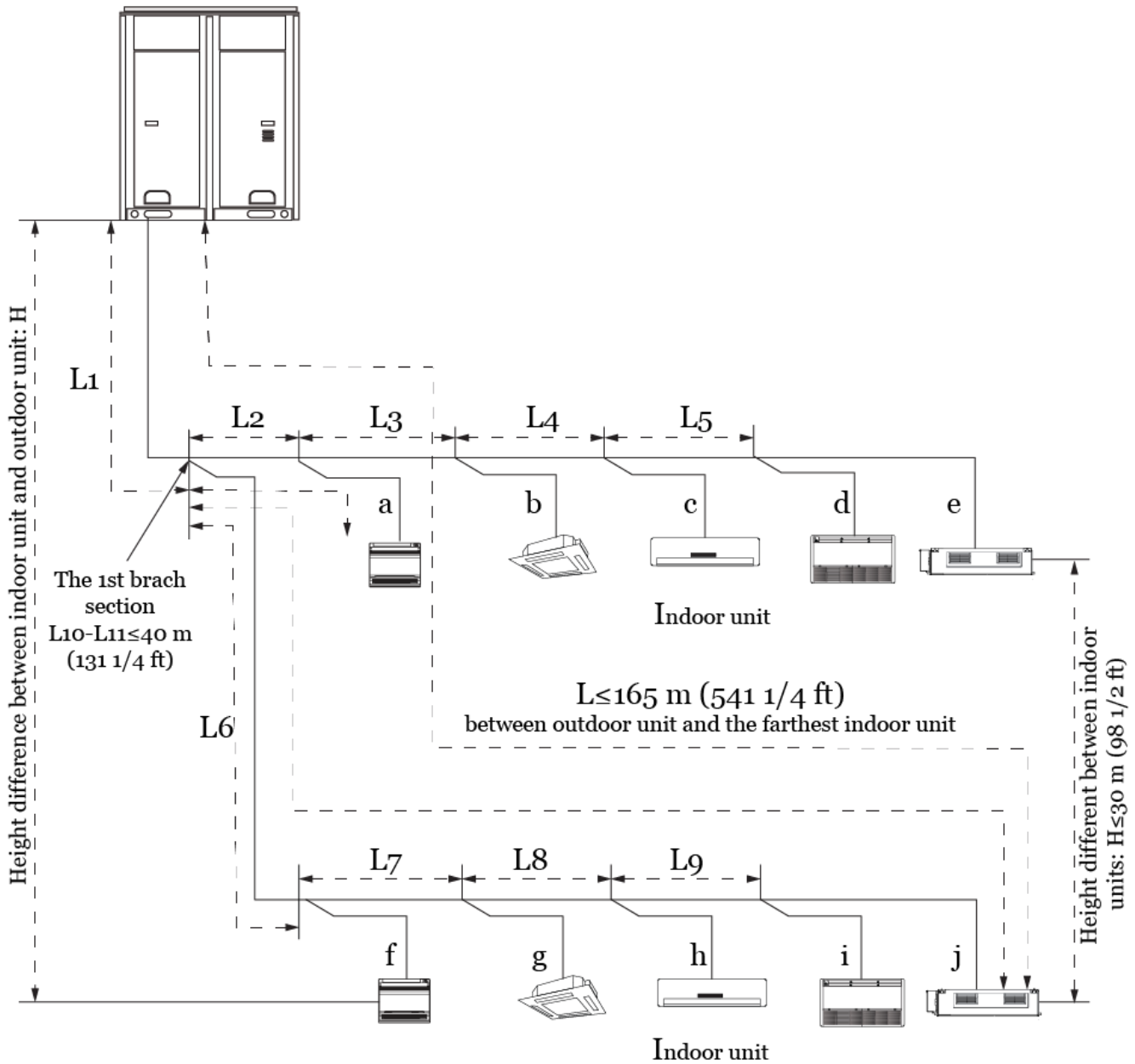


Fig. 19

L10: Length from the first branch to the farthest IDU;
 L11: Length from the first branch to the nearest IDU;
 Equivalent length of branch of IDU is 0.5m (1-3/4ft.).

R410A Refrigerant System		Allowable Value m(ft.)	Fitting Pipe
Total length (actual length) of fitting pipe		≤1000(3280-3/4)	L1+L2+L3+L4+...+L9+a+b+...+i+j
Length of farthest fitting pipe m(ft.)	Actual length	≤165(541-1/4)	L1+L6+L7+L8+L9+j
	Equivalent length	≤190(623-1/4)	
Difference between the pipe length from the first branch of IDU to the farthest IDU and the pipe length from the first branch of IDU to the nearest IDU		≤40(131-1/4)	L10-L11
Equivalent length from the first branch to the furthest piping (1)		≤40(131-1/4)	L6+L7+L8+L9+j
Height difference between outdoor unit and indoor unit	Outdoor unit at upper(2)	≤90(295-1/4)	—
	Outdoor unit at lower(2)	≤90(295-1/4)	—
Height difference between indoor units		≤30(98-2/4)	—
Maximum length of Main pipe(3)		<90(295-1/4)	L1
From IDU to its nearest branch (4)		≤40(131-1/4)	a, b, c, d, e, f, g, h, i, j

- Normally, the pipe length from the first branch of IDU to the farthest IDU is 40m (131-1/4ft.). Under the following conditions, the length can reach 90m (295-1/4ft.).
 - Actual length of pipe in total: $L1+L2x2+L3x2+L4x2+...+L9x2+a+b+...+i+j \leq 1000m$ (3280- 3/4ft.).
 - Length between each IDU and its nearest branch a, b, c, d, e, f, g, h, i, j $\leq 40m$ (131- 1/4ft.).
 - Difference between the pipe length from the first branch of IDU to the farthest IDU and the pipe length from the first branch of IDU to the nearest IDU: $L10-L11 \leq 40m$ (131-1/4ft.).
- When the outdoor unit is at upper side and height difference is more than 50m, please consult company for the related technical requirement.
- When the maximum length of the main pipe from ODU to the first branch of IDU is $\geq 90m$ (295-1/4ft.), then adjust the pipe size of the gas pipe and liquid pipe of main pipe according to the following table.

Outdoor Model	Gas pipe size mm(in.)	Liquid pipe size mm(in.)
VRFO-72VP-U2C(55)5	No need to enlarge pipe size	No need to enlarge pipe size
VRFO-96VP-U2C(55)5	No need to enlarge pipe size	Φ12.7(1/2)
VRFO-120VP-U2C(55)5	No need to enlarge pipe size	Φ15.9(5/8)
VRFO-144VP-U2C(55)5	Φ34.9(1-3/8)	Φ15.9(5/8)
VRFO-168VP-U2C(55)5	Φ34.9(1-3/8)	Φ19.05(3/4)
VRFO-192VP-U2C(55)5	Φ34.9(1-3/8)	Φ19.05(3/4)
VRFO-216VP-U2C(55)5	Φ34.9(1-3/8)	Φ19.05(3/4)
VRFO-240VP-U2C(55)5	No need to enlarge pipe size	Φ19.05(3/4)
VRFO-264VP-U2C(55)5	No need to enlarge pipe size	Φ22.2(7/8)
VRFO-288VP-U2C(55)5	No need to enlarge pipe size	Φ22.2(7/8)
VRFO-312VP-U2C(55)5	No need to enlarge pipe size	Φ22.2(7/8)
VRFO-336VP-U2C(55)5	No need to enlarge pipe size	Φ22.2(7/8)
VRFO-360VP-U2C(55)5	No need to enlarge pipe size	Φ22.2(7/8)

- If the length between an IDU and its nearest branch is above 10m (32-4/5ft.), then increase the size of the liquid pipe of IDU (only for the pipe size that is $\leq 6.35mm$ (1/4in.).

Connection Pipe among Outdoor Modules

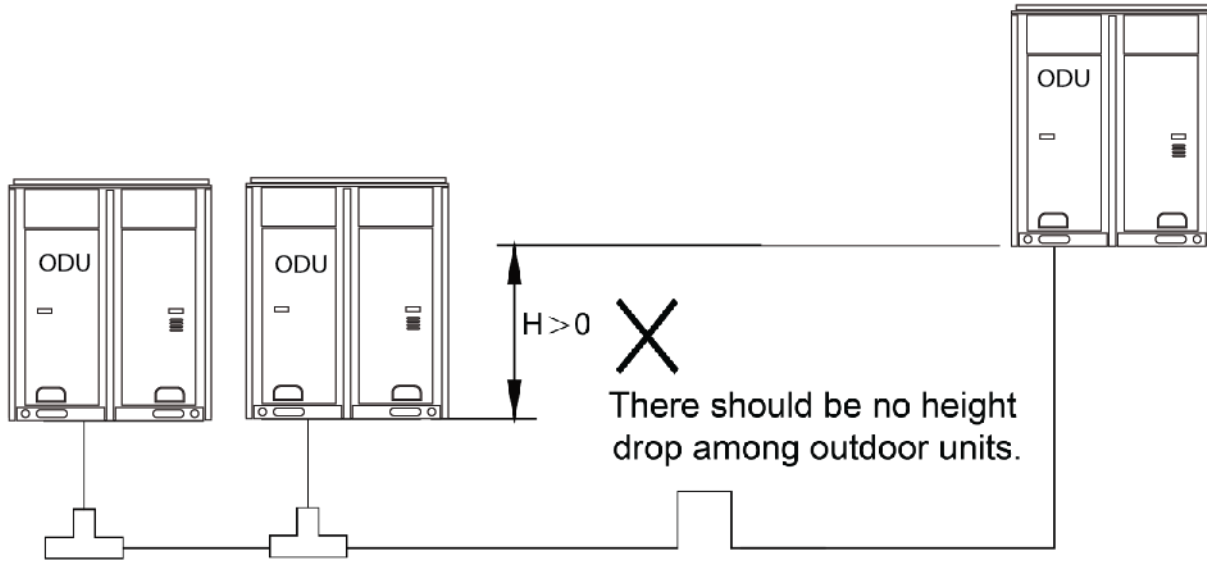


Fig.20

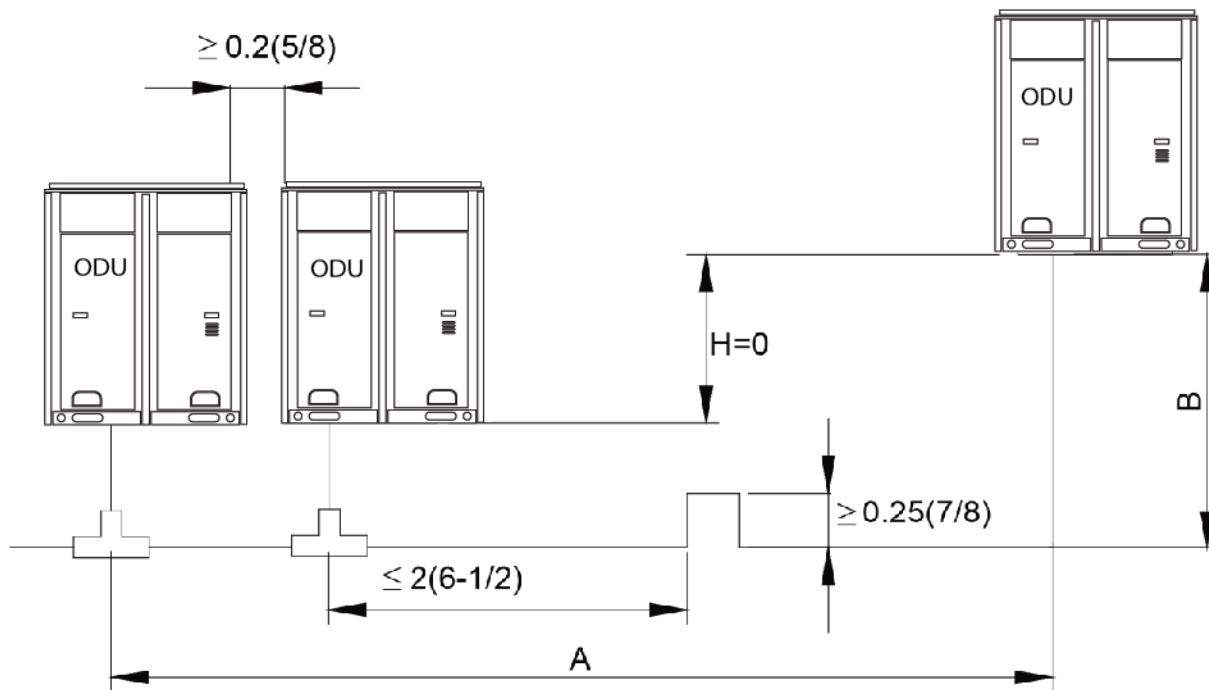


Fig.21

NOTICE

When the distance between outdoor units exceeds 2m (6-1/2ft.), U-type oil trap should be added at low-pressure gas pipe. $A+B \leq 10m$ (32-7/8ft.).

Fitting pipe between Outdoor Unit and the First Manifold

For single module system, pipe size (between outdoor unit and the first manifold) is determined by that of outdoor unit.

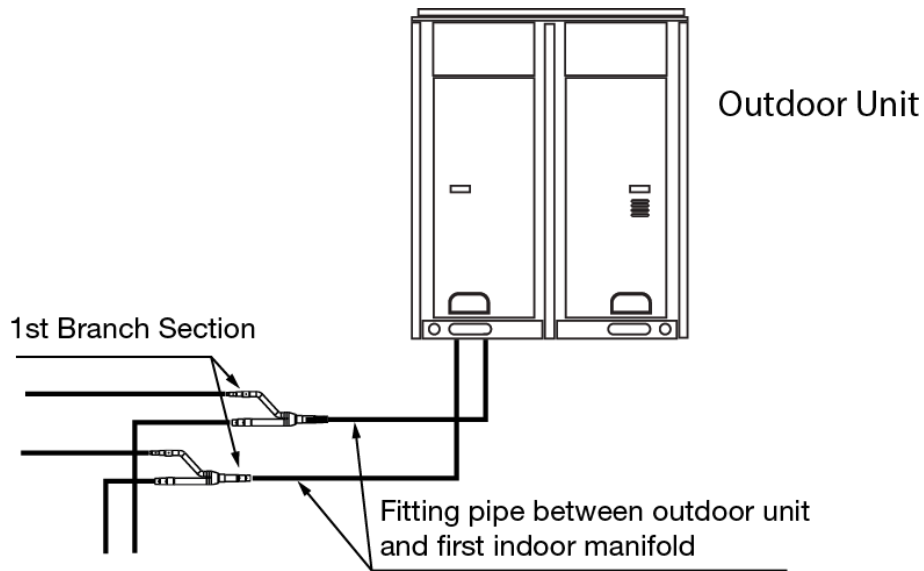


Fig. 22

Basic Module	Pipe between ODU and the first branch of IDU	
	Gas Pipe mm(in.)	Liquid Pipe mm(in.)
VRFO-72VP-U2C(55)5	Φ19.05(3/4)	Φ9.52(3/8)
VRFO-96VP-U2C(55)5	Φ22.2(7/8)	Φ9.52(3/8)
VRFO-120VP-U2C(55)5	Φ28.6(1-1/8)	Φ12.7(1/2)

For multi-module unit, select appropriate manifold connected to outdoor module as per the pipe size of basic module. Pipe size of basic outdoor module is shown as follows:

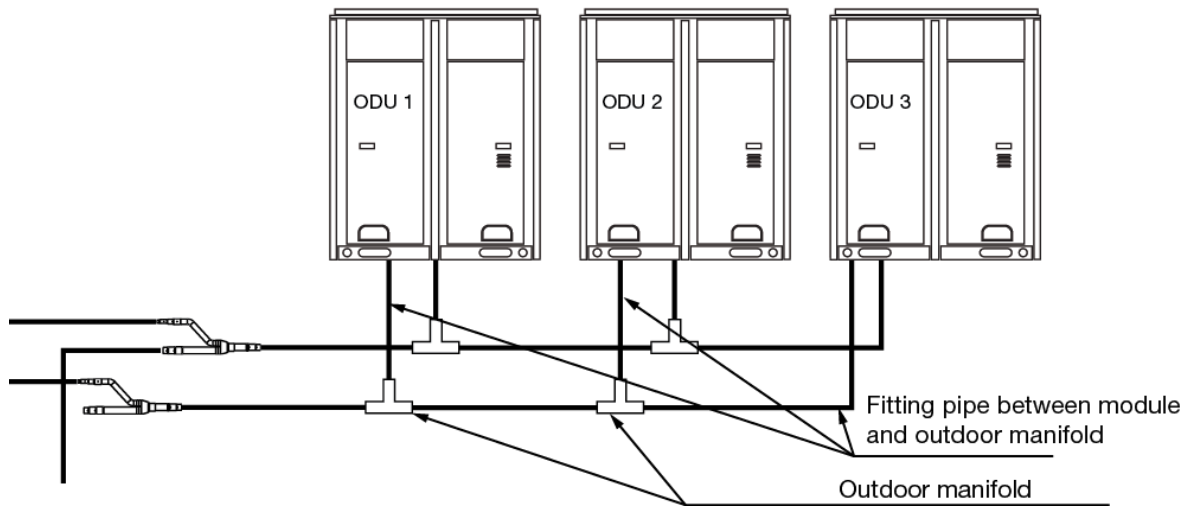


Fig. 23

Basic Module	Pipe between ODU and the first branch of IDU	
	Gas Pipe mm(in.)	Liquid Pipe mm(in.)
VRFO-72VP-U2C(55)5	Φ19.05(3/4)	Φ9.52(3/8)
VRFO-96VP-U2C(55)5	Φ22.2(7/8)	Φ9.52(3/8)
VRFO-120VP-U2C(55)5	Φ28.6(1-1/8)	Φ12.7(1/2)

Select the branch of outdoor module

Select the branch of outdoor module	Module's capacity C (kBtu/h)	Model
	$144 \leq C$	ML01/A

Fitting pipe between two manifolds from basic modules

Pipe size (between two manifolds from basic modules) is based on the total capacity of upstream modules

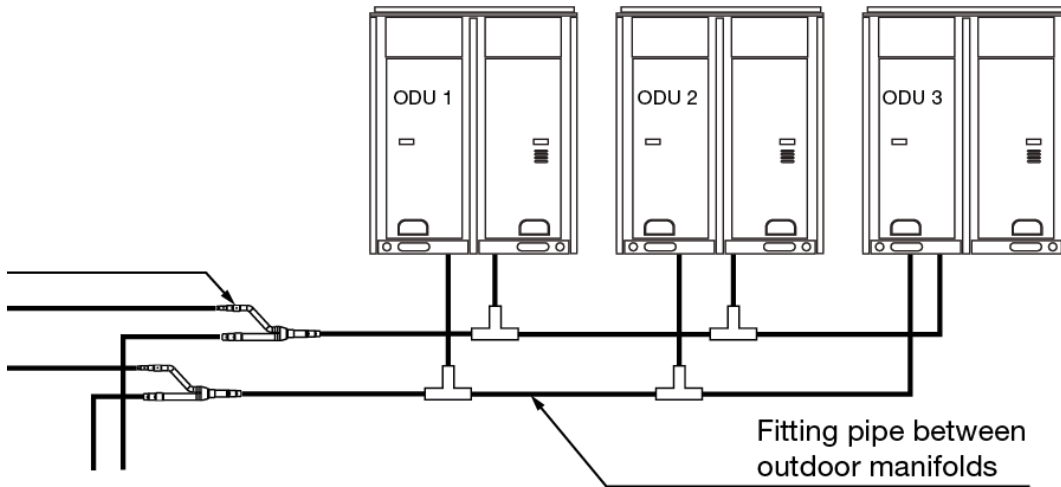


Fig. 24

Total capacity of upstream modules Q(Btu/h)	Pipe size between manifolds	
	Gas pipe size mm(in.)	Liquid pipe size mm(in.)
144000	Φ28.6(1-1/8)	Φ12.7(1/2)
168000	Φ28.6(1-1/8)	Φ15.9(5/8)
192000	Φ28.6(1-1/8)	Φ15.9(5/8)
216000	Φ28.6(1-1/8)	Φ15.9(5/8)
240000	Φ34.9(1-3/8)	Φ15.9(5/8)

Fitting pipe between the first manifold from indoor unit and the end manifold from outdoor unit

Single module unit

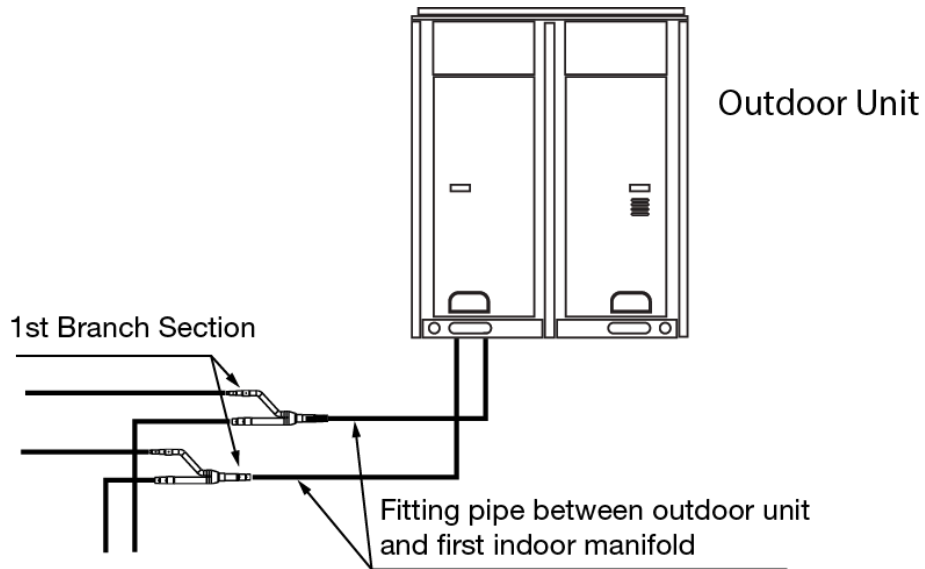


Fig.25

Basic Module	Pipe between ODU and the first branch of IDU	
	Gas Pipe mm(in.)	Liquid Pipe mm(in.)
VRFO-72VP-U2C(55)5	Φ19.05(3/4)	Φ9.52(3/8)
VRFO-96VP-U2C(55)5	Φ22.2(7/8)	Φ9.52(3/8)
VRFO-120VP-U2C(55)5	Φ28.6(1-1/8)	Φ12.7(1/2)

For multiple modules, the piping from ODU to the first branch of IDU is based on the total rated capacity of outdoor modules.

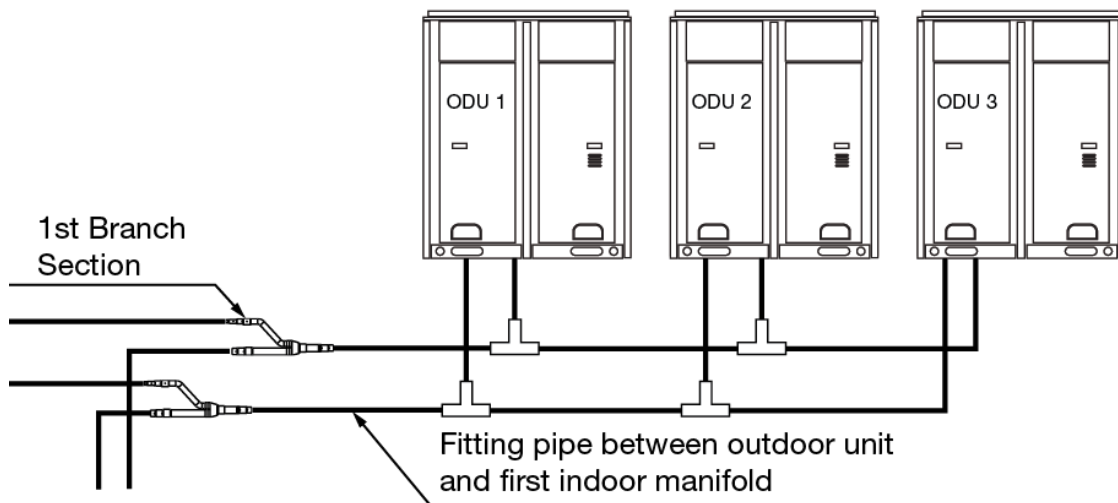


Fig. 26

Total rated capacity of outdoor modules (multi-modular system)	Pipe between ODU and the first branch of IDU	
	Gas pipe size mm(in.)	Liquid pipe size mm(in.)
VRFO-144VP-U2C(55)5	Φ28.6(1-1/8)	Φ12.7(1/2)
VRFO-168VP-U2C(55)5	Φ28.6(1-1/8)	Φ15.9(5/8)
VRFO-192VP-U2C(55)5	Φ28.6(1-1/8)	Φ15.9(5/8)
VRFO-216VP-U2C(55)5	Φ28.6(1-1/8)	Φ15.9(5/8)
VRFO-240VP-U2C(55)5	Φ34.9(1-3/8)	Φ15.9(5/8)
VRFO-264VP-U2C(55)5	Φ34.9(1-3/8)	Φ19.05(3/4)
VRFO-288VP-U2C(55)5	Φ34.9(1-3/8)	Φ19.05(3/4)
VRFO-312VP-U2C(55)5	Φ34.9(1-3/8)	Φ19.05(3/4)
VRFO-336VP-U2C(55)5	Φ34.9(1-3/8)	Φ19.05(3/4)
VRFO-360VP-U2C(55)5	Φ41.3(1-5/8)	Φ19.05(3/4)

Manifold at indoor unit side

Manifold at indoor unit side can be selected as per total capacity of downstream indoor unit(s). Refer to the following table.

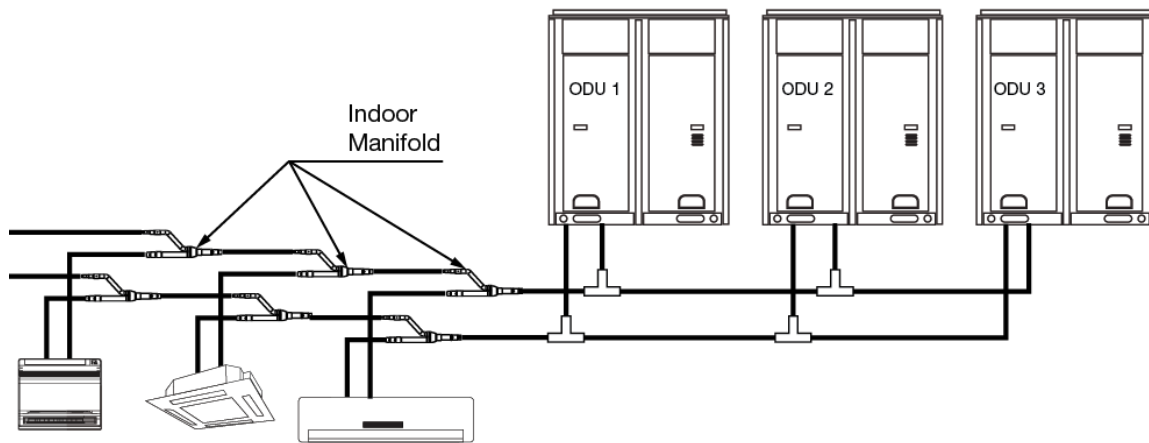


Fig. 27

R410A Refrigerant System	Total capacity of downstream indoor unit(s) C (KBtu/h)	Model
Y-type Manifold	$C < 68$	VRFO-YtubeP-1AA
	$68 \leq C \leq 102$	VRFO-YtubeP-1BA
	$102 < C \leq 239$	VRFO-YtubeP-02A
	$239 < C$	VRFO-YtubeP-03A

Fitting pipe between manifolds

Pipe size (between two manifolds at indoor unit side) is based on the total capacity of upstream indoor unit(s).

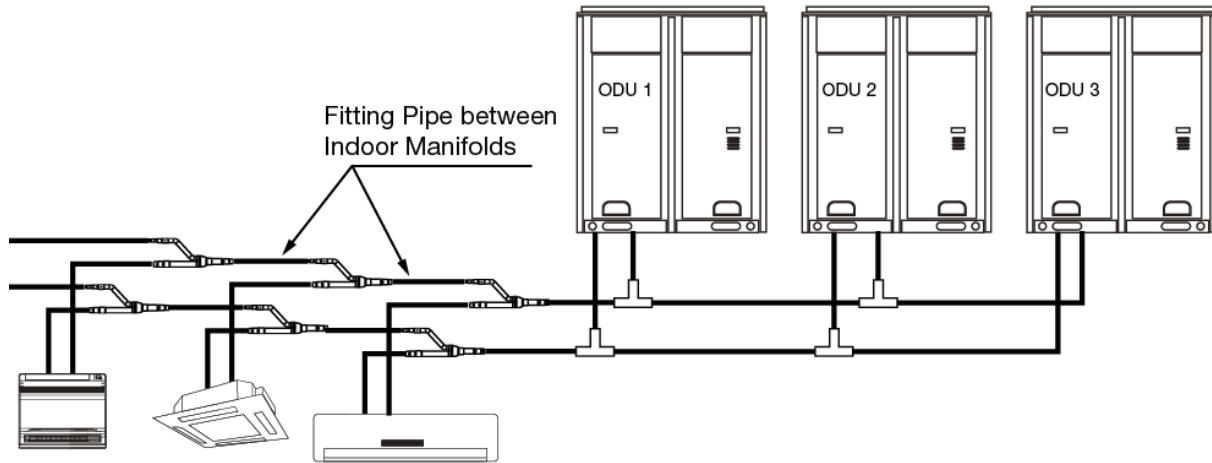


Fig. 28

Total capacity of downstream indoor unit(s) C(Btu/h)	Dimension of the pipe of indoor branch	
	Gas Pipe mm(in.)	Liquid Pipe mm(in.)
$C \leq 17100$	$\Phi 12.7(1/2)$	$\Phi 12.7(1/2)$
$17100 < C \leq 48500$	$\Phi 15.9(5/8)$	$\Phi 15.9(5/8)$
$48500 < C \leq 72000$	$\Phi 19.05(3/4)$	$\Phi 19.05(3/4)$
$72000 < C \leq 96000$	$\Phi 22.2(7/8)$	$\Phi 22.2(7/8)$
$96000 < C \leq 144000$	$\Phi 28.6(1-1/8)$	$\Phi 28.6(1-1/8)$
$144000 < C \leq 216000$	$\Phi 28.6(1-1/8)$	$\Phi 28.6(1-1/8)$
$216000 < C \leq 240000$	$\Phi 34.9(1-3/8)$	$\Phi 34.9(1-3/8)$
$240000 < C \leq 336000$	$\Phi 34.9(1-3/8)$	$\Phi 34.9(1-3/8)$
$336000 < C$	$\Phi 41.3(1-5/8)$	$\Phi 41.3(1-5/8)$

Fitting pipe between indoor unit and manifold

Manifold should be matched with fitting pipe of indoor unit.

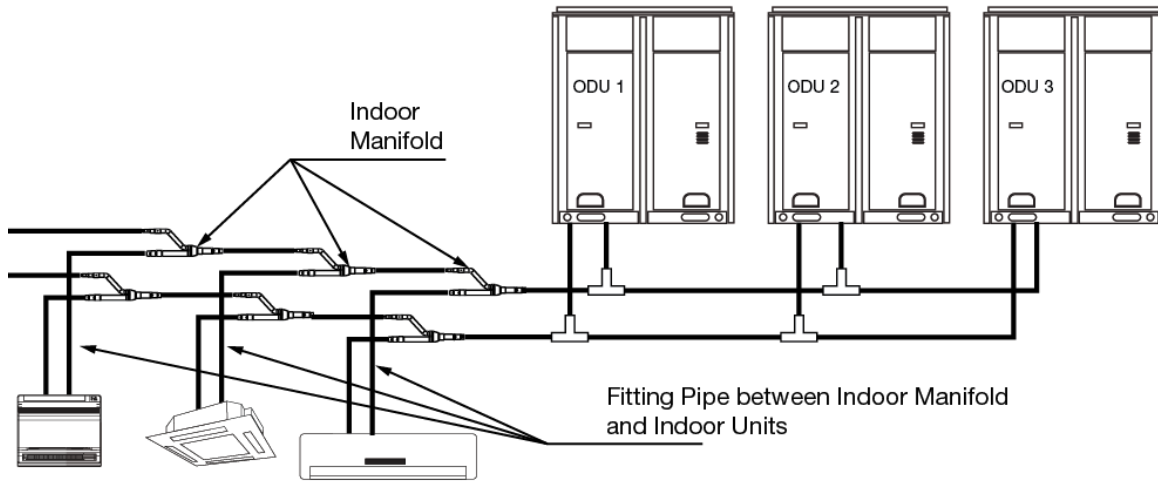


Fig. 29

Rated capacity of indoor unit C(Btu/h)	Pipe between indoor branch and IDU	
	Gas Pipe mm(in.)	Liquid Pipe mm(in.)
$C \leq 7500$	$\Phi 9.52(3/8)$	$\Phi 6.35(1/4)$
$7500 < C \leq 17100$	$\Phi 12.7(1/2)$	$\Phi 6.35(1/4)$
$17100 < C \leq 48500$	$\Phi 15.9(5/8)$	$\Phi 9.52(3/8)$
$48500 < C \leq 72000$	$\Phi 19.05(3/4)$	$\Phi 9.52(3/8)$
$72000 < C$	$\Phi 22.2(7/8)$	$\Phi 9.52(3/8)$

Installation of the Connection Pipe

Precautions when installing the connection pipe

1. Conform to the following principles during piping connection: Connection pipeline should be as short as possible. The height difference between indoor and outdoor units should be as short as possible. Keep number of bends as little as possible. The radius of curvature should be as large as possible.
2. Weld the connection pipes between indoor and outdoor unit. Please strictly conform to the requirements for welding process. Rosin joints and pin holes are not allowable.
3. When laying the pipes, be careful not to deform them. The radius of bending parts should be more than 200mm (7-7/8in.). The pipes cannot be repeatedly bent or stretched, otherwise the material will harden. Do not bend or stretch the pipe over three times at the same position.
4. Please use a torque wrench to connect union nut on the indoor unit. See Fig. 30.

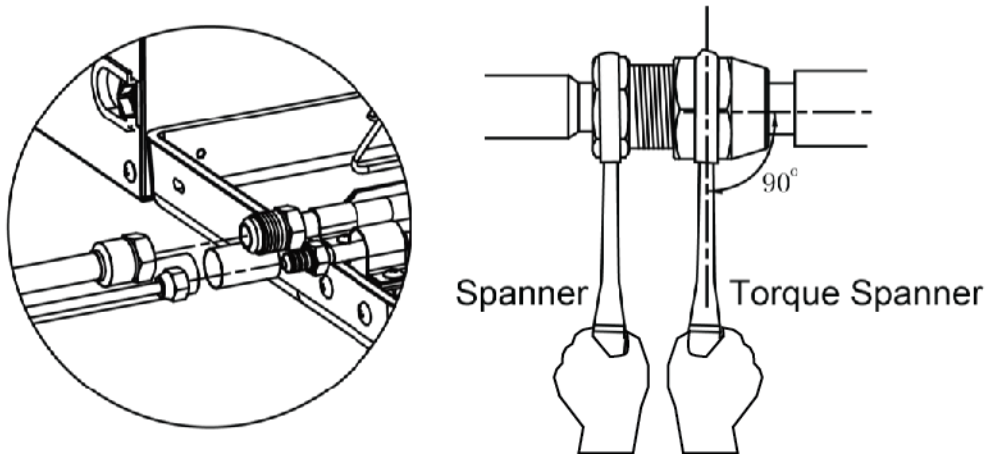


Fig. 30

1. Align the expansion end of copper pipe with the center of threaded joint. Tighten the flare nuts with your hands.
2. Tighten the flare nuts with torque wrench until you hear a "click" sound.
3. Use sponge to wrap the connecting pipe and joints without thermal insulation and tie it up with plastic tape.
4. A mounting support for the connection pipe is required.
5. The curvature degree of the connection pipe should not be small, otherwise the pipe might crack. Installation personnel should use tube bender when bending the pipe.
6. DO NOT forcibly stretch the pipe joint, otherwise indoor capillary or other pipes might be damaged and lead to refrigerant leakage.

Y-type manifold

1. Y-type manifold

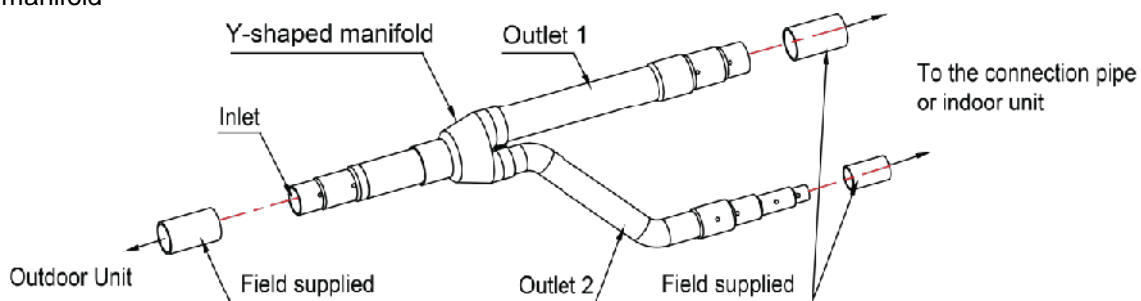


Fig. 31

2. Y-type manifold has several pipe sections with different pipe size, which facilitates to match with various copper pipe. Use pipe cutter to cut in the middle of the pipe section with different pipe size and deburr as well. See Fig.32.

3. Y-type manifold must be installed vertically or horizontally.

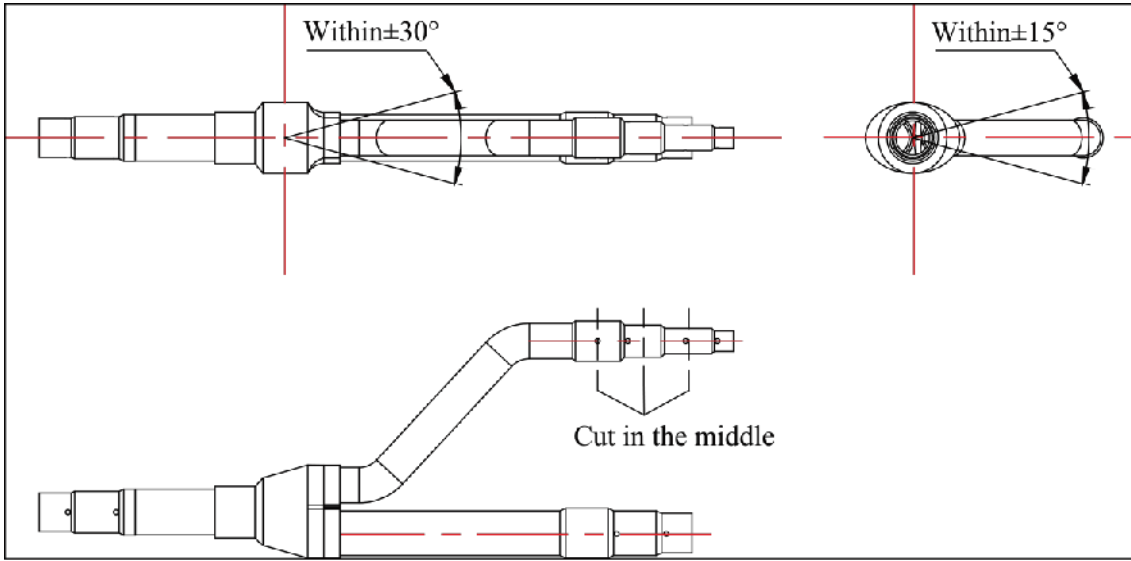
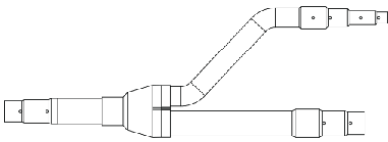


Fig. 32

Y-type manifold	Total capacity of downstream indoor unit(s) C (KBtu/h)	Model
	$C < 68$	VRFO-YtubeP-1AA
	$68 \leq C \leq 102$	VRFO-YtubeP-1BA
	$102 < C \leq 239$	VRFO-YtubeP-02A
	$239 < C$	VRFO-YtubeP-03A

4. Manifold is isolated by insulating material that can bear 120°C (248°F) or higher temperatures. Manifold attached foam cannot be taken as insulating material.

Installation and thermal insulation for pipeline

- For multi VRF system, every copper pipe should be labeled so as to avoid misconnection.
- Manifolds can be laid in the following ways:
The length of a straight pipe between two manifolds cannot be less than 500 mm (19-11/16in.). The length of a straight pipe before the main pipe port of the manifold cannot be less than 500mm (19-11/16in.). The length of a straight pipe between the branch of the manifold and the IDU cannot be less than 500mm (19-11/16in.). See Fig.33.

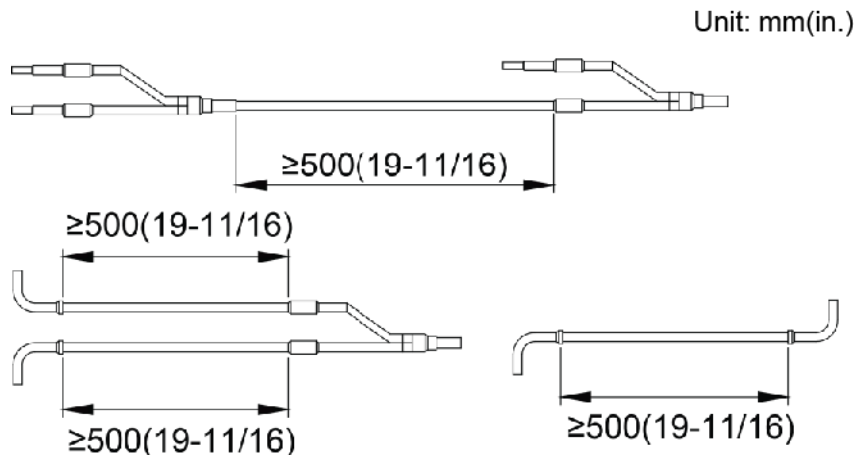


Fig. 33

- There must be three fixing point for both horizontal and vertical installation of the Y-type manifold. See Fig.34.
Fixing point 1: 100 mm on the main inlet manifold from the welding point
Fixing point 2: 200 mm on the main branched pipe from the welding point

Fixing point 3: 250 mm on the branched pipe from the welding point

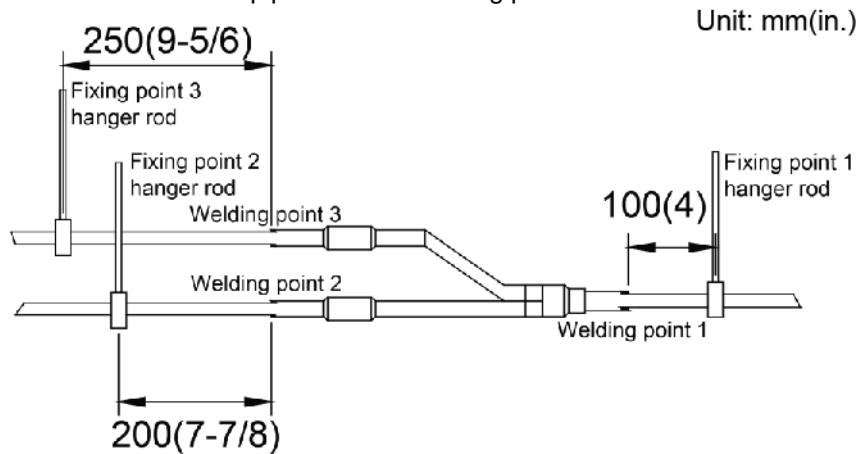


Fig. 34

4. Thermal insulation for pipeline

- 1) To avoid condensate or water leakage on connecting pipe, the gas pipe and liquid pipe must be wrapped with thermal insulating material and adhesive pipe for insulation from
- 2) For heat pump unit, liquid pipe should bear 70°C (158°F) or above, and gas pipe should bear 120°C (248°F) or above. For cooling only unit, both liquid pipe and gas pipe should bear 70°C (158°F) or above. Example: Polyethylene foam can bear 120°C (248°F) above and foaming polyethylene can bear 100°C (212°F) above.
- 3) Joints at indoor and outdoor units should be wrapped with insulating material and leave no clearance between pipe and wall. See Fig.35.

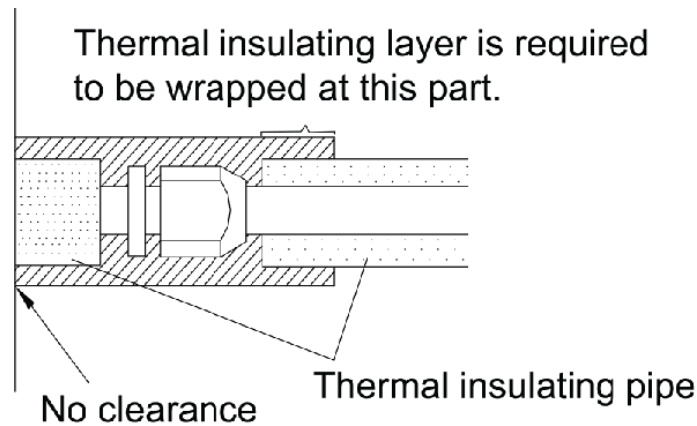


Fig. 35

- 4) Manifold attached foam cannot be taken as insulating material.
- 5) When wrapping the tape, the later circle should cover half of the former one. Don't wrap the tape so tightly, otherwise the insulation effect will be weakened.
- 6) After wrapping the pipe, adopt sealing material to completely fill the hole so as to prevent wind and rain from entering the room.

Support and protection for pipeline

1. Support should be made for hanging connection pipe. Distance between each support cannot be over 1m (39-3/8in.).
2. Protection against accidental damage should be made for outdoor pipeline. When the pipeline exceeds 1m (39-3/8in.), a pin. board should be added for protection.

Air Purging and Refrigerant Charge

Air purging

1. Confirm outdoor liquid and gas valves are closed. Air purge from the nozzle located on liquid and gas valves by vacuum pump. See Fig.36.
2. When there are more than 2 outdoor units, air purging from the nozzle located on the oil balance valve. Confirm outdoor oil balance valves are closed. See Fig.37.

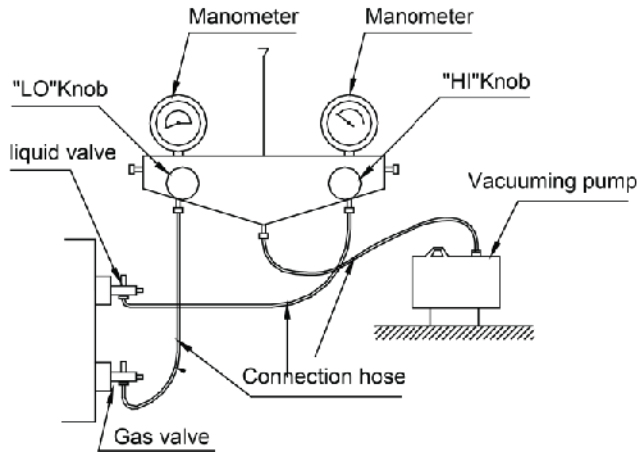


Fig. 36

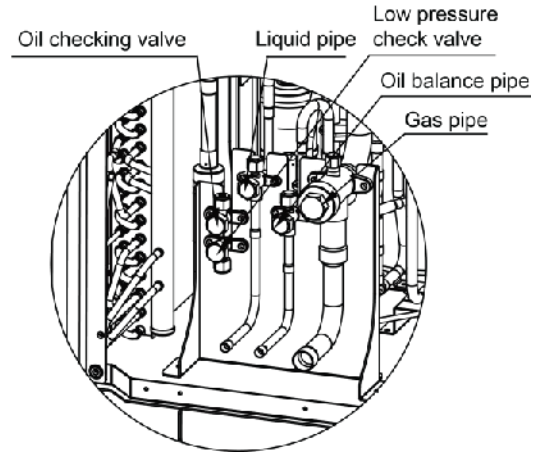


Fig. 37

Additional refrigerant charging

Outdoor unit has been charged with refrigerant before delivery.

Charge additional refrigerant for field-installed connecting pipe. If the pipeline is longer than 1m (39-3/8in.), please refer to the following table for charging amount of refrigerant. (Liquid pipe prevails)

How much additional refrigerant should be charged.

Total refrigerant charging amount $R = \text{Pipeline charging amount } A + \Sigma \text{charging amount } B \text{ of every module.}$

1. Pipeline charging amount
Added refrigerant quantity A for piping = $\Sigma \text{Liquid pipe length} \times \text{Added refrigerant quantity for each meter (in.) of liquid pipe.}$

	Diameter of liquid pipe mm(in.)							
	28.6 (1-1/8)	25.4 (1)	22.2 (7/8)	19.05 (3/4)	15.9 (5/8)	12.7 (1/2)	9.52 (3/8)	6.35 (1/4)
kg/m	0.680	0.520	0.350	0.250	0.170	0.110	0.054	0.022
OZ/in.	0.61	0.47	0.31	0.22	0.15	0.10	0.05	0.02

2. Σ Refrigerant charging amount B of every module.

Refrigerant charging amount B of every module kg(Pounds)		Rated Capacity(1000Btu/h)		
IDU/ODU rated capacity collocation ratio C	Quantity of included IDUs(N)	72	96	120
$50\% \leq C \leq 90\%$	$N < 4$	0	0	0
	$N \geq 4$	0.5(1.1)	0.5(1.1)	0.5(1.1)
$90\% < C \leq 105\%$	$N < 4$	1(2.2)	1(2.2)	1.5(3.3)
	$8 > N \geq 4$	2(4.4)	2(4.4)	3(6.6)
	$N \geq 8$	4(8.8)	3.5(7.7)	4(8.8)
$105\% < C \leq 135\%$	$N < 4$	2(4.4)	2(4.4)	2.5(5.5)
	$8 > N \geq 4$	4(8.8)	3.5(7.7)	4(8.8)
	$N \geq 8$	4.5(9.9)	4.5(9.9)	5(11.0)

NOTICE

1. IDU/ODU rated capacity collocation ratio $C = \text{Sum of rated cooling capacity of indoor unit} / \text{Sum of rated cooling capacity of outdoor unit}$.
2. If all of the indoor units are fresh air indoor units, the quantity of refrigerant added to each module is 0kg
3. If outdoor air processor is connected with normal VRF indoor unit, adopt the perfusion method for normal indoor.

Example1:

- The ODU is composed of 3 modules: 72kBtu/h, 120 kBtu/h and 120 kBtu/h. The IDUs are made up of 7sets of 48 kBtu/h.
- IDU/ODU rated capacity collocation ratio $C = 48 \times 7 / (72 + 120 + 120) = 108\%$. The quantity of included IDUs is more than 4 sets. Please refer to the above table.
 - Refrigerant charging amount B for 72kBtu/h module is 4.0kg (8.8pounds).
 - Refrigerant charging amount B for 120 kBtu/h module is 4.0kg (8.8pounds).
 - Refrigerant charging amount B for 120 kBtu/h module is 4.0kg (8.8pounds).
- So, Σ Refrigerant charging amount B of every module = $4.0 + 4.0 + 4.0 = 12\text{kg}$ (8.8+8.8+8.8 =26.4pounds).
- Suppose the Pipeline charging amount $A = \Sigma$ Liquid pipe length \times refrigerant charging amount of every 1m (or 1in.) liquid pipe = 25kg (55.1 pounds)
- Total refrigerant charging amount $R = 25 + 12 = 37\text{kg}$ (55.1+26.4=81.5pounds).

Example 2:

- Outdoor unit is a 72kBtu/h module and the indoor unit is a 72kBtu/h fresh air unit. The quantity (B) of refrigerant added to this module is 0kg (0pounds).
- So, ΣB (Quantity of refrigerant added to each module) = 0kg (0pounds).
- Suppose that A (Quantity of refrigerant added to connection pipe) = Σ Length of liquid pipe \times Quantity of refrigerant added to liquid pipe per meter = 5kg (11pounds).
- R (Quantity of added refrigerant in total) = $5 + 0 = 5\text{kg}$ (11+0=11pounds).
- Modular combination of outdoor unit is subject to combinations that is currently available.

After confirming that there is no leakage from the system, with the compressor not in operation, charge additional R410A to the specified amount. To add the additional refrigerant charge to the unit, use the filling opening of the liquid pipe valve of the outdoor unit.

If required additional refrigerant cannot be quickly filled to increase the pressure in the pipe, set the unit to cooling mode at startup and then fill the refrigerant from gas valve of outdoor unit. If ambient temperature is low, the unit can be set to heating mode instead of cooling mode.

Electric Wiring

Wiring precautions

⚠WARNING

1. Wiring should conform to national rules. All the parts, materials, electric work should be in accordance with local codes.
2. Rated voltage and exclusive power supply should be used.
3. Power cord should be fixed soundly and reliable. Never forcibly pull the power cord.
4. Wire size of power cord should be large enough. A damaged power cord and connecting wire should be replaced by dedicated cable.
5. All the electrical work should be performed by professional personnel as per local laws, regulations and this manual.
6. Connect the unit to the special grounding device and make sure the unit is grounded properly.
7. Air switch and circuit breaker is required to be set. Air switch should have both magnetic trip and thermal trip functions to protect the unit when a short circuit or overload happens. D-type breaker is recommended to be used.
8. Wiring diagram attached on the unit is the most accurate.

Wiring of power cord

Every unit should have corresponding short-circuit and overload protection. And also a main switch is required to control power supply or disconnection. See Fig.38.

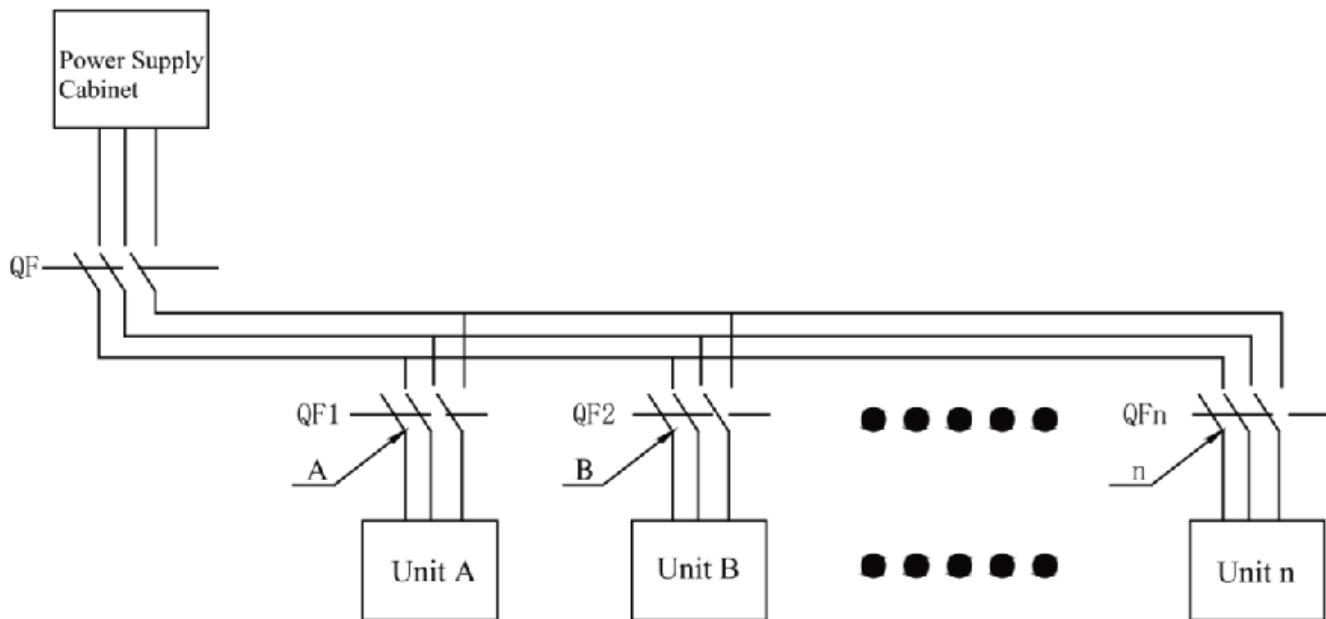


Fig. 38

Outdoor Unit

Outdoor units	Power Supply	Fuse Capacity	Minimum Circuit Ampacity	Maximum Overcurrent Protection
	V/Ph /Hz	A	A	A
VRFO-72 VP-U2C(55)5	208V/230V 3~ 60Hz	45	30	45
VRFO-96 VP-U2C(55)5	208V/230V 3~ 60Hz	70	45	70
VRFO-120 VP-U2C(55)5	208V/230V 3~ 60Hz	100	74	100
VRFO-144 VP-U2C(55)5	208V/230V 3~ 60Hz	70	55	70
VRFO-168 VP-U2C(55)5	208V/230V 3~ 60Hz	90	70	90
VRFO-192 VP-U2C(55)5	208V/230V 3~ 60Hz	125	99	125
VRFO-216 VP-U2C(55)5	208V/230V 3~ 60Hz	125	111	125
VRFO-240 VP-U2C(55)5	208V/230V 3~ 60Hz	150	140	150
VRFO-264 VP-U2C(55)5	208V/230V 3~ 60Hz	150	123	150
VRFO-288 VP-U2C(55)5	208V/230V 3~ 60Hz	150	136	150
VRFO-312 VP-U2C(55)5	208V/230V 3~ 60Hz	175	164	175
VRFO-336 VP-U2C(55)5	208V/230V 3~ 60Hz	200	177	200
VRFO-336 VP-U2C(55)5	208V/230V 3~ 60Hz	200	177	200
VRFO-360 VP-U2C(55)5	208V/230V 3~ 60Hz	225	205	225

⚠WARNING

1. Specification of circuit breaker and power cord is selected on the basis of unit's maximum power (max. current).
2. Specification of power cord is based on the working condition where ambient temperature is 40 °C (104°F) and multi-core cable with copper conductor(working temperature is 90 °C (194°F), e.g. power cable with YJV cross-linked copper, insulated PE and PVC sheath) is lying on the surface of slot. If working conditions are different, please adjust the specification according to national standard.
3. Copper-core cable must be used.
4. The above sectional area is suitable for a maximum distance of 15m (49-1/5ft.). If it's over 15m (49-1/5ft.), sectional area must be expanded to prevent overload current from burning the wire or causing fire hazard.
5. Specification of circuit breaker is based on the working condition where the ambient temperature of circuit breaker is 40°C (104°F). If working condition is different, please adjust the specification according to national standard.
6. The air switch should include magnetic trip function and thermal trip function so that system can be protected from short circuit and overload.
7. An all-pole disconnection switch having a contact separation of at least 3mm (1/8in.) in all poles should be connected in fixed wiring.

Connection of power cord

⚠WARNING

1. Before obtaining access to terminals, all supply circuits must be disconnected.
2. If units are type I electrical appliances, they must be reliably grounded.
3. Ground resistance must be in accord with requirements of local standard.
4. The Green-yellow wire within units are ground wire. Do not use it for other purposes. Nor should it be cut off or secured by tapping screws. Otherwise, it may cause electric shock.
5. Power supply at user side must have reliable ground terminal. Do not connect ground wire to the following places:
 - 1) Water pipe.
 - 2) Gas pipe.
 - 3) Drainage pipe.
 - 4) Other places that are considered by professionals as unreliable.
6. Power cord and communication wire should be separated, with a distance of more than 20cm (7-7/8in.). Otherwise, system's communication may not work well.

Steps and graphic of power cord connection:

1. Knock off the cross-through opening that's used for leading the external power cord, with the cross-through rubber ring on the opening. Then lead the cable through the opening. Connect L1, L2, L3 of power cord and ground wire separately to the positions on wiring board (for power supply) that are marked with L1, L2, L3 and the ground screw nearby.
2. Use cable ties to tie the cable securely.
3. Lead the power cord as instructed in the graphic below:

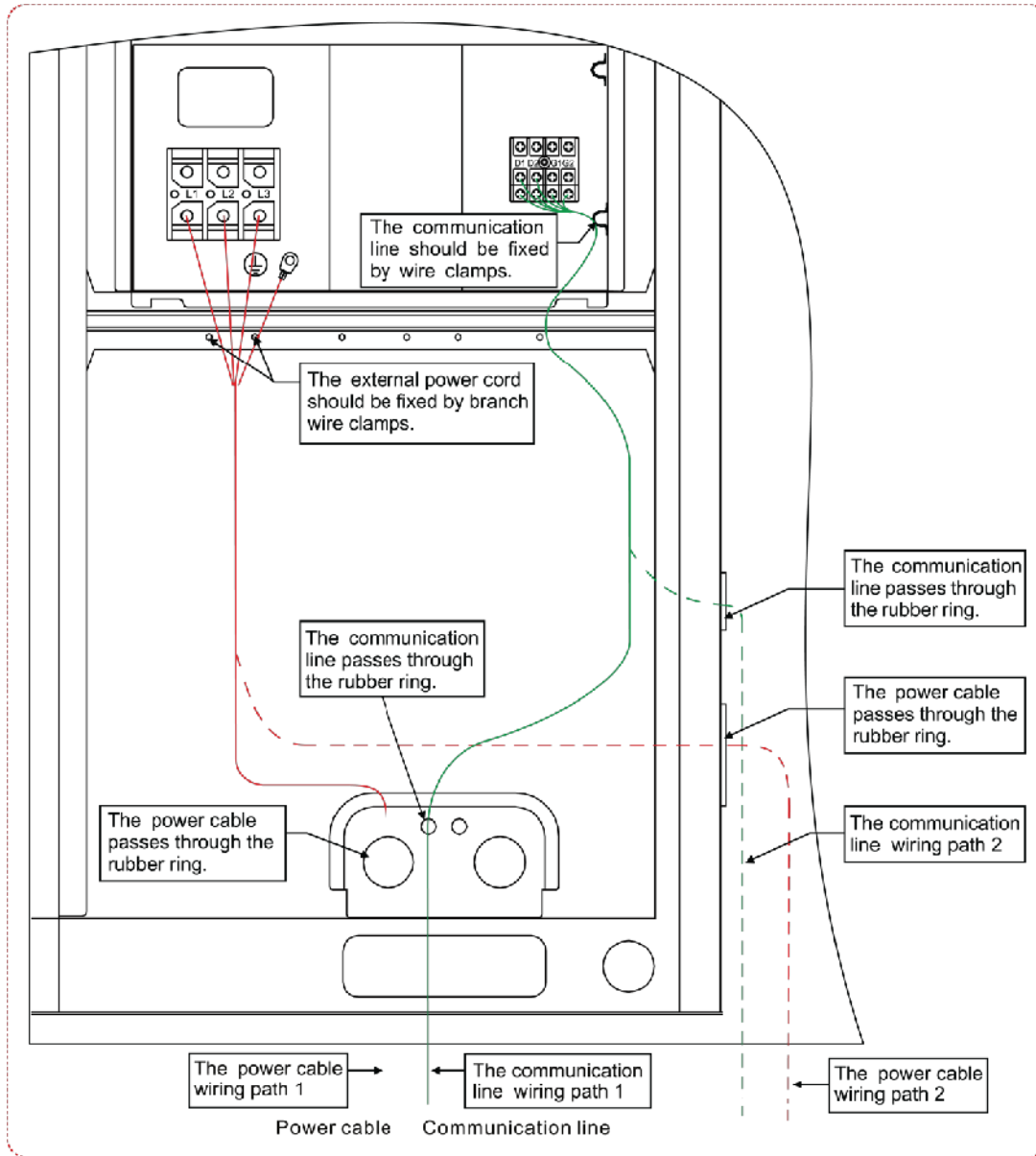


Fig. 39

System Communication

Communication system include:

1. Communication among outdoor basic modules.
2. Communication between ODU and IDU.
3. Communication among IDUs.
4. Communication between IDU and wired controller.
5. Connection between IDU and light board receiver.
6. Communication between different refrigeration systems.
7. Graphics of general communication connection.

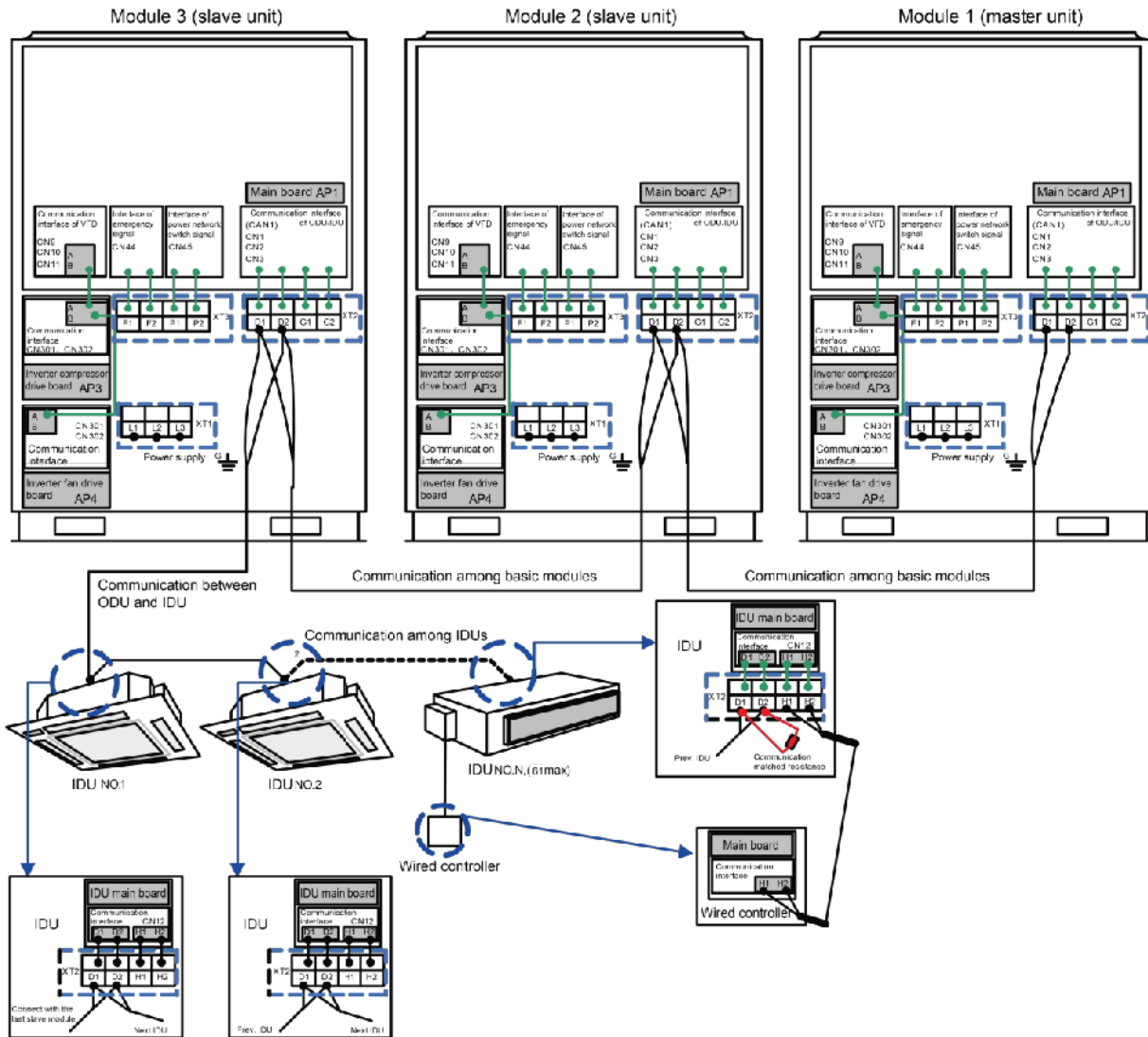


Fig. 40

Communication mode of Modular DC Inverter Units

CAN bus mode is taken for communication between IDU and ODU and communication among IDUs.

Selection and connection mode of communication material

Select communication material

NOTICE

If air conditioners are installed at places where there's strong electromagnetic interference, the communication wire of IDU and wired controller must use shielded wire and the communication wire between IDU and IDU/ODU must use shielded twisted pair.

1. Select communication wire between IDU and wired controller

Material type	Total length of communication line between IDU unit and wired controller L m(ft.)	Wire size	Remarks
Light/Ordinary polyvinyl chloride sheathed cord.	$L \leq 250(820-1/5)$	2×AWG18~ 2×AWG16	<ol style="list-style-type: none"> Total length of communication line can't exceed 250m (820-1/5ft.). The cord should be Circular cord (the cores shall be twisted together). If unit is installed in places with intense magnetic field or strong interference, it is necessary to use shielded wire.

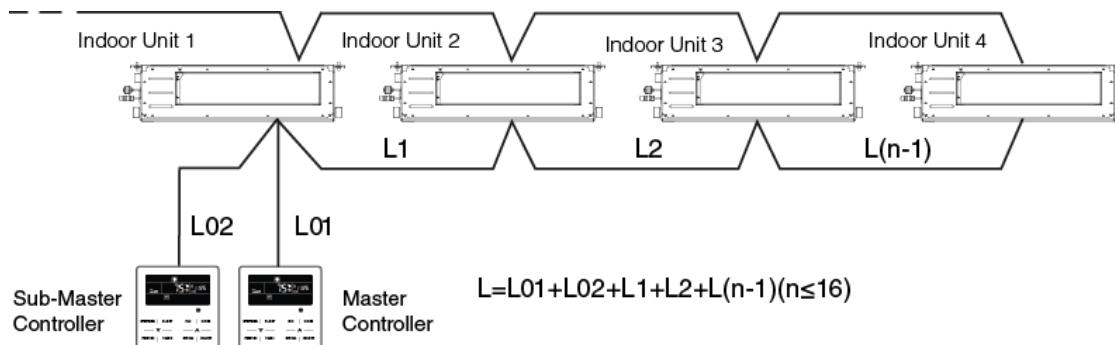


Fig. 41

2. Select communication wire between ODU and IDU

Type	Total Length L(m) of Communication Cable between IDU Unit and IDU (ODU) Unit m(ft.)	Wire size	Remarks
Light/Ordinary polyvinyl chloride sheathed cord.	$L \leq 1000(3280-5/6)$	$\geq 2 \times \text{AWG}18$	<ol style="list-style-type: none"> If the wire diameter is enlarged to 2 ×AWG16, the total communication length can reach 1500m (4921-1/4ft.). The cord should be Circular cord (the cores shall be twisted together). If unit is installed in places with intense magnetic field or strong interference, it is necessary to use shielded wire.

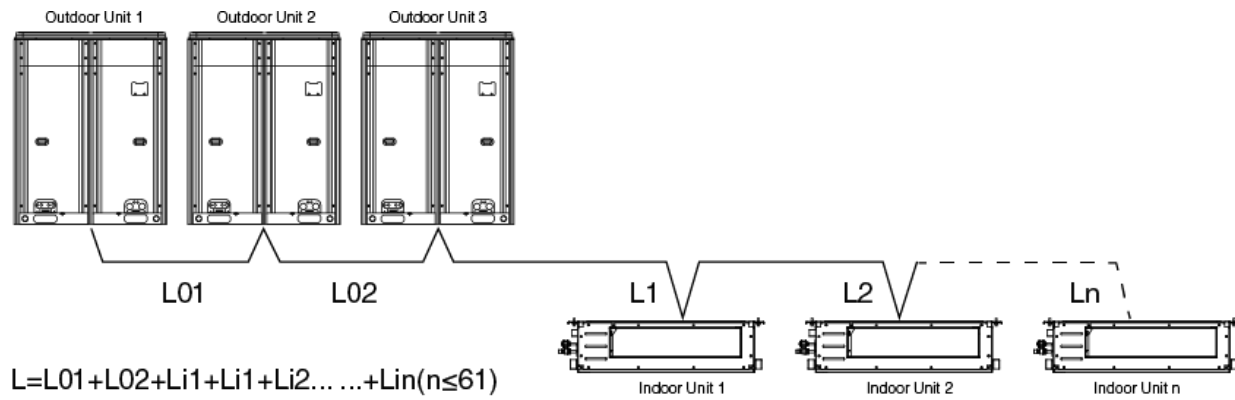


Fig. 42

NOTICE

All of the selected communication wire must be consistent with local laws and regulations.

Connection mode of communication

1. All communication wires of VRF must be connected in series rather than in star.

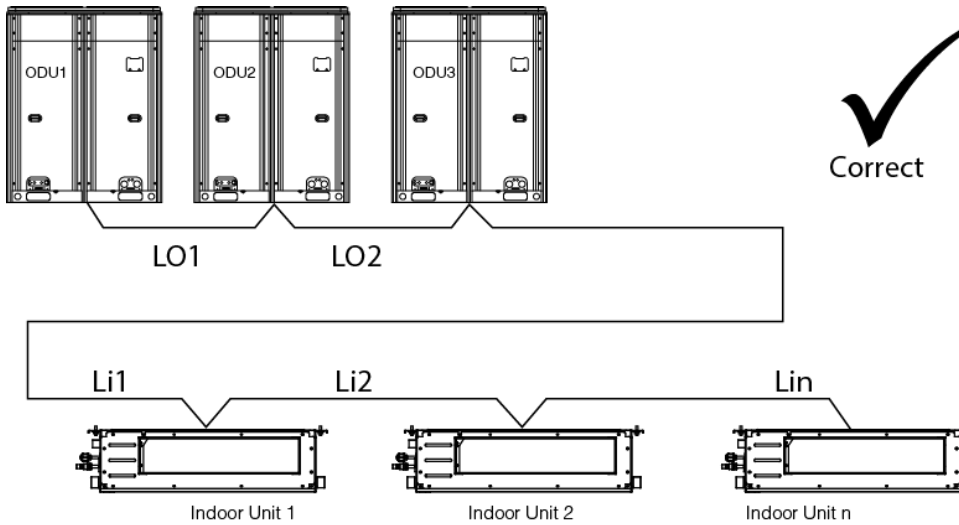


Fig. 43

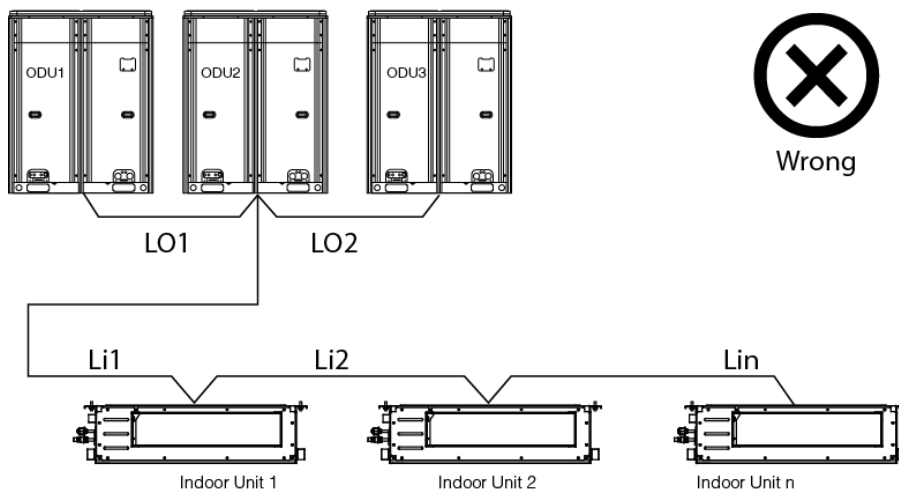


Fig. 44

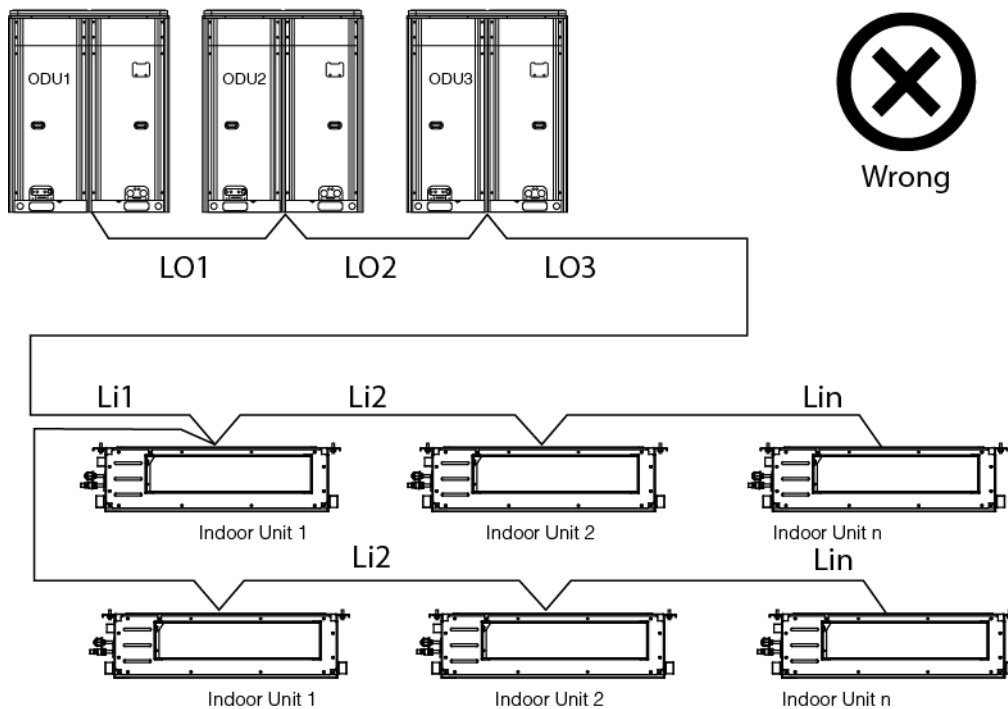


Fig. 45

2. All communication wires of VRF are connected by screws.

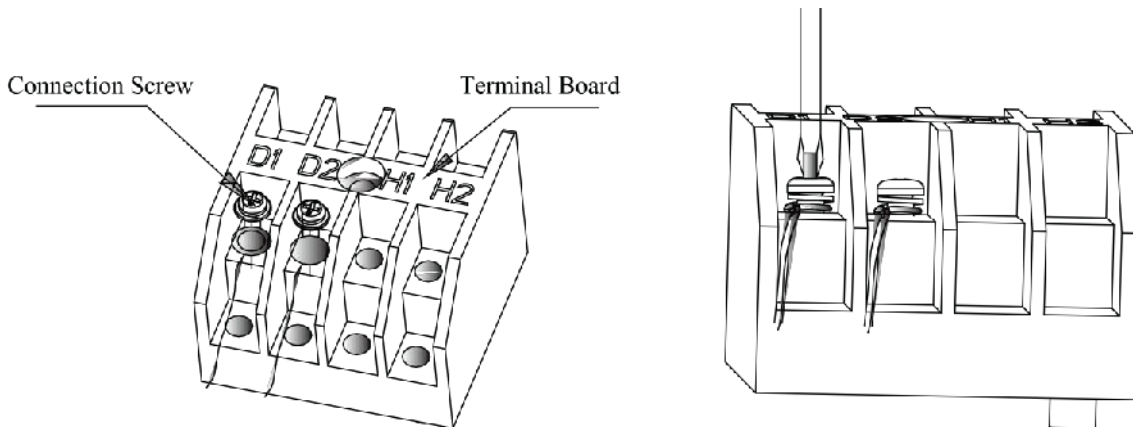


Fig. 46

3. If a single communication wire is not long enough and needs to be connected, the connected joint must be welded or pressure-welded. Do not simply twist the wires together.

Communication address

Auto addressing technology is adopted for VRF IDU and ODU. No need to set address codes manually. Only the addresses of the master unit and central control need to be set (address of central control is only needed when there are multiple refrigeration systems).

NOTICE

When installing remote monitor or central controller, displacement on indoor units' project codes must be made. Otherwise, there will be collision malfunction of the project codes. For detail operation methods, please refer to the *VRF Installation and Maintenance Manual*.

Connection Method and Steps for System Communication

Communication connection between IDU and ODU

NOTICE

The centralized controller can be installed when it is necessary.
 Connect IDU and ODU via terminal D1/D2 of wiring board XT2. Below are the connection graphics of single unit and modular units:

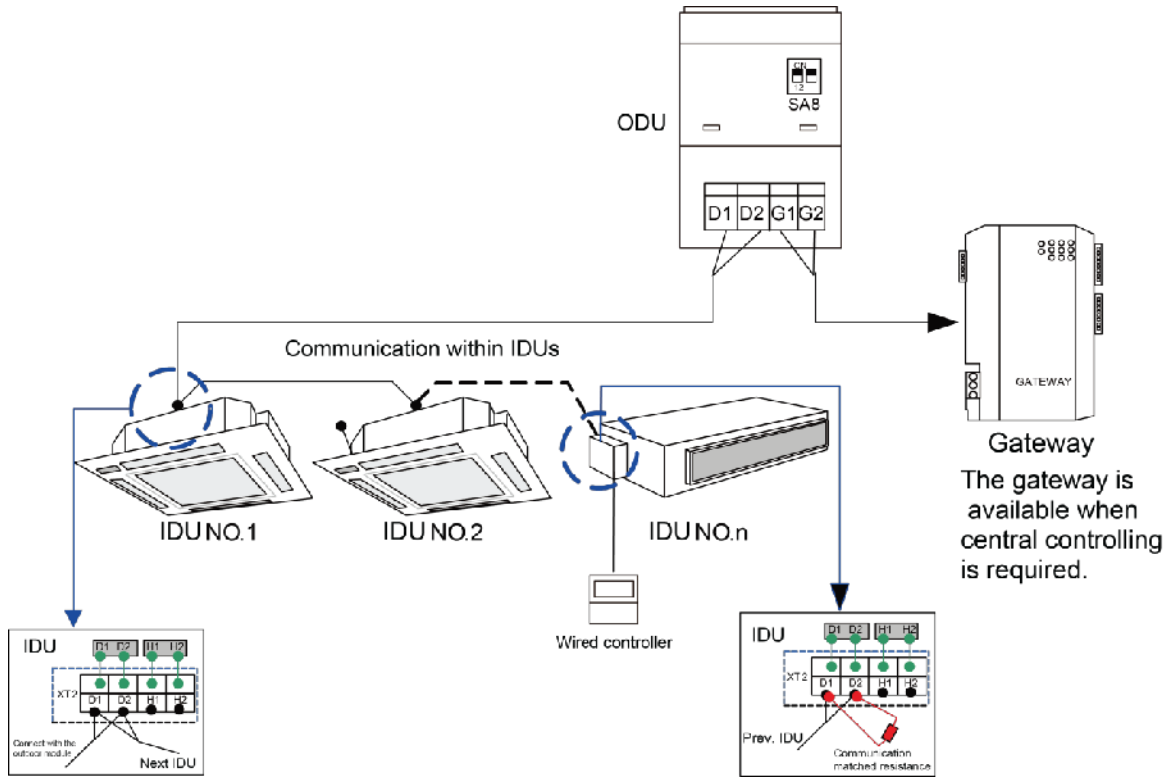


Fig. 47

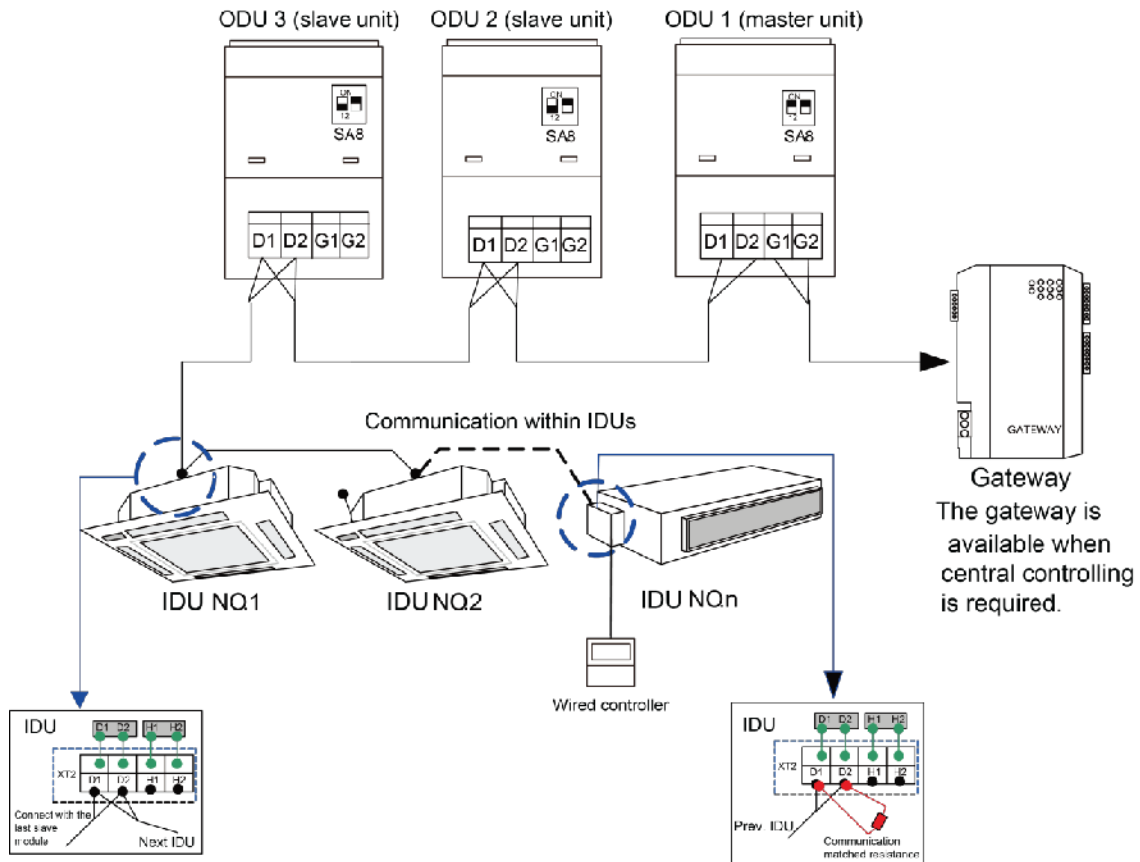


Fig.48 Connection of modular unit

NOTICE

1. For modular outdoor units, if there are multiple outdoor modules, then the master unit must be the first outdoor module on the communication wire and should not connect with IDU (master unit is set by SA8 of the outdoor main board).
2. For modular outdoor units, if there are multiple outdoor modules, then indoor units must be connected with the last slave module of ODU (slave module is set by SA8 of the outdoor main board).
3. Communication wire and power cord must be separated.
4. Communication wire must be of proper length. Extension is not allowed.
5. IDUs must be connected in series. The last IDU must be connected with the communication matched resistance (supplied in the list of ODU spare parts).

Communication connection between IDU and wired controller

There are 4 kinds of connection between IDU and wired controller, as shown below:

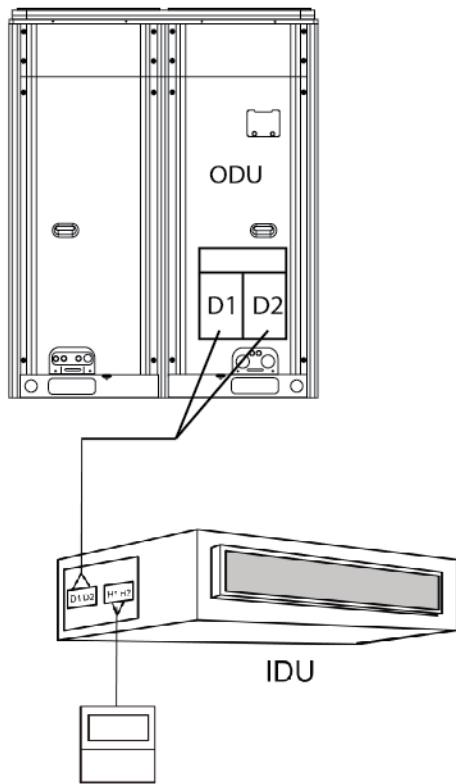


Fig.49 One wired controller controls one IDU

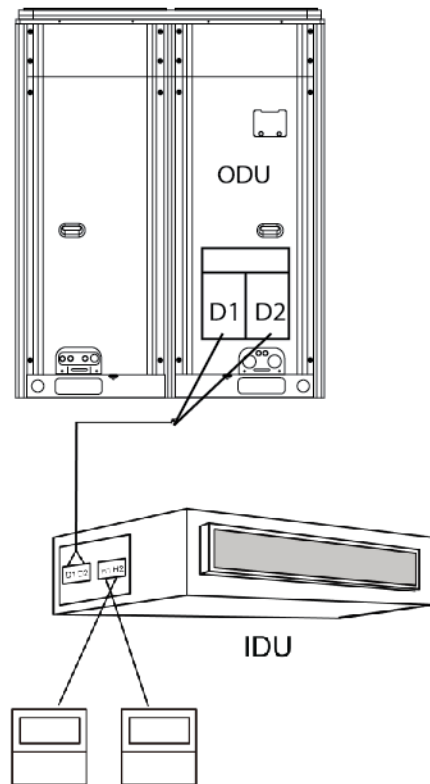


Fig.50 Two wired controllers controls one IDU

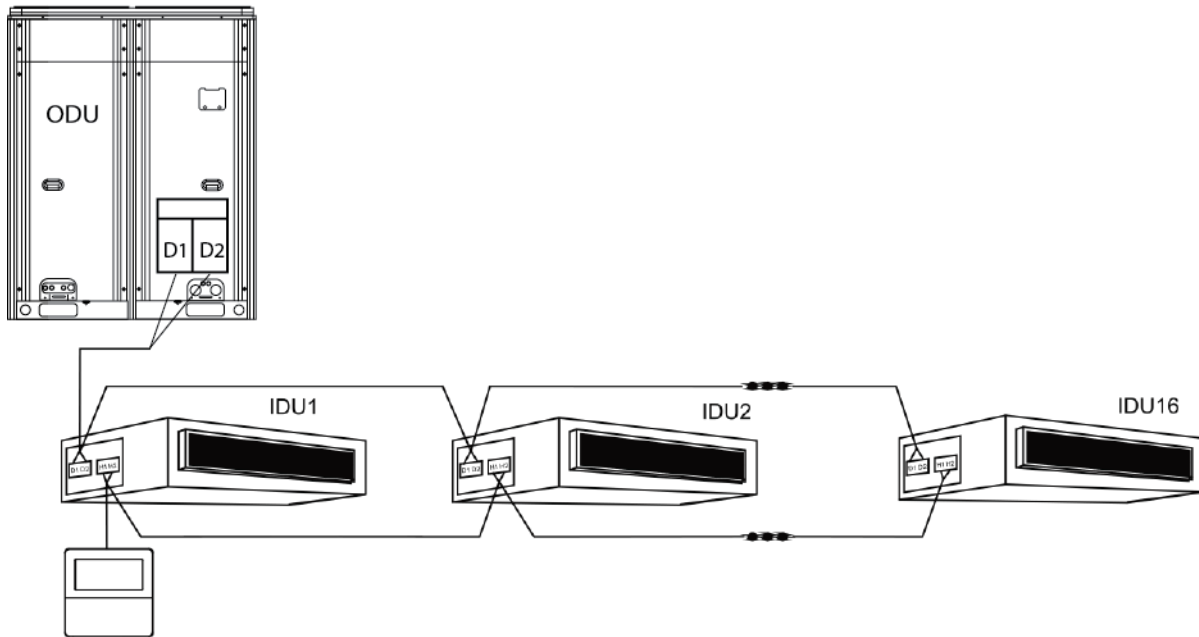


Fig.51 One wired controller controls multiple IDUs

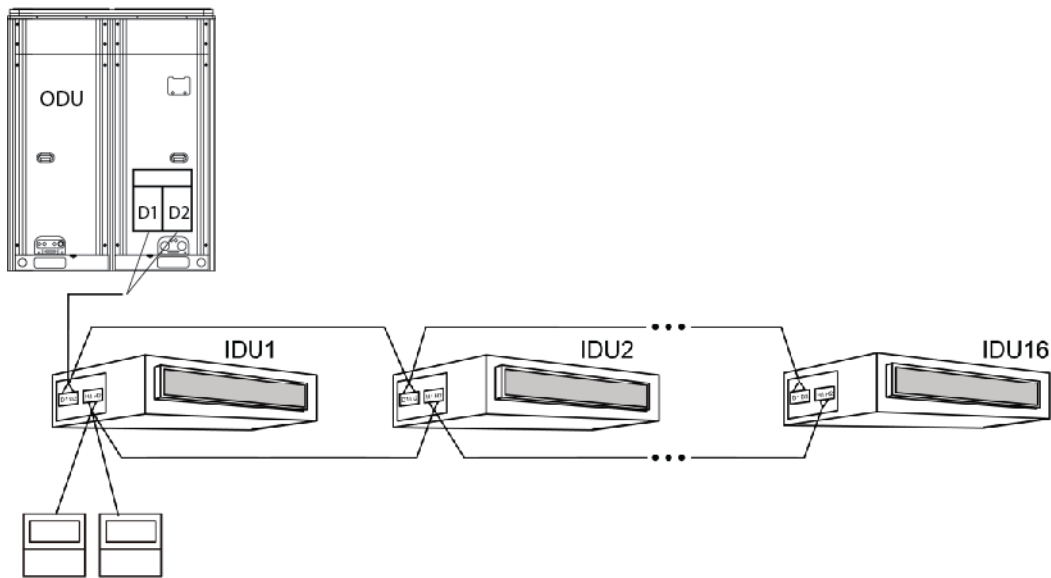


Fig.52 Two wired controllers control multiple IDUs

When two wired controllers control multiple IDUs, the wired controller can be connected to any one IDU, provided that the connected IDU is of the same series. One, and only one, of the wired controllers must be set as a slave controller. At most 16 IDUs can be controlled by wired controllers and the connected IDUs shall be within a same IDU network.

No matter when unit is turned on or off, slave controller can be set.

How to set a slave controller:

Hold “function” button on the designated controller for 5s, and temperature zone displays C00. Continue holding “function” button for 5s and setting screen of controller parameter will come out. Default temperature zone displays P00.

Press ▲ button or ▼ button to select parameter code P13.

Press “mode” button to switch to setup of parameter values. The parameter value will blink.

Press ▲ button or ▼ button to select code 02.

And then press “confirm/cancel” to finish setting.

Press “confirm/cancel” to return to the previous display until you exit from the setup of parameter values.

Below are user’s parameter settings:

Parameter code	Parameter name	Parameter scope	Default value	Remark
P13	Set up address for wired controller	01: Master wired controller 02: Slave wired controller	01	When 2 wired controllers control one or more IDUs, they should have different addresses. Slave wired controller (02) can’t set up units’ parameters except its own address.

Communication connection between duct type IDU and light board receiver

When the duct type IDU needs to be connected to light board remote receiver, it can be connected via Dsp1 and Dsp2 on the IDU main board.

IDU type	Connection wire	Main board interface of corresponding IDU
Duct type IDU	Between boards (17-core)	Dsp1 (direct to 8-core interface) Dsp2 (direct to 9-core interface)

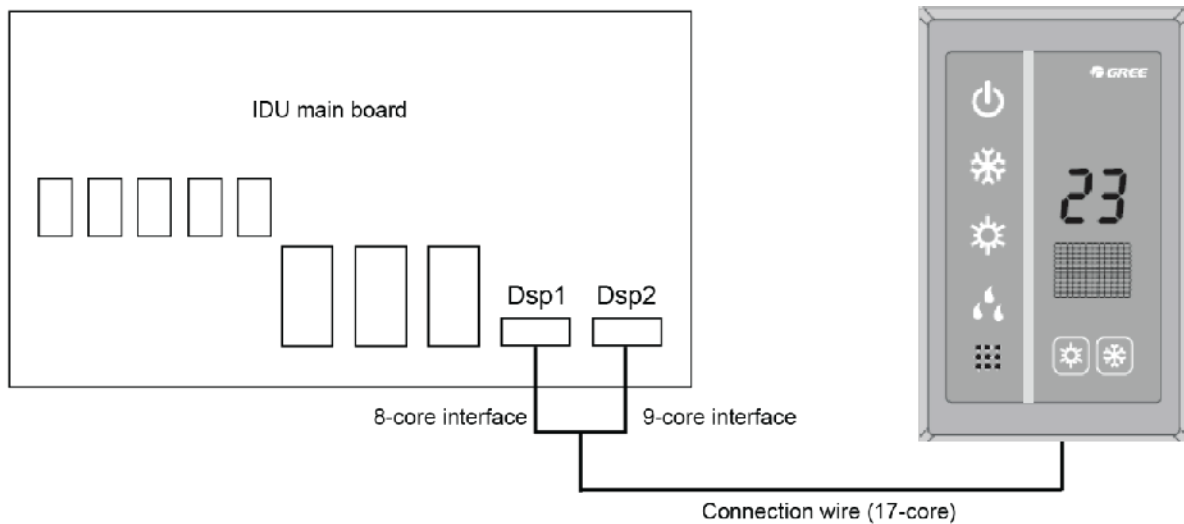


Fig.53

NOTICE

1. Wired controller and light board remote receiver can be used at the same time.
2. When light board remote receiver is used, please use remote controller at the same time.

Communication connection of central controlling units

NOTICE

The centralized controller can be installed when it is necessary.

Port connection G1 and G2 on the wiring board XT2 of master unit among each multi VRF system (see below)

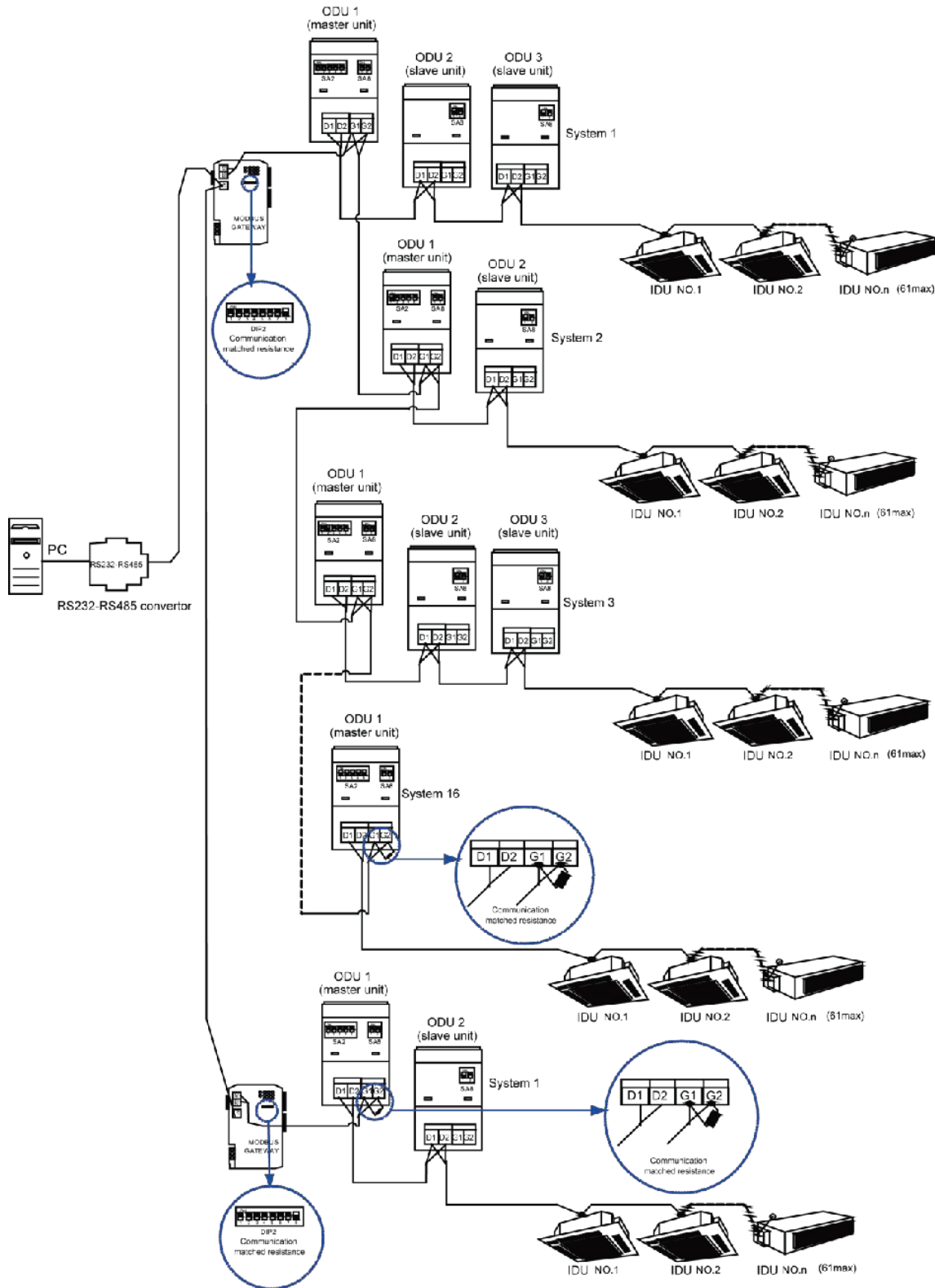


Fig.54

External Electrical Wiring Diagram

⚠WARNING

1. Every unit should be equipped with a circuit breaker for short-circuit and overload protection. In general, circuit breaker is at OFF status.
2. During operation, all indoor units and outdoor units belonging to the same system must be kept energized status. Otherwise, the unit can't operate normally.

External wiring diagram of a single unit

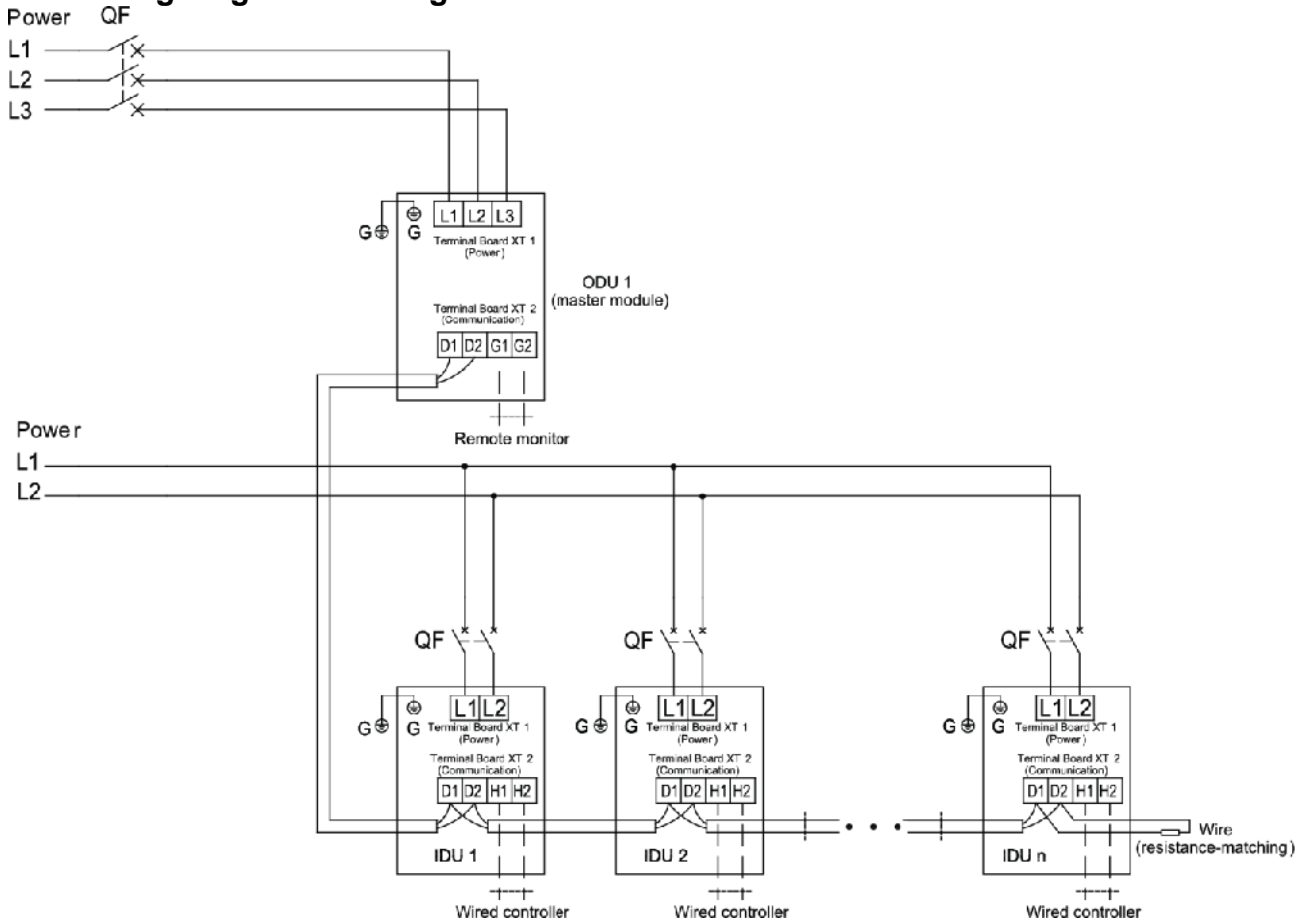


Fig.55

NOTICE

The maximum number of IDU is based upon ODU capacity. For details, please refer to the introduction of unit combinations.

External wiring diagram of modular connection

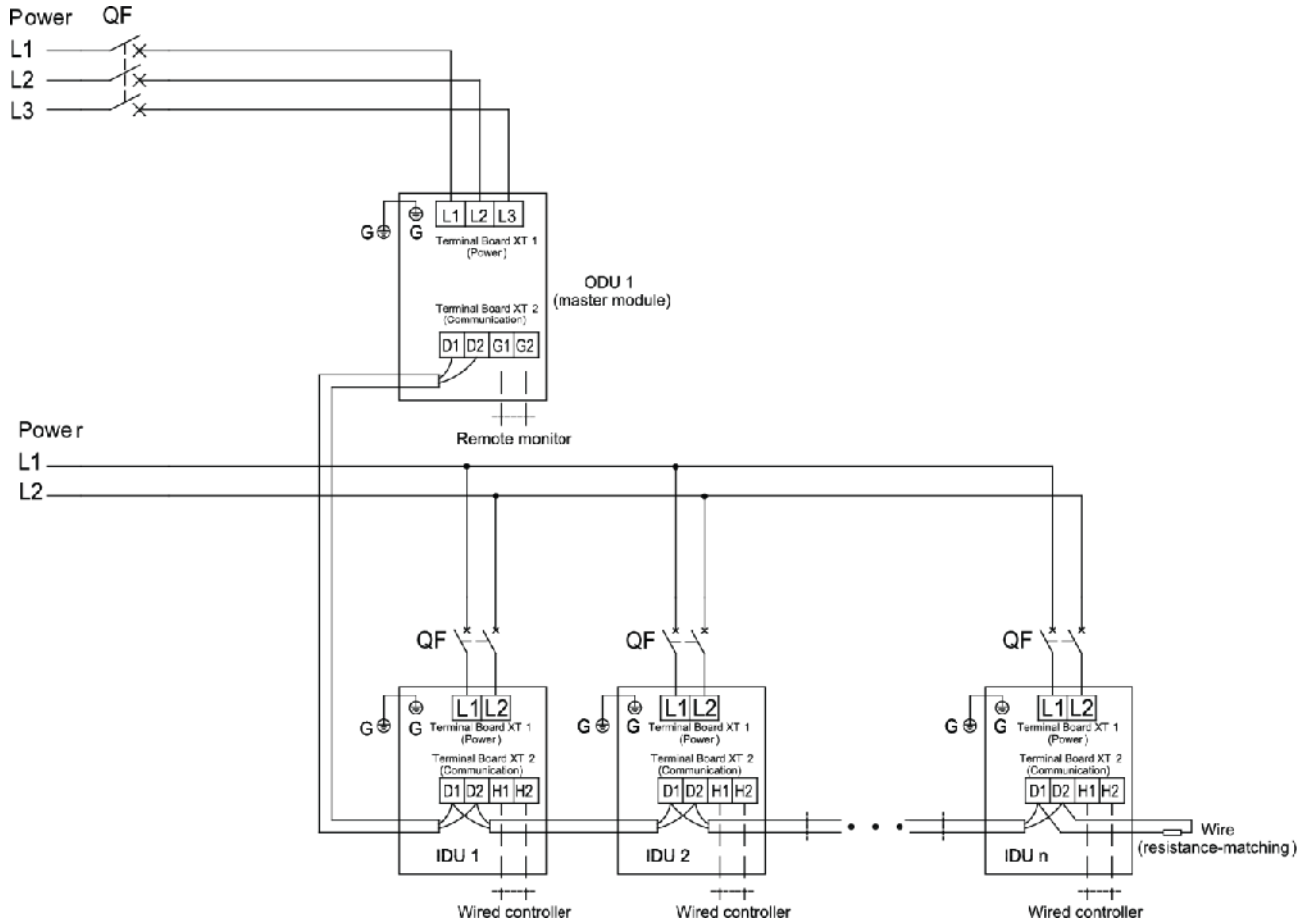


Fig.56

NOTICE

Maximum number of ODU (N) and maximum number of IDU (n) are based upon the combination type of ODU. For details, please refer to the introduction of unit combinations.

Check Items after Installation and Trial Run

Check Items after Installation

Check Items	Conditions Might Happen	Check
Has the unit been fixed firmly?	The unit may drop, shake or emit noise.	
Have you done the gas leakage test?	It may cause insufficient cooling/heating capacity.	
Is the unit properly thermal insulated?	It may cause condensation and dripping.	
Does the unit drain properly?	It may cause condensation and dripping.	
Is the voltage in accordance with the rated voltage specified on the nameplate?	It may cause malfunction or damage the part.	
Is the electric wiring and piping connection installed correctly and securely?	It may cause malfunction or damage the part.	
Has the unit been grounded securely?	It may cause electrical leakage.	
Is the power cord specified?	It may cause malfunction or damage the part.	
Has the inlet and outlet been blocked?	It may cause insufficient cooling/heating capacity.	
Has the pipe length and refrigerant charging amount been recorded?	The refrigerant charging amount is not accurate.	
Is the address code of outdoor modules correct?	The unit cannot run normally. Communication malfunction might happen.	
Is the address code of indoor units and wired controllers correct?	The unit cannot run normally. Communication malfunction might happen.	
Has the communication line been connected correctly?	The unit cannot run normally. Communication malfunction might happen.	
Is the piping connection and valve status correct?	The unit cannot run normally.	
Is the phase sequence of external power cord correct or not?	Operation failure occurs or unit is damaged.	
Is the engineering piping work and wiring holes sealed correctly?	Maybe there are mice biting the wires, which is the cause of malfunction.	

Trial Run

NOTICE

During debugging, one and only one module must be set as a master module.

During debugging, one and only one IDU must be set as a master IDU.

When no special requirement is needed, there is no need to set other functions. Unit can operate according to factory settings. When special requirement is needed, please read the Service Manual or Debugging and Maintenance Manual.

Preparation before trial run

1. The power supply should be turned on only after finishing all of the installation.
2. All the control wires and cables are connected correctly and safely. Completely open the gas and liquid valves.
3. All the objects like metal filing, thrum and clip should be cleared after installation.
4. Check if the unit appearance and piping system was damaged during transportation.
5. Check if the terminals of electrical element are loose and the phase sequence is correct.
6. Check the valve:
For single-module unit, fully open the gas and liquid valve and close oil balance valve.
For dual/three module units, fully open the gas, liquid valve and oil balance valve.

Trial run

NOTICE

1. Before test operation, make sure unit is powered on and compressor has been preheated for more than 8 hours. Touch the unit to check if it is normally preheated. Start test operation after unit is preheated. If it does not preheat, the compressor might be damaged. Debugging must be performed by professional technicians or under the guide of professional technicians.

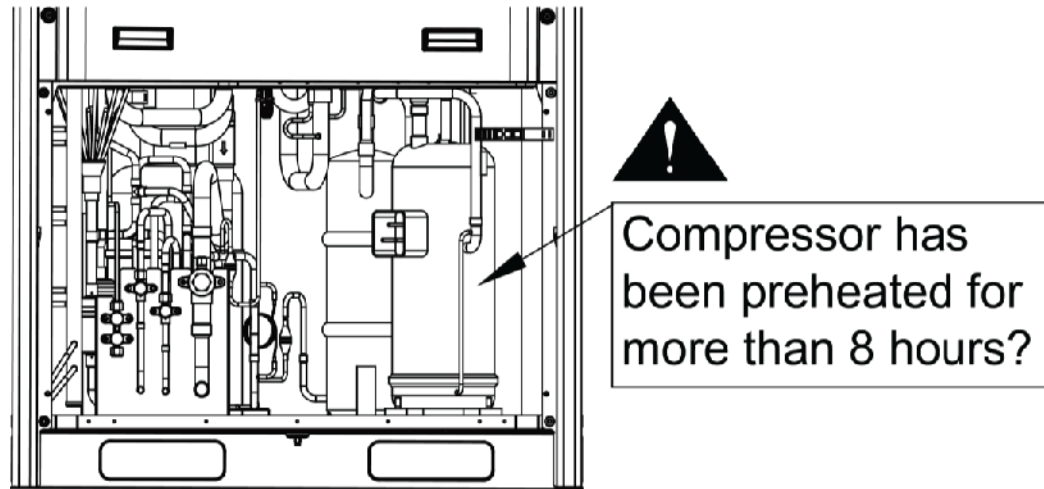


Fig.57

2. When debugging starts, system will operate according to the ambient temperature.
 - a. When outdoor temperature is above 20°C (68°F), debugging shall be in cooling mode.
 - b. When outdoor temperature is below 20°C (68°F), debugging shall be in heating mode.
3. Before debugging, confirm again whether the cut-off valve of each basic module is fully turned on.
4. During debugging, front panel of the outdoor unit must be fully closed; otherwise, debugging accuracy will be affected (see below).

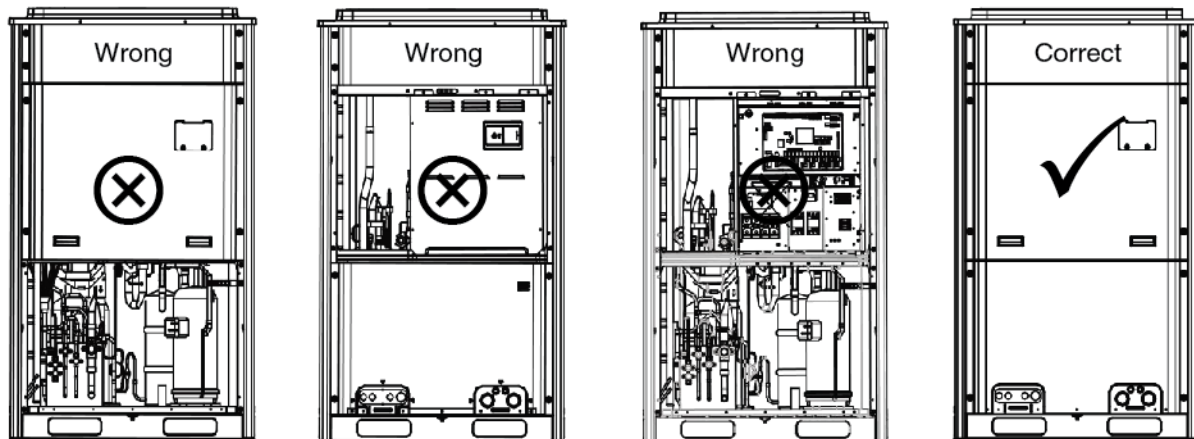


Fig.58

5. Before debugging, make sure the needed amount of refrigerant has been added to the pipe or at least 70% of the needed refrigerant has been added.
6. Description of each stage of debugging progress:

Description of each stage of debugging progress							
progress	Debugging code		Progress code		Status code		Meaning
	LED1		LED2		LED3		
	Code	Display status	code	Display status	Code	Display status	
01_Set up master unit	db	light	01	light	A0	light	System is not debugged.
	db	light	01	light	CC	light	System doesn't have master unit. Reset master unit.
	db	light	01	light	CF	light	More than 2 master units are set. Reset master unit.
	db	light	01	light	OC	light	Master unit is successfully set. Start next progress.
Description of each stage of debugging progress							
02_Allocate addresses	db	light	02	light	Ad	blink	System is allocating addresses.
	db	light	02	light	L7	blink	Master IDU is not set. Please set master IDU. If it's not set in 1min, system will set the master IDU randomly.
	db	light	02	light	OC	light	Allocation is finished. Start next progress.
03_Confirm the quantity of modules	db	light	03	light	01~04	blink	LED3 displays the quantity of modules. Confirm the number manually.
	db	light	03	light	OC	light	System has confirmed the quantity of modules. Start next progress
04_Confirm the quantity of IDUs	db	light	04	light	01~80	blink	LED3 displays the quantity of IDUs. Confirm the number manually.
	db	light	04	light	OC	light	System has confirmed the quantity of IDUs. Start next progress.
05_Detect internal communication	db	light	05	light	C2	light	System detects "driven communication error between master unit and inverter compressor".
	db	light	05	light	C3	light	System detects "driven communication error between master unit and inverter fan".
	db	light	05	light	CH	light	IDU/ODU "high proportion of rated capacity".
	db	light	05	light	CL	light	IDU/ODU "low proportion of rated capacity".
	db	light	05	light	OC	light	Detection is finished. Start next progress.
06_Detect outdoor components	db	light	06	light	Error code	light	System detects error in outdoor components.
	db	light	06	light	OC	light	No error in outdoor components. Start next progress.
07_Detect indoor components	db	light	07	light	XXXX/ Error code	light	System detects error in indoor components. XXXX is the project no. of the faulted IDU. 3s later, relevant error code is displayed. For example, IDU no. 100 has d5 error, then LED3 displays like this: 01 (2s later) 00 (2s later) d5, and repeat again.
	db	light	07	light	OC	light	No error in indoor components. Start next progress.
08_Confirm preheated compressor	db	light	08	light	U0	light	Preheat time for compressor is less than 8h.
	db	light	08	light	OC	light	Preheat time for compressor is 8h. Start next progress.
09_Refrigerant judgments before startup	db	light	09	light	U4	light	System refrigerant is not enough. System downtime equilibrium pressure is lower than 0.3MPa (4-2/5psig).
	db	light	09	light	OC	light	System refrigerant is normal. Start next progress.
10_Status judgments of outdoor valves before startup	db	light	10	light	ON	light	Outdoor valves are being turned on.
	db	light	10	light	U6	light	Outdoor valves are not fully turned on.
	db	light	10	light	OC	light	Outdoor valves are turned on normally.

Description of each stage of debugging progress							
progress	LED1	LED2	LED3	progress	LED1	LED2	Meaning
	Code	Display status	code	Display status	Code	Display status	
11_Calculate refrigerant quantity manually	db	light	11	light	AE	light	Calculate the refrigerant quantity manually and confirm the perfusion status of refrigerant (the quantity of refrigerant added into the system must be recorded accurately).
12_Confirm debugging startup	db	light	12	light	AP	blink	Ready for units to start debugging.
	db	light	12	light	AE	light	Manual calculation of refrigerant quantity is set up.
13_	—	—	—	—	—	—	no meaning.
14_	—	—	—	—	—	—	no meaning.
15_Cooling debugging	db	light	15	light	AC	light	Debugging is enabled in cooling mode (debugging mode, auto-selected by system).
	db	light	15	light	Error code	light	Error occurs during debugging in cooling mode.
	db	light	15	light	J0	light	Error of other modules occurs during debugging in cooling mode.
	db	light	15	light	U9	light	Outdoor pipeline and valves are not normal.
	db	light	15	light	XXXX/ U8	light	System detects error in indoor pipeline. XXXX is the project no. of the faulted IDU. 3s later, error code U8 is displayed. For example, IDU no. 100 has U8 error, then LED3 displays like this: 01 (2s later) 00 (2s later) U8, and repeat again.
16_Heating debugging	db	light	16	light	AH	light	Debugging is enabled in heating mode (debugging mode, auto-selected by system).
	db	light	16	light	Error code	light	Error occurs during debugging in heating mode.
	db	light	16	light	J0	light	Error of other modules occurs during debugging in heating mode.
	db	light	16	light	U9	light	Outdoor pipeline and valves are not normal.
	db	light	16	light	XXXX/ U8	light	System detects error in indoor pipeline. XXXX is the project no. of the faulted IDU. 3s later, error code U8 is displayed. For example, IDU no. 100 has U8 error, then LED3 displays like this: 01 (2s later) 00 (2s later) U8, and repeat again.
17_Debugging finished	01~04	light	OF	light	OF	light	Debugging is finished. System is on standby condition. LED1 displays module address. LED2 and LED3 display "OF".

Debugging operation mode

VRF multi VRF system has two debugging modes: one is direct operation on main board of outdoor units while the other is PC operation via special software. In PC software debugging, indoor/outdoor parameters can be displayed and historical data can be recorded and inquired. (Operation details can be found in relevant instruction manuals)

1. (1) Debugging through operation on main board of outdoor units

In this debugging mode, the following debugging functions are included on the main board:

Step 1: front panel of the outdoor units must be fully closed. Open the debugging window of each basic module;

Step 2: disconnect power for outdoor units. According to design requirements of external static pressure, set up corresponding static pressure mode for the units. Setting methods can be seen in Outdoor Fan Static Pressure Setup SA6_ESP_S;

Step 3: disconnect power for outdoor units and set one module as a master unit. Setting methods can be seen in Master Unit Setup SA8_MASTER_S;

Step 4: Connect power for all indoor units. Make sure all IDUs are power on. Then all outdoor modules will display “Debugging not enabled”;

Step 5: Find the module with “01” module address to be the master module. Hold SW7 button on the master module for at least 5s to enable debugging;

Step 6: Wait. Unit will then start progress 01 and 02; in progress 01, if master unit is not correctly set, progress 01 will show the following errors:

Progress	Debugging Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
01_01 Set up master unit:	db	light	01	light	CC	light	System doesn't have master unit. Reset master unit.
	db	light	01	light	CF	light	More than 2 master units are set. Reset master unit.
	db	light	01	light	OC	light	Master unit is successfully set. Start next progress.

According to the above errors, reset the master unit as instructed in Master Unit Setup SA8_MASTER_S. After reset is finished, start debugging again.

In progress 02, if master IDU is not detected, then progress 02 will show the following errors:

LED1		LED2		LED3	
Function code	Display mode	Current progress	Display mode	Current status	Display mode
db	light	02	light	L7	blink

At this time, all buttons are ineffective. Set master IDU in 1min via debugging software. If master IDU is not set in 1min, system will set up a master IDU randomly. After that, system will start next progress.

Step 7: in progress 03, the quantity of modules needs to be confirmed manually. Main board of each module will display:

Progress	Debugging Code		Progress Code		Status Code	
	LED1		LED2		LED3	
	Code	Display status	Code	Display status	Code	Display status
03_Quantity of modules	db	light	03	light	Quantity of modules	blink

If the quantity displayed is the same with actual quantity, then press SW7 confirmation button on the master unit to confirm it. Unit will start next progress:

Progress	Debugging Code		Progress Code		Status Code	
	LED1		LED2		LED3	
	Code	Display status	Code	Display status	Code	Display status
03_Confirm the quantity of modules	db	light	03	light	OC	light

If the quantity displayed is different from actual quantity, then disconnect power and check whether communication wire among each module is correctly connected. After the check, start debugging again.

Step 8: in progress 04, the quantity of IDUs needs to be confirmed manually. Main board of each module will display:

Progress	Debugging Code		Progress Code		Status Code	
	LED1		LED2		LED3	
	Code	Display status	Code	Display status	Code	Display status
04_Confirm the quantity of IDUs	db	Light	04	Light	Quantity of connected IDUs	blink

If the quantity displayed is the same with actual quantity, then press SW7 confirmation button on the master unit to confirm it. Unit will start next progress:

Progress	Debugging Code		Progress Code		Status Code	
	LED1		LED2		LED3	
	Code	Display status	Code	Display status	Code	Display status
04_Confirm the quantity of IDUs	db	Light	04	Light	OC	Light

Step 9: progress 05 is “Detect internal communication”

If no error is detected, system will display as below and then start next progress.

Progress	Debugging Code		Progress Code		Status Code	
	LED1		LED2		LED3	
	Code	Display status	Code	Display status	Code	Display status
05_Detect internal communication	db	Light	05	Light	OC	Light

If error is detected, system will stay at current progress. Error has to be solved manually. Below are relevant errors:

Progress	Debugging Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
05_Detect internal communication	db	Light	05	Light	C2	Light	System detects “driven communication error between master unit and inverter compressor”.
	db	Light	05	Light	C3	Light	System detects “driven communication error between master unit and inverter fan”.
	db	Light	05	Light	CH	Light	IDU/ODU “high proportion of rated capacity”.
	db	Light	05	Light	CL	Light	IDU/ODU “low proportion of rated capacity”.

Elimination methods of above errors can be found in Troubleshooting.

Step 10: progress 06 is “Detect outdoor components”

If no error is detected, system will display as below and then start next progress.

Progress	Debugging Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
06_Detect outdoor components	db	Light	06	Light	OC	Light	No error is detected in outdoor components. Start next progress.

If error is detected, system will stay at current progress. Error has to be solved manually. Below is relevant error:

Progress	Debugging Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
06_Detect outdoor components	db	Light	06	Light	Error code	Light	System detects error in outdoor components.

Elimination methods of above error can be found in Troubleshooting.

Step11: progress 07 is “Detect indoor components”

If no error is detected, system will display as below and then start next progress.

Progress	Debugging Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
07_Detect indoor components	db	Light	07	Light	OC	Light	No error is detected in indoor components. Start next progress.

If error is detected, system will stay at current progress. Error has to be solved manually. Below is relevant error:

Progress	Debugging Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
07_Detect indoor components	db	Light	07	Light	XXXXor Error code	Light	System detects error in indoor components.

XXXX is the project no. of the faulted IDU. 3s later, relevant error code is displayed. For example, IDU no. 100 has d5 error, then LED3 displays like this: 01 (2s later) 00 (2s later) d5, and repeat again.

Elimination methods of above error can be found in Troubleshooting.

Step 12: progress 08 is “Confirm preheated compressor”

If more than 8h of preheat time is detected, system will display as below and start next progress.

Progress	Debugging Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
08_Confirm preheated compressor	db	Light	08	Light	OC	Light	Preheat time for compressor is 8h. Start next progress.

If less than 8h of preheat time is detected, system will give error alarm and display as below. Then press SW7 confirmation button to skip the wait time and start next progress. But this will cause force start of the compressor, which may damage the compressor.

Progress	Debugging Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
08_Confirm preheated compressor	db	Light	08	Light	UO	Light	Preheat time for compressor is less than 8h.

Step 13: progress 09 is “Refrigerant judgments before startup”

If the refrigerant quantity inside the system meets the requirement of operation startup, system will display as below and start next progress.

Progress	Debugging Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
09_Refrigerant judgments before startup	db	Light	09	Light	OC	Light	System refrigerant is normal. Start next progress.

If there's no or not enough refrigerant in the system to meet the requirement of operation startup, system will display U4 “refrigerant shortage protection” and fails to start next progress. Then check if there's any leakage or add refrigerant inside until error eliminated.

Progress	Debugging Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
09_Refrigerant judgments before startup	db	Light	09	Light	O4	Light	System refrigerant is not enough. System downtime equilibrium pressure is lower than 0.3MPa (4-2/5psig).

Step 14: progress 10 is “Status judgments of outdoor valves before startup”

If master unit displays below, status judgments are enabled.

Progress	Debugging Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
10_Status judgments of outdoor valves before startup	db	Light	10	Light	ON	Light	Outdoor valves are being turned on.

If unit detects that valve status is not normal, it will display as below:

Progress	Debugging Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
10_Status judgments of outdoor valves before startup	db	Light	10	Light	U6	Light	Outdoor valves are not fully turned on.

Then check the big and small valves whether they are fully turned on. After the check, press SW6 return button to restart the judgments.

If unit detects that valve status is normal, it will display as below and start next progress.

Progress	Debugging Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
10_Status judgments of outdoor valves before startup	db	Light	10	Light	OC	Light	Outdoor valves are turned on normally.

Step 15: progress 11 is “Calculate refrigerant quantity manually”

No need to operate. System will start next progress.

Step 16: progress 12 is “Confirm debugging startup”

In order to make sure all preparation work is done before startup, this step is designed for user to confirm the startup again. Operate as below:

If master unit displays as below, system is waiting for confirmation signal.

Progress	Debugging Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
12_Status judgments of outdoor valves before startup	db	Light	12	Light	AP	Blink	Ready for units to start debugging.

If it's confirmed, press SW7 confirmation button. Unit will display as below and start next progress.

Progress	Debugging Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
12_Status judgments of outdoor valves before startup	db	Light	12	Light	AE	Light	Manual calculation of refrigerant quantity is set up.

Step 17: after unit is confirmed to start debugging, system select cooling/heating mode according to ambient temperature.

A If cooling mode is selected, relevant display is as below:

Progress	Debugging Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
15_Cooling debugging	db	Light	15	Light	AC	Light	Debugging is enabled in cooling mode (debugging mode, auto-selected by system).
	db	Light	15	Light	Error code	Light	Error occurs during debugging in cooling mode.
	db	Light	15	Light	J0	Light	Error of other modules occurs during debugging in cooling mode.
	db	Light	15	Light	U9	Light	Outdoor pipeline and valves are not normal.
	db	Light	15	Light	XXXX/ U8	Light	System detects error in indoor pipeline. XXXX is the project no. of the faulted IDU. 3s later, error code U8 is displayed. For example, IDU no. 100 has U8 error, then LED3 displays like this: 01 (2s later) 00 (2s later) U8, and repeat again.

B If heating mode is selected, relevant display is as below:

Progress	Debugging Code		Progress Code		Status Code		Meaning
	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
16_Heating debugging	db	Light	16	Light	AE	Light	Debugging is enabled in heating mode (debugging mode, auto-selected by system).
	db	Light	16	Light	Error code	Light	Error occurs during debugging in heating mode.
	db	Light	16	Light	J0	Light	Error of other modules occurs during debugging in heating mode.
	db	Light	16	Light	U9	Light	Outdoor pipeline and valves are not normal.
	db	Light	16	Light	XXXX/ U8	Light	System detects error in indoor pipeline. XXXX is the project no. of the faulted IDU. 3s later, error code U8 is displayed. For example, IDU no. 100 has U8 error, then LED3 displays like this: 01 (2s later) 00 (2s later) U8, and repeat again.

Step 18: if there's no error during operation for about 40min, system will automatically confirm that debugging is finished and then stop. System resumes standby condition and displays as below:

	Debugging Code		Progress Code		Status Code		Meaning
Progress	LED1		LED2		LED3		
	Code	Display status	Code	Display status	Code	Display status	
Debugging finished	01-04	Light	OF	Light	OF	Light	Debugging is finished. System is on standby condition. LED1 displays module address. LED2 and LED3 display "OF".

Step 19: after debugging is finished, some functions can be set up according to project's actual needs. For specific details, please refer to System Functions Setup. If no special requirements, skip this step.

Step 20: deliver the product to user and inform user about usage precautions.

Appendix: judgment reference of normal operational parameters

Reference of Debug Parameters of VRF DC Inverter Multi VRF System					
No	Debug item	Parameter name	Unit	Reference	
1	System parameters	ODU	Outdoor ambient temp	°C (°F)	
2			Discharge tube temp of inverter compressor 1	°C (°F)	<ul style="list-style-type: none"> When system compressor starts up, temp of discharge tube or casing top in cooling mode is within 70~95°C (158~203°F), and at least 10°C (50°F) higher than system high pressure saturation temp; Temp in heating mode is within 65~80°C (149~176°F), and at least 10°C (50°F) higher than system high pressure saturation temp.
3			Casing top temp of inverter compressor 1	°C (°F)	
4			Discharge tube temp of inverter compressor 2	°C (°F)	<ul style="list-style-type: none"> When inverter compressor starts but inverter compressor 2 stops, the discharge tube temperature of inverter compressor 2 is almost the same with ambient temp.
5			Casing top temp of inverter compressor 2	°C (°F)	
6			Defrost temp 1	°C (°F)	<ul style="list-style-type: none"> In cooling mode, defrost temp1 is 5~11°C (41~51.8°F) lower than system high pressure value; In heating mode, defrost temp1 is about 2°C (35.6°F) different from system low pressure value.
7			System high pressure	°C (°F)	<ul style="list-style-type: none"> System's normal high pressure value is within 20~25°C (68~77°F) According to the change in ambient temp and system operational capacity, system's high pressure value is 10~40 °C(50~104°F) higher than ambient temp The higher ambient temp is, the smaller temp difference is. When ambient temp is 25~35°C(77~95°F), system's high pressure value in cooling mode is 44~53°C(111.2~127.4°F). When ambient temp is -5~10°C(23~50°F), system's high pressure value in heating mode is 40~52°C(104~125.6°F).
8			System low pressure	°C (°F)	<ul style="list-style-type: none"> When ambient temp is 25~35°C(77~95°F), system's low pressure value in cooling mode is 0~8°C(32~46.4°F). When ambient temp is -5~10°C(23~50°F), system's low pressure value in heating mode is -15~5°C(5~41°F).
9			Opening angle of heating EXV	PLS	<ul style="list-style-type: none"> In cooling mode, heating electronic expansion valve remains 480PLS. In heating mode, the opening angle of adjustable electronic expansion valve varies within 120~480PLS.
10			Operating freq. of inverter compressor 1	Hz	Varies from 20Hz to 95Hz
11			Current of inverter compressor 1	A	According to different operating freq. and different load, current will vary from 7A to 40A.
12			IPM temp of inverter compressor 1	°C (°F)	When ambient temp is lower than 35°C (95°F), IPM temp is below 85°C(185°F). Highest temp won't be above 95°C (203°F).
13			Inverter compressor 1 driven bus voltage	V	Normal bus voltage is 1.414 times of power voltage. For example, if 3-phase power voltage is 220V, then the bus voltage after rectification is: 220V X 1.414=311V. It's normal if actual voltage varies 15v from the calculated voltage.
14			Operating freq. of inverter compressor 2	Hz	Varies from 30Hz to 100Hz
15			Current of inverter compressor 2	A	According to different operating freq. and different load, current will vary from 7A to 25A.
16			IPM temp of inverter compressor 2	°C (°F)	When ambient temp is lower than 35°C (95°F), IPM temp is below 80°C (176°F). Highest temp won't be above 95°C (203°F).
17			Inverter compressor 2 driven bus voltage	V	Normal bus voltage is 1.414 times of power voltage. For example, if 3-phase power voltage is 220V, then the bus voltage after rectification is: 220V X 1.414=311V. It's normal if actual voltage varies 15v from the calculated voltage.

Reference of Debug Parameters of VRF DC Inverter Multi VRF System

No	Debug item	Parameter name	Unit	Reference	
18	System parameters	ODU	Operating frequency of fan motor 1	Hz	Adjusts in 0~65Hz according to system pressure.
19			Current of fan motor 1	A	
20			Operating frequency of fan motor 2	Hz	Adjusts in 0~65Hz according to system pressure.
21			Current of fan motor 2	A	
22		IDU	Ambient temp of IDU	°C (°F)	—
23			Inlet tube temp of indoor heat exchanger	°C (°F)	<ul style="list-style-type: none"> According to different ambient temp, for a same IDU under cooling mode, inlet tube temp will be 1~7°C (33.8~44.6°F) lower than outlet tube temp. For a same IDU under heating mode, inlet tube temp will be 10~20°C (50~68°F) lower than outlet tube temp.
24			Outlet tube temp of indoor heat exchanger	°C (°F)	
25			Opening angle of indoor EXV	PLS	Adjusts opening angle automatically in 200~2000PLS.
26		Communication parameter	Communication data	—	Quantity of IDU and ODU detected by software is the same with actual quantity. No communication error.
27	Drainage system	—	—	IDU can drain water out completely and smoothly. Condensate pipe has no backward slope of water. Water of ODU can be drained completely through drainage pipe. No water drop from unit base.	
28	Others	—	°C (°F)	Compressor and indoor/outdoor fan motor has no strange noise. Unit operates normally.	

Common Malfunction and Troubleshooting

Check the following items before contacting for repair.

Phenomenon	Reason	Measure
The unit doesn't run.	Without power supply	Connect to power supply
	Voltage is too low	Check if the voltage is within rating range
	Broken fuse or breaker trips off	Replace fuse or connect breaker
	Insufficient energy of remote controller	Replace new battery
	Remote controller is out of control scope	Control scope is within 8m
Unit runs but stop immediately	Air intake or outlet of indoor or outdoor unit is blocked	Remove obstruction
Abnormal cooling or heating	Air intake or outlet of indoor or outdoor unit is blocked	Remove obstruction
	Improper temperature setting	Adjust setting at wireless remote controller or wired controller
	Fan speed is set too low	Adjust setting at wireless remote controller or wired controller
	Wind direction is not correct	Adjust setting at wireless remote controller or wired controller
	Door or windows are opened	Close the door or windows
	Direct sunshine	Draw curtain or louver
	Too many people in the room	
	Too many heat resources in the room	Reduce heat resources
Filter is blocked for dirt	Clean the filter	

NOTICE

1. When installing remote monitor or central controller, displacement on indoor units' project codes must be made. Otherwise, there will be collision malfunction of the project codes. For detailed operation methods, please refer to the VRF Installation and Maintenance Manual.
2. If problem cannot be solved after checking the above items, please contact YMGI service center with issue(s) and model numbers of units.

Following circumstances are not malfunction.

"Malfunction"	Reason
Unit doesn't run	When unit is restarted immediately after it is turned off
	When power is turned on
Mist comes from the unit	In cooling mode
Noise is emitted	Slight cracking sound is heard when just turned on
	There is consecutive sound when cooling
	There is sound when unit starts or stops
	There is slight and consecutive sound when unit is running or after running
	There is sound when unit starts or stops
	There is slight and consecutive sound when unit is running or after running
	Cracking sound is heard when unit is operating and after operating
The unit blows out duct	Unit is run after not being used for prolonged period
The unit emits odor	Operating
Indoor unit still runs after switched off	After every indoor unit receive "stop" signal, fan will keep running
Mode conflict	COOL or HEAT mode cannot be operated

Error Indication

Inquiry method of malfunction display: combine division number and content number to check the corresponding malfunction.

Indoor:

Error Code	Content	Error Code	Content
L0	Malfunction of IDU	d2	Malfunction of lower water temperature sensor of water tank
L1	Protection of indoor fan	d3	Malfunction of ambient temperature sensor
L2	Auxiliary heating protection	d4	Malfunction of entry-tube temperature sensor
L3	Water-full protection	d6	Malfunction of exit-tube temperature sensor
L4	Abnormal power supply for wired controller	d7	Malfunction of humidity sensor
L5	Freeze prevention protection	d8	Malfunction of water temperature sensor
L7	No main IDU	d9	Malfunction of jumper cap
L8	Power supply is insufficient	dA	Web address of IDU is abnormal
L9	For single control over multiple units, number of IDU is inconsistent	dH	PCB of wired controller is abnormal
LA	For single control over multiple units, IDU series is inconsistent	dC	Setting capacity of DIP switch code is abnormal
LH	Alarm due to bad air quality	dL	Malfunction of air outlet temperature sensor
LC	IDU is not matching with outdoor unit	dE	Malfunction of indoor CO2 sensor
LL	Malfunction of water flow switch	dF	Malfunction of upper water temperature sensor of water tank
LE	Rotation speed of EC DC water pump is abnormal	dJ	Malfunction of backwater temperature sensor
LF	Malfunction of shunt valve setting	dP	Malfunction of inlet tube temperature sensor of generator
LJ	Setting of functional DIP switch code is wrong	dU	Malfunction of drainage pipe temperature sensor of generator
LP	Zero-crossing malfunction of PG motor	db	Debugging status
LU	Indoor unit's branch is not consistent for one-to-more unit of heat pump system	dd	Malfunction of solar power temperature sensor
d1	Indoor PCB is poor	dn	Malfunction of swing parts
E0	Malfunction of ODU	FC	Current sensor of compressor 2 is abnormal
E1	High-pressure protection	FL	Current sensor of compressor 3 is abnormal
E2	Discharge low-temperature protection	FE	Current sensor of compressor 4 is abnormal
E3	Low-pressure protection	FF	Current sensor of compressor 5 is abnormal
E4	High discharge temperature protection of compressor	FJ	Current sensor of compressor 6 is abnormal
J0	Protection for other modules	FP	Malfunction of DC motor
J1	Over-current protection of compressor 1	FU	Malfunction of casing top temperature sensor of compressor 1
J2	Over-current protection of compressor 2	Fb	Malfunction of casing top temperature sensor of compressor 2
J3	Over-current protection of compressor 3	Fd	Malfunction of exit tube temperature sensor of mode exchanger
J4	Over-current protection of compressor 4	Fn	Malfunction of inlet tube temperature sensor of mode exchanger
J5	Over-current protection of compressor 5	b1	Malfunction of outdoor ambient temperature sensor
J6	Over-current protection for compressor 6	b2	Malfunction of defrosting temperature sensor 1
J7	Gas-mixing protection of 4-way valve	b3	Malfunction of defrosting temperature sensor 2
J8	High pressure ratio protection of system	b4	Malfunction of liquid temperature sensor of sub-cooler
J9	Low pressure ratio protection of system	b5	Malfunction of gas temperature sensor of sub-cooler
JA	Protection because of abnormal pressure	b6	Malfunction of inlet tube temperature sensor of vapor liquid separator
JC	Water flow switch protection	b7	Malfunction of exit tube temperature sensor of vapor liquid separator
JL	Protection because high pressure is too low	b8	Malfunction of outdoor humidity sensor
JE	Oil-return pipe is blocked	b9	Malfunction of gas temperature sensor of heat exchanger
JF	Oil-return pipe is leaking	bA	Malfunction of oil-return temperature sensor 1
P0	malfunction of driving board of compressor	bH	Clock of system is abnormal
P1	Driving board of compressor operates abnormally	bE	Malfunction of inlet tube temperature sensor of condenser

Error Code	Content	Error Code	Content
P2	Voltage protection of driving board power of compressor	bF	Malfunction of outlet tube temperature sensor of condenser
P3	Reset protection of driving module of compressor	bJ	High-pressure sensor and low-pressure sensor are connected reversely
P4	Drive PFC protection of compressor	bP	Malfunction of temperature sensor of oil-return 2
P5	Over-current protection of inverter compressor	bU	Malfunction of temperature sensor of oil return 3
P6	Drive IPM module protection of compressor	bb	Malfunction of temperature sensor of oil return 4
P7	Malfunction of drive temperature sensor of compressor	H0	Malfunction of driving board of fan
P8	Drive IPM high temperature protection of compressor	H1	Driving board of fan operates abnormally
P9	Desynchronizing protection of inverter compressor	H2	Voltage protection of driving board power of fan
PA	Malfunction of drive storage chip of compressor	H3	Reset protection of driving module of fan
PH	High-voltage protection of compressor's drive DC bus bar	H4	Drive PFC protection of fan
PC	Malfunction of current detection circuit drive of compressor	H5	Over-current protection of inverter fan
PL	Low voltage protection for DC bus bar of drive of compressor	H6	Drive IPM module protection of fan
PE	Phase-lacking of inverter compressor	H7	Malfunction of drive temperature sensor of fan
PF	Malfunction of charging loop of driven of compressor	H8	Drive IPM high temperature protection of fan
PJ	Failure startup of inverter compressor	H9	Desynchronizing protection of inverter fan
PP	AC current protection of inverter compressor	HA	Malfunction of drive storage chip of inverter outdoor fan
PU	AC input voltage of drive of inverter compressor	HH	High-voltage protection of fan's drive DC bus bar
F0	Main board of ODU is poor	HC	Malfunction of current detection circuit of fan drive
F1	Malfunction of high-pressure sensor	HL	Low voltage protection of bus bar of fan drive
F3	Malfunction of low-pressure sensor	HE	Phase-lacking of inverter fan
F5	Malfunction of discharge temperature sensor of compressor 1	HF	Malfunction of charging loop of fan drive
F6	Malfunction of exit-tube temperature sensor	HJ	Failure startup of inverter fan
F7	Malfunction of humidity sensor	HP	AC current protection of inverter fan
F8	Malfunction of water temperature sensor	HU	AC input voltage of drive of inverter fan
F9	Malfunction of jumper cap	HJ	Failure startup of inverter fan
FA	Web address of IDU is abnormal	HP	AC current protection of inverter fan
FH	Current sensor of compressor 1 is abnormal	HU	AC input voltage of drive of inverter fan

Debugging:

Error Code	Content	Error Code	Content
U0	Preheat time of compressor is insufficient	C6	Alarm because ODU quantity is inconsistent
U2	Wrong setting of ODU's capacity code/jumper cap	C7	Abnormal communication of converter
U3	Power supply phase sequence protection	C8	Emergency status of compressor
U4	Refrigerant-lacking protection	C9	Emergency status of fan
U5	Wrong address for driving board of compressor	CA	Emergency status of module
U6	Alarm because valve is abnormal	CH	Rated capacity is too high
U8	Malfunction of pipeline for IDU	CC	No main unit
U9	Malfunction of pipeline for ODU	CL	The matching ratio of rated capacity for IDU and ODU is too low
UC	Setting of main IDU is succeeded	CE	Communication malfunction between mode exchanger and IDU
UL	Emergency operation DIP switch code of compressor is wrong	CF	Malfunction of multiple main control units
UE	Charging of refrigerant is invalid	CJ	Address DIP switch code of system is shocking
UF	Identification malfunction of IDU of mode exchanger	CP	Malfunction of multiple wired controller
C0	Communication malfunction between IDU, ODU and IDU's wired controller	CU	Communication malfunction between IDU and the receiving lamp
C1	Communication malfunction between main control and DC-DC controller	Cb	Overflow distribution of IP address
C2	Communication malfunction between main control and inverter compressor driver	Cd	Communication malfunction between mode exchanger and ODU
C3	Communication malfunction between main control and inverter fan driver	Cn	Malfunction of network for IDU and ODU of mode exchanger
C4	Malfunction of lack of IDU	Cy	Communication malfunction of mode exchanger
C5	Alarm because project code of IDU is inconsistent		

Status:

Error Code	Content	Error Code	Content
A0	Unit waiting for debugging	Ay	Shielding status
A2	Refrigerant recovery operation of after-sales	n0	SE operation setting of system
A3	Defrosting	n3	Compulsory defrosting
A4	Oil-return	n4	Limit setting for max. capacity/output capacity
A6	Heat pump function setting	n5	Compulsory excursion of engineering code of IDU
A7	Quiet mode setting	n6	Inquiry of malfunction
A8	Vacuum pump mode	n7	Inquiry of parameters
AH	Heating	n8	Inquiry of project code of IDU
AC	Cooling	n9	Check quantity of IDU on line
AL	Charge refrigerant automatically	nA	Heat pump unit
AE	Charge refrigerant manually	nH	Heating only unit
AF	Fan	nC	Cooling only unit
AJ	Cleaning reminding of filter	nE	Negative code
AP	Debugging confirmation when starting up the unit	nF	Fan model
AU	Long-distance emergency stop	nJ	High temperature prevention when heating
Ab	Emergency stop of operation	nU	Eliminate the long-distance shielding command of IDU
Ad	Limit operation	nb	Bar code inquiry
An	Child lock status	nn	Length modification of connection pipe of ODU

Maintenance and Care

Regular check, Maintenance and care should be performed every six months by professional personnel, which will prolong the unit life span. Disconnect the power supply before cleaning and maintenance.

Outdoor Heat Exchanger

Outdoor heat exchanger is required to be cleaned once every six months. Use vacuum cleaner with nylon brush to clean up dust and sundries on the surface of heat exchanger. Blow away dust with compressed air if available. Never use water to wash the heat exchanger.

Drain Pipe

Regularly check if the drain pipe is clogged in order to drain condensate smoothly.

Notice before Seasonal Use

1. Check if the inlet/outlet of the indoor/outdoor unit is clogged.
2. Check if the ground wire is earthed reliably.
3. Check if battery of remote wireless controller has been replaced.
4. Check if the filter screen has been set soundly.
5. After long period of shutdown, open the main power switch 8 hours before reoperating the unit so as to preheat the compressor crankcase.
6. Check if the outdoor unit is installed firmly. If there is something abnormal, please contact the YMGI appointed service center.

Maintenance after Seasonal Use

1. Cut off main power supply of the unit.
2. Clean filter screen and indoor and outdoor units.
3. Clean the dust and sundries on the indoor and outdoor units.
4. In the event of rusting, use the anti-rust paint to stop spreading of rust.

Parts Replacement

Purchase parts from YMGI appointed service center or dealer if necessary.

NOTICE

During airtight and leakage test, never mix oxygen, ethyne and other dangerous gas into refrigeration circuit. In case of hazard, it's better to use nitrogen or refrigerant to accomplish such test.

After-sales Service

In case the air-conditioning unit you bought has any quality problem or you have any inquiry, please contact the local after-sales service agency designated by YMGI.

Warranty should meet the following requirements:

1. First run of the unit should be operated by professional personnel from YMGI appointed service center.
2. Only YMGI manufactured accessories can be used on the machine.
3. All the instructions listed in this manual should be followed.
4. Warranty will be automatically invalid if fails to obey any item mentioned above





YMG is dedicated to designing, manufacturing and distributing the highest quality, energy saving and environmentally friendly air conditioner and heat pump products, while providing the best service and support to all of our customers. Our mission is to help build a sustainable, efficient and Green world.

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(58)2-Single Zone 16-22 SEER, 09-36K Btu/h
(58)4, (78)1-Single Zone 18-23 SEER, 09-36K Btu/h
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YMG Group

601 Arrow Ln, O'Fallon, MO 63366
 www.ymgigroup.com
 Tel: 866-833-3138 • Fax: 866-377-3355
 Email: info@ymgigroup.com

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