YMGI, Engineered Comfort Products for A Sustainable and Efficient Green World!

SERVICE MANUAL

DC INVERTER MULTIPLE ZONE 80 and 90 CH (59)2S SYMPHONY CHOIR OUTDOOR UNIT

Model Numbers:

WMMS-80CH-V2B(59)2S

WMMS-90CH-V2B(59)2S

Thank you for choosing this YMGI product. Please read the owner's manual carefully before installation and 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 repair 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 even personal injury.

Installer: 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.

Servicer: 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.

Safety advisories appear throughout this manual and your personal safety and the proper operation of this appliance depend upon the strict observance of these precautions.

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 could also be 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 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. 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 and by NEC and your state and 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.

Copyright

⚠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 and 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, improper operation, improper service or natural disasters of any kind.

⚠WARNING

Do not connect power to the unit until all wiring, tubing and all unit inspections and testing 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, Purchasers, Installers, and Contractors

Thank you for choosing an 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 retail stores such as Home Depot, Lowe's, Sears, etc. 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 doesn't 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 near future. These problems can cost more to fix than any upfront savings. **YMGI warranty doesn't 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@ymgigroup.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.
- Be sure to have ONLY the licensed HVAC professional perform all aspects of the installation. 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.
- When hiring an HVAC technician that is offering their services as a "side job" and not hiring 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.
- Have the installation technician read in full the installation manual and all supplied documents for the product model you purchased. Details within the 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 irrevocable and permanent.
- It is possible for a licensed contractor/technician to make a mistake during the installation. YMGI doesn't 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 prior to the negative leak check.
5. Not conducting a positive leak check by charging the system with dry-nitrogen 350 PSI to hold for 3+ hours, and performing soap bubble testing.
6. Not conducting a negative leak check by evacuating the copper lines for 30 minutes for each zone. Vacuum must be held at 500 microns or better for at least 60 minutes, starting 60-minute timer after the vacuum pump is turned off.
7. Not selecting the correct size of 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 or 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 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 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 the manufacturer 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).
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 non-licensed 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 decision maker 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 pipe causing contamination. Label them 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 is 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 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 the vacuum level of 500 Microns can be held for at least 60 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 filter, carefully pour some clear water onto the up-right aluminum coil surface to test if the water can drain out of each the indoor unit's freely 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, 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 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 doesn't 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 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, 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, 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: **7-years** on the **compressor** and **2-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 an YMGI-validated and approved warranty filing, for a period of 7 years from the date of successful installation at its original installation location.

Parts: YMGI will warrant parts of an YMGI-validated and approved warranty filing, for two 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 to YMGI Group 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 successful installation at 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 or any other conditions beyond the control of YMGI Group.
- 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 completely by the installing technician and signed by both the installing company 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 doesn't 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 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 out the parts ASAP. Expedited shipping is available at the customer's expense.***

4. Replacement parts that have an approved warranty registration are to be warranted for the remainder of the 2-year on parts and a 7-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.

   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.

LIMITED PRODUCT WARRANTY REGISTRATION FORM

Top Portion and Keep Copy A is for YMGI Internal records. Copy B is for Installer to Fill out and Mail back to YMGI. Bottom Copy C for Customer records.

For YMGI Use Only								
	Date:		Shipping Packing List Number:		Registration Card Serial No.			
	Did the Company Pay YMGI:		Unit(s) Work Successfully:	Yes/No	Date Completed Registration Card Received:			
	Installation Invoice Attached to the Registration Card		Hired YMGI Recommended HVAC Contractor/Technician?		Warranty Approved		Warranty Denied	

Outdoor Unit Serial Number :	Indoor Unit Serial Numbers:				
		Unit 1		Unit 6	
		Unit 2		Unit 7	
		Unit 3		Unit 8	
		Unit 4		Unit 9	
		Unit 5		Unit 10	

Contact at Installation Location:

Name:		Phone:		Fax:	
Address:		Email:			
City:		State (Province):		Country:	

Contact of the Installing HVAC Contractor/Technician:

Technician Full Name (Print):		Phone:		Fax:	
HVAC Technician's Company:		Email:			
Company Address:		City:		State (Province):	
Currently Licensed/Certified HVAC Technician License or Certification Number:		License Approved/ Certified by:			
Official Phone # to Check the License Validity:					

Checklist for Installing HVAC Technician to Verify Installation Quality, and for Warranty Processing Purpose (If not filled out completely by technician, warranty will be voided)

1) Did you install the whole system? If not, please note below.

Yes	No	% of installation done by you (HVAC technician).

2) What had been done, prior to your arrival?

3) Did you read the User Manual and Installation Instructions before starting the installation?

Yes		No	

4) Who unpacked the unit and accessory boxes to check for damage?

5) Supply electrical power V/Ph/Hz measured at wiring terminal block of

Indoor unit:		Outdoor unit:	

6) Incoming electrical power V/Ph/Hz measured at terminal blocks of

Indoor unit:		Outdoor unit:	

7) Wire gauge, length and terminal colors between circuit breaker/disconnect switch to outdoor unit:

8) Wire gauge, length and terminal colors between each indoor and outdoor unit:

Unit A Unit B Unit C Unit D

9) The size of HVAC circuit breaker/fuse or disconnect switch to the outdoor unit:

10) Are the inter-connecting wires and copper lines between indoor and outdoor units installed/covered/protected by line set covers, or anything else?

11) What is the refrigerant pipe length between each indoor unit and the outdoor unit?

Unit A	Unit B	Unit C	Unit D

12) Where is/are the indoor unit(s) located? (Bedroom, kitchen, etc.)

Unit A	Unit B	Unit C	Unit D

13) What is the elevation difference between each indoor unit and the outdoor unit?

Unit A	Unit B	Unit C	Unit D

14) Did you check the indoor unit for condensate leakage and refrigerant leakage, before and after connecting them?

Yes		No	

15) Where is the outdoor unit located? Is the outdoor unit anchored to ground or secured onto wall bracket?

Ground wall balcony roof other location or pad	Yes	No

16) Have you checked to make sure there is no cross-piping and/or cross-wiring between any two indoor units (zones)? What was your procedure?

17) Were the refrigerant pipe ends capped or sealed, prior to running them through structures to keep debris from entering the copper lines?

18) Have you checked both cooling and heating on all indoor units individually to ensure proper function?

Yes		No	

19) Did you charge the inter-connecting copper pipes and indoor unit with nitrogen to check for positive leakage (pressures 150-200PSI), before conducting a vacuum leak check?

Yes		No	

20) Did you vacuum correctly to check the connecting pipes and indoor unit for leakage? What was the micron gauge reading, for how many minutes?

21) Did you check the compressor's start and stop sequences to determine proper functionality?

Yes		No	

22) If copper length were not made to the supplied or recommended refrigerant pipe length, how much refrigerant added or deducted?

23) Measured refrigerant pressures at outdoor service suction valve, when unit was stabilized.

Heat pump (PSI):	Cooling (PSI):	Outdoor Ambient Temp. (°F):

24) 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

25) Have you checked all unit functions with customer present, and all functions are working correctly?

Yes		No	

26) Did you show the user how to operate the unit? Did he/she understand you?

Yes	No	Yes	No

27) Do you provide regular one-year free technical service for this installation?

Yes		No	

28) Do you list the working details in the invoice and leave a copy to the customer?

Yes		No	

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

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

By signing above, I acknowledge the liability and responsibility for any false statement or omission of facts, and I authorize YMGI to verify the details provided above, and make its decision on warranty. I understand our filing or filling out of the warranty card/form DOES NOT imply automatic warranty approval, because warranty is approved only to qualified and successful installations by a qualified HVAC technician. I understand that the warranty (if approved) is a standard 5 year compressor and 1 year parts only, and does not include any labor coverage. I agree to and will follow all the contents contained in the Limited Product Warranty Policy of YMGI, and no 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 out 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" and not hiring 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 about installing equipment that has been purchased by someone other than themselves. They prefer to purchase and install the equipment 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 all the 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, or 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's room temperature too low.
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 short-cycling (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 cause 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.

NOTICE

YMGI Group will not be responsible for any personal injury or any property damage caused by improper or incorrect installation, improper service or maintenance or by not following the instructions listed in this manual.

DO NOT pull on the power supply cords or refrigeration lines that are connected to the indoor and outdoor units. Install the power supply cords and secure them into position. PVC line set cover is recommended for the outdoor unit to protect against rain, sunlight and accidental damage.

DO NOT allow cold air to blow directly onto people for a prolonged period, as this could make people cold and uncomfortable.

DO NOT undersize any of the power supply wires.

DO NOT connect several units to a single breaker. Don't undersize or oversize the circuit breaker. A poorly sized circuit breaker can cause unit failure and even fire.

DO NOT wire or open a unit while the unit is running. Make sure to disconnect the power supply and switch off all circuits prior to inspecting or servicing the unit. Inspecting and servicing the unit while the power supply is connected, and the circuits are switched on could cause an electrical shock or fire.

DO NOT install the indoor unit near any cooking surfaces, in direct sunlight or any ventilation systems. Poor placement could decrease efficiency and waste energy.

DO NOT install the unit in places where there is exposure to flammable materials or gas.

DO NOT apply chemical solvents, flammable insecticides, or abrasive materials directly on the unit. Clean the unit only with a soft dry cloth.

DO NOT install the unit in a damp laundry room or near flammable gas. All units must be protected by a certified electrical circuit breaker in accordance with all safety and electrical codes.

DO NOT use the system for anything other than what it was designed.

DO NOT store or install the units near food, paint, or other chemicals.

DO NOT use the unit in cool or dry mode for prolonged periods where humidity is higher than 90%.

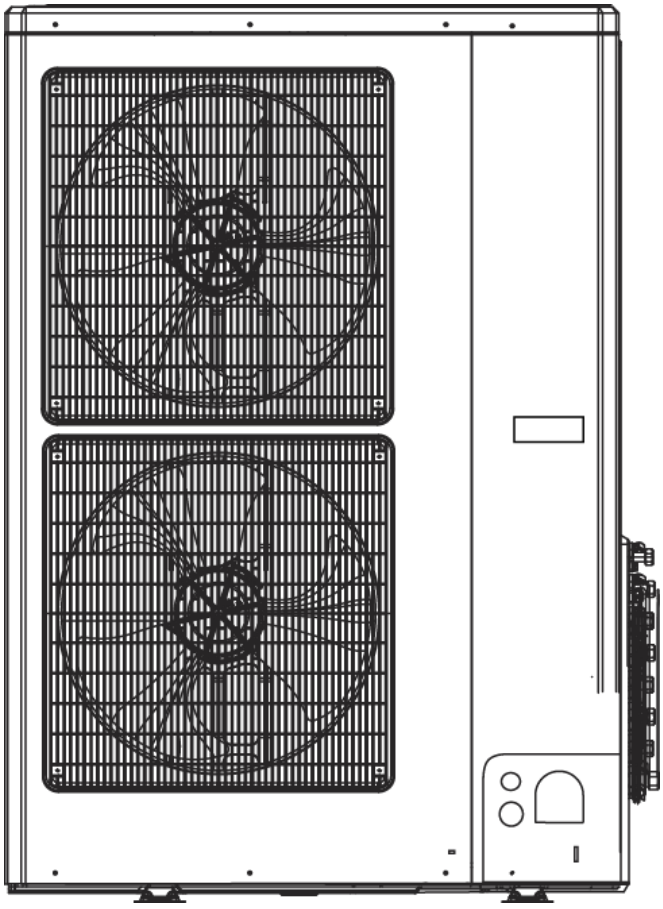
DO NOT operate the unit for prolonged periods without refreshing ambient air. Open a door or window periodically to allow in fresh air.

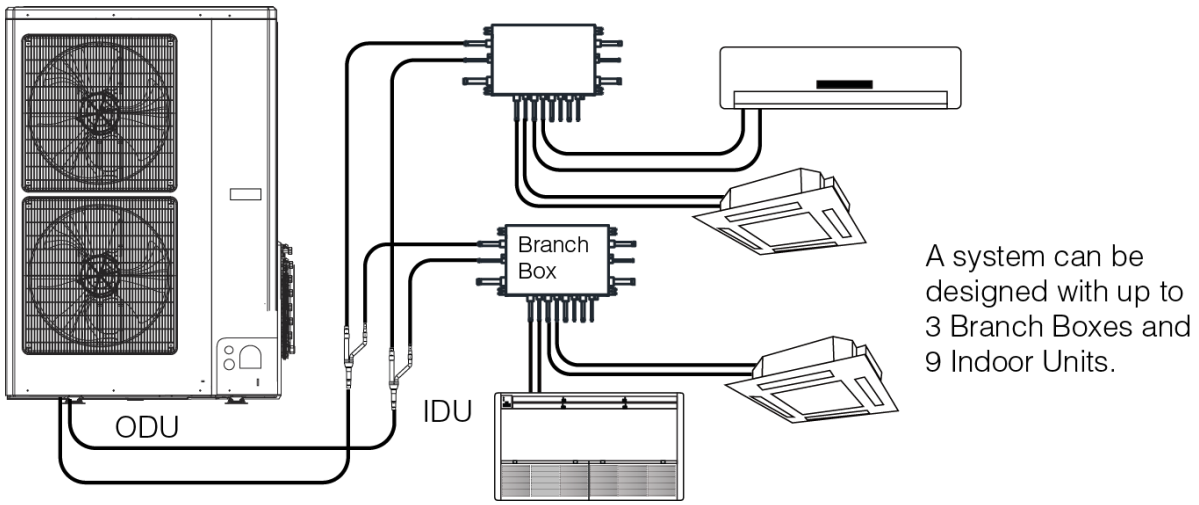
Technical Information

Outdoor Unit

WMMS-80CH-V2B(59)2S

WMMS-90CH-V2B(59)2S





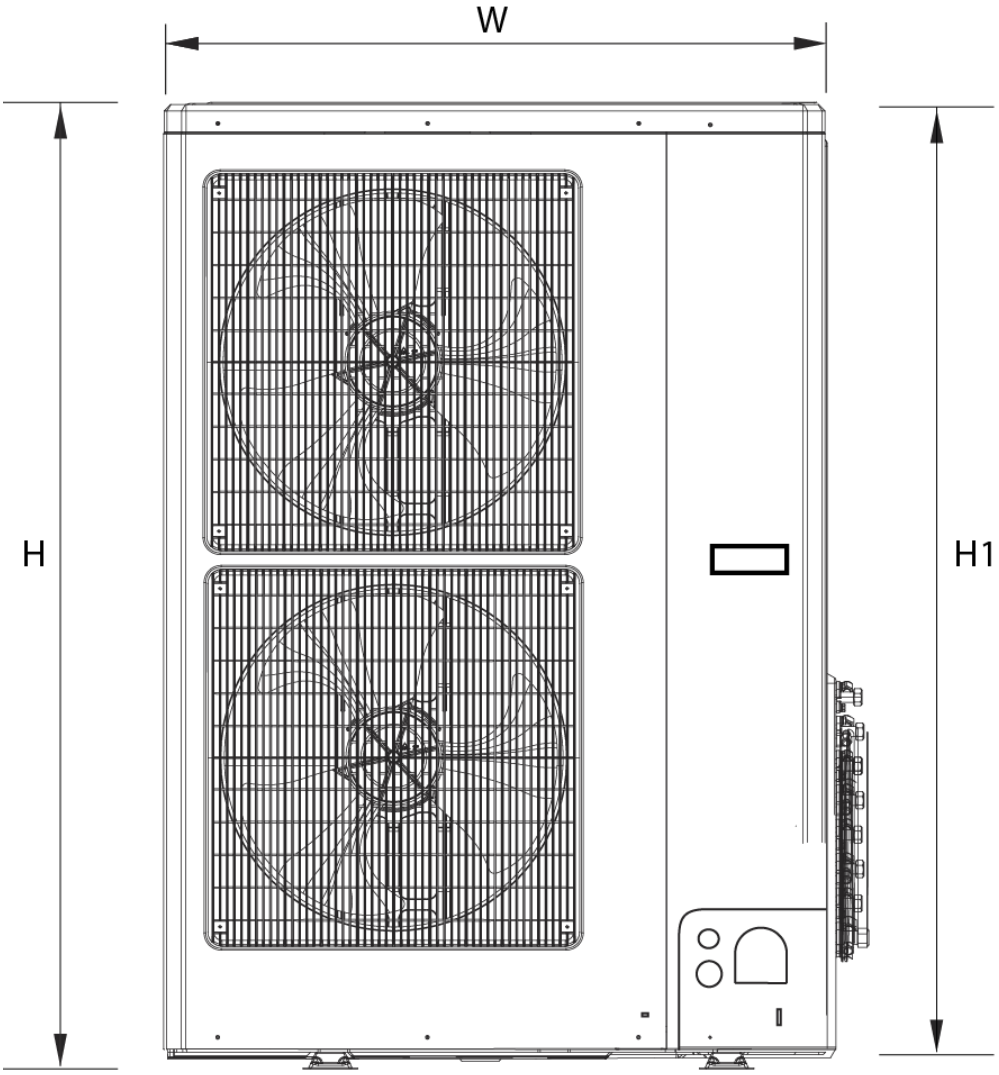
(59)2S ODU Specification Sheet

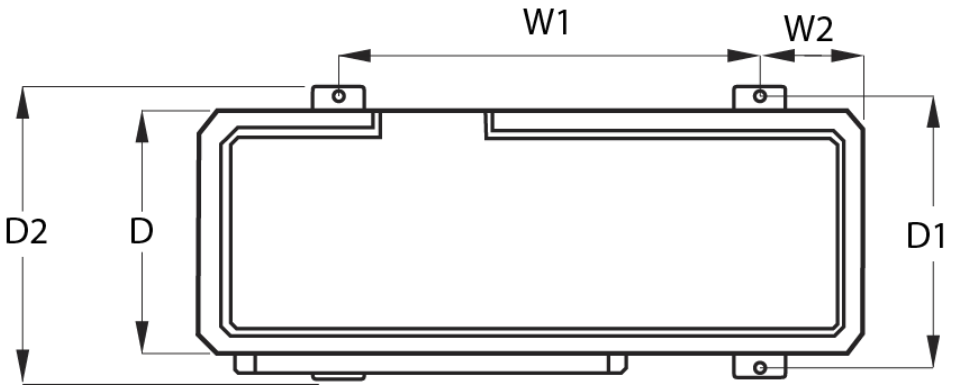
Model Number		WMMS-80CH-V2B(59)2S	WMMS-90CH-V2B(59)2S
Allowed Capacity Rating Totals-All Indoor Units	Btu/h	86,000	98,000
Cooling Capacity-Rating	Btu/h	47800.00	52900.00
Min. / Max. Cooling Capacity	Btu/h	3412.00 / 54592.00	3412.00 / 61416.00
Heating Capacity-Rating	Btu/h	54600.00	61400.00
Min. / Max. Heating Capacity	Btu/h	4094.40 / 59368.80	4094.40 / 63122.00
EER	W/W	2.80	2.77
EER	Btu/h/W	9.56	9.45
COP	Btu/h/W	12.41	11.81
SEER	Btu/h/W	16	16
HSPF	Btu/h/W	8	8
Air Flow Volume	CFM	3766.40	4119.50
Sound Pressure Level Low-High	dB(A)	43 - 57	43 - 58
Sound Power Level Low-High	dB(A)	52 - 67	52 - 68
Rated Input Ele. Power Supply	V	208-230 / 1 / 60	208-230 / 1 / 60
Fuse Current	A	50	50
HVAC Type Circuit Breaker	A	50	50
Cooling / Heating Power Input	KW	5.00 / 4.40	5.60 / 5.20
Rated Power Input	KW	5.60	6.50
Cooling / Heating Current Input	AMP	23.00 / 20.00	25.00 / 22.50
Rated Current	AMP	28.00	28.00
Compressor Type1	-	Inverter Rotary	Inverter Rotary
Compressor Capacity	Btu/h	46075	46076
Compressor Power Input	W	4580.00	4580.01
Compressor Rated Load Amp (RLA)	A	23.00	23.00
Chassis Electrical Heater Power Input	W	140.00	140.00
Chassis Electrical Heater Current	A	0.6	0.6
Fan Quantity / Type	-	2 / Axial-flow	2 / Axial-flow
Motor Full Load Amp(FLA)	A	1	2
Fan Motor Speed High to Low	RPM	784/680/576/480/384/280	864/760/608/464/352/280
Fan Motor Power Input / Output	W	150W /120W	150W /120W
Condenser Face Area	Sq.Ft	13.89	13.89
Condenser Max. Allowable Pressure	PSI	623	623
Permissible Excessive Operating Pressure for Discharge Side	PSI	580	580
Permissible Excessive Operating Pressure for Suction Side	PSI	145	145
High Presser Overload Protector	PSI	542	542
Low Presser Overload Protector	PSI	23.2	23.2
Cooling Operation Ambient Temperature Range	° F	5 ~ 118	5 ~ 118
Heating Operation Ambient Temperature Range	° F	-4 ~ 75	-4 ~ 75
Maximum IDU Qty.	Unit	8	9
Defrosting Method	-	Automatic defrosting	Automatic defrosting
Metering Device	-	Electronic expansion valve	Electronic expansion valve

Outline Dimension Diagram

WMMS-80CH-V2B(59)2S
WMMS-90CH-V2B(59)2S

Dimensions (inches)	
W	35 13/32 "
W1	22 17/32"
W2	5 1/2"
H	53 3/32"
H1	52 1/4"
D	13 3/8"
D1	14 7/8"
D2	16 7/32"





MAINTENANCE

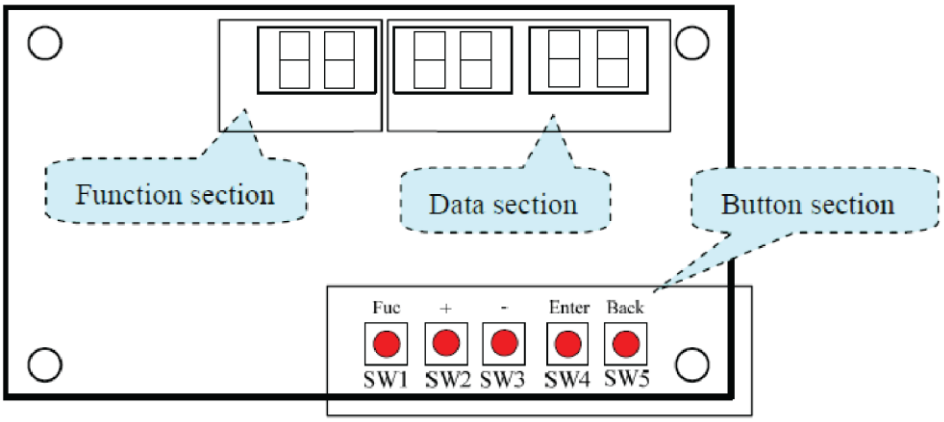
Testing Board Introduction

The testing board is in the front of electrical box and can be observed well. It has several following advantages:

- Automatically detect indoor unit numbers
- Automatically assign indoor unit addresses
- Automatically display real running function and error code
- Option settings to suit the demand of the customer

1.1 Composition of Testing Board

The testing board is composed of the function section, data section and button section.



1.2 Instruction of Function and Data Section

Running state	Function Display	Data Display
Stop	1. The section will display the numbers of the indoor units which have established communication with the outdoor unit. For example, if there are seven established indoor units, this section will display “7”. 2. It will display the address of the indoor units by turns. For example, the “1b” is represents the indoor unit 1B. (BU module:1/2/3，Indoor unit: A/B/C)	1. If the function section displays the numbers of the indoor units, the data section will display the outside temperature. For example, the “35” represents 35℃. **2.** If the function section displays the address of the indoor unit, the data display will show the capacity of the indoor unit, for example, the “35” is represented of 3500W.
Normal	Running state codes: Code / Running state UE / Pressure equalization UP / Pump down UC / Cooling UH / Heating F7 / Oil returning H1 / Defrosting	Displays the position of the target gear of the compressor. If the gear is zero, it will display “0”. For example, the gear is the fifteenth; it will display “15”. The range of the gear is from 0 to 60.
Malfunction	If the malfunction occurs in the system, Display will show the error code. If there are several malfunctions, it will display the error codes in series at intervals of 2 seconds.	1. If the malfunction occurs in the outdoor unit, This display will show nothing. 2. If the malfunction occurs in the indoor units, This display will show the address of the indoor unit.

Process Control Setting

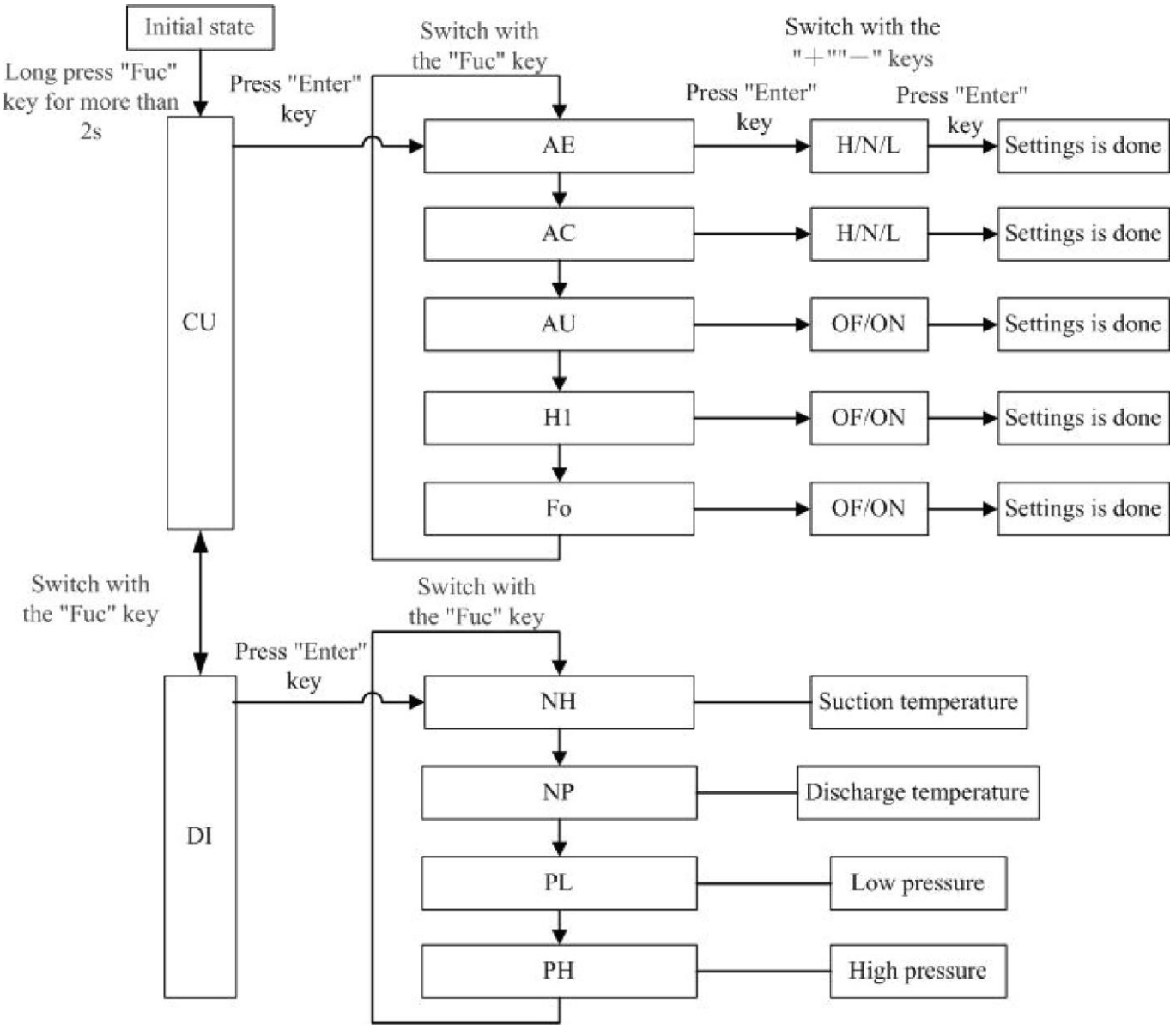
1.3.1 Button section

Key	Fuc	+	−	Enter	Back
Signification	Function	Increase	Decrease	Enter	Back

Caution !

1. When entering the menu to set parameters, the function section will flash running codes and the data section will flash value.
2. When the menu is set, the data section will flash “=”. After the “=” stops blinking, the unit will run the new parameters.

1.3.2 Flow chart of operation



1. Long press “Fuc” key for more than 2s to enter the first-level menu. The first-level menu includes control unit and display unit.
    - Press “Enter” key to enter the second-level menu.
    - Press “Fuc” key to switch the menu.
    - Press “Back” key to the previous menu.
2. Control unit operation:
    - **When entering into the control unit:**
      The function section flashes the running code and the data section display the current value uninterrupted.
    - **Set parameters:**
      Press “Enter” key to enter the second-level menu, and set parameters with the “＋” “－” keys. Now the function section displays the running code uninterrupted and the data section flashes the set parameters.
    - **Finish setting:**
      After press “Enter” key to the end, the function section will display the running code uninterrupted and the data section display the set parameters uninterrupted.
    - **Back:**
      Press “Back” key to the previous menu, and long press the “Back” key to exit the operation.
3. Display unit operation:
    - **When entering into the display unit:**
      The function section display running code uninterrupted and the data section display the current value uninterrupted.
    - □ “＋” “－” **Keys are invalid in the operation.**
4. If no operation is performed within 1min, it will automatically return to the normal display.

1.3.3 Examples

Set condensation temperature

1. Long press “Fuc” key for more than 2s to enter the first-level menu:
   the function section flashes “CU” code and the data section is blank.

2. Press “Enter” key to enter the second-level menu:
   the function section flashes “AE” code and the data section display the current parameters.

3. Switch with the “Fuc” key to set condensation temperature:
   the function section flashes “AC” code and the data section display the current parameters.

4. Press “Enter” key:
   the function section displays “AC” code uninterrupted and the data section flashes the current parameters.

5. Switch with the “＋” “－” to the target value, and then press “Enter” key:
   the function section displays “AC” code uninterrupted and the data section flashes the new parameters uninterrupted.

1.3.4 Definitions of Running Codes

Sorts	Function section	Data section	Remarks
Control Unit	**CU**	**Blank**	
Set evaporation temperature	AE	Default: N	Use the "＋" "－" keys to switch L, N and H. • If you want to get a higher cooling capacity, select L; else select H.
Set condensation temperature	AC	Default: N	Use the "＋" "－" keys to switch L, N and H. • If you want to get a higher heating capacity, select H; else select L.
Vacuum operation	AU	The current parameter	Use the "＋" "－" keys to switch ON, OF. • ON represents that the unit is running the current state. • OF represents that the unit is not running the current state.
Set defrosting mode	H1	The current parameter	
Set refrigerant recovery mode	Fo	The current parameter	
Display Unit	**DI**	**Blank**	
Display suction temperature	PU	Suction temperature. For example, 15 represents 15℃	"＋" and "－" Keys are invalid in the operation.
Display discharge temperature	PC	Discharge temperature. For example, 70 represents 70℃	
Display low pressure	PL	Low pressure. For example, 95 represents 0.95Mpa	
Display high pressure	PH	High pressure. For example, 280 represents 2.8Mpa	

1.3.5 The code of data section

Set evaporation temperature	H(represent High)	N(represent Normal)	L(represent Low)
Set condensation temperature			
Vacuum operation	OF (represent OFF)	ON	/
Set defrosting mode	OF(represent OFF)	ON	/
Set defrosting mode	OF(represent OFF)	ON	/

2 Troubleshooting

Warning!

a. In the event of abnormal conditions (like, stinky smell), please shut off the main power supply immediately and then contact the GREE appointed service center; otherwise the continuous abnormal running would damage the air conditioning unit and also would cause electric shock or fire hazard etc.
b. Do not repair the air conditioner personally but instead contact the professionally skilled personnel at the GREE appointed service center, as the incorrect repair would cause electric shock or fire hazard etc.

2.1 Check before Contacting Maintenance Serviceman

Please check the following items before contacting the maintenance serviceman.

Conditions	Causes	Corrective actions
The unit does not run at all	Broken fuse or breaker is off	Replace the damaged fuse or close the breaker
	Power off	Restart the unit after power supply resumes
	Power supply plug is loose	Plug the power supply properly
	The batteries voltage of the remote controller is insufficient	Replace with new batteries
	Remote controller is out of the control scope	The distance shall be within 8m
The unit stops soon after it starts	Air inlet or outlet of indoor unit or outdoor unit is blocked	Remove the obstacles
Cooling or heating is abnormal	Air inlet or outlet of indoor unit or outdoor unit is blocked	Remove the obstacles
	Temperature setting is improper	Adjust the setting of remote controller or wire controller
	Air speed is set too low	Adjust the setting of remote controller or wire controller
	Improper airflow direction	Adjust the setting of remote controller or wire controller
	Door or window is open	Close the door or window
	Under direct sunshine	Hang curtain or blinders over the window
	Too many people in the room	
	Too many heat sources indoors	Reduce the heat sources
	The filter screen is dirt or blocked	Clean the filter screen

Note:

If the air conditioner still runs abnormally after the above check and handling, please contact the local service center and also give a description of the error occurred as well as the model of the unit.

2.2 Trouble Shooting

The conditions listed below are not classified into errors.

Conditions		Causes
The unit does not run	When restart the unit soon after it is stopped	The overload protection switch of the unit let the startup delayed for three minutes
	As soon as power supply is on	The unit will stand by for approximate one minute
The unit blows out mist	When the cooling operation starts	The hi-humidity air indoor is cooled quickly
The unit generates noise	The unit “clatters” as soon as it starts running	It is the sound generated during the initialization of the electronic expansion valve
	The unit “swishes” during the cooling operation	It is the sound when the refrigerant gas runs inside the unit
	The unit “swishes” when it is started or stopped	It is the sound when the refrigerant gas stops running
	The unit “swishes” when it is in and after the running	It is the sound when the draining system is operating
	The unit “squeaks” when it is in and after the running	It is the sound of frication generated by the skin plate etc. which swells due to the temperature change
The unit blows out dust	When the unit restarts after it is not used for a long time	The dust inside the unit is blown out again
The unit emits odors	When the unit is running	The odors absorbed in are blown out

2.3 Error description

- **Outdoor Unit**
  If some error occurs when the unit is running, the error code will be displayed on the wired controller, the testing board of the outdoor unit. Check for more details about the meaning of each error.

Errors of definition	Main control display for outdoor unit			Indoor unit code	Testing board code
	Yellow LED	Red LED	Green LED		
The compressor is startup	Flash 1 time				
IPM current protection	Flash 3 times			H5	H5
IPM temperature protection	Flash 5 times			P8	P8
PFC current protection	Flash 7 times			HC	HC
PFC temperature protection	Flash 8 times			P8	P8
Low voltage protection	Flash 9 times			PL	PL
High voltage protection	Flash 10 times			PH	PH
Low pressure protection	Flash 11 times			E3	E3
High pressure protection	Flash 12 times			E8	E8
High pressure switch protection	Flash 13 times			E1	E1
Capacitor charging error	Flash 14 times			PU	PU
Current protection	Flash 15 times			E5	E5
Memory card error	Flash 16 times			EE	EE
Compressor demagnetizing protection	Flash 17 times			HE	HE
Compressor desynchronizing	Flash 18 times			H7	H7
Compressor phase lack	Flash 19 times			U2	U2
Compressor phase circuit detection error	Flash 20 times			U1	U1
Compressor current protection	Flash 21 times			L9	L9
Compressor overload protection	Flash 22 times			H3	H3
Compressor discharge temperature protection	Flash 23 times			E4	E4
Lack of refrigerant or jam protection	Flash 31 times			F0	F0
Normal operation		Flash 1 time			
Frequency limitation for current protection		Flash 2 times			F8
Oil returning mode		Flash 3 times		F7	F7
Defrosting mode		Flash 4 times		H1	H1
Frequency limitation for IPM temperature protection		Flash 5 times		EU	EU
Frequency limitation for PFC temperature protection		Flash 6 times		EU	EU
Frequency limitation for compressor overload protection		Flash 8 times			LU
Frequency limitation for discharge temp. protection		Flash 9 times			F9
Frequency limitation for low pressure protection		Flash 10 times			Pn
Frequency limitation for high pressure protection		Flash 11 times		F6	F6
Discharge temperature sensor error		Flash 12 times		F5	F5
Outside temperature sensor error		Flash 13 times		F3	F3
Suction temperature sensor error		Flash 15 times			dc
Condenser temperature sensor error		Flash 16 times		A7	A7
Sub-cool temperature sensor error		Flash 17 times			bC
Low pressure sensor error		Flash 18 times			dL

High pressure sensor error		Flash 19 times			e1
Fan motor protection		Flash 20 times		H6	H6
Driving board is connected			Flash 1 time		
Testing board is connected			Flash 2 times		
Computer is connected			Flash 4 times		
Indoor unit 1 is connected			Flash 5 times		
Indoor unit 2 is connected			Flash 6 times		
Indoor unit 3 is connected			Flash 7 times		
Indoor unit 4 is connected			Flash 8 times		
Indoor unit 5 is connected			Flash 9 times		
Indoor unit 6 is connected			Flash 10 times		
Indoor unit 7 is connected			Flash 11 times		
Indoor unit 8 is connected			Flash 12 times		
Indoor unit 9 is connected			Flash 13 times		
Indoor anti-freeze protection				E2	E2
Inside temperature sensor error				F1	F1
Evaporator midway temp sensor error				F2	F2
Liquid pipe of BU module temperature sensor error				b5	b5
Gas pipe of BU module temperature sensor				b7	b7

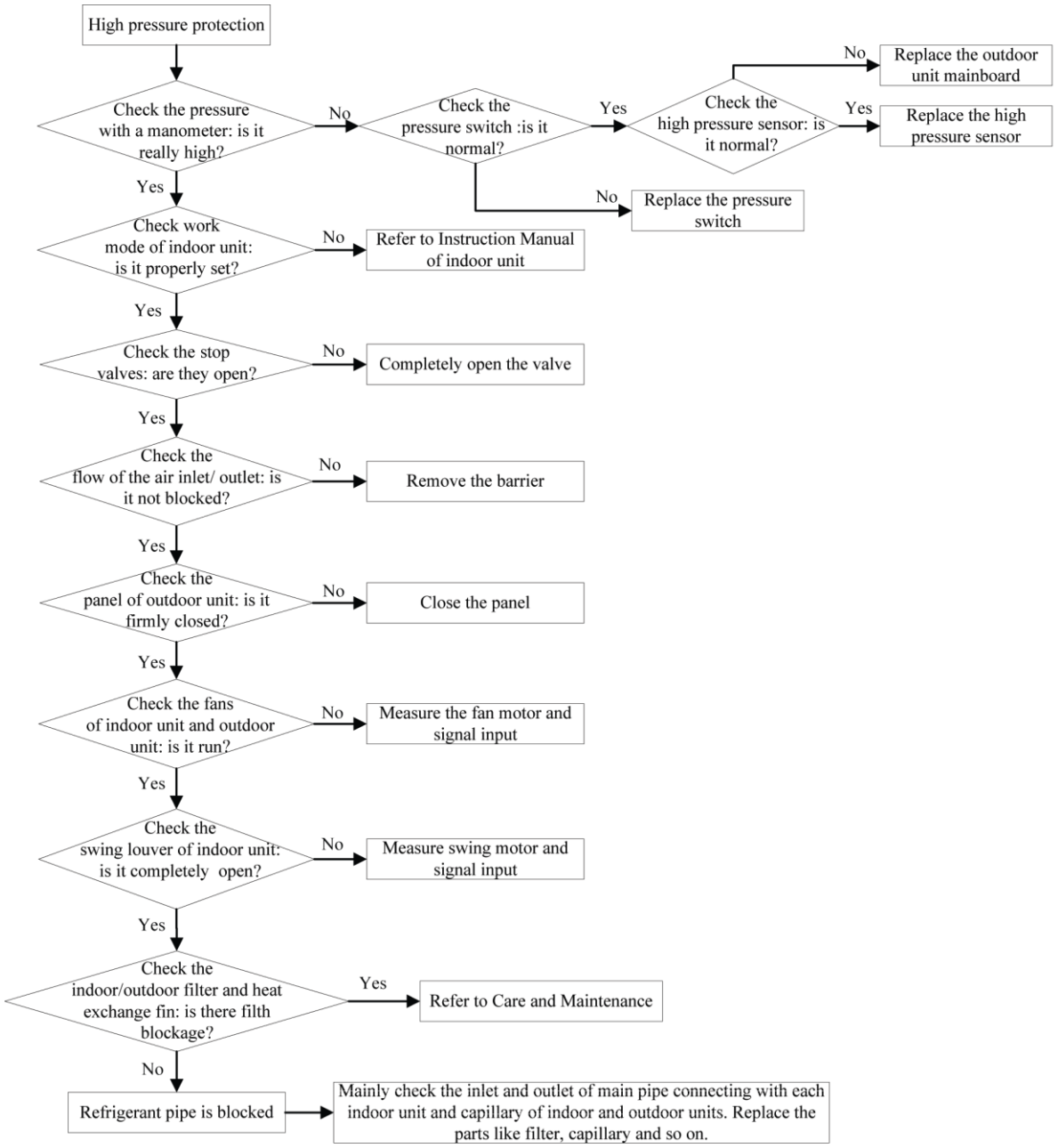
Error							
Mode conflicts						E7	E7
Communication error	BU 1	Indoor unit A				E6	E6 1A
		Indoor unit B					E6 1B
		Indoor unit C					E6 1C
	BU 2	Indoor unit A					E6 2A
		Indoor unit B					E6 2B
		Indoor unit C					E6 2C
	BU 3	Indoor unit A					E6 3A
		Indoor unit B					E6 3B
		Indoor unit C					E6 3C
Communication error between the main board and driving board							P6
Communication error between the main board and testing board							CE
Indoor unit gas sensor error							Fn
Indoor unit humidity sensor error							L1
Indoor unit water full protection							E9
Jumper terminal error						C5	C5
Power supply phase lack							dJ
Outdoor unit fan motor error							L3
Refrigerant recovery mode						Fo	Fo

Service personnel shall collect the malfunction information as much as possible and research them thoroughly, list these electrical parts which may cause malfunction, service personnel shall be able to determine the specific reason and solve the faulted parts.

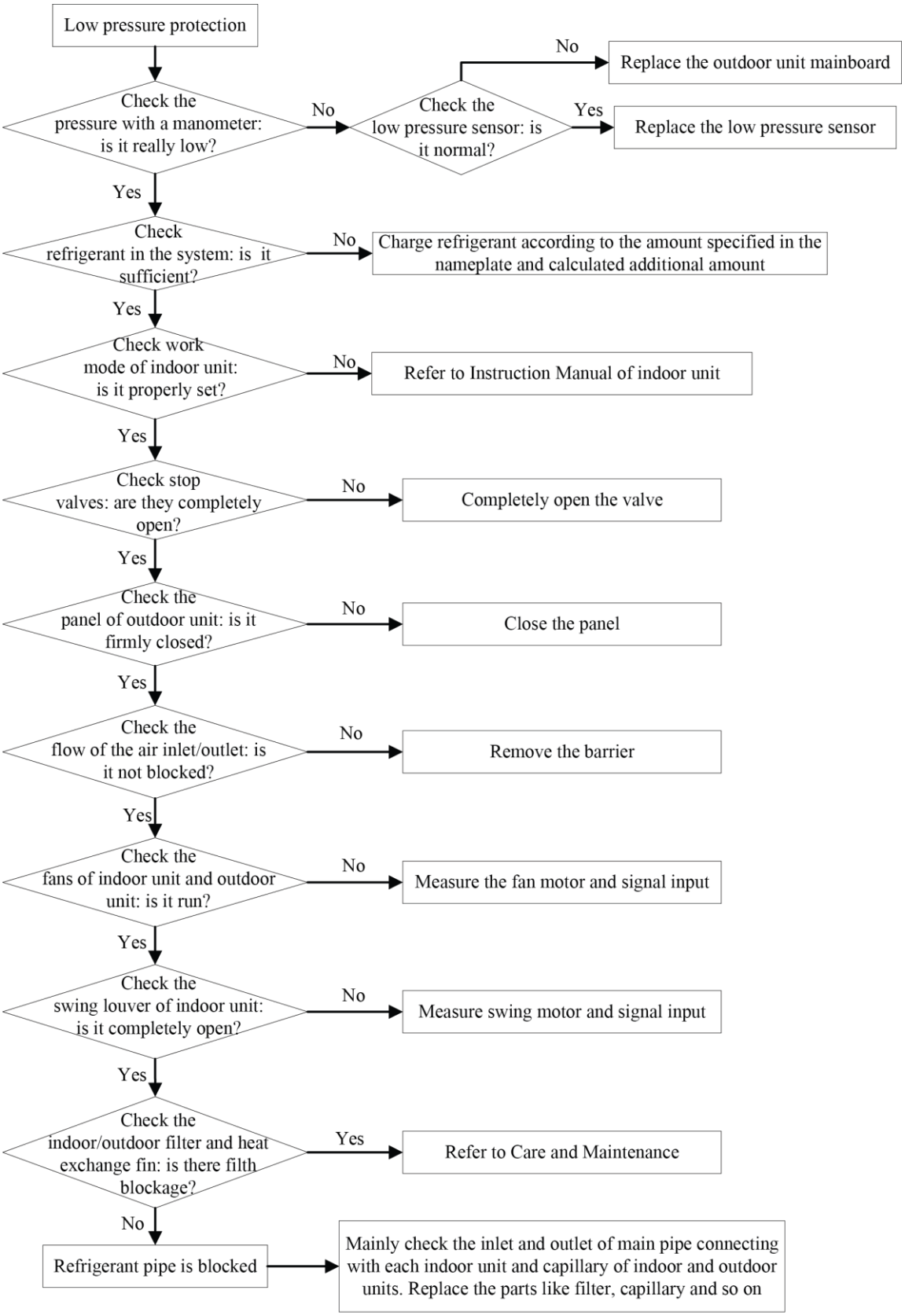
Observe the status of the complete device and do not observe the partial.

It is advised to start from the simple operation during analyzing, judging and confirming malfunction reason, then conduct the complicated operations such removal of device, part replacement and refrigerant filling.
Find the malfunction reason carefully as unit may occur several malfunction at the same time and one malfunction may develop into several malfunction, so entire system analysis shall be established to make the judged result exact and credible.

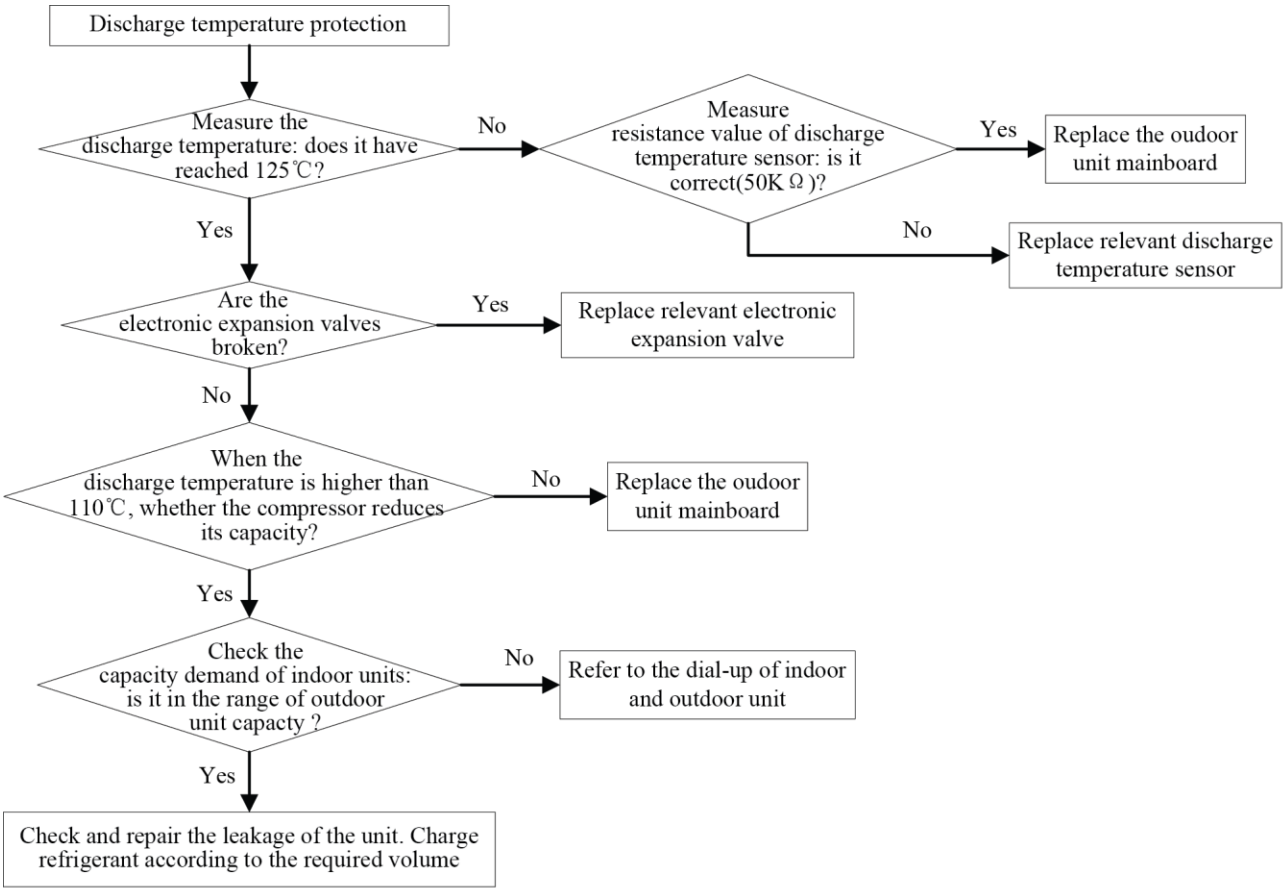
3.1 Malfunction display: High Pressure Protection



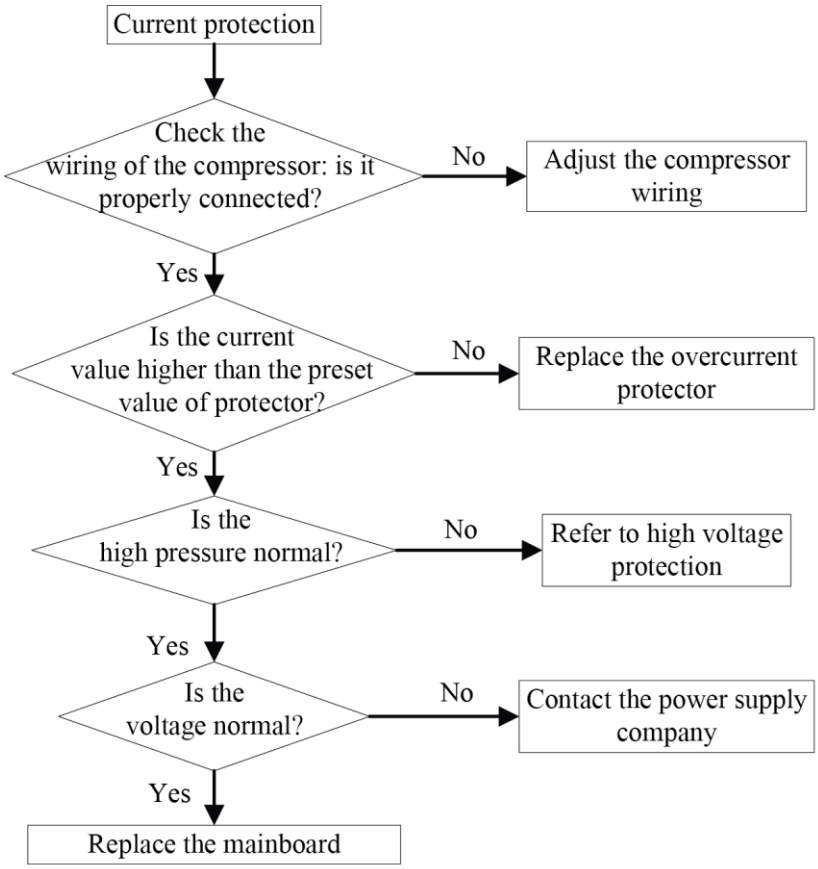
3.2 Malfunction display: Low Pressure Protection



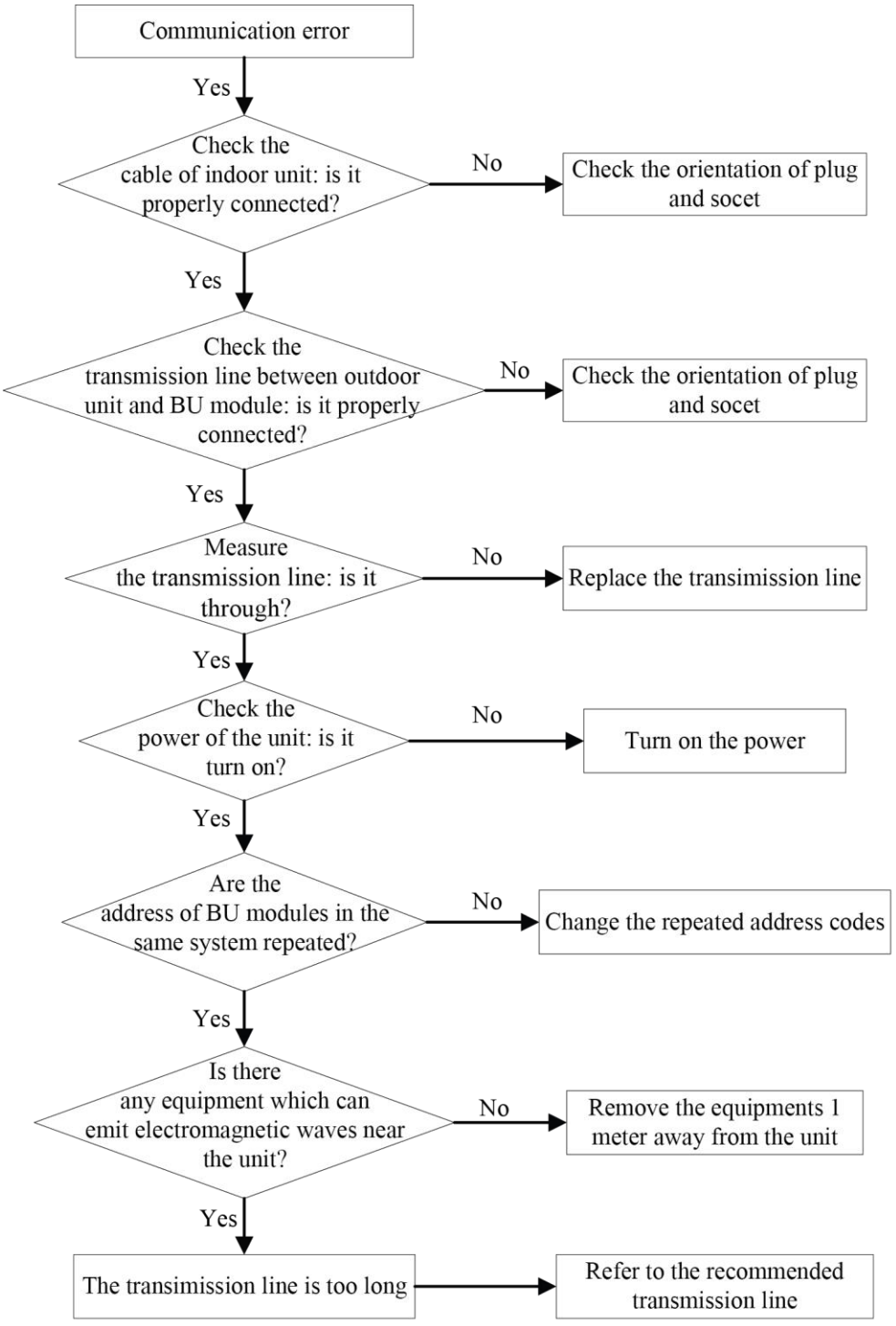
3.3 Malfunction display: Discharge temperature protection



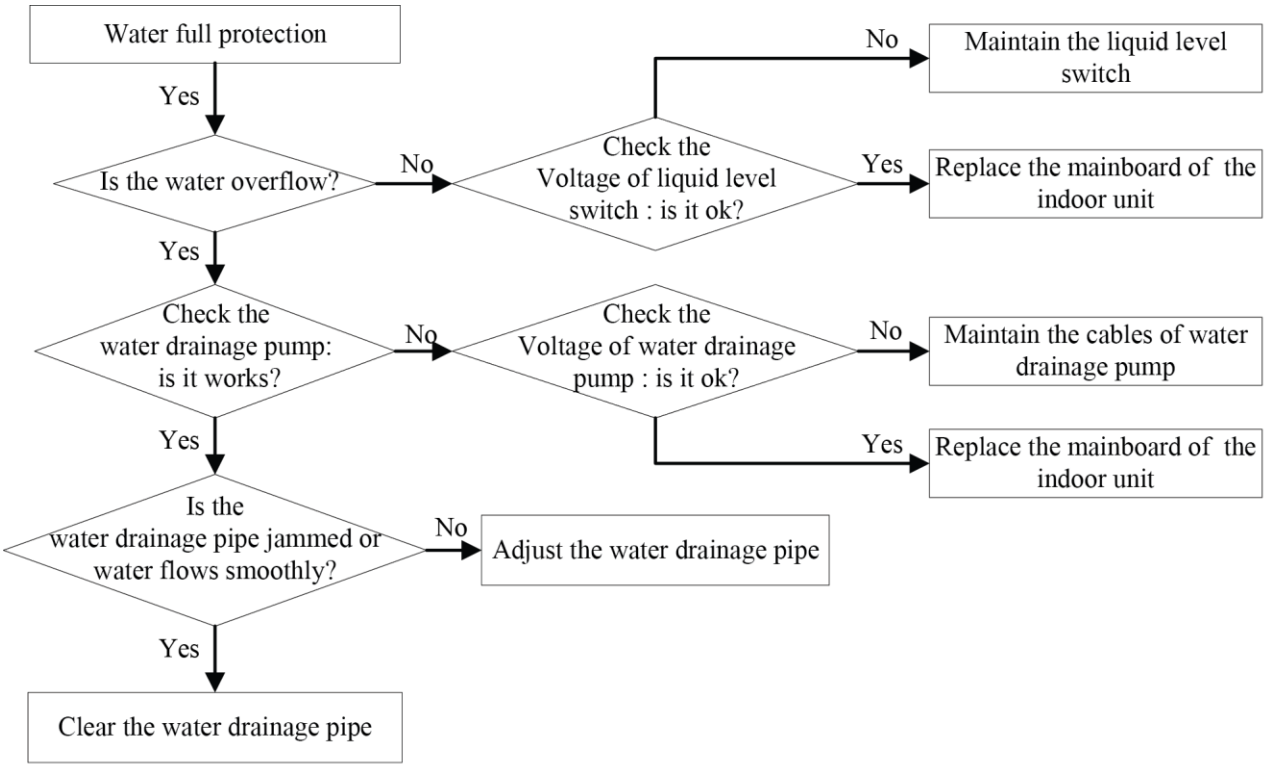
3.4 Malfunction display: Current protection



3.5 Malfunction display: Communication error

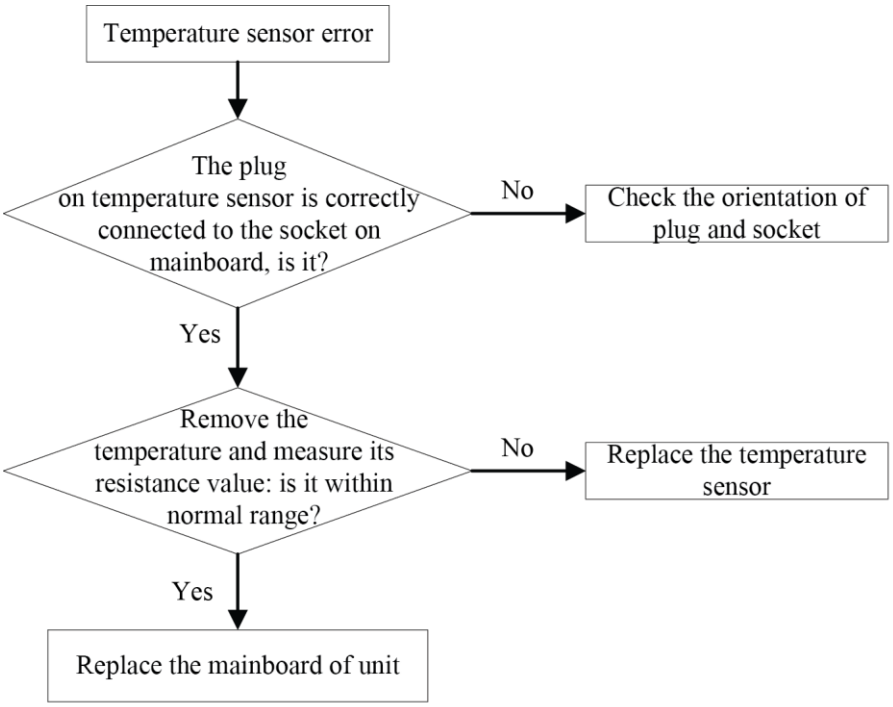


3.6 Malfunction display: Indoor unit water full protection

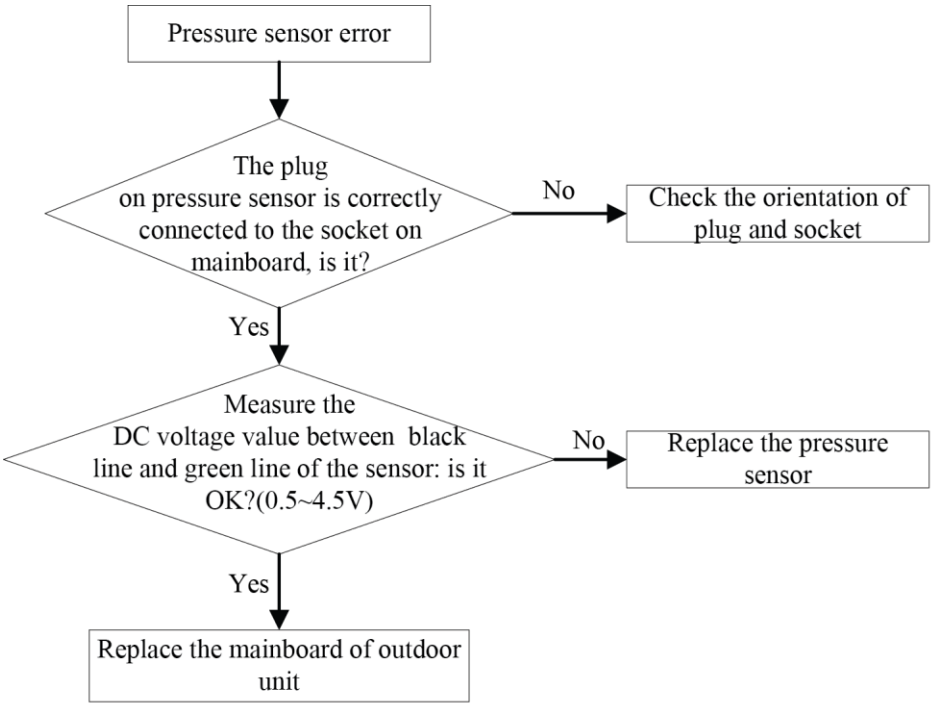


3.7 Malfunction display: Temperature sensor error

The resistance value of discharge temperature sensor is 50 KΩ;
The resistance value of outside temperature sensor and inside temperature sensor are all 15 KΩ;
The others are 20 KΩ.

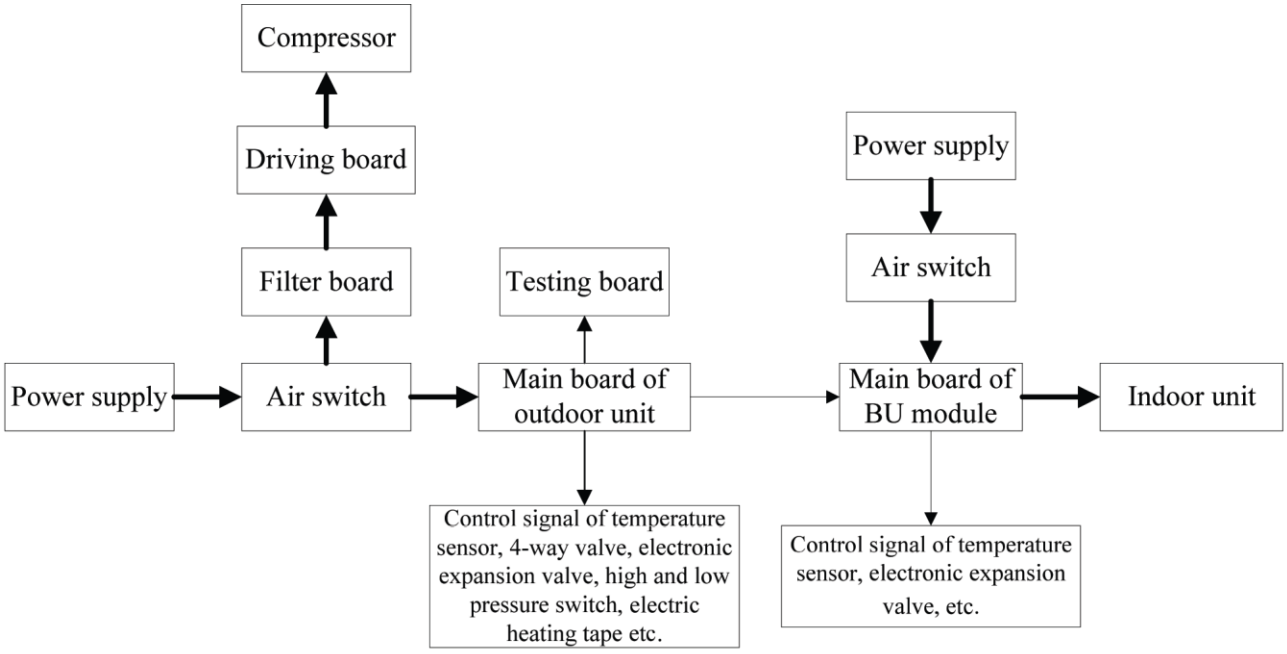


3.8 Malfunction display: High/Low pressure sensor error



4 POWER DISTRIBUTION

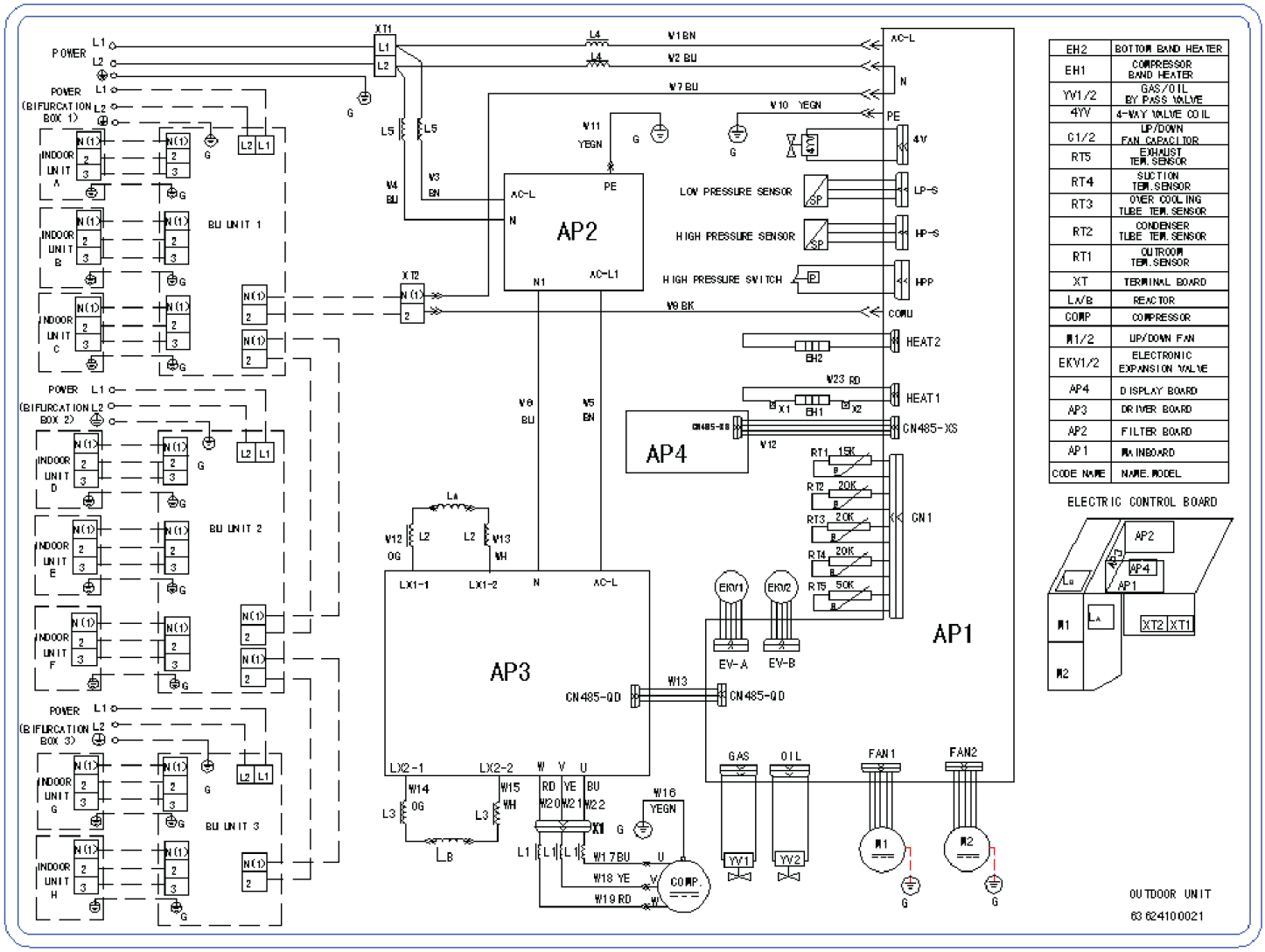
4.1 Diagram of Power Distribution



(The thick line represents power line while thin line represents the control line.)

4.2 Wiring diagram

Note:
This drawing is just for reference; please always refer to the electric wiring stuck to the unit for actual wiring.
4.2.1 Outdoor unit
GWHD(56S)ND3CO; GWHD(48S)ND3CO



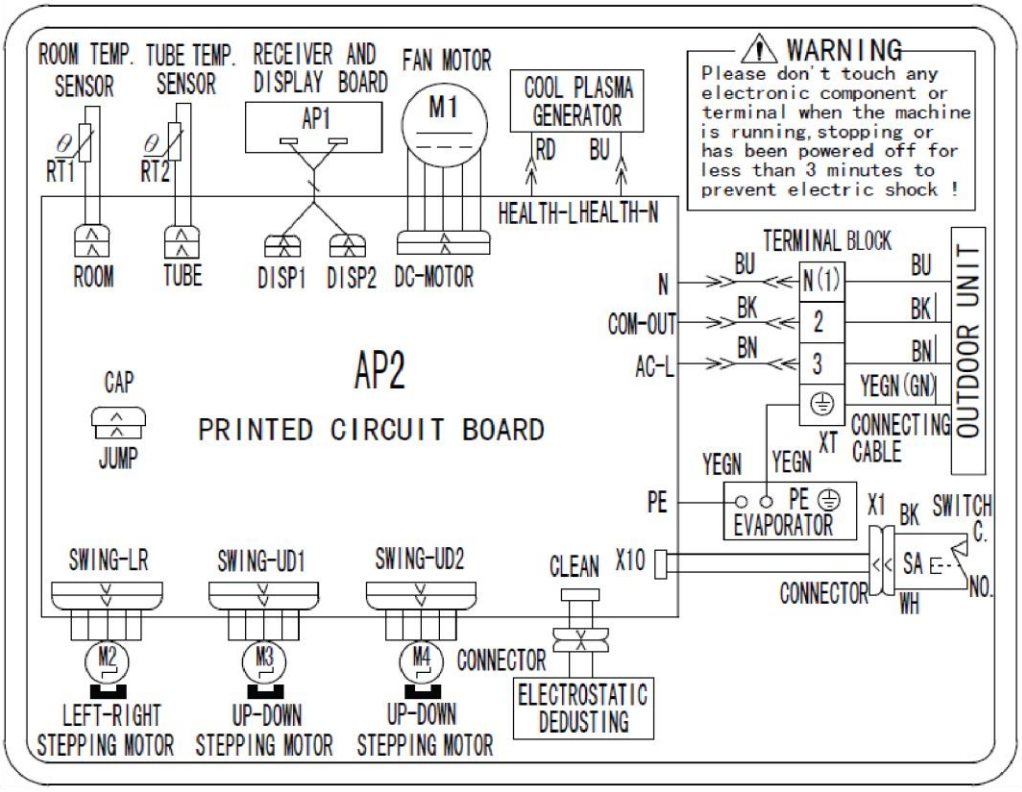
EH2	BOTTOM BAND HEATER
EH1	COMPRESSOR BAND HEATER
YV1/2	GAS/OIL BY PASS VALVE
4YV	4-WAY VALVE COIL
C1/2	UP/DOWN FAN CAPACITOR
RT5	EXHAUST TEM. SENSOR
RT4	SUCTION TEM. SENSOR
RT3	OVER COOLING TUBE TEM. SENSOR
RT2	CONDENSER TUBE TEM. SENSOR
RT1	OUTDOOR TEM. SENSOR
XT	TERMINAL BOARD
L-A/B	REACTOR
COMP	COMPRESSOR
M1/2	UP/DOWN FAN
EKV1/2	ELECTRONIC EXPANSION VALVE
AP4	DISPLAY BOARD
AP3	DRIVER BOARD
AP2	FILTER BOARD
AP1	MAINBOARD
CODE NAME	NAME. MODEL

4.2.2 Indoor unit

1) Wall mounted type

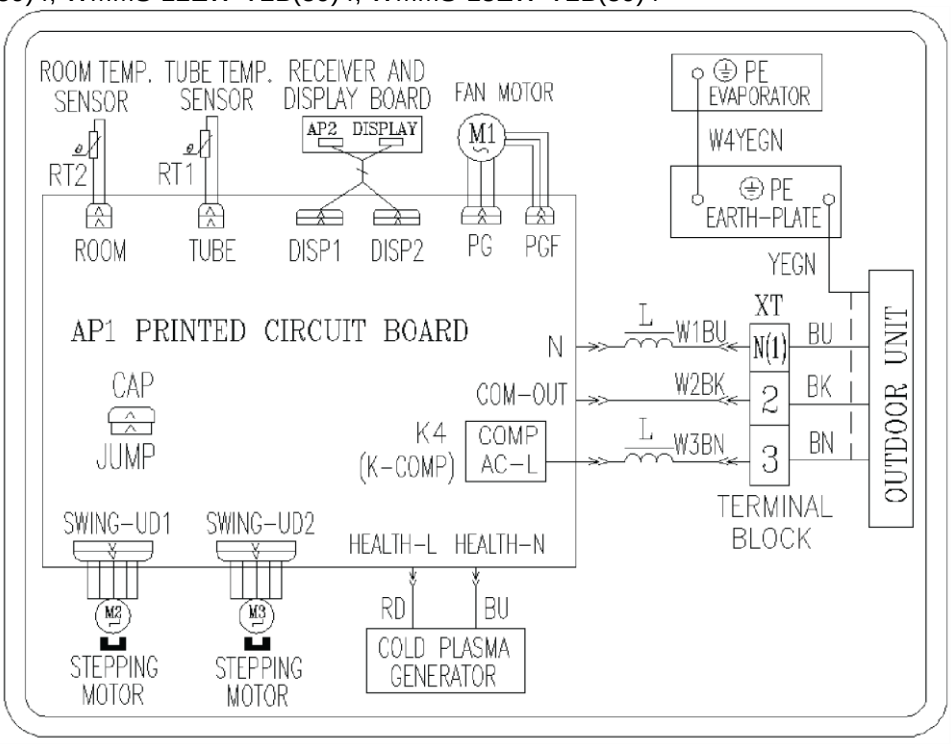
- Hansol

GWH09TB-D3DNA1A/I; GWH12TB-D3DNA1A/I; GWH18TC-D3DNA1A/I; GWH24TD-D3DNA1A/I



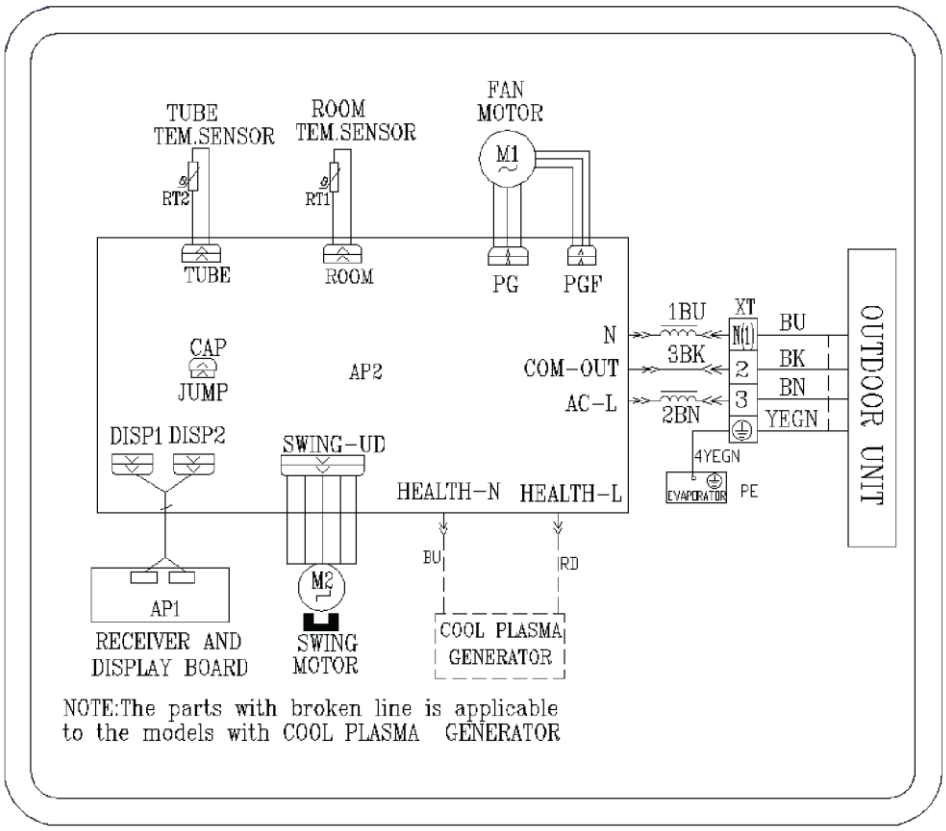
- U-Cool

WMMS-09EW-V2B(59)4, WMMS-12EW-V2B(59)4, WMMS-18EW-V2B(59)4



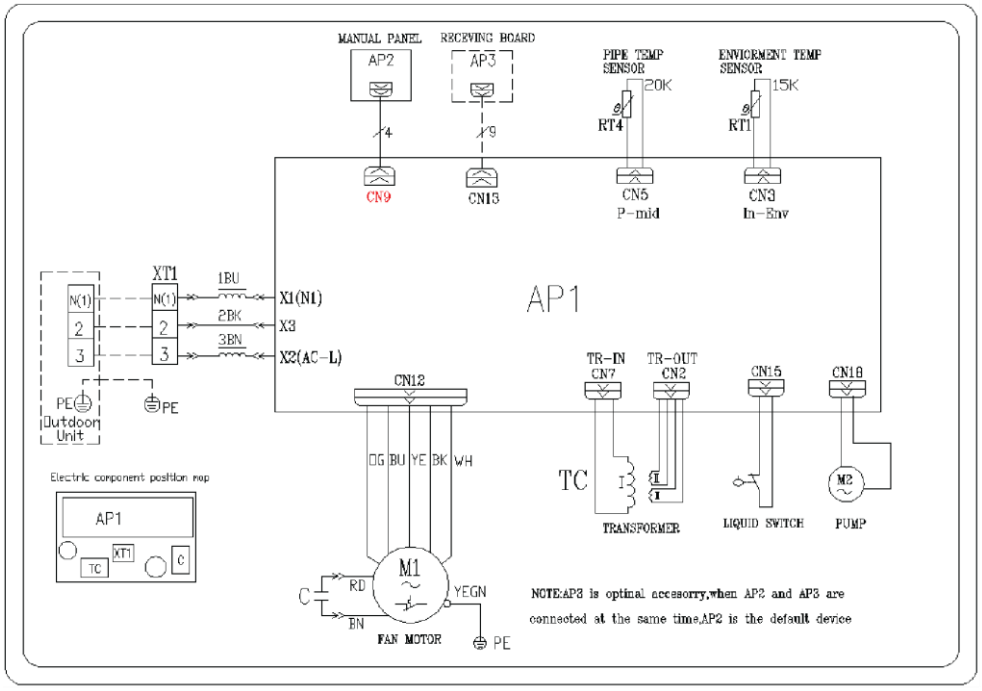
- Cozy

GWH09MB-D3DNA3D/I; GWH12MB-D3DNA3D/I; GWH18MC-D3DNA3D/I; GWH24MD-D3DNA3D/I



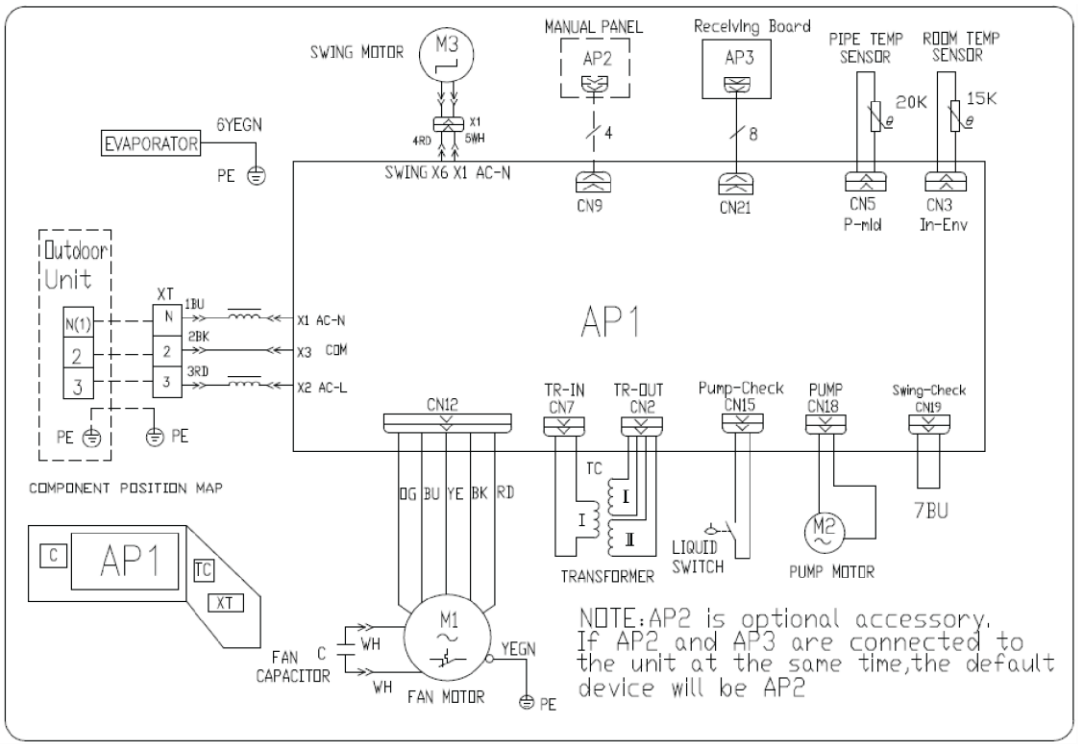
2) Duct type

WMMS-09EF-V2B(59)2, WMMS-12EF-V2B(59)2, WMMS-18EF-V2B(59)2, WMMS-24EF-V2B(59)2,

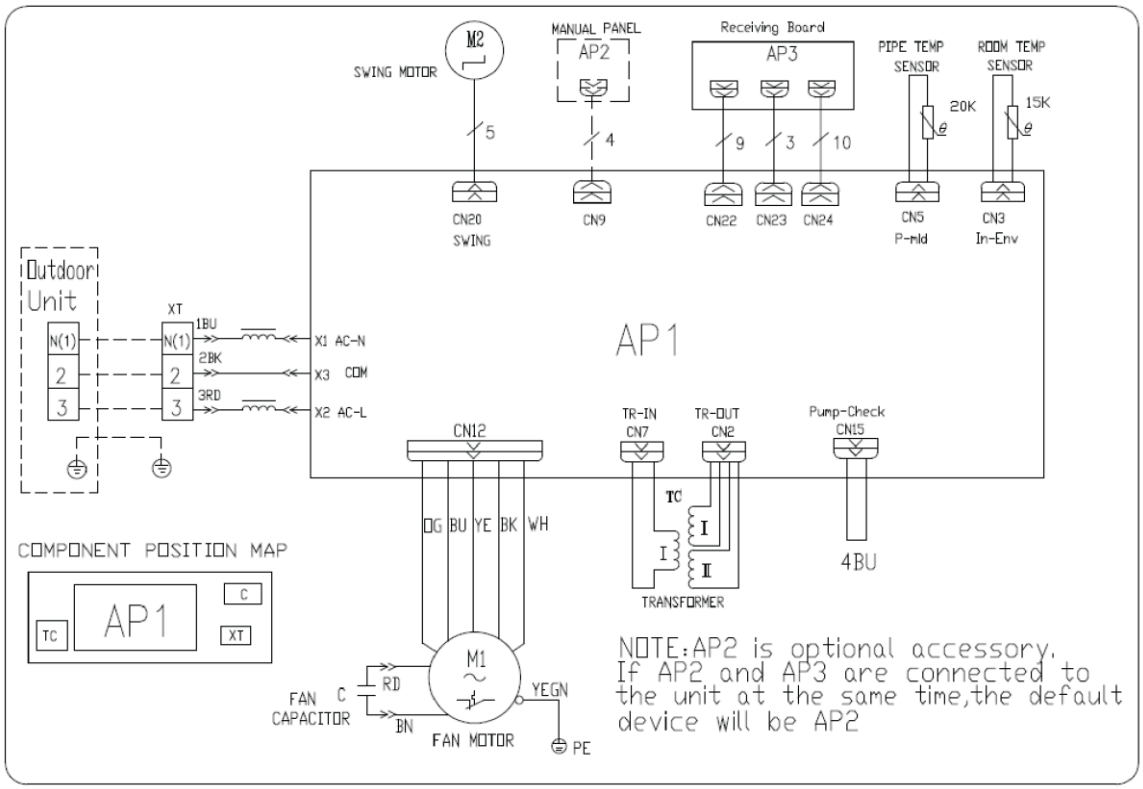


3) Cassette

GKH(12)BA-D3DNA2A/I; GKH(18)BA-D3DNA2A/I; GKH(24)BA-D3DNA1A/I

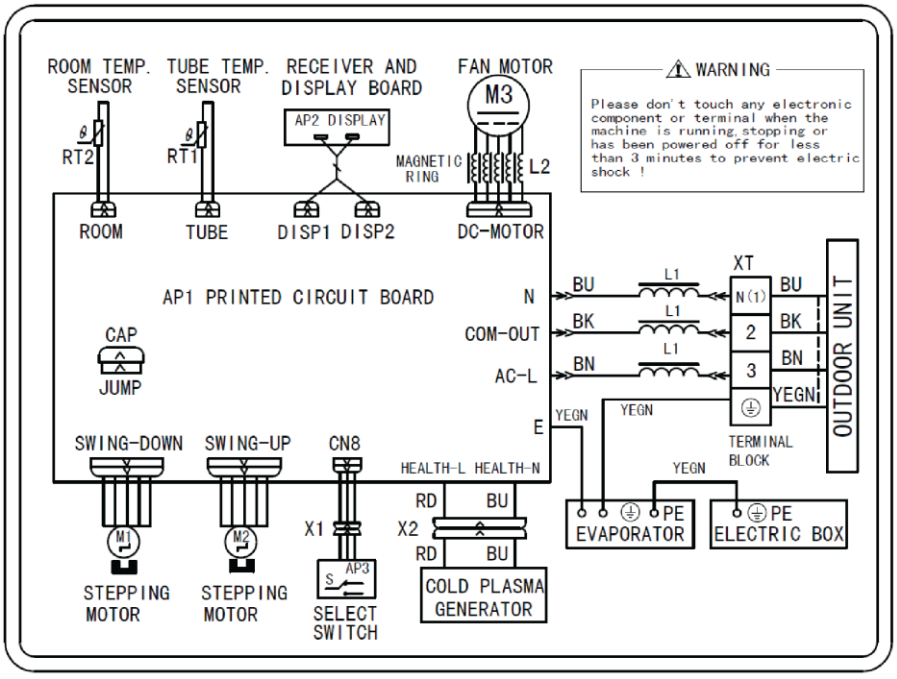


4) Floor ceiling
WMMS-12EU-V2B(59)2, WMMS-18EU-V2B(59)2, WMMS-24EU-V2B(59)2,



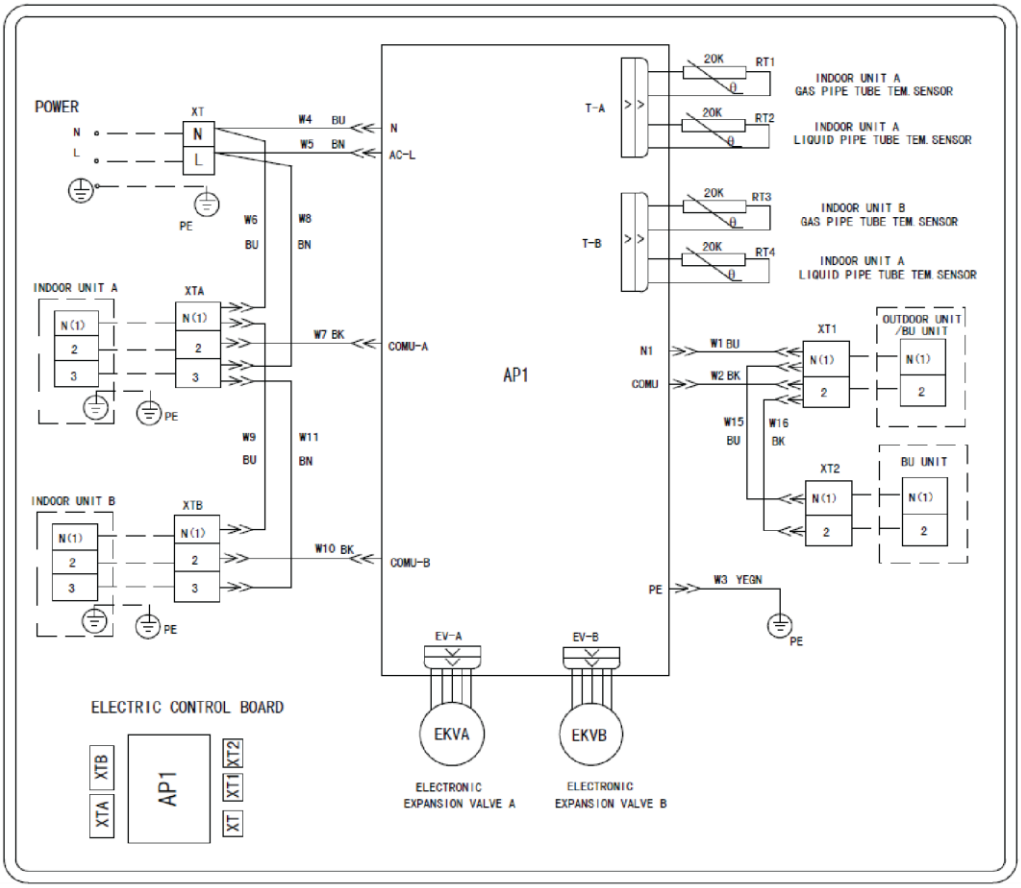
5) Console

WMMS-09EL-V2B(59)2, WMMS-12EL-V2B(59)2, WMMS-18EL-V2B(59)2,

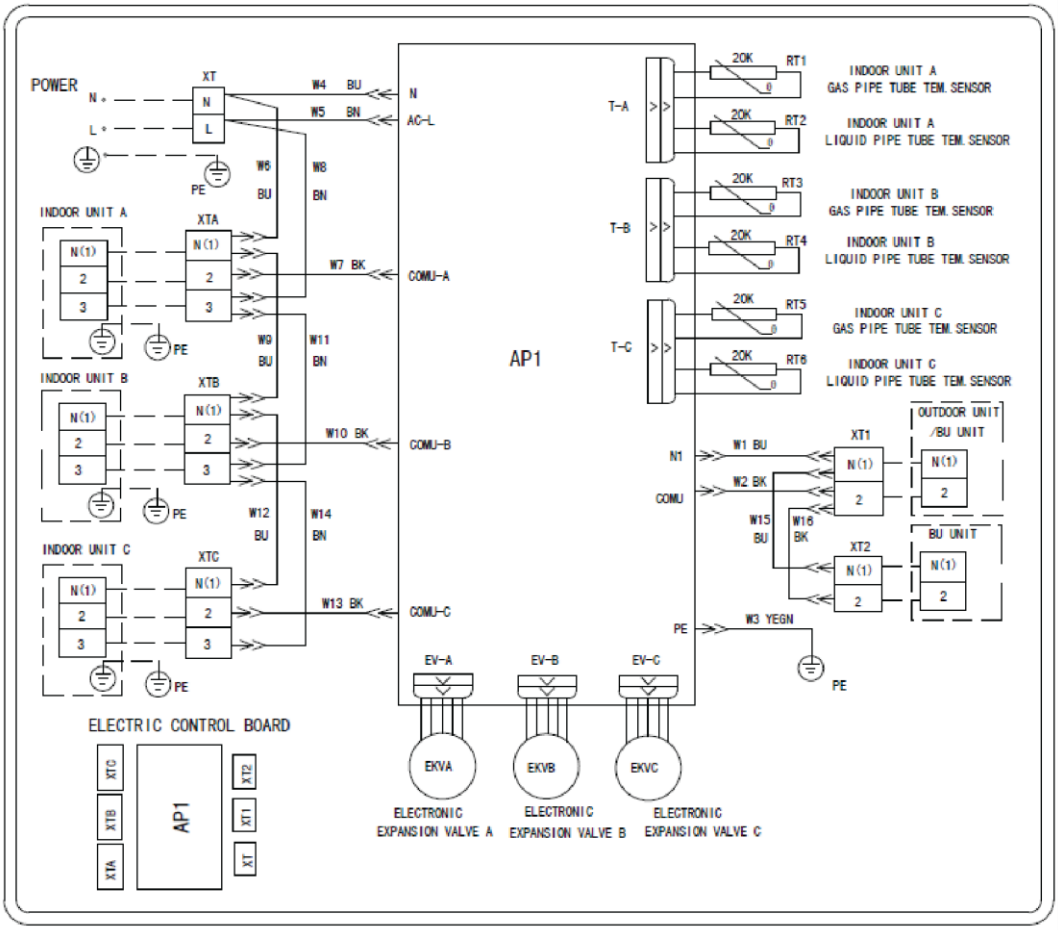


4.2.3 BU module

FXA2A-D; FXA2B-D



FXA3A-D; FXA3B-D



5 THE RESISTANCES OF COMMON TEMPERATURE SENSORS

Temp.（℃）	Resistance	Voltage (15K/5V)	Voltage (15K/3.3V）	Temp.（℃）	Resistance	Voltage (15K/5V)	Voltage (15K/3.3V）
-20	144.000	0.472	0.311	25	15.000	2.500	1.650
-19	138.100	0.490	0.323	26	14.360	2.554	1.686
-18	128.600	0.522	0.345	27	13.740	2.610	1.722
-17	121.600	0.549	0.362	28	13.160	2.663	1.758
-16	115.000	0.577	0.381	29	12.600	2.717	1.793
-15	108.700	0.606	0.400	30	12.070	2.771	1.829
-14	102.900	0.636	0.420	31	11.570	2.823	1.863
-13	97.400	0.667	0.440	32	11.090	2.875	1.897
-12	92.220	0.699	0.462	33	10.630	2.926	1.931
-11	87.350	0.733	0.484	34	10.200	2.976	1.964
-10	82.750	0.767	0.506	35	9.779	3.027	1.998
-9	78.430	0.803	0.530	36	9.382	3.076	2.030
-8	74.350	0.839	0.554	37	9.003	3.125	2.062
-7	70.500	0.877	0.579	38	8.642	3.172	2.094
-6	66.880	0.916	0.605	39	8.297	3.219	2.125
-5	63.460	0.956	0.631	41	7.653	3.311	2.185
-4	60.230	0.997	0.658	42	7.352	3.355	2.215
-3	57.180	1.039	0.686	43	7.065	3.399	2.243
-2	54.310	1.082	0.714	44	6.791	3.442	2.272
-1	51.590	1.126	0.743	45	6.529	3.484	2.299
0	49.020	1.172	0.773	46	6.278	3.525	2.326
1	46.800	1.214	0.801	47	6.038	3.565	2.353
2	44.310	1.265	0.835	48	5.809	3.604	2.379
3	42.140	1.313	0.866	49	5.589	3.643	2.404
4	40.090	1.361	0.899	50	5.379	3.680	2.429
5	38.150	1.411	0.931	51	5.179	3.717	2.453
6	36.320	1.461	0.965	52	4.986	3.753	2.477
7	34.580	1.513	0.998	53	4.802	3.787	2.500
8	32.940	1.564	1.033	54	4.625	3.822	2.522
9	31.380	1.617	1.067	55	4.456	3.855	2.544
10	29.900	1.670	1.102	56	4.294	3.887	2.566
11	28.510	1.724	1.138	57	4.139	3.919	2.586
12	27.180	1.778	1.174	58	3.990	3.949	2.607
13	25.920	1.833	1.210	59	3.848	3.979	2.626
14	24.730	1.888	1.246	60	3.711	4.008	2.646
15	23.600	1.943	1.282	61	3.579	4.037	2.664
16	22.530	1.998	1.319	62	3.454	4.064	2.682
17	21.510	2.054	1.356	63	3.333	4.091	2.700
18	20.540	2.110	1.393	64	3.217	4.117	2.717
19	19.630	2.166	1.429	65	3.105	4.143	2.734
20	18.750	2.222	1.467	66	2.998	4.167	2.750
21	17.930	2.278	1.503	67	2.898	4.190	2.766
22	17.140	2.334	1.540	68	2.797	4.214	2.781
23	16.390	2.389	1.577	69	2.702	4.237	2.796
24	15.680	2.445	1.613	70	2.611	4.259	2.811

5.2 20 KΩ

Temp. (℃)	Resistance (kΩ)	Voltage (15K/5V)	Voltage (15K/3.3V)	Temp. (℃)	Resistance (kΩ)	Voltage (15K/5V)	Voltage (15K/3.3V)
-30	361.8	0.262	0.173	23	21.85	2.389	1.577
-29	339.8	0.278	0.183	24	20.9	2.445	1.614
-28	319.2	0.295	0.195	25	20	2.500	1.650
-27	300	0.313	0.206	26	19.14	2.555	1.686
-26	282.2	0.331	0.218	27	18.32	2.610	1.722
-25	265.5	0.350	0.231	28	17.55	2.663	1.758
-24	249.9	0.371	0.245	29	16.8	2.717	1.793
-23	235.3	0.392	0.259	30	16.1	2.770	1.828
-22	221.6	0.414	0.273	31	15.43	2.822	1.863
-21	208.9	0.437	0.288	32	14.79	2.874	1.897
-20	196.9	0.461	0.304	33	14.18	2.926	1.931
-19	181.4	0.497	0.328	34	13.59	2.977	1.965
-18	171.4	0.522	0.345	35	13.04	3.027	1.998
-17	162.1	0.549	0.362	36	12.51	3.076	2.030
-16	153.3	0.577	0.381	37	12	3.125	2.063
-15	145	0.606	0.400	38	11.52	3.173	2.094
-14	137.2	0.636	0.420	39	11.06	3.220	2.125
-13	129.9	0.667	0.440	40	10.62	3.266	2.155
-12	123	0.699	0.462	41	10.2	3.311	2.185
-11	116.5	0.733	0.484	42	9.803	3.355	2.215
-10	110.3	0.767	0.507	43	9.42	3.399	2.243
-9	104.6	0.803	0.530	44	9.054	3.442	2.272
-8	99.13	0.839	0.554	45	8.705	3.484	2.299
-7	94	0.877	0.579	46	8.37	3.525	2.326
-6	89.17	0.916	0.605	47	8.051	3.565	2.353
-5	84.61	0.956	0.631	48	7.745	3.604	2.379
-4	80.31	0.997	0.658	49	7.453	3.643	2.404
-3	76.24	1.039	0.686	50	7.173	3.680	2.429
-2	72.41	1.082	0.714	51	6.905	3.717	2.453
-1	68.79	1.126	0.743	52	6.648	3.753	2.477
0	65.37	1.171	0.773	53	6.403	3.787	2.500
1	62.13	1.218	0.804	54	6.167	3.822	2.522
2	59.08	1.265	0.835	55	5.942	3.855	2.544
3	56.19	1.313	0.866	56	5.726	3.887	2.565
4	53.46	1.361	0.898	57	5.519	3.919	2.586
5	50.87	1.411	0.931	58	5.32	3.949	2.607
6	48.42	1.462	0.965	59	5.13	3.979	2.626
7	46.11	1.513	0.998	60	4.948	4.008	2.646
8	43.92	1.564	1.033	61	4.773	4.037	2.664
9	41.84	1.617	1.067	62	4.605	4.064	2.682
10	39.87	1.670	1.102	63	4.443	4.091	2.700
11	38.01	1.724	1.138	64	4.289	4.117	2.717
12	36.24	1.778	1.174	65	4.14	4.143	2.734

13	34.57	1.833	1.209	66	3.998	4.167	2.750
14	32.98	1.888	1.246	67	3.861	4.191	2.766
15	31.47	1.943	1.282	68	3.729	4.214	2.781
16	30.04	1.998	1.319	69	3.603	4.237	2.796
17	28.68	2.054	1.356	70	3.481	4.259	2.811
18	27.39	2.110	1.393	71	3.364	4.280	2.825
19	26.17	2.166	1.429	72	3.252	4.301	2.838
20	25.01	2.222	1.466	73	3.144	4.321	2.852
21	23.9	2.278	1.503	74	3.04	4.340	2.865
22	22.85	2.334	1.540	75	2.94	4.359	2.877

5.3 50 KΩ

Temp. (℃)	Resistance (kΩ)	Voltage (15K/5V)	Voltage (15K/3.3V)	Temp. (℃)	Resistance (kΩ)	Voltage (15K/5V)	Voltage (15K/3.3V)
-30	911.56	0.054	0.036	50	17.651	1.808	1.193
-29	853.66	0.058	0.038	51	16.99	1.853	1.223
-28	799.98	0.062	0.041	52	16.358	1.897	1.252
-27	750.18	0.066	0.043	53	15.753	1.942	1.281
-26	703.92	0.070	0.046	54	15.173	1.986	1.311
-25	660.93	0.075	0.049	55	14.618	2.031	1.340
-24	620.94	0.079	0.052	56	14.085	2.076	1.370
-23	583.72	0.084	0.056	57	13.575	2.121	1.400
-22	549.04	0.089	0.059	58	13.086	2.166	1.429
-21	516.71	0.095	0.063	59	12.617	2.211	1.459
-20	486.55	0.101	0.066	60	12.368	2.235	1.475
-19	458.4	0.107	0.070	61	11.736	2.300	1.518
-18	432.1	0.113	0.075	62	11.322	2.345	1.548
-17	407.51	0.120	0.079	63	10.925	2.389	1.577
-16	384.51	0.127	0.084	64	10.544	2.434	1.606
-15	362.99	0.134	0.088	65	10.178	2.478	1.635
-14	342.83	0.142	0.094	66	9.8269	2.522	1.664
-13	323.94	0.150	0.099	67	9.4896	2.565	1.693
-12	306.23	0.158	0.104	68	9.1655	2.609	1.722
-11	289.61	0.167	0.110	69	8.9542	2.638	1.741
-10	274.02	0.176	0.116	70	8.5551	2.695	1.778
-9	259.37	0.186	0.123	71	8.2676	2.737	1.806
-8	245.61	0.196	0.129	72	7.9913	2.779	1.834
-7	232.67	0.206	0.136	73	7.7257	2.821	1.862
-6	220.5	0.217	0.143	74	7.4702	2.862	1.889
-5	209.05	0.228	0.151	75	7.2245	2.903	1.916
-4	198.27	0.240	0.158	76	6.9882	2.943	1.943
-3	188.12	0.252	0.167	77	6.7608	2.983	1.969
-2	178.65	0.265	0.175	78	6.542	3.023	1.995
-1	169.68	0.278	0.184	79	6.3315	3.062	2.021
0	161.02	0.292	0.193	80	6.1288	3.100	2.046
1	153	0.307	0.202	81	5.9336	3.138	2.071
2	145.42	0.322	0.212	82	5.7457	3.175	2.096
3	138.26	0.337	0.223	83	5.5647	3.212	2.120
4	131.5	0.353	0.233	84	5.3903	3.249	2.144
5	126.17	0.367	0.242	85	5.2223	3.285	2.168
6	119.08	0.387	0.256	86	5.0605	3.320	2.191
7	113.37	0.405	0.267	87	4.9044	3.355	2.214
8	107.96	0.424	0.280	88	4.7541	3.389	2.237
9	102.85	0.443	0.292	89	4.6091	3.423	2.259
10	98.006	0.463	0.306	90	4.4693	3.456	2.281
11	93.42	0.483	0.319	91	4.3345	3.488	2.302
12	89.075	0.505	0.333	92	4.2044	3.520	2.323
13	84.956	0.527	0.348	93	4.0789	3.551	2.344
14	81.052	0.549	0.362	94	3.9579	3.582	2.364
15	77.349	0.572	0.378	95	3.841	3.612	2.384
16	73.896	0.596	0.393	96	3.7283	3.642	2.404
16	73.896	0.596	0.393	97	3.6194	3.671	2.423
17	70.503	0.621	0.410	98	3.5143	3.700	2.442
18	67.338	0.647	0.427	99	3.4128	3.728	2.460
19	64.333	0.673	0.444	100	3.3147	3.755	2.478
20	61.478	0.700	0.462	101	3.22	3.782	2.496

21	58.766	0.727	0.480	102	3.1285	3.809	2.514
22	56.189	0.755	0.499	103	3.0401	3.834	2.531
23	53.738	0.784	0.518	104	2.9547	3.860	2.547
24	51.408	0.814	0.537	105	2.8721	3.884	2.564
25	49.191	0.845	0.558	106	2.7922	3.909	2.580
26	47.082	0.876	0.578	107	2.715	3.932	2.595
27	45.074	0.908	0.599	108	2.6404	3.956	2.611
28	43.163	0.941	0.621	109	2.5682	3.978	2.626
29	41.313	0.974	0.643	110	2.4983	4.001	2.640
30	39.61	1.008	0.665	111	2.4308	4.022	2.655
31	37.958	1.043	0.688	112	2.3654	4.044	2.669
32	36.384	1.078	0.711	113	2.3021	4.064	2.682
33	34.883	1.114	0.735	114	2.2409	4.085	2.696
34	33.453	1.151	0.759	115	2.1816	4.105	2.709
35	32.088	1.188	0.784	116	2.1242	4.124	2.722
36	30.787	1.226	0.809	117	2.0686	4.143	2.734
37	29.544	1.264	0.835	118	2.0148	4.162	2.747
38	28.359	1.303	0.860	119	1.9626	4.180	2.759
39	27.227	1.343	0.886	120	1.9123	4.197	2.770
40	26.147	1.383	0.913	121	1.8652	4.214	2.781
41	25.114	1.424	0.940	122	1.8158	4.232	2.793
42	24.128	1.465	0.967	123	1.7698	4.248	2.804
43	23.186	1.507	0.994	124	1.7253	4.264	2.814
44	22.286	1.549	1.022	125	1.6821	4.280	2.825
45	21.425	1.591	1.050	126	1.6402	4.295	2.835
46	20.601	1.634	1.078	127	1.5996	4.310	2.845
47	19.814	1.677	1.107	128	1.5602	4.325	2.855
48	19.061	1.721	1.136	129	1.522	4.340	2.864
49	18.34	1.764	1.164	130	1.485	4.354	2.873

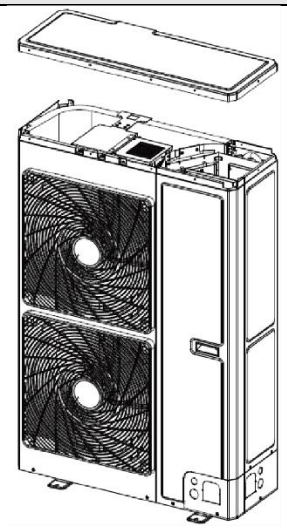
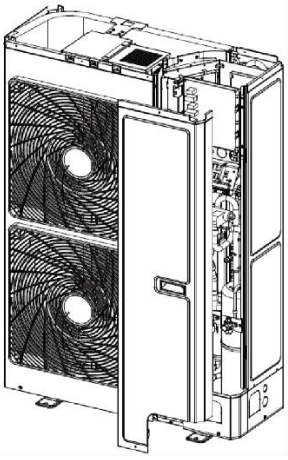
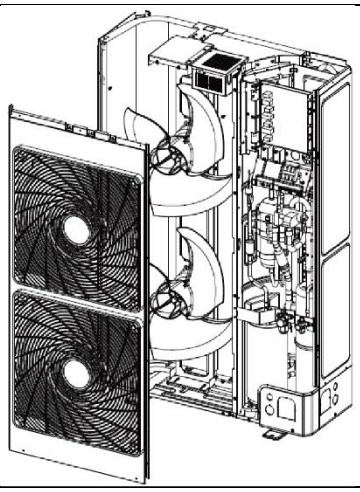
6 DISASSEMBLY AND ASSEMBLY PROCEDURE OF MAIN PARTS

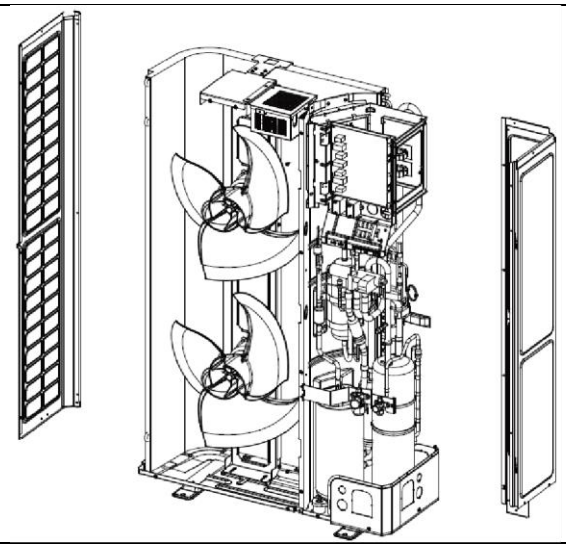
6.1 Outdoor Unit

6.1.1 Disassembly and Assembly of the plates

Remarks: Prior to the assembly of the plates, make sure the power supply is cut off.

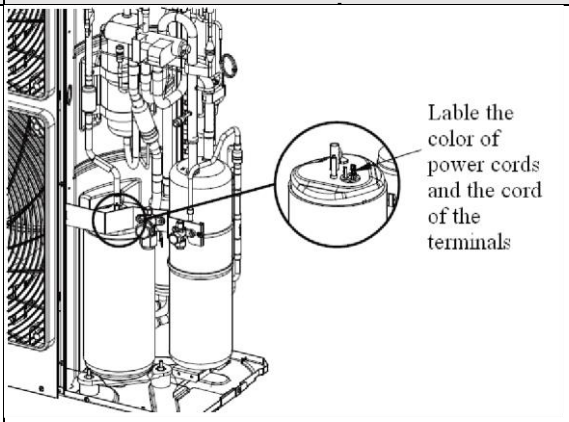
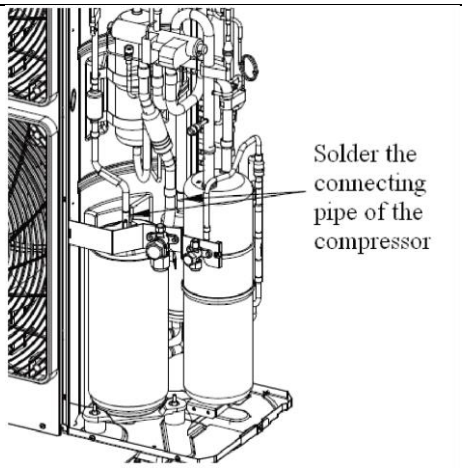
Remarks: Prior to the assembly of the plates, make sure the power supply is cut off.

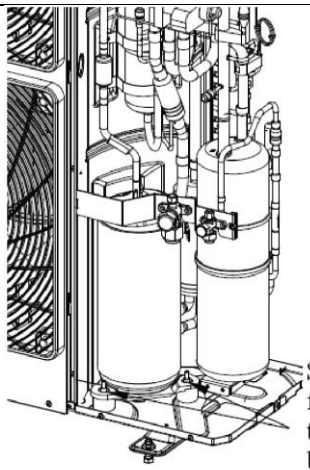
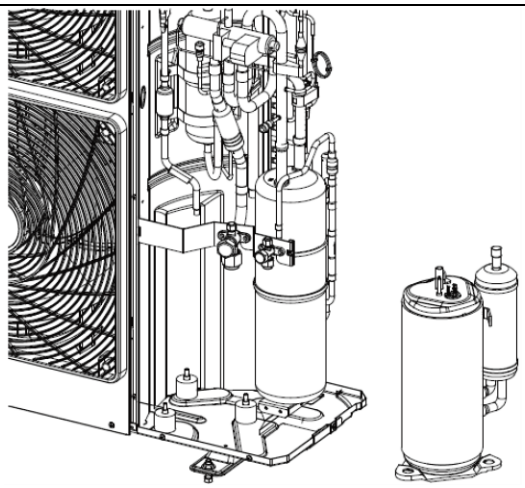
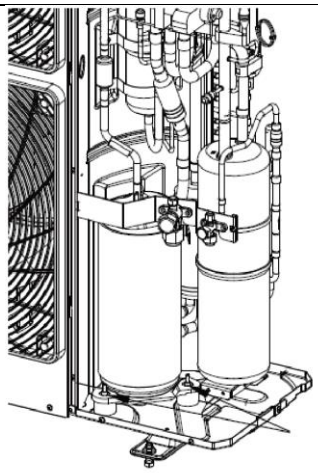
Steps	Illustrations	Operation Instructions
1. Disconnect the coping plate		a) Unscrew the fixed screws of the coping plate. b) Remove the coping plate.
2. Disconnect the front side plate		a) Unscrew the fixed screw of the front side plate. b) Remove the front side plate.
3. Disconnect the outer case		a) Unscrew the fixed screws of the outer case. b) Remove the outer case.

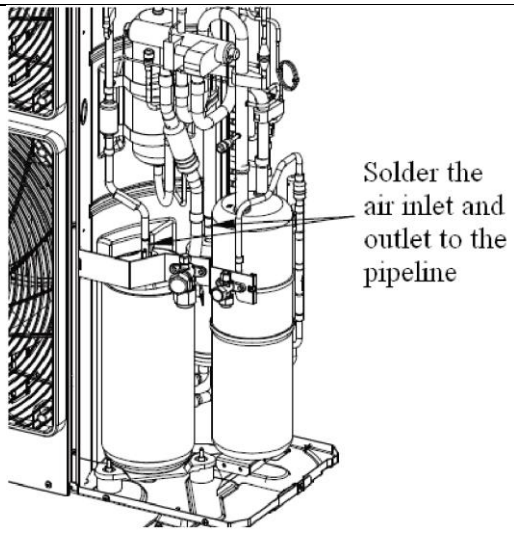
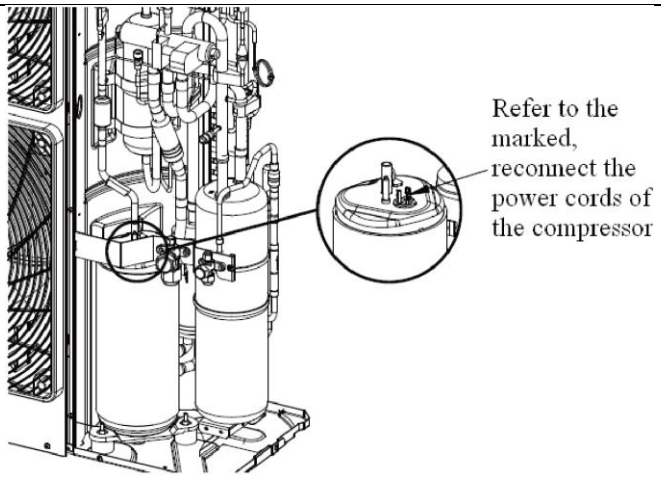
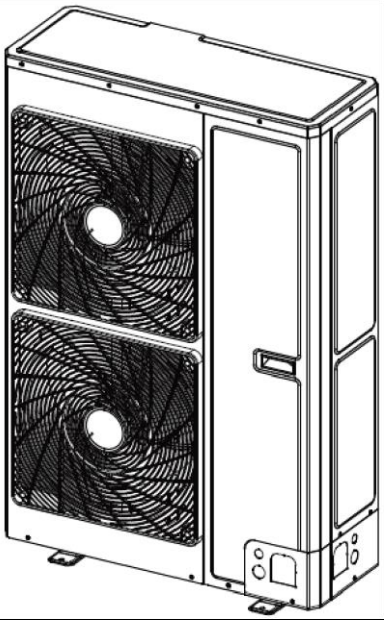
4. Disconnect the left side plate and rear side plateside plate and rear side plate		a) Unscrew the fixed screws of left side plate and rear side plate. b) Remove left side plate and rear side plate.

6.1.2 Assembly and Disassembly of the Compressor

Remarks: Prior to the assembly of the compressor, make sure there is no refrigerant in the pipeline and the power supply is cut off.

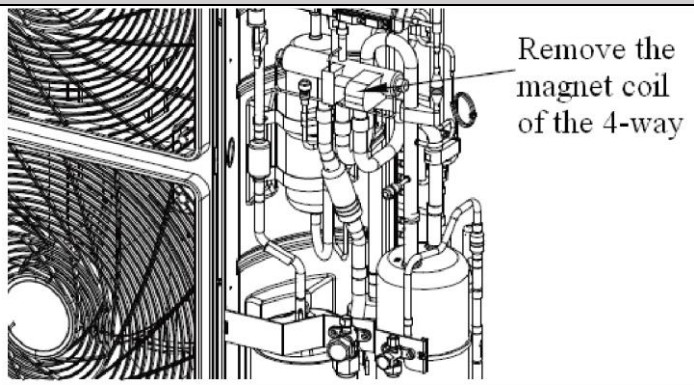
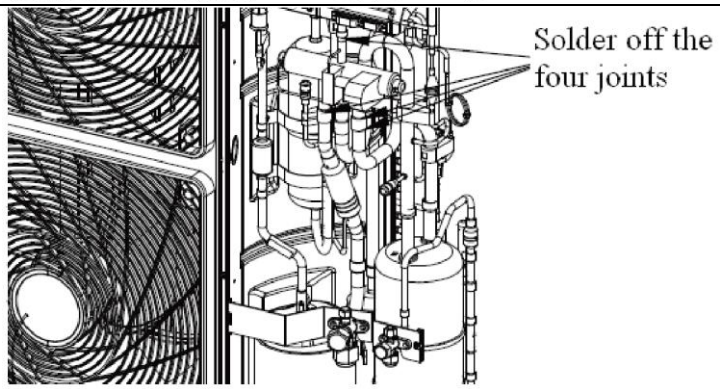
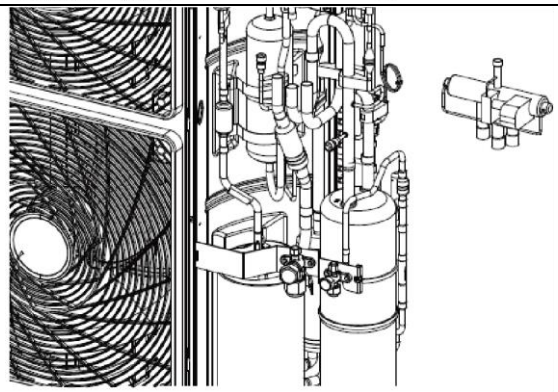
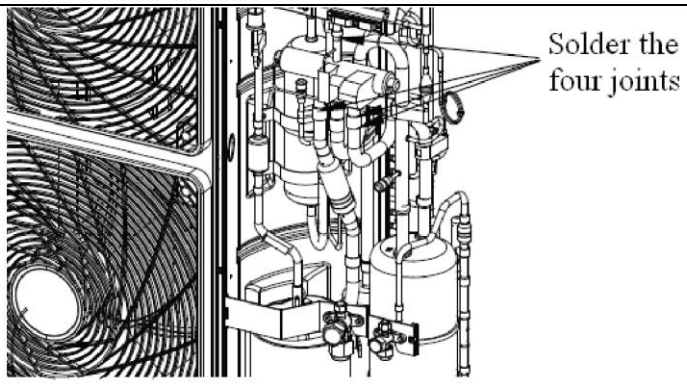
Steps	I	Operation Instructions
1. Remove the power code of the compressor		a. Unscrew the fixed screws of power code; b. Remove the power code. **Note:** when removing the power cord, please label the power cord and the terminals to avoid misconnecting next time.
2. Remove the connecting pipe of the compressor		a. Solder the joint of connecting pipe of the compressor. b) Pull out the connecting pipe **Note:** never let the flame contact any other component.

3. Loose the fixed screws of the compressor base	 Screw off the fixing screw of the compressor base	Unscrew the fixed screw of the compressor base
4. Remove the compressor away from the seating		Remove and replace the compressor. Note: never let the flame contact any other component during the replacement.
5. Fix the new compressor on the seating	 Tighten the screws on the base of the compressor	Tighten the screws on the seating of the new compressor

6. Solder the pipeline with the suction and discharge ports of the compressor		Solder the connecting pipe to make them connected Note: never let the flame contact any other component.
7. Reconnect the power cords		a. Tighten the fixing screw of the power cord. b. Connect the power cord. Note: mark the color of the power cord and corresponding terminal.
8. Put back the electric heating belt and the discharge temperature sensor etc.		
9. Check and screw back the plates		a. Check if the pipe is well connected. b. Check if the parts and wire well connected. c. If there is no problem, fix the cover.

6.1.3 Disassembly and Assembly of 4-way valve

Remarks:
Prior to the assembly of the compressor, make sure there is no refrigerant in the pipeline and the power supply is cut off.

Steps	Illustrations	Operation Instructions
1. Remove the magnet coil of the 4-way valve		a. Unscrew the fixed screws of the magnet coil b. Remove the magnet coil.
2. Disconnect the 4-way valve and the connecting pipe		Solder off the connecting pipes. Note: never let the flame contact any other component.
3. Replace the new 4-way valve		Install the new 4-way valve
4. Solder the new 4-way valve and install the magnet coil.		Solder the connecting Pipes Note: To avoid heat damage the internal structure of the 4-way, wrap it to be brazed with sufficient wet cloths.

Tools for Installation and Maintenance


Level meter


Measuring tape


Screw driver


Impact drill


Drill head


Electric drill


Electroprobe


Universal meter


Torque wrench


Open-end wrench


Inner hexagon spanner


Electronic leakage detector


Vacuum pump


Pressure meter


Pipe pliers


Pipe pliers


Pipe cutter


Pipe expander


Pipe bender


Soldering appliance


Refrigerant container


Electronic scale

Appendix:

Appendix 1: Reference Sheet of Celsius and Fahrenheit

Conversion formula for Fahrenheit degree and Celsius degree: Tf=Tcx1.8+32

Set temperature

Fahrenheit display temperature °F	Fahrenheit °F	Celsius °C		Fahrenheit display temperature °F	Fahrenheit °F	Celsius °C		Fahrenheit display temperature °F	Fahrenheit °F	Celsius °C
61	60.8	16		69/70	69.8	21		78/79	78.8	26
62/63	62.6	17		71/72	71.6	22		80/81	80.6	27
64/65	64.4	18		73/74	73.4	23		82/83	82.4	28
66/67	66.2	19		75/76	75.2	24		84/85	84.2	29
68	68	20		77	77	25		86	86	30

Ambient temperature

Fahrenheit display temperature °F	Fahrenheit °F	Celsius °C		Fahrenheit display temperature °F	Fahrenheit °F	Celsius °C		Fahrenheit display temperature °F	Fahrenheit °F	Celsius °C
32/33	32	0		55/56	55.4	13		79/80	78.8	26
34/35	33.8	1		57/58	57.2	14		81	80.6	27
36	35.6	2		59/60	59	15		82/83	82.4	28
37/38	37.4	3		61/62	60.8	16		84/85	84.2	29
39/40	39.2	4		63	62.6	17		86/87	86	30
41/42	41	5		64/65	64.4	18		88/89	87.8	31
43/44	42.8	6		66/67	66.2	19		90	89.6	32
45	44.6	7		68/69	68	20		91/92	91.4	33
46/47	46.4	8		70/71	69.8	21		93/94	93.2	34
48/49	48.2	9		72	71.6	22		95/96	95	35
50/51	50	10		73/74	73.4	23		97/98	96.8	36
52/53	51.8	11		75/76	75.2	24		99	98.6	37
54	53.6	12		77/78	77	25				

USER NOTES

Please record any questions or problems you have experienced as a unit history:

No.	Date	Company Name, Technician Name, Phone & HVAC License #	Job Not Performed by Technician	Technician Checklist Completed Fully?

SERVICE / MAINTENANCE NOTES

No.	Date	Type of Service / Maintenance	Company Name, Technician Name, Phone & HVAC License #



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- **Symphony SOLAR DC Inverter**
  (56) Single PV, (79) Single PH 12-18K Btu/h
  (86) Single Zone All DC 09-24K Btu/h
  (55) Multi Zone Solar VRF 3, 4, 8, 16, and 24 Ton.
- **Symphony SOLO DC Inverter**
  (57)2,3 Single Zone 16 SEER, 09-36K Btu/h
  (58)4, (78)1-Single Zone 18-23 SEER, 09-36K Btu/h
- **Symphony CHOIR DC Inverter**
  (46)2 DC Inverter Multiple Zone 15 SEER, 2x09K and 2x12K Btu/h
  (59)2S-DC Inverter Multiple Zone 16 SEER 6x09K to 9x09K Btu/h
  (59)4-DC Inverter Multiple Zone 21 SEER 2x09K to 5x12K Btu/h
- **Symphony VRF - DC Inverter HP, Heat Recovery, and Solar. Up to 64 zones.**
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