



Installation, Operation, and Maintenance

DC Inverter Multi VRF System

Model Number:

TRN-V36WLA1

TRN-V48WLA1

TRN-V60WLA1

⚠ SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

⚠ AVERTISSEMENT DE SÉCURITÉ

Seul le personnel qualifié doit installer et procéder à l'entretien des équipements. L'installation, le démarrage et la réparation des équipements de chauffage, de ventilation et de climatisation peuvent être dangereux et nécessitent une formation et des connaissances spécifiques. Un équipement mal installé, réglé ou modifié par un individu non qualifié peut entraîner des blessures graves, voire mortelles. Lors de toute intervention sur l'équipement, respectez toutes les précautions figurant dans la documentation et sur les étiquettes et autocollants fixés à l'équipement.

Preface

For correct installation and operation, please read all instructions carefully. Before reading the instructions, please be aware of the following items:

⚠ WARNING
(1) The design standard of multi VRF system conforms to related standard of sales countries.
(2) To ensure safety when operating this system, please strictly follow the instructions in this manual.
(3) The total capacity of running indoor units must not exceed that of the outdoor units. Otherwise, the cooling (heating) effect of each IDU would be poor.
(4) Make sure that this manual is kept by direct operators and maintainers.
(5) If the product needs to be installed, moved or maintained, please contact our designated dealer or local service center for professional support. Users should not disassemble or maintain the unit by themselves, otherwise it may cause relative damage, and our company will bear no responsibilities.
(6) All the illustrations and information in the instruction manual are only for reference. In order to make the product better, we will continuously conduct improvement and innovation. If there is adjustment in the product, please subject to actual product.
(7) Under the standby status, the unit will consume a little power for ensuring reliability of the complete unit, maintaining normal communication and preheating refrigerant. When the unit won't be used for a long time, please cut off the power of the complete unit. However, please preheat it when operating the unit next time.

User Notice

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

Children should be supervised to ensure that they do not play with the appliance.



DISPOSAL: Do not dispose this product as unsorted municipal waste. Collection of such waste separately for special treatment is necessary.



Exception Clauses

Manufacturer will bear no responsibilities when personal injury or property loss is caused by the following reasons:
(1) Damage the product due to improper use or misuse of the product.
(2) Alter, change, maintain or use the product with other equipment without abiding by the instruction manual of manufacturer.
(3) After verification, the defect of product is directly caused by corrosive gas.
(4) After verification, defects are due to improper operation during transportation of product.
(5) Operate, repair, maintain the unit without abiding by instruction manual or related regulations.
(6) After verification, the problem or dispute is caused by the quality specification or performance of parts and components that produced by other manufacturers.
(7) The damage is caused by natural calamities, bad using environment or force majeure.

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1 Safety Notices (Please be sure to abide them)

⚠ DANGER	If not abide them strictly, it may cause severe damage to the unit or the people.
⚠ WARNING	If not abide them strictly, it may cause slight or medium damage to the unit or the people.
⚠ CAUTION	This sign indicates that the items must be prohibited. Improper operation may cause severe damage or death to people.
NOTICE	This sign indicates that the items must be observed. Improper operation may cause damage to people or property.

⚠ WARNING	
(1)	This product can't be installed at corrosive, inflammable or explosive environment or the place with special requirements, such as kitchen. Otherwise, it will affect the normal operation or shorten the service life of the unit, or even cause fire hazard or serious injury. As for above special places, please adopt special air conditioner with anti-corrosive or anti-explosion function.
(2)	Follow this instruction to complete the installation work. Please carefully read this manual before unit startup and service.
(3)	Wire size of power cord should be large enough. The damaged power cord and connection wire should be replaced by exclusive cable.
(4)	After connecting the power cord, please fix the electric box cover properly in order to avoid accident.
(5)	Never fail to comply with the nitrogen charge requirements. Charge nitrogen when welding pipes.
(6)	Never short-circuit or cancel the pressure switch to prevent unit damage.
(7)	Please firstly connect the wired controller before energization, otherwise wired controller can not be used.
(8)	Before using the unit, please check if the piping and wiring are correct to avoid water leakage, refrigerant leakage, electric shock, or fire etc.
(9)	Do not insert fingers or objects into air outlet/inlet grille.
(10)	Open the door and window and keep good ventilation in the room to avoid oxygen deficit when the gas/oil supplied heating equipment is used.
(11)	Never start up or shut off the air conditioner by means of directly plug or unplug the power cord.
(12)	Turn off the unit after it runs at least five minutes; otherwise it will influence oil return of the compressor.
(13)	Do not allow children operate this unit.
(14)	Do not operate this unit with wet hands.
(15)	Turn off the unit or cut off the power supply before cleaning the unit, otherwise electric shock or injury may happen.
(16)	Never spray or flush water towards unit, otherwise malfunction or electric shock may happen.
(17)	Do not expose the unit to the moist or corrosive circumstances.
(18)	Under cooling mode, please don't set the room temperature too low and keep the temperature difference between indoor and outdoor unit within 5°C (9°F).
(19)	User is not allowed to repair the unit. Fault service may cause electric shock or fire accidents. Please contact our designated dealer or local service center for help.
(20)	Before installation, please check if the power supply is in accordance with the requirements specified on the nameplate. And also take care of the power safety.
(21)	Installation should be conducted by dealer or qualified personnel. Please do not attempt to install the unit by yourself. Improper handling may result in water leakage, electric shock or fire disaster etc.
(22)	Be sure to use the exclusive accessory and part to prevent the water leakage, electric shock and fire accidents.
(23)	Make sure the unit can be earthed properly and soundly after plugging into the socket so as to avoid electric shock. Please do not connect the ground wire to gas pipe, water pipe, lightning rod or telephone line.
(24)	Electrify the unit 8 hours before operation. Please switch on for 8 hours before operation. Do not cut off the power when 24 hours short-time halting (to protect the compressor).

⚠ WARNING

- | |
|---|
| (25) If refrigerant leakage happens during installation, please ventilate immediately. Poisonous gas will emerge if the refrigerant gas meets fire. |
| (26) Volatile liquid, such as diluent or gas will damage the unit appearance. Only use soft cloth with a little neutral detergent to clean the outer casing of unit. |
| (27) If anything abnormal happens (such as burning smell), please power off the unit and cut off the main power supply, and then immediately contact our designated dealer or local service center. If abnormality keeps going, the unit might be damaged and lead to electric shock or fire. |
| (28) Refrigerant gas is heavier than air and replaces oxygen. A massive leak can lead to oxygen depletion, especially in basements, and an asphyxiation hazard could occur leading to serious injury or death. |
| (29) Do not touch the refrigerant pipes during and immediately after operation as the refrigerant pipes may be hot or cold, depending on the condition of the refrigerant flowing through the refrigerant piping, compressor, and other refrigerant cycle parts. Your hands may suffer burns or frostbite if you touch the refrigerant pipes. To avoid injury, give the pipes time to return to normal temperature or, if you must touch them, be sure to wear proper gloves. |
| (30) Refrigerant R-410A in the system must be kept clean, dry, and tight. (a) Clean and Dry — Foreign materials (including mineral oils such as SUNISO oil or moisture) should be prevented from getting into the system. |
| (31) Tight — R-410A does not contain any chlorine, does not destroy the ozone layer, and does not reduce the earth's protection against harmful ultraviolet radiation. R-410A can contribute to the greenhouse effect if it is released. Therefore take proper measures to check for the tightness of the refrigerant piping installation. |
| (32) Since R-410A is a blend, the required additional refrigerant must be charged in its liquid state. If the refrigerant is charged in a state of gas, its composition can change and the system will not work properly. |
| (33) Near machinery emitting electromagnetic waves. Electromagnetic waves may disturb the operation of the control system and cause the unit to malfunction. |
| (34) This air conditioner is an appliance that should not be accessible to the general public. |
| (35) For installation work, follow the instructions in the Installation Manual and use tools and pipe components specifically made for use with R410A refrigerant. The R410A refrigerant in the HFC system is pressurized 1.6 times the pressure of usual refrigerants. If pipe components not designed for R410A refrigerant are used and the unit is not installed correctly, the pipes may burst and cause damage or injuries. In addition, water leakage, electric shock, or fire may result. |
| (36) When opening or closing the valve below freezing temperatures, refrigerant may spurt out from the gap between the valve stem and the valve body, resulting in injuries. |
| (37) Be sure to safely dispose of the packaging materials. Packaging materials, such as nails and other metal or wooden parts may cause stabs or other injuries. |
| (38) The base and attachments of the outdoor unit must be periodically checked for looseness, cracks or other damage. If such defects are left uncorrected, the unit may fall down and cause damage or injuries. |
| (39) Turn on the main power switch more than 12 hours before starting operation. Starting operation just after turning on the power switch can severely damage the internal parts. Keep the main power switch turned on during the operation season. |
| (40) Do not touch the refrigerant pipes with bare hands during operation. The refrigerant pipes are hot or cold depending on the condition of the flowing refrigerant. If you touch the pipes, burns or frostbite may result. |
| (41) Installation of the electric heater must strictly adhere to the manufacturer's instructions. Unauthorized modification of the electric heating circuit is strictly prohibited, as it may cause fire hazards. |
| (42) HVAC systems may experience operational disruptions due to electromagnetic interference (EMI), potentially affecting medical devices and broadcast signal transmissions. Conversely, variable-frequency drives (VFDs), dedicated generators, high-frequency medical devices, and radio communication equipment may also interfere with HVAC system operation. |

If the product needs to be installed, moved or maintained, please contact our designated dealer or local service center for professional support, otherwise our company would bear no legal reliability for the related damages arising therefrom.

2 Product Introduction

2.1 Names of Main Parts

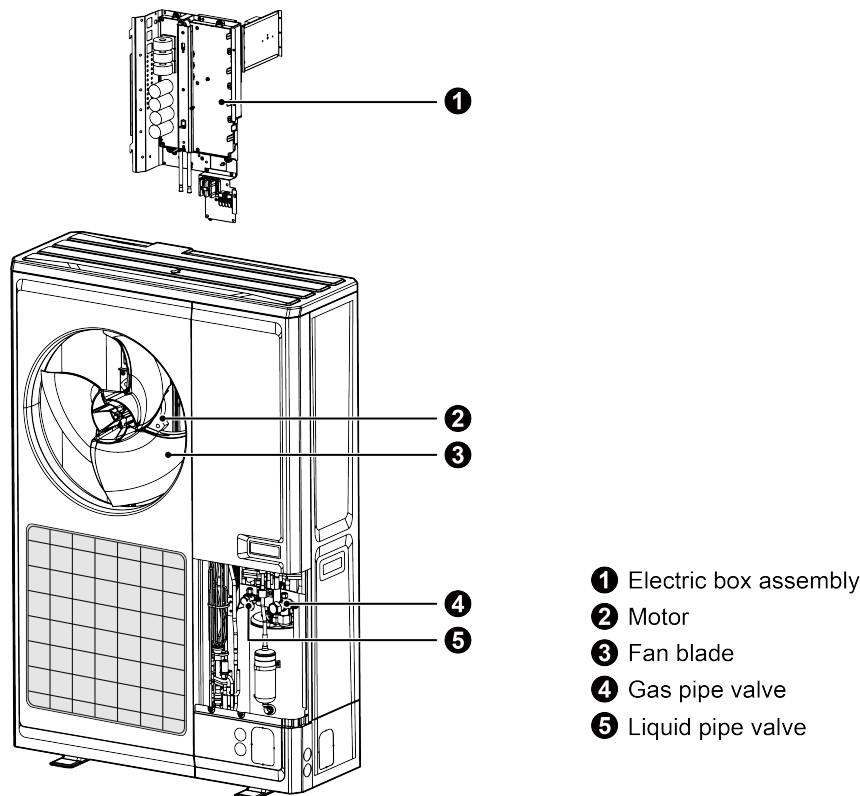


Fig.2.1.1

2.2 Combinations of Indoor and Outdoor Units

- (1) See below the number of indoor units that can be connected to the outdoor unit.
- (2) The total capacity of indoor units should be within 50%~135% of that of the outdoor unit.

Model	Max Sets of Connectable IDUS
GMV-V36WL/C-T(U)	7
GMV-V48WL/C-T(U)	8
GMV-V60WL/C-T(U)	10

- (3) Can be connected to various indoor units. When any one of the indoor units receives operating command, outdoor unit will start operation as per required capacity. When all indoor units stop, outdoor unit will be shut off.

2.3 Operating Range

Cooling	Outdoor temperature: -18*~54°C(0*~129°F)
Heating	Outdoor temperature: -30~27°C(-22~81°F)

*Note: Cooling at -18~-5°C (0~50°F) is conditional. Please inquire our engineers for more information.

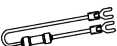
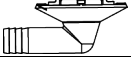
3 Preparation before Installation

NOTICE

Graphics here are only for reference. Please refer to actual products.

3.1 Standard Parts

Please use the supplied standard parts as required.

Parts for Outdoor Unit				
No.	Name	Appearance	Qty	Remark
1	User Manual		1	—
2	Wiring (match with resistance)		1	Must be connected to the last IDU of communication connection
3	Liquid side connection pipe		1	—
4	Gas side connection pipe		1	—
5	Chassis gluey plug		3	—
6	Drainage joint		1	—
7	Information confirmation table for engineering installation	—	1	—

3.2 Installation Site

⚠ WARNING	
(1)	The unit must be installed where strong enough to withstand the weight of the unit and fixed securely, otherwise the unit would topple or fall off.
(2)	Do not install where there is a danger of combustible gas leakage.
(3)	Do not install the unit near heat source, steam, or flammable gas.
(4)	Children under 10 years old must be supervised not to operate the unit.
(5)	Select a location which is out of children's reach. Keep the unit away from children.
(6)	Make sure the location has space for heat exchange and maintenance so that unit can operate reliably with good ventilation.
(7)	Make sure the location has space for heat exchange and maintenance so that unit can operate reliably with good ventilation.
(8)	Install the unit where it will not be tilted by more than 5°.
(9)	During installation, if the outdoor unit has to be exposed to strong wind, it must be fixed securely.

NOTICE	
(1)	If possible, do not install the unit where it will be exposed to direct sunlight (If necessary, install a blind that does not interfere with the air flow).
(2)	Install ODU in a place where it will be free from getting dirty or getting wet by rain as much as possible.
(3)	Install ODU where it is convenient to connect IDU.
(4)	ODU and IDU should stay as close as possible to shorten the length of refrigerant pipe and reduce bend angles.
(5)	Install ODU where the condensate water can be drained out freely during heating operation. Do not place animals and plants in the path of the warm air.
(6)	Take the air conditioner weight into account and select a place where noise and vibration are small.

If the ODU is totally surrounded by walls, please refer to the following figure for space dimension:
Unit: mm(inch)

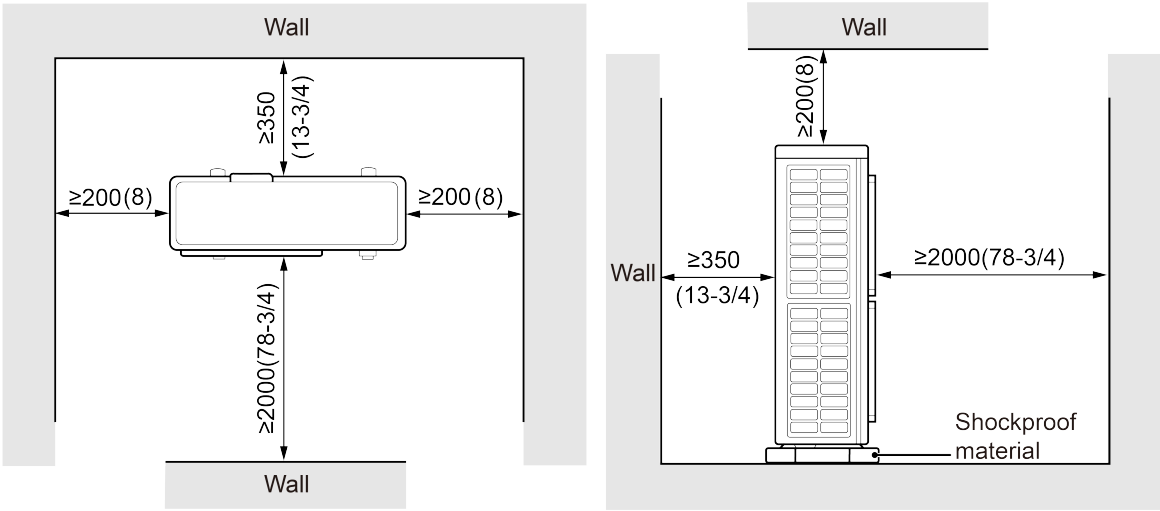


Fig.3.2.1

3.3 Installation Requirements for Cold and Snowy Areas

- (1) Selection of installation position
- 1) Select a position where the snow will no affect the normal operation of the unit.
 - 2) Select a position where the wind will no directly blow the air inlet and the air outlet.

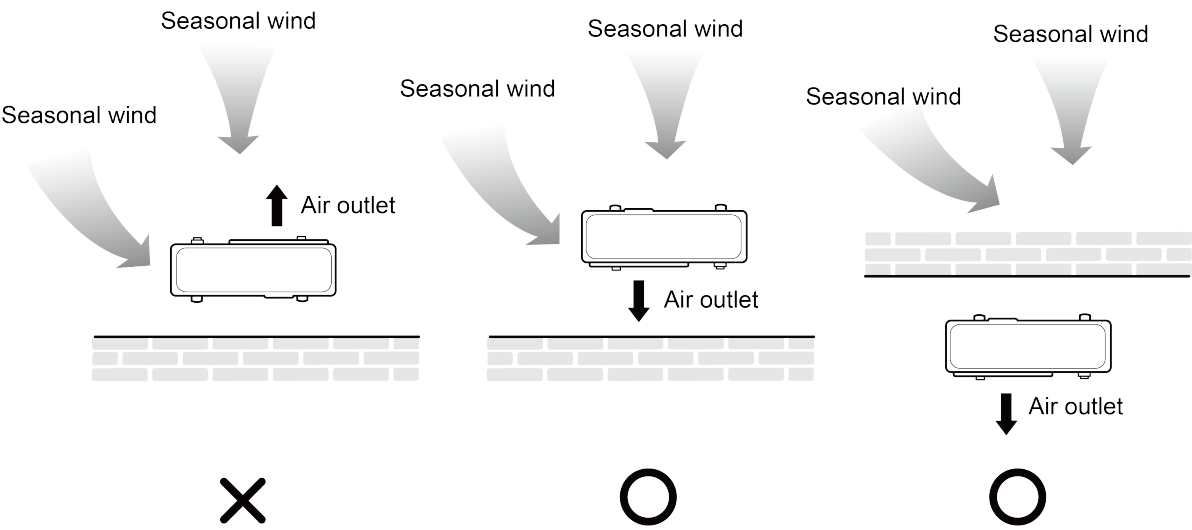


Fig.3.3.1

(2) Requirements for the installation base

- 1) The maximum snowfall should be considered for the height of the installation base. The height of the base should be 500mm(19-11/16inch) higher than the biggest predicted snowfall to prevent the snow covering the bottom part of the unit.

Unit: mm(inch)

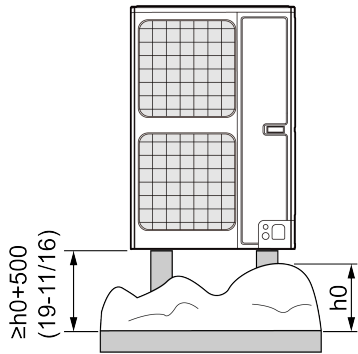


Fig.3.3.2

- 2) As for the severe cold areas, please adopt longitudinal base to avoid blocking the water drainage of chassis due to ice and snow accumulation.

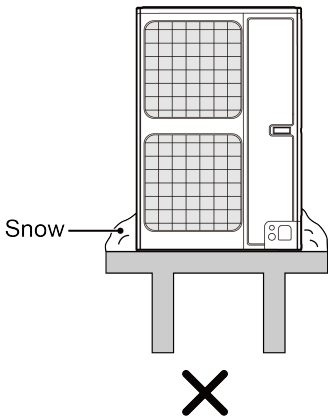


Fig.3.3.3 Ice and snow accumulation affects heat exchange

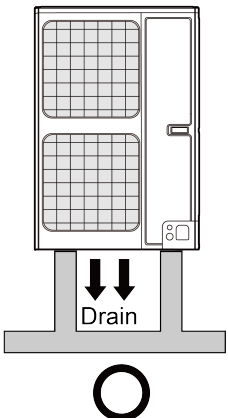


Fig.3.3.4 Smooth water drainage

(3) Installation of protective device

- 1) If there may be lateral snowfall may occur, you are suggested to install a lateral sunshade to ensure the normal operation of heat exchanger.

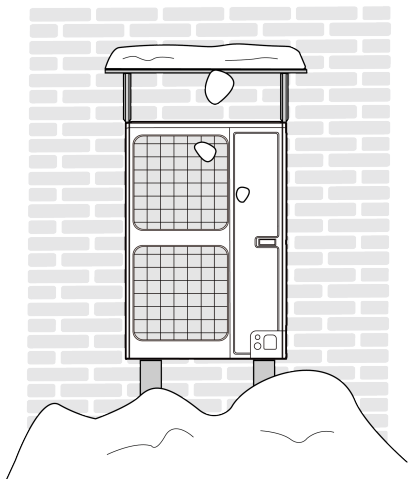


Fig.3.3.5

- 2) Please install a damper at the air-return side and on the top of the outdoor unit to avoid the outdoor unit exposing to wind and snow.

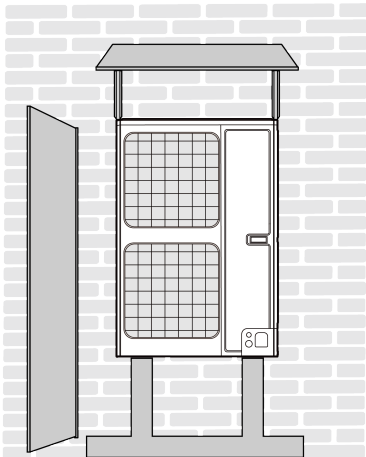


Fig.3.3.6

- (4) If the unit is installed at the place with heavy snowfall, please remove the air-in grille to prevent snow accumulation on the fins.
- (5) Prohibit adopting the centralized drainage installation for severe cold or snowy areas; otherwise, the drainage pipe and the chassis may be iced. If it's unavoidable, please adopt corresponding measures to prevent the ice blockage for the centralized drainage pipe, such as adding electric heater for the drainage pipe.

3.4 Piping Work Requirements

Refer to the table below for piping work requirements:

R410A Refrigerant System	
Outer diameter (mm/inch)	Wall thickness (mm/inch)
Φ6.35(Φ1/4)	≥0.8(1/32)
Φ9.52(Φ3/8)	≥0.8(1/32)
Φ12.7(Φ1/2)	≥0.8(1/32)
Φ15.9(Φ5/8)	≥1.0(1/25)
Φ19.05(Φ3/4)	≥1.0(1/25)

4 Installation Instruction

NOTICE

Graphics here are only for reference. Please refer to actual products. Unspecified dimensions are all in mm.

4.1 Safety Precautions for Installing, Repairing and Moving Units

⚠ WARNING	
(1)	The unit should not be installed in places with high environmental pH, high voltage fluctuations, vehicles and ships.
(2)	Do not touch the fins of the heat exchanger. Improper touch can cause damage or injury.
(3)	Do not mix any substances except the refrigerant when installing or moving the refrigerant circuit, and do not leave any air in the pipe. If air or other substances are mixed in the refrigerant circuit, the system pressure will rise and it will cause compressor explosion.
(4)	Do not charge the refrigerant other than the specified one when installing or moving the unit. Otherwise, it may cause problems such as poor operation, malfunction, mechanical fault, etc., and even cause major safety accident.
(5)	When moving or repairing the unit, be sure to use the pressure gauge. First, perform the cooling operation, and then completely close the high pressure side valve (liquid valve). When the pressure gauge reads 0~0.05MPa, completely close the low pressure side valve (air valve), and then immediately stop operation and cut off the power.
(6)	When recovering the refrigerant, it is necessary to ensure that the connection pipe can be disassembled only after the liquid valve and the air valve are completely closed and the power is turned off. If disassembling the connection pipe when the power hasn't been cut off and the compressor still running, the air will be mixed into the system and then the pressure will rise, which will cause compressor explosion.
(7)	When installing the unit, make sure that the connection pipe is securely connected before turning on the compressor. If the compressor is turned on before the connection of the connection pipe is completed and the shut-off valve is opened, the air will be mixed into the system and then the pressure will rise, which will cause compressor explosion.
(8)	Wiring between indoor unit and outdoor unit must be properly connected by adopting the specified electric wires and the terminals should be fixed well and not affected by external forces. Poor connection or fixing may cause a fire accident.
(9)	No connection is allowed in the middle of the wire. When the length of the connection wire is not enough, please contact the designated service store to re-equip a dedicated electric wire with sufficient length.
(10)	If it vibrates and causes noise, please add rubber cushion between the outdoor unit and the installation base.
(11)	When the outdoor unit is in heating or defrosting, it needs to drain water. When installing the drain pipe, plug the accompanied drainage connector to the drainage hole on the chassis of the outdoor unit. Then connect a drain hose to the drainage connector (If drainage connector is used, the outdoor unit should be at least 10cm from the installation ground).
(12)	For areas with frequent snowfall, please clean up the snow in time to avoid covering unit.
(13)	The unit installed in areas expecting snow are suggested to be raised with support frames.
(14)	If it's possible, please try to avoid the places where the snow will be accumulated easily. If not, please install a protective device to prevent snow accumulated on the top or around of the unit.
(15)	When installing the unit, use appropriate protective equipment and tools for safety. Failure to do so could cause injuries.
(16)	Be extremely careful when transporting the units. 2 or more persons are needed to handle the unit, as it weighs 20 kg, 44 lbs or more. Do not grasp the packaging bands. Wear protective gloves to remove the unit from the packaging and to move it, as you can injure your hands on the fins or the edge of other parts.
(17)	The mounting bracket shall remain structurally sound throughout its service life. Any degradation must be repaired immediately; failure to do so may cause equipment detachment, resulting in personal injury or property damage.

4.2 Dimension of Outdoor Unit and Mounting Hole

Unit Outline and Installation Dimension.

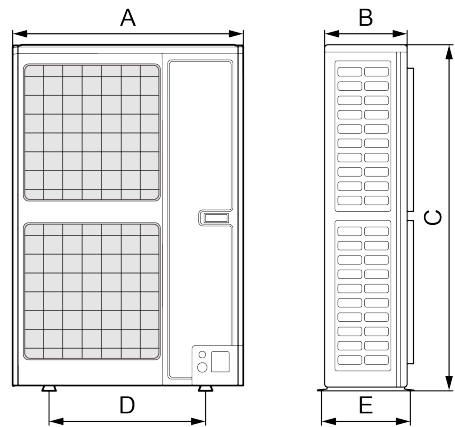


Fig.4.2.1

Unit: mm(inch)

Model	A	B	C	D	E
GMV-V36WL/C-T(U) GMV-V48WL/C-T(U) GMV-V60WL/C-T(U)	900 (35-3/8)	340 (13-3/8)	1345 (53)	572 (22-1/2)	378 (14-7/8)

4.3 Connection Pipe

4.3.1 Schematic Diagram of Piping Connection

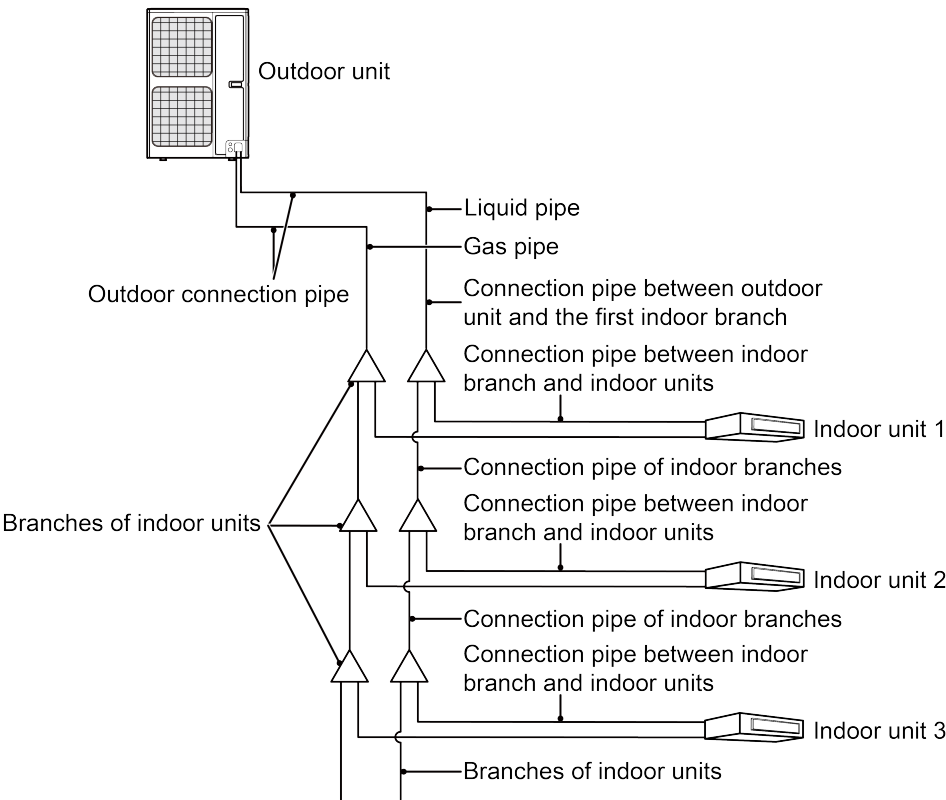


Fig.4.3.1

4.3.2 Allowable Length and Height Difference of Connection Pipe

Y type branch joint is adopted to connect indoor and outdoor units. Connecting method is shown in Fig.4.3.2 below.

NOTICE

Equivalent length of one Y-type branch is 0.5m(1-5/8feet).

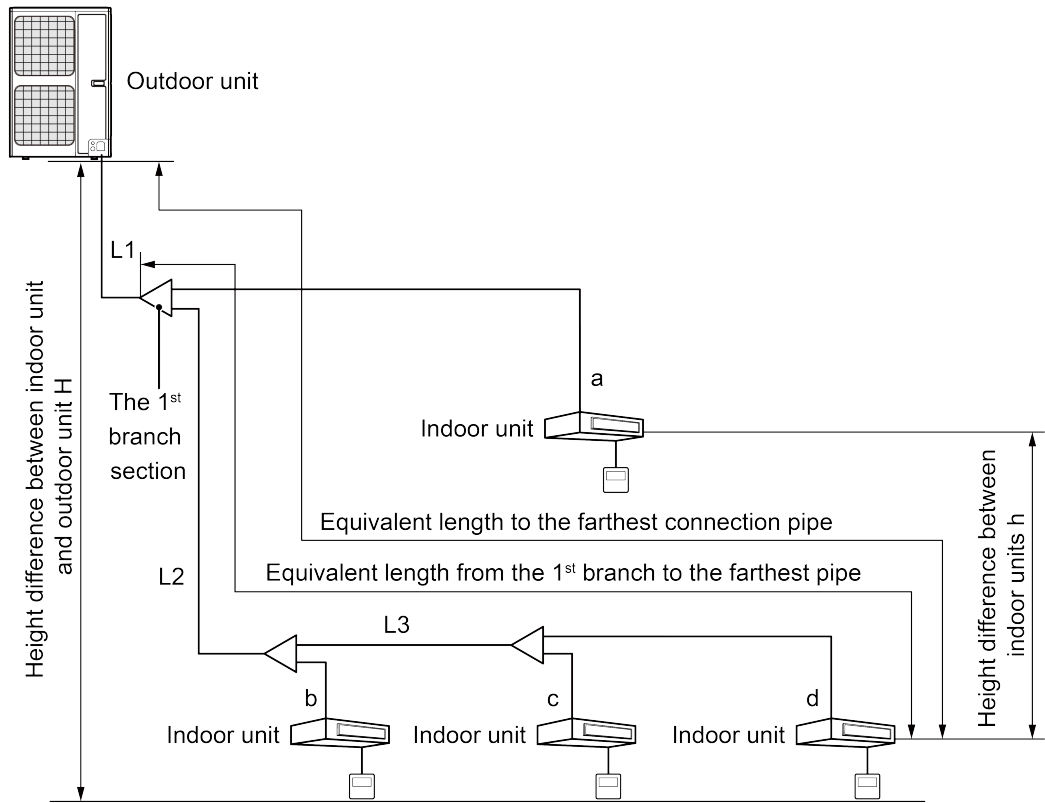


Fig.4.3.2 Allowable Length and Height Difference of Connection Pipe

—		Allowable Value		Fitting Pipe
		m	feet	
Total length (actual length) of fitting pipe		150	492	L1+L2+L3+a+b+c+d
Length of farthest fitting pipe	Actual length	65	213	L1+L2+L3+d
	Equivalent length	80	262	
From the 1 st branch to the farthest indoor pipe		40	131	L2+L3+d
Height difference between ODU and IDU	ODU at upper side	50	164	—
	ODU at lower side	40	131	—
Height difference between IDUs		15	49	—

4.3.3 Pipe Selection

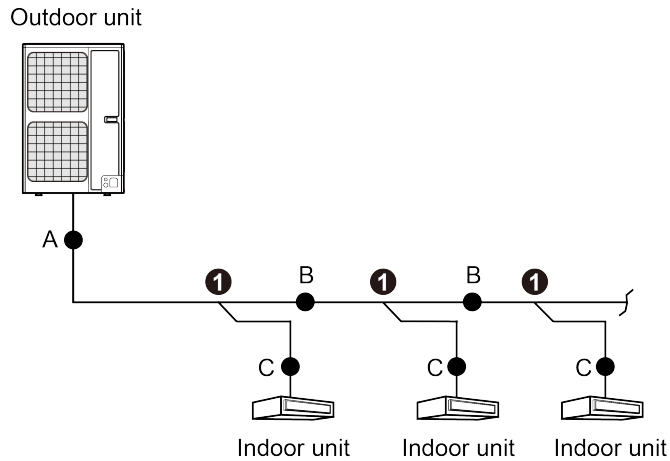


Fig.4.3.3

(1) Pipe "A" between the outdoor unit and the manifold of indoor unit.

The pipe size is based on the dimension of outdoor connection pipe.

Basic Module	Pipe Dimension	
	Gas pipe (mm/inch)	Liquid pipe (mm/inch)
GMV-V36WL/C-T(U)	Φ15.9 (Φ5/8)	Φ9.52 (Φ3/8)
GMV-V48WL/C-T(U)	Φ15.9 (Φ5/8)	Φ9.52 (Φ3/8)
GMV-V60WL/C-T(U)	Φ19.05 (Φ3/4)	Φ9.52 (Φ3/8)

(2) Select the manifold "①" at indoor side.

Manifold at indoor unit side can be selected as per total capacity of downstream indoor unit(s).

Refer to the following table.

Refrigerant System	Total Capacity of Downstream Indoor Units X (Btu/h)	Model
Y type branch	$X < 68200$	FQ01A/A
	$68200 \leq X \leq 102400$	FQ01B/A
	$102400 < X \leq 238800$	FQ02/A
	$238800 < X \leq 460600$	FQ03/A
	$460600 < X$	FQ04/A

(3) Fitting pipe "B" between indoor side manifolds.

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

Total Capacity of Downstream Indoor Units X (Btu/h)	Pipe (mm/inch)	Liquid Pipe (mm/inch)
$X \leq 19000$	Φ12.7 (Φ1/2)	Φ6.35 (Φ1/4)
$19000 < X \leq 48500$	Φ15.9 (Φ5/8)	Φ9.52 (Φ3/8)
$48500 < X \leq 76400$	Φ19.05 (Φ3/4)	Φ9.52 (Φ3/8)

(4) Fitting pipe "C" between indoor unit and manifold.

Manifold should be matched with fitting pipe of indoor unit.

Rated Capacity of IDU X (Btu/h)	Gas Pipe (mm/inch)	Liquid Pipe (mm/inch)
$X \leq 9600$	Φ9.52 (Φ3/8)	Φ6.35 (Φ1/4)
$9600 < X \leq 17000$	Φ12.7 (Φ1/2)	Φ6.35 (Φ1/4)
$17000 < X \leq 48000$	Φ15.9 (Φ5/8)	Φ9.52 (Φ3/8)
$48000 < X \leq 55000$	Φ19.05 (Φ3/4)	Φ9.52 (Φ3/8)
$55000 < X \leq 96000$	Φ22.2 (Φ7/8)	Φ9.52 (Φ3/8)

NOTICE

If the distance between IDU and its nearest branch is over 10m(33feet), then the liquid pipe of IDU (rated capacity $\leq 17000\text{Btu/h}$) shall be enlarged.

4.4 Installation of Connection Pipe

⚠ CAUTION	
(1)	Conform to the following principles during pipe connection: Connection pipe should be as short as possible, so is the height difference between indoor and outdoor units. Keep the number of bends as little as possible. Radius of curvature should be as large as possible.
(2)	Weld the connection pipe between indoor and outdoor units. Please strictly follow the requirements for welding process. Rosin joint or pin hole is not allowed.
(3)	When laying the pipe, be careful not to distort it. Radius of bending parts should be over 200mm(8inch). Note that pipes cannot be repeatedly bent or stretched; otherwise the material will get harder. Do not bend or stretch the pipe for more than 3 times at the same position.
(4)	The wall thickness of field-installed pipes should be selected in accordance with the relevant local, state, and national regulations.
(5)	To cut pipes, use a pipe cutter, not a grinder or other tools that use abrasive materials.
(6)	Refrigerant pipe bending radius must be 4" (100 mm) or more.
(7)	Use leak detector or soapy water to check for gas leaks after connections are completed.

4.4.1 Flaring Process

- (1) Use pipe cutter to cut the connection pipe in case it is unshaped.
- (2) Keep the pipe downward in case cutting scraps get into the pipe. Clear away the burrs after cutting.
- (3) Remove the flared nut connecting indoor connection pipe and outdoor unit. Then use flaring tool to fix the flared nut into the pipe (as shown in Fig.4.4.1).
- (4) Check if the flared part is flaring evenly and if there is any crack.

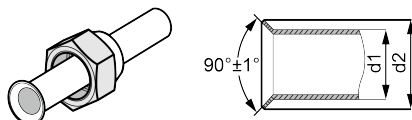


Fig.4.4.1

4.4.2 Pipe Bending

- (1) Reshape the pipe by hand. Be careful not to damage the pipe.
- (2) Do not bend the pipe over 90°.
- (3) If pipe is repeatedly bent or stretched, it will get hard and difficult to bend and stretch again. Therefore, do not bend or stretch the bend for over 3 times.
- (4) In case that direct bending will open cracks to the pipe, first use sharp cutter to cut the insulating layer, as shown in Fig.4.4.2. Do not bend the pipe until it is exposed. When bending is done, wrap the pipe with insulating layer and then secure it with adhesive tape.

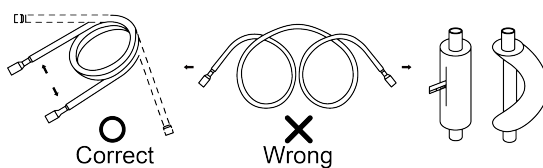


Fig.4.4.2

4.4.3 Indoor Pipe Connection

- (1) Remove pipe cover and pipe plug.
- (2) Direct the flared part of copper pipe to the center of screwed joint. Twist on the flared nut tightly by hand, as in Fig.4.4.3 (Make sure indoor pipe is correctly connected. Improper location of the center will prevent flared nut from being securely twisted. Thread of nut will get damaged if the flared nut is twisted forcibly).
- (3) Use torque wrench to twist on the flared nut tightly until the wrench gives out a click sound (Hold the handle of wrench and make it at right angle to the pipe. as in Fig.4.4.3).

⚠ CAUTION	
(1)	Use sponge to wrap the un-insulated connection pipe and joint. Then tie the sponge tightly with plastic tape.
(2)	Connection pipe should be supported by a bearer rather than the unit.
(3)	The bending angle of piping should not be too small; otherwise the piping might have cracks. Please use a pipe bender to bend the pipe.
(4)	When connecting IDU with connection pipe, do not pull the big and small joints of IDU with force in case the capillary tube or other tubes have cracks and cause leakage.
(5)	Tighten all flare nuts to specification using a torque wrench. If tightened too much, the flare nut can break after an extended period and refrigerant can leak out.
(6)	Use 2 wrenches to tighten piping connections.

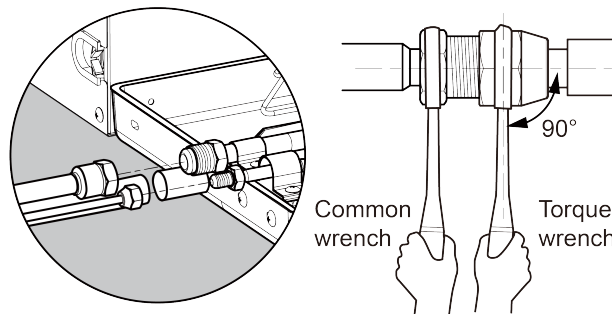


Fig.4.4.3

Pipe Diameter(mm/inch)	Tightening Torque
Φ6.35(1/4)	15~30(N·m)
Φ9.52(3/8)	35~40(N·m)
Φ12.7(1/2)	45~50(N·m)
Φ15.9(5/8)	60~65(N·m)
Φ19.05(3/4)	70~75(N·m)

4.4.4 Outdoor Pipe Connection

Twist the flared nut on the connection pipe of outdoor valves. Twisting method is the same as for indoor pipe connection.

During engineering installation, the connection pipe inside the unit must be wrapped by insulation sleeve.

According to customer requirement or space limit, outlet pipe can be installed from the front, right or rear side.

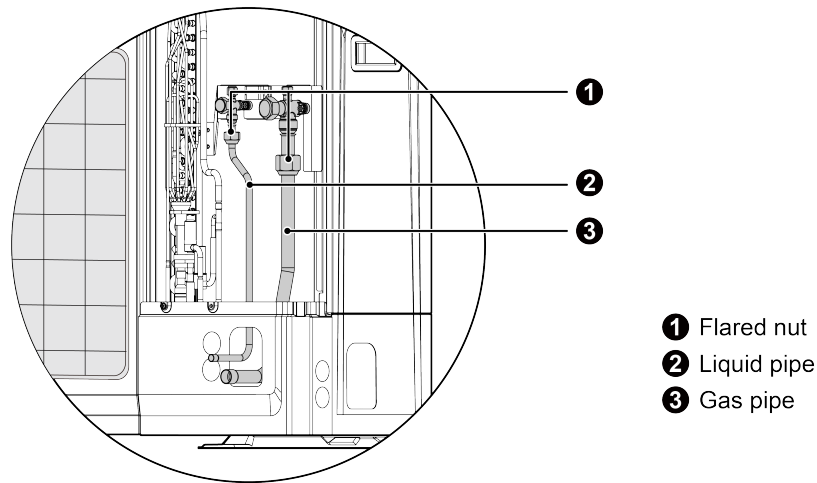


Fig.4.4.4

4.4.5 Installation of Y-type Branch

The main function of manifold is used to shunt the refrigerant. Pay attention to the following points when installing it:

- (1) When installing the manifold, it should be as close as possible to the indoor unit to reduce the influence of the indoor unit manifold on the refrigerant distribution.
- (2) The manifold must be matched with the equipment. The other products which are not specified by the manufacturer shall not be used.
- (3) Check the model before installing the manifold. Do not use it incorrectly.
 - 1) Y-type manifold can be installed vertically or horizontally.

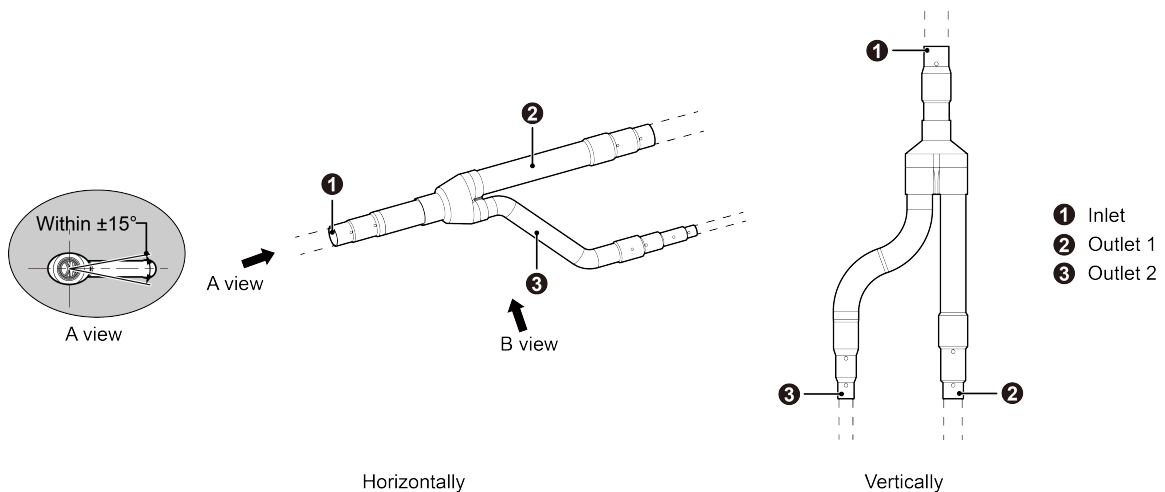


Fig.4.4.5

- 2) The installation of the branch pipe has the following requirements. Please install it according to the angle shown in the figure below. Improper installation may lead to malfunction of the outdoor unit.

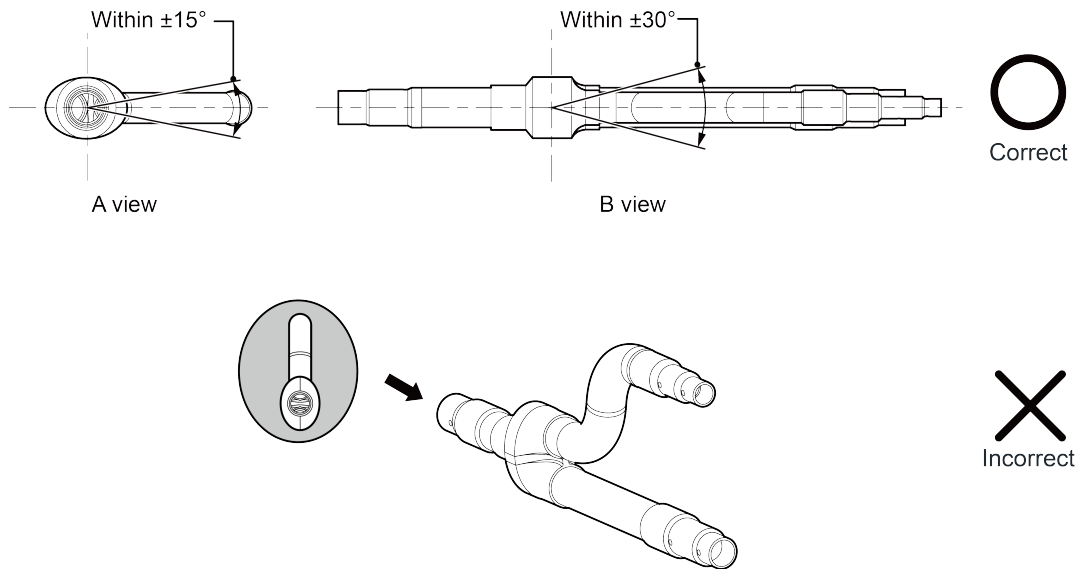


Fig.4.4.6

- 3) 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. See the Fig. as below.

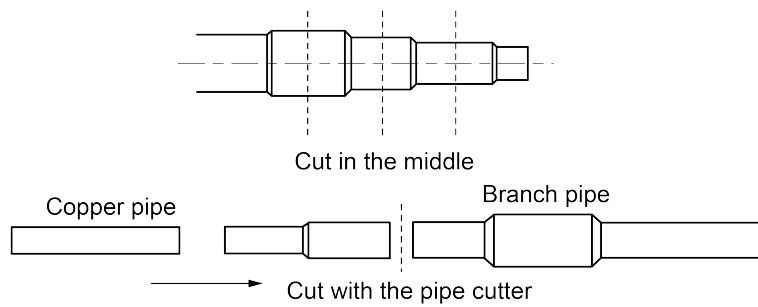


Fig.4.4.7

- 4) The length of a straight pipe between two manifolds cannot be less than 500mm (19-11/16 inch).
- 5) The length of a straight pipe before the main pipe port of the manifold cannot be less than 500mm (19-11/16 inch).
- 6) The length of a straight pipe between the branch of the manifold and the IDU cannot be less than 500mm (19-11/16 inch).

Unit: mm(inch)

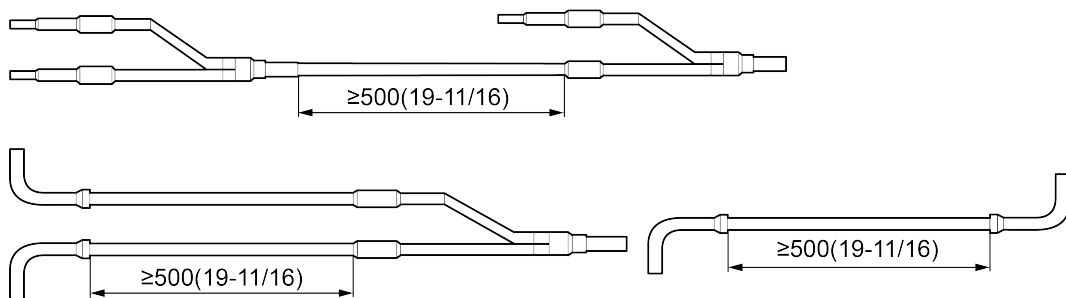


Fig.4.4.8

(4) Fixation of Manifold

- 1) There must be three fixing point for both horizontal and vertical installation of the Y-type manifold.

Fixing point 1: 100 mm (4 inch) on the main inlet manifold from the welding point.

Fixing point 2: 200 mm (7-7/8 inch) on the main branched pipe from the welding point.

Fixing point 3: 250 mm (9-7/8 inch) on the branched pipe from the welding point.

Unit: mm(inch)

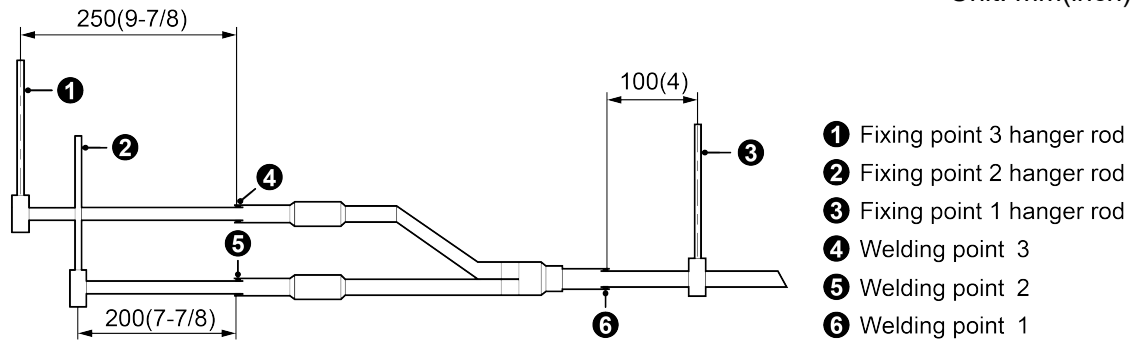


Fig.4.4.9

- 2) The branches of the manifold should be parallel and should not be overlapped.
- 3) The liquid pipe and the gas pipe should have the same pipe length and the same laying circuit.
- 4) Since the structure of the manifold is relatively complicated, it must be rigorous and careful for heat preservation to ensure the tight insulation.

4.4.6 Thermal Insulation for Pipeline

- (1) For multi VRF system, every copper pipe should be labeled so as to avoid misconnection.
- (2) At the branch inlet, leave at least 500mm(19-11/16inch) straight pipe section.
- (3) Thermal insulation for pipeline
 - 1) To avoid condensate or water leakage on the connection pipe, the gas pipe and liquid pipe must be wrapped with thermal insulating material and adhesive tape for insulation from the air.
 - 2) Joints of indoor and outdoor unit should be wrapped with insulating material and leave no gap between pipe and wall. See Fig.4.4.10.

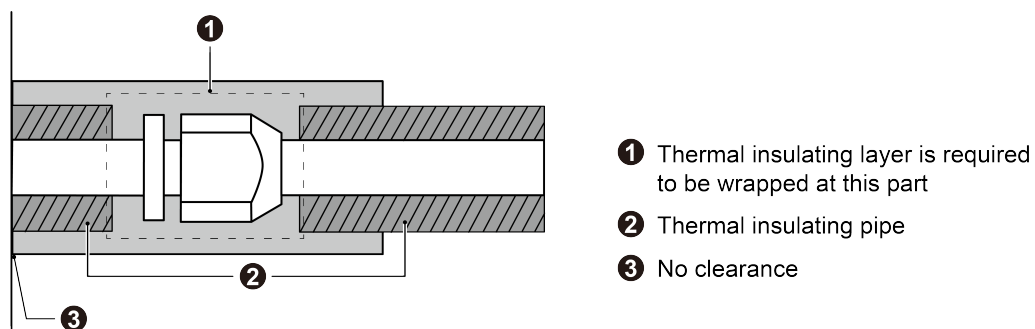


Fig.4.4.10

- 3) When wrapping the tape, the later circle should cover half of the former one. Don't wrap the tape too tight, otherwise the insulation effect will be weakened.
- 4) After wrapping the pipe, apply sealing material to completely seal the hole on the wall.

NOTICE

- | |
|--|
| (1) Thermal insulating material shall be able bear the pipe temperature. 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. |
| (2) Thermal insulating material of branches should be the same as that of the pipeline. The attached foam of branches cannot be taken as insulating material. |
| (3) Be sure to use the insulation of specified thickness. Excessive thickness may cause incorrect installation of the indoor unit and lack of thickness may cause dew drippage. |
| (4) Ensure that the 2 refrigerant pipes are insulated to prevent condensation. |
| (5) Connection piping shall be insulated with water-proof material. The ends of the insulation must be sealed to maintain insulation effectiveness. |

4.4.7 Support and Protection of Pipeline

CAUTION

- | |
|--|
| (1) Support should be made for hanging connection pipe. Distance between each support cannot be over 1m(3-1/4feet). |
| (2) Protection against accidental damage should be made for outdoor pipeline. When pipeline exceeds 1m(3-1/4feet), a pinch board should be added for protection. |

4.4.8 Disassembly of Compressor Feet

In order to prevent unit from damage during transportation, 2 metal pieces are fitted to outdoor unit's compressor feet before unit leaves factory. See Fig.4.4.11.

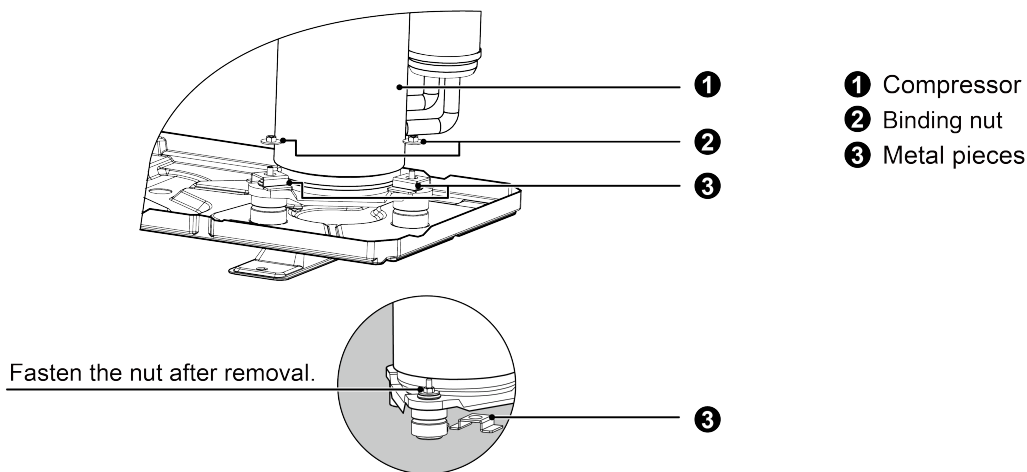


Fig.4.4.11

When installing the unit, metal pieces for transportation must be removed. Then fasten the binding nuts again and wrap back soundproofing cotton. If unit runs with metal pieces fitting on, compressor will shake abnormally and unit's operating life will be shortened.

4.5 Vacuum Pumping, Refrigerant Adding

CAUTION

Do not purge the air with refrigerants but use a vacuum pump to vacuum the installation! There is no extra refrigerant in the outdoor unit for air purging!

4.5.1 Vacuum Pumping

- (1) Outdoor unit has been charged with refrigerant before delivery. Field-installed connection pipe needs to be charged with additional refrigerant.

- (2) Confirm whether outdoor liquid and gas valves are closed.
- (3) Use vacuum pump to withdraw the air inside indoor unit and connection pipe from the outdoor valve, as shown in Fig.4.5.1 below.
- (4) When pumping down the refrigerant, stop the compressor before disconnecting the refrigerant pipes. The compressor may burst and cause injury if any foreign substance, such as air, enters the system.

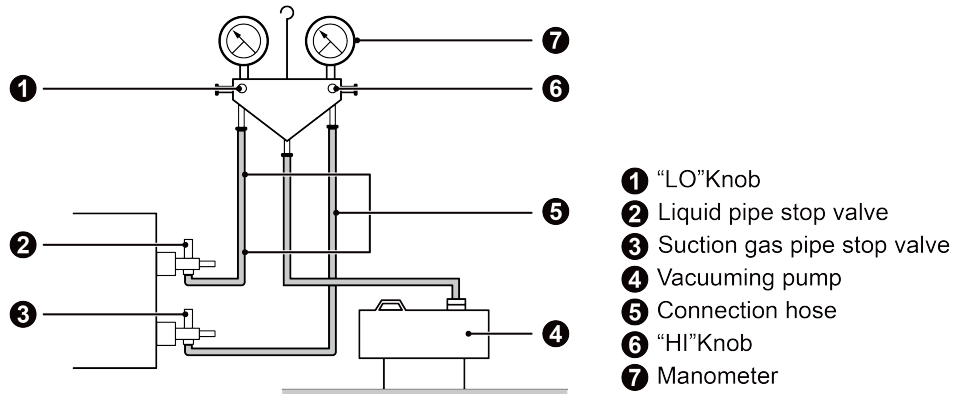


Fig.4.5.1

4.5.2 Additional Refrigerant Charging

NOTICE

- (1) The amount of refrigerant charged into the system before leaving the factory does not include the amount of refrigerant added to the pipelines and the outdoor unit.
- (2) The additional amount of refrigerant added to the pipelines is determined according to the size of the liquid pipe and its length on site.
- (3) Record the amount of refrigerant added to facilitate after-sales maintenance.

①Additional refrigerant charge $R = \text{pipeline additional refrigerant charge } A + \text{outdoor unit additional refrigerant charge } B$

②Calculation of pipeline additional refrigerant charge A

Pipeline additional refrigerant charge $A = \text{liquid pipe length } (\Sigma) \times \text{additional refrigerant charge per meter of the liquid pipe.}$

$X1$: The length of liquid pipe $\Phi 6.35\text{mm}(\Phi 1/4 \text{ inch})$;

$X2$: The length of liquid pipe $\Phi 9.52\text{mm}(\Phi 3/8 \text{ inch})$;

The Length of $X1+X2$	The Length of $X2$	Quantity Additional Refrigerant Charge Per Meter of the Liquid Pipe A
$\leq 20\text{m}(65-5/8\text{feet})$	$\leq 20\text{m}(65-5/8\text{feet})$	0
$> 20\text{m}(65-5/8\text{feet})$	$\geq 20\text{m}(65-5/8\text{feet})$	$(X2-20\text{m}) \times 0.054\text{kg/m} + X1 \times 0.022\text{kg/m}$ $\{X2-(65-5/8\text{ft})\} \times 0.036\text{LBS/ft} + X1 \times 0.015\text{LBS/ft}$
	$< 20\text{m}(65-5/8\text{feet})$	$(X1+X2-20\text{m}) \times 0.022 \text{ kg/m}$ $\{X1+X2-(65-5/8\text{ft})\} \times 0.015\text{LBS/ft}$

③Calculation of outdoor unit additional refrigerant charge $B(\text{kg(LBS)})$

Indoor Unit Quantity	Outdoor Unit Capacity(kBtu/h)		
	36	48	60
≤ 2	0	0	0
3	0.3(0.66)	0.3(0.66)	0.5(1.10)
4	0.6(1.32)	0.6(1.32)	0.6(1.32)
≥ 5	0.6(1.32)	0.6(1.32)	1.0(2.20)

NOTE:

The maximum refrigerant charging volume for the system can't exceed 16.5LBS (including the refrigerant charged in the factory).

Record the amount of refrigerant added to facilitate after-sales maintenance. After ensuring that the system does not leak and the compressor is not working, first charge the specified amount of R410A into the unit from the injection port of the outdoor unit liquid pipe valve until the required amount is reached. If the amount of refrigerant that needs to be added cannot be filled quickly due to pressure rise in the pipe, then power on the unit in cooling mode and charge the refrigerant through the gas valve of the outdoor unit.

For example:

The ODU is composed of the module: 60 kBtu/h.

The IDUs are made up of 4 sets of 15 kBtu/h.

X1=30m(98feet), X2=15m(49feet)

The pipeline additional refrigerant charge A $= (30+15-20) \times 0.022 = 0.55\text{kg}$

$(98+49-65-5/8) \times 0.015 = 1.22\text{LBS}$

outdoor unit additional refrigerant charge B=0.6kg(1.32LBS)

Total Additional refrigerant charge R $= 0.55+0.6=1.15\text{kg}$ ($1.22+1.32=2.54\text{LBS}$).

4.5.3 Engineering installation information confirmation

Calculate the additional refrigerant quantity according to the method in section 4.5.2, and record the additional refrigerant quantity and related engineering pipe length information in the engineering installation information confirmation table.

INFORMATION CONFIRMATION TABLE FOR ENGINEERING INSTALLATION		
Length and height of connection pipe	The length from the outdoor unit to the first branch	ft.
	The length from the first branch to the farthest indoor unit	ft.
	Location of outdoor unit	☐ upper side/ ☐ middle/ ☐ lower side
	The maximum height from the indoor unit to the outdoor unit (outdoor unit is above indoor unit/outdoor unit is under the indoor unit)	/ ft.
Refrigerant additional information	The length of pipe $\Phi 1/4$ inch/The length of pipe $\Phi 3/8$ inch	ft.
	Additional refrigerant volume A for the pipe/Additional refrigerant charge volume B for the outdoor unit	/ LBS.
	Total additional refrigerant volume A+B	/ LBS.
Installation completion date/Commissioning completion date		/
1.Length and height of connection pipes can't exceed the range indicated in the instruction manual. 2.The maximum refrigerant charging volume for the system can't exceed 16.5LBS (including the refrigerant charged in the factory). 3.When this table is filled, please stick it at the inner surface of side plate of the unit for checking during maintenance.		

4.6 Electric Wiring

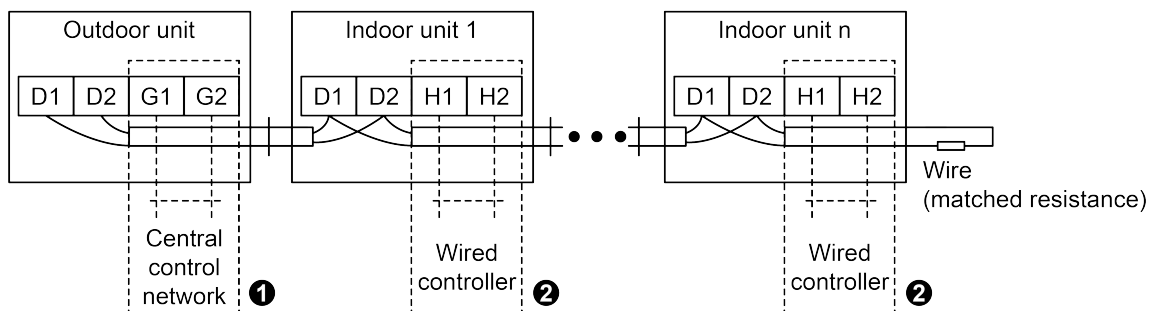
⚠ WARNING	
(1)	All electrical installation must be performed by qualified technicians in accordance with local laws, regulations and this user manual.
(2)	Use air conditioner specialized power supply and make sure that it is consistent with system's rated voltage.
(3)	Do not pull the power cord with force.

⚠ WARNING

- (4) Caliber of the power cord must be large enough. A damaged power cord or connection wire must be replaced by specialized electrical cords.
- (5) Connect the unit to specialized grounding device and make sure it is securely grounded. It's a must to install air switch and current circuit breaker that can cut off the power of the entire system. The air switch should include magnetic trip function and thermal trip function so that system can be protected from short circuit and overload.
- (6) Air conditioner belongs to class I electrical appliance, so it must be securely grounded.
- (7) The yellow-green wire inside the unit is a ground wire. Do not cut it off or secure it with tapping screws, otherwise it will lead to electric shock.
- (8) Power supply must include secure grounding terminal. Do not connect the ground wire to the following: ①Water pipe; ②Gas pipe; ③Drain pipe; ④Other places that are deemed as not secure by professional technicians.
- (9) Be sure the power supply has been cut off and the capacitor on the main board has been discharged prior to electric wiring and service.
- (10) Do not change any part; and do not shield, shortcut or remove any part.
- (11) An insufficient power supply capacity or improper electrical construction may lead to electric shocks or fire.
- (12) Never splice the power cable or the indoor-outdoor-branch box connection cable, otherwise it may result in a smoke, a fire or communication failure.
- (13) After using the isolator, be sure to turn off and on the main power supply to reset the system. Otherwise, the outdoor unit may not be able to detect the branch box(es) or indoor units.
- (14) If the connecting wire is incorrectly connected to the terminal block, the unit does not operate normally.
- (15) Grounding conductors shall not be connected to gas pipes, water pipes, lightning rods, or telephone grounding systems. Inadequate grounding may result in a risk of electric shock. If the power cord is damaged, it must be replaced only by the manufacturer, qualified service personnel, or certified technicians to prevent hazards.

4.6.1 Wiring Diagram

Connection of power cord and communication cord. Supply power for each unit separately. Each unit shall be equipped with a circuit breaker for short circuit and abnormal overload protection.



Note: (1) For outdoor units equipped with the function of central control, connect wires according to drawing ①. For indoor units with the function of wired control, connect wires according to drawing ②.

(2) n represents the maximum number of connectable indoor units, which is determined by the capacity of the outdoor unit. For details, please refer to the capacity configuration instructions of the unit.

Fig.4.6.1

NOTE: Keep all the units in the same system energized during using. Otherwise, the system will not operate normally.

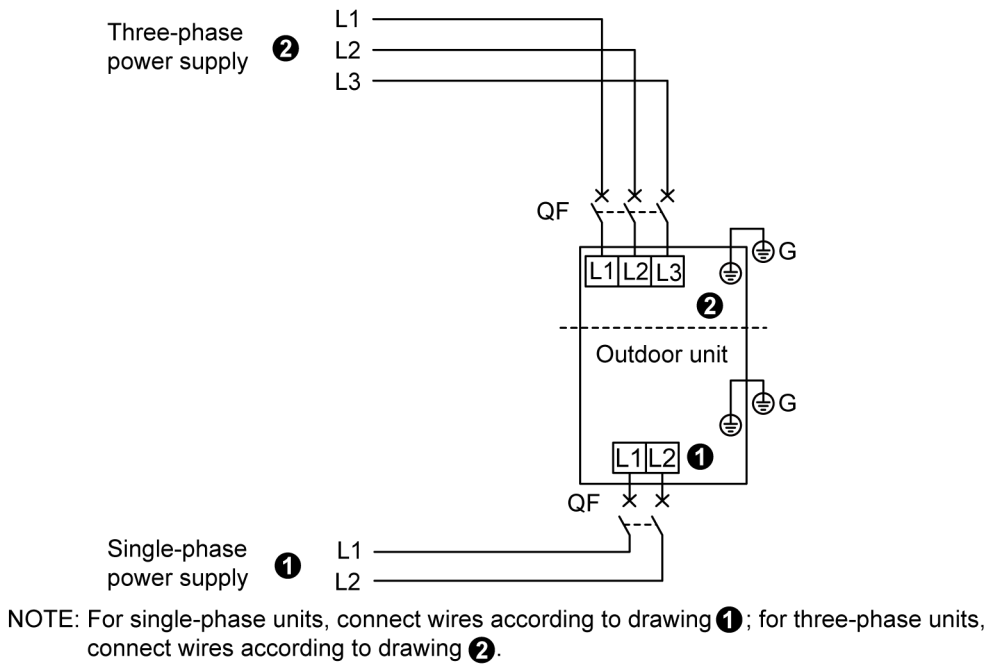


Fig.4.6.2

NOTE: Connect the power cord to the corresponding terminal and grounding screws. Please refer to the circuit diagram for wiring.

⚠ WARNING

- (1) Before starting work, check that power is not being supplied to the indoor unit and outdoor unit.
- (2) Wrong wire connection may burn the electrical components.
- (3) Connect the connection cords firmly to the terminal block. Imperfect installation may cause a fire.
- (4) Always connect the ground wire.
- (5) Securely fasten the outside unit terminal cover (panel). If the terminal cover/panel is not installed properly, dust or water may enter the outside unit causing fire or electric shock.
- (6) Always use a current leakage breaker that is compatible with higher harmonics as this unit is equipped with an inverter. The use of an inadequate breaker can cause the incorrect operation of inverter.
- (7) Make sure that the current leakage breaker is one compatible with higher harmonics.
- (8) Be sure to use the appropriate type of overcurrent protection switch. Note that generated overcurrent may include some amount of direct current.

4.6.2 Electrical Parameters

Model	Power Supply	Fuse Capacity (A)	Maximum Over-Current Protection (A)	Minimum Circuit Ampacity (A)
GMV-V36WL/C-T(U)	208/230V-1Ph-60Hz	35	35	33.8
GMV-V48WL/C-T(U)	208/230V-1Ph-60Hz	40	40	38.8
GMV-V60WL/C-T(U)	208/230V-1Ph-60Hz	40	40	38.8

4.6.3 Engineering Wiring of Power Supply and Communication Cable

- (1) Please refer to the following part for wiring. Connect the power cord and communication cord to the corresponding wiring board and grounding screws according to the circuit diagram.
- (2) The wiring shall not touch the pipeline, edge and device.
- (3) For the wiring of power and communication cord, the picture is for reference only. If there're discrepancies between it and the structure in the picture, the actual unit shall prevail.

(4) Wiring is subject to the self-equipped diagram of the unit used at present.

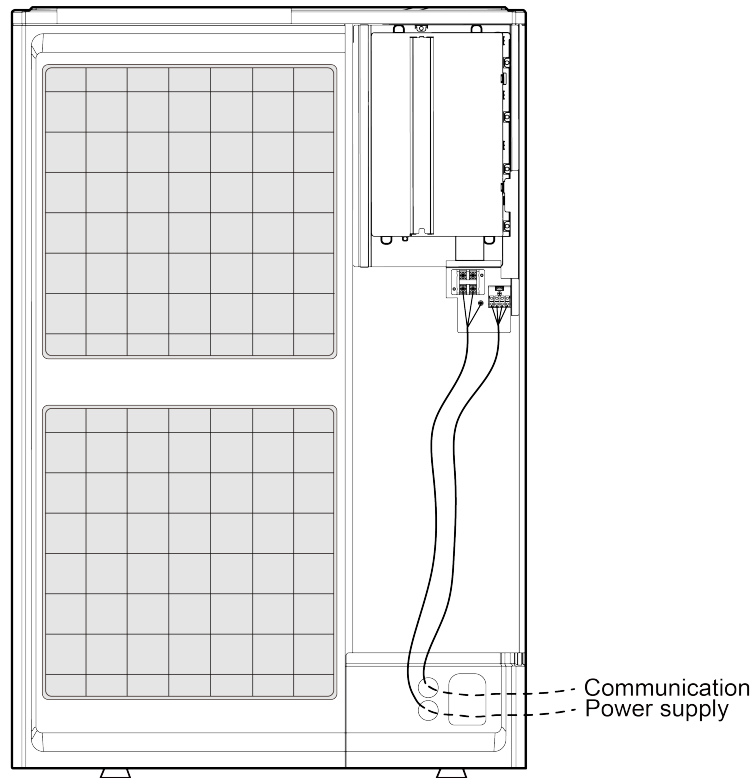


Fig.4.6.3

5 Check Items after Installation and Test Operation

5.1 Check Items after Installation

Check Items	Possible Conditions Due to Improper Installation	Check
Each part of the unit is installed securely?	Unit may drop, shake or emit noise.	
Gas leakage test is taken or not?	Insufficient cooling (heating) capacity.	
Unit gets proper thermal insulation or not?	There may be condensation and dripping.	
Drainage is smooth or not?	There may be condensation and dripping.	
Is the voltage in accordance with the rated voltage specified on the nameplate?	Unit may have malfunction or components may get damaged.	
Is the electric wiring and pipe connection installed correctly?	Unit may have malfunction or components may get damaged.	
Unit is securely grounded or not?	Electrical leakage.	
Power cord meets the required specification?	Unit may have malfunction or components may get damaged.	
Is the air inlet/outlet blocked?	Insufficient cooling (heating) capacity.	
Length of refrigerant pipe and the charging amount of refrigerant are recorded or not?	The refrigerant charging amount is not accurate.	
Binding pieces on compressor feet are removed or not?	Compressor may get damaged.	

5.2 Test Operation and Debugging

NOTICE	
(1)	After finishing the first installation or replacing the main board of outdoor unit, it is necessary to perform test operation and debugging. Otherwise, unit won't be able to work.
(2)	Test operation and debugging must be performed by professional technicians or under the guidance of professional technicians.

5.2.1 Prepare the Test Operation and Debugging

- (1) Do not connect power until all installation work is finished.
- (2) All control circuits and wires are correctly and securely connected.
- (3) Check whether unit's appearance and pipeline system has been damaged during transportation.
- (4) Calculate the quantity of refrigerant that needs to be added according to the pipe length. Pre-charge the refrigerant. In case that the required charging quantity is not reached while refrigerant can't be added, record the quantity of refrigerant that still needs to add and complement the quantity during test operation. For details of adding refrigerant during test operation, see below.
- (5) After refrigerant is added, make sure valves of outdoor unit are completely open.
- (6) For the convenience of troubleshooting during debugging, unit shall be connected to a PC with applicable debugging software. Make sure unit's real-time data can be checked through this computer. The installation and connection of debugging software can be found in the Service Manual.
- (7) Before test operation, make sure unit is power on and compressor has been preheated for more than 8 hours. Touch the unit to check whether it's normally preheated. If yes, start test operation. Otherwise, compressor might be damaged.

5.2.2 Test Operation and Debugging

Description of test operation procedures and main board display of ODU

Description of each stage of debugging progress			
—	Debugging code		Code meaning and operation method
Progress	LED		
	Code	Display status	
01_Set master unit	A0	ON	System is not debugged, hold main board's SW3 button for 5s to start debugging.
	01	ON	2s later, next step starts.
02_Allocate addresses	02/Ad	Display circularly	System is allocating addresses. 10s later, display as below.
	02/L7	Display circularly	No master indoor unit. Display will be on for 1min, during which master IDU can be set manually. If not, system will set the unit with minimum IP address as the master IDU.
	02/oC	Display circularly	Allocation is finished. 2s later, next step starts.
03_Confirm the quantity of ODU	03/01	Display circularly	System is confirming. 1s later, next step starts.
04_Confirm the quantity of IDU	04/00~16	Display circularly	"00~16" displays the quantity of indoor unit. Confirm the number manually. If the number is not consistent the display one, cut off power of IDU and ODU and check whether communication wire of IDU is correctly connected. After the check, connect power and start debugging from progress 01. If the number is then correct, press main board's SW3 button to confirm. Then the display is as below.
	04/oC	Display circularly	System has confirmed the quantity. 2s later, next step starts.

Description of each stage of debugging progress			
—	Debugging code		Code meaning and operation method
Progress	LED		
	Code	Display status	
05_ Detect ODU's internal communication and capacity ratio	05/C2	Display circularly	Communication between master ODU and driver has error. Check the communication connection of ODU's main board and drive board. When the error is eliminated, start next step. If power is off during troubleshooting, then restart debugging from progress 01 after power is on.
	05/oC	Display circularly	Communication of master ODU and driver is normal. Unit will display as in the left for 2s and detect the capacity ratio of IDU and ODU. If the ratio is within range, then next step will start 2s later. If the ratio is out of range, unit will display as below.
	05/CH	Display circularly	Rated capacity ratio of IDU is too high. Change the combination way of IDU and ODU to make the ratio within range. And restart debugging from progress 01.
	05/CL	Display circularly	Rated capacity ratio of IDU is too low. Change the combination way of IDU and ODU to make the ratio within range. And restart debugging from progress 01.
06_ Detect outdoor components	06/error code	Display circularly	Outdoor component's error. Besides "06", the other blinking will display the related error code. After errors are eliminated, system will start next step automatically. If power is off during troubleshooting, then restart debugging from progress 01 after power is on.
	06/oC	Display circularly	System detects no error on outdoor component. 10s later, next step starts.
07_ Detect indoor components	07/XX/error code	Display circularly	System detects error on indoor components. XX means the project code of IDU with error, e.g. no.1 IDU has d5 and d6 errors, meanwhile no.3 IDU displays error d6 and d7, then the nixie tube will display "07", "01", "d5", "d6" and "03" circularly. After errors are eliminated, system will start next step automatically. If power is off during troubleshooting, then restart debugging from progress 01 after power is on.
	07/XXXX/error code	Display circularly	If errors occur in IDU which the project code is ≥ 3-digit number, then it will display the 2 big digits of project code first, then the 2 small digits, finally the error code, e.g: L1 error occurs in no.101 IDU, then the nixie tube will display "01","01" and "L1" circularly. Display method is the same for several IDUs with multiple errors.
	07/oC	Display circularly	No error on components of IDU. 5s later, next step starts.
08_ Confirm preheated compressor	08/U0	Display circularly	Preheat time for compressor is less than 8 hours. Display will be as in the left until the preheat time reaches 8 hours. Press main board's SW3 button to confirm manually that the preheat time has reached 8 hours. Then start next step. (NOTE: Compressor may get damaged if it is started without 8 hours of preheat time).
	08/oC	Display circularly	Compressor has been preheated for 8 hours. 2s later, next step starts.

Description of each stage of debugging progress			
—	Debugging code		Code meaning and operation method
Progress	LED		
	Code	Display status	
09_ Refrigerant judgments before startup	09/U4	Display circularly	System is lack of refrigerant and display will be as in the left. Please cut off power of IDU and ODU and check if there is leakage on pipeline. Solve the leakage problem and complement refrigerant into the unit. Then connect power and restart debugging from progress 01. (Note: Before re-charging refrigerant, unit must be power off in case system starts progress 10 automatically) .
	09/oC	Display circularly	Refrigerant is normal and unit will display as in the left for 2s.Then next step starts.
10_ Status judgments of outdoor valves before startup	10/on	Display circularly	Valves of ODU are being inspected. Compressor will start operation for 2min or so and then stop. The opening and closing status of outdoor valves are as below.
	10/U6	Display circularly	Outdoor valves are not fully turned on. Press main board's SW4 button and display shows "09/OC". Then check if the gas and liquid valves of ODU are completely open. After confirmation, press the SW4 button again. Then compressor will start running for about 2min to inspect the status of valves.
	10/oC	Display circularly	Valves status is normal. Unit will display as in the left for 2s and then start next step.
12_ Confirm debugging startup	12/AP	Display circularly	Ready for units to start debugging. Press main board's SW3 button to confirm startup of debugging. 2s later, main board will display as below.
	12/AE	Display circularly	Startup is confirmed. After displaying for 2s, system will choose "15_Cooling debugging" or "16_Heating debugging" according to ambient temperature. If the project requests to add refrigerant but it is not complemented before debugging, then refrigerant can be added in this process through the L-VALVE.
15_ Cooling debugging	15/AC	Display circularly	Debugging for cooling mode. If no malfunction occurs for 50min when compressor is running, then the system is certified as normal. After shutting down the unit for 5s, the system will enter normal standby status.
	15/error code	Display circularly	Malfunction occurs when debugging for cooling mode.
16_ Heating debugging(For heat pump units only)	16/AH	Display circularly	Debugging for heating mode. If no malfunction occurs for 50min when compressor is running, then the system is certified as normal. After shutting down the unit for 5s, the system will enter normal standby status.
	16/error code	Display circularly	Malfunction occurs when debugging for heating mode.
17_ Debugging finished	oF	ON	The entire unit has finished debugging and under standby-by condition.

5.2.3 Appendix: Reference of Normal Operation Parameters

No.	Debug item		Parameter name	Unit	Reference
1	System parameters	ODU parameters	Outdoor temperature	°C(°F)	—
2			Compressor discharge temperature	°C(°F)	- When compressor starts, discharge temp in cool mode is within 70~105°C(158~221°F) and at least 10°C(18°F) higher than the high pressure saturation temperature. - As for temp in heat mode, it is within 65~90°C(149~194°F) and at least 10°C(18°F) higher than the high pressure saturation temperature.
3			Defrosting temperature	°C(°F)	- In cool mode, defrosting temperature is 4~10°C(7.2~18°F) lower than system's high pressure value. - In heat mode, defrosting temperature is about 2°C(3.6°F) different from system's low pressure value.
4			System high pressure	°C(°F)	- In cool mode, the normal high pressure value is within 20~55°C(68~131°F). According to the change of ambient temperature and system's operating capacity, the high pressure value will be 10~30°C(18~54°F) higher than ambient temperature. The higher ambient temperature is, the smaller temperature difference is. If ambient temp is 25~35°C(77~95°F) in cool mode, system's high pressure value will be within 44~53°C(111~127°F). - In heat mode, if ambient temperature is above -5°C(23°F), system's high pressure value is within 40~52°C(104~126°F). If ambient temperature is low and many IDUs are turned on, the high pressure will be lower.
5			System low pressure	°C(°F)	- When ambient temperature in cool mode is 25~35°C(77~95°F), the low pressure value is 0~8°C(32~46°F). - When ambient temperature in heat mode is above -5°C(23°F), the low pressure value is -15~8°C(5~46°F).
6			Opening degree of thermal EXV	PLS	- In cool mode, the thermal electronic expansion valve remains 480PLS. - In heat mode, the adjustable opening degree of EXV is 60~480PLS.
7			Compressor's operating frequency	Hz	Changes in 15Hz~120Hz.
8			Compressor's operating current	A	When compressor works normally, the current is no more than 18A.
9			Compressor's IPM temperature	°C(°F)	When ambient temperature is below 35°C(95°F), IPM temp is lower than 80°C(176°F) and the highest temperature won't be above 95°C(203°F).
10			Fan motor's operating frequency	Hz	Changes in 0~50Hz according to system's pressure.

No.	Debug item		Parameter name	Unit	Reference
11	System parameters	IDU parameters	IDU ambient temperature	°C(°F)	—
12			Indoor heat exchanger's inlet temperature	°C(°F)	● According to ambient temperature, for a same IDU in cool mode, the inlet temp will be 1~7°C(1.8~12.6°F) lower than the outlet temperature, and 4~9°C(7.2~16.2°F) higher than the low pressure value. ● For a same IDU in heat mode, the inlet temperature will be 10~20°C(18~36°F) lower than the outlet temperature.
13			Opening degree of indoor EXV	PLS	● In cool mode, the opening degree of indoor EXV varies within 50~480PLS. ● In heat mode, the opening degree of indoor EXV varies within 35~480PLS.
14	Communication parameters		Communication data	—	Number of IDUs detected by software is the same with the actual number. No communication error.
15	Drainage system		—	—	Indoor unit can drain water out completely and smoothly. Condensate pipe has no backward slope of water; Water of outdoor unit can be drained completely through drainage pipe. No water drop from unit base.
16	Others		—	—	Compressor and indoor/outdoor fan motor do not have strange noise. Unit can operate normally.

6 Common Malfunctions and Troubleshooting

WARNING

- (1) If an abnormal situation (such as peculiar smell) occurs, please stop the operation immediately and turn off the main power supply, and then contact Gree authorized maintenance center. If the unit continues to operate under abnormal situation, the air conditioner will be damaged and an electric shock or fire accident may result.
- (2) Do not maintain the air conditioner by yourself, misoperation may cause electric shock or fire hazard. Please contact professional personnel of Gree authorized maintenance center to maintain.

- Before asking for maintenance, please check the following issues first.

Phenomenon	Causes	Troubleshooting
Air conditioner can't operate	Fuse is broken or circuit breaker is open	Replace fuse or close the circuit breaker
	Power failure	Restart up the unit and then the unit will operate
	Power supply is not connected	Connect the power supply
	The power for batteries of remote controller is insufficient	Replace the batteries
	Remote controller is not within the remote control range	Remote control range is within 8m
Air conditioner operates, while it stops operation immediately	Air inlet or air outlet of indoor unit/outdoor unit is blocked	Eliminate the obstacles
Cooling or heating is abnormal	Air inlet or air outlet of indoor unit/outdoor unit is blocked	Eliminate the obstacles
	Temperature setting is improper	Adjust temperature setting by remote controller or wired controller
	Fan speed is set too low	Adjust fan speed setting by remote controller or wired controller
	Fan direction is not correct	Adjust fan direction setting by remote controller or wired controller
	Door or window is open	Close door and window

Phenomenon	Causes	Troubleshooting
Cooling or heating is abnormal	Direct sunshine	Hang curtains or window shade at the window
	Too many persons in the room	—
	Too many thermal source in the room	Reduce the thermal source
	The filter is dirty and blocked	Clean the filter

NOTICE

If problem cannot be solved after checking the above items, please contact Gree service center and describe the cases and models.

- Following circumstances are not malfunctions.

Phenomenon		Causes
Unit doesn't run	When unit is started immediately after it is just turned off	Overload protection switch makes it run after 3 minutes delay
	When power is turned on	Standby operating for about 1 minute
Mist comes from the unit	Under cooling	Indoor high humidity air is cooled rapidly
Noise is emitted	When the power supply is connected, there is small "dada" sound.	It is the sound of startup action of electronic expansion valve.
	When the system is conducting cooling or defrosting, there is continuous "sa——" sound.	This is the sound of refrigerant flowing inside the unit.
	When the system is switching cooling and heating modes; during heating operation, the unit enters or quits defrosting operation or oil return operation, there is "chi——" sound.	This is the sound for direction reversal of 4-way valve.
	When the system is started or stopped for a short time, you can hear the sound of "sa——"; you can also hear this sound for a short time after the start or stop of the defrosting operation.	This is the sound produced when the refrigerant stops or changes the flow.
	When the system is in cooling operation or after it stops running, a continuous "sa ——" sound can be heard	This is the operation sound of drain system.
	When the system is running or after it stops running, a "creaking" sound can be heard.	This is the sound produced when plastic parts such as panel expansion and contraction due to temperature changes.
	When the system is in heating operation, after the indoor unit stops running, the sound like running water can be heard.	The unit is melting the frost on the outdoor unit, please wait about 10 minutes (due to different unit models, the waiting time will vary).
	When the indoor unit stops running, a faint "sa——" sound or "gurgling" sound can be heard.	This sound can be heard when other indoor units are running. This is to prevent oil and refrigerant from staying in the indoor unit, and to keep a small amount of refrigerant flowing.
	When the unit is running, the operating sound of the compressor changes.	This is caused by changes in compressor operating frequency.
	During the operation of the unit or after the operation is started or stopped, a continuous "sa ——" sound can be heard.	This is the sound produced when the refrigerant bypass valve operates.

Phenomenon		Causes
Noise is emitted	When the operating mode of the unit changes, the indoor unit and outdoor unit will produce "sa ——" and "gurgling" sounds.	This is the sound produced when the refrigerant stops or changes flow.
	The sound from the outdoor unit can be heard indoors	This is because the outdoor unit is installed close to the window or wall, and the sound insulation is poor, and the external noise is transmitted in.
There is dust blowing out from the unit	Start operation after it is not used for a long time	Dust in indoor unit is blew out
The unit emits odor	Operating	The odor of the air conditioner is sucked into the room and then blown out
The indoor unit is still running after shutting down	The indoor unit is still running after shutting down	The fan of indoor unit will continue to work for 20 to 70 seconds to fully use the residual cooling or heat of the heat exchanger, and to prepare for the next use.
Mode conflict	Cooling or heating mode cannot start up	When the selected operation mode of the indoor unit conflicts with the operation mode of the outdoor unit, after five seconds, the indoor unit error indicator flashes or the remote controller displays the operation conflict, and the indoor unit shuts down. At this time, the indoor unit can be converted to run with the outdoor unit. The mode can be restored to normal without conflict. The cooling mode and dry mode do not conflict, and the air supply does not conflict with any mode.
Wired controller displays A3 code	Unit enters frost mode operation	During cold weather heating operation, when frost or ice may form on the outdoor unit heat exchanger, the unit will automatically enter the defrost mode for a few minutes.
Wired controller displays A4 code	Unit enters oil-return mode operation	When the outdoor unit runs for a certain time, it will automatically enter the oil return mode to run for a few minutes to ensure that the internal compression of the external machine is effectively lubricated.

7 Error Indication

Inquiry method of error indication: combine division symbol and content symbol to check the corresponding error.

Indoor:

Error Code	Content	Error Code	Content
L0	Malfunction of IDU (uniform)	d1	Indoor PCB is poor
L1	Protection of indoor fan	d2	Malfunction of lower water temperature sensor of water tank
L2	Auxiliary heating protection	d3	Malfunction of ambient temperature sensor
L3	Water-full protection	d4	Malfunction of entry-tube temperature sensor
L4	Abnormal power supply for wired controller	d5	Malfunction of middle temperature sensor
L5	Freeze prevention protection	d6	Malfunction of exit-tube temperature sensor
L6	Mode shock	d7	Malfunction of humidity sensor

Error Code	Content	Error Code	Content
L7	No main IDU	d8	Malfunction of water temperature sensor
L8	Power supply is insufficient	d9	Malfunction of jumper cap
L9	For single control over multiple units, number of IDU is inconsistent	dA	Web address of IDU is abnormal
LA	For single control over multiple units, IDU series is inconsistent	dH	PCB of wired controller is abnormal
LH	Alarm due to bad air quality	dC	Abnormal setting for capacity button
LC	IDU is not matching with outdoor unit	dL	Malfunction of air outlet temperature sensor
LL	Malfunction of water flow switch	dE	Malfunction of indoor CO ₂ sensor
LE	Rotation speed of EC DC water pump is abnormal	dF	Malfunction of upper water temperature sensor of water tank
LF	Malfunction of shunt valve setting	dJ	Malfunction of backwater temperature sensor
LJ	Setting of functional DIP switch code is wrong	dP	Malfunction of inlet tube temperature sensor of generator
LP	Zero-crossing malfunction of PG motor	dU	Malfunction of drainage pipe temperature sensor of generator
LU	Indoor unit's branch is not inconsistent for one-to-more unit of heat recovery system	db	Debugging status
Lb	Inconsistent IDU of group-controlled reheat and dehumidification system	dd	Malfunction of solar power temperature sensor
y1	Malfunction of inlet tube temperature sensor 2	dn	Malfunction of swing parts
y2	Malfunction of outlet tube temperature sensor 2	dy	Malfunction of water temperature sensor
y7	Malfunction of fresh air intake temperature sensor	y8	Main error of indoor air box sensor
yA	IFD malfunction	—	—

Outdoor:

Error Code	Content	Error Code	Content
F0	Main board of ODU is poor	E0	Malfunction of ODU (uniform)
F1	Malfunction of high-pressure sensor	E1	High-pressure protection
F3	Malfunction of low-pressure sensor	E2	Discharge low-temperature protection
F5	Malfunction of discharge temperature sensor of compressor 1	E3	Low-pressure protection
F6	Malfunction of exit-tube temperature sensor	E4	High discharge temperature protection of compressor
F7	Malfunction of humidity sensor	Ed	Drive module low temperature protection
F8	Malfunction of water temperature sensor	J0	Protection for other modules
F9	Malfunction of jumper cap	J1	Over-current protection of compressor 1
FA	Web address of IDU is abnormal	J2	Over-current protection of compressor 2
FC	Current sensor of compressor 2 is abnormal	J3	Over-current protection of compressor 3
FL	Current sensor of compressor 3 is abnormal	J4	Over-current protection of compressor 4
FE	Current sensor of compressor 4 is abnormal	J5	Over-current protection of compressor 5
FF	Current sensor of compressor 5 is abnormal	J6	Over-current protection for compressor 6
FJ	Current sensor of compressor 6 is abnormal	J7	Gas-mixing protection of 4-way valve
FP	Malfunction of DC motor	J8	High pressure ratio protection of system
FU	Malfunction of casing top temperature sensor of compressor 1	J9	Low pressure ratio protection of system
Fb	Malfunction of casing top temperature sensor of compressor 2	JA	Protection because of abnormal pressure
Fd	Malfunction of exit tube temperature sensor of mode exchanger	JC	Water flow switch protection
Fn	Malfunction of inlet tube temperature sensor of mode exchanger	JL	Protection because high pressure is too low
b1	Malfunction of outdoor ambient temperature sensor	JE	Oil-return pipe is blocked

Error Code	Content	Error Code	Content
b2	Malfunction of defrosting temperature sensor 1	JF	Oil-return pipe is leaking
b3	Malfunction of defrosting temperature sensor 2	P0	malfunction of driving board of compressor (uniform)
b4	Malfunction of liquid temperature sensor of sub-cooler	P1	Driving board of compressor operates abnormally (uniform)
b5	Malfunction of gas temperature sensor of sub-cooler	P2	Voltage protection of driving board power of compressor (uniform)
b6	Malfunction of inlet temp sensor of gas-liquid separator	P3	Reset protection of driving module of compressor
b7	Malfunction of outlet temp sensor of gas-liquid separator	P4	Drive PFC protection of compressor
b8	Malfunction of outdoor humidity sensor	P5	Over-current protection of inverter compressor
b9	Malfunction of gas temperature sensor of heat exchanger	P6	Drive IPM module protection of compressor
bA	Malfunction of oil-return temperature sensor 1	P7	Malfunction of drive temperature sensor of compressor
bH	Clock of system is abnormal	P8	Drive IPM high temperature protection of compressor
bE	Malfunction of inlet tube temperature sensor of condenser	P9	Desynchronizing protection of inverter compressor
bF	Malfunction of outlet tube temperature sensor of condenser	PA	Malfunction of drive storage chip of compressor
bJ	High-pressure sensor and low-pressure sensor are connected reversely	PH	High-voltage protection of compressor's drive DC bus bar
bP	Malfunction of temperature sensor of oil-return 2	PC	Drive current detection circuit malfunction of compressor
bU	Malfunction of temperature sensor of oil return 3	PL	Low-voltage protection of compressor's drive DC bus bar
bb	Malfunction of temperature sensor of oil return 4	PE	Phase-lacking of inverter compressor
bd	Malfunction of air inlet temperature sensor of subcooler	PF	Drive charging circuit malfunction of compressor
bn	Malfunction of liquid inlet temperature sensor of subcooler	PJ	Failure startup of inverter compressor
H0	Malfunction of driving board of fan (uniform)	PP	AC current protection of inverter compressor
H1	Driving board of fan operates abnormally (uniform)	PU	AC input voltage of drive of inverter compressor
H2	Voltage protection of driving board power of fan (uniform)	G0	PV reversed connection protection
H3	Reset protection of driving module of fan	G1	PV Anti-islanding protection
H4	Drive PFC protection of fan	G2	PV DC overcurrent protection
H5	Over-current protection of inverter fan	G3	PV power generation overload
H6	Drive IPM module protection of fan	G4	PV leakage current protection
H7	Malfunction of drive temperature sensor of fan	G5	Phase-lacking protection at power grid side
H8	Drive IPM high temperature protection of fan	G6	Phase-lacking protection at power grid side
H9	Desynchronizing protection of inverter fan	G7	PV LVRT
HA	Malfunction of drive storage chip of inverter outdoor fan	G8	Overcurrent protection at power grid side
HH	High-voltage protection of fan's drive DC bus bar	G9	Drive IPM module protection at power grid side
HC	Drive current detection circuit malfunction of fan	GA	Low/high input voltage protection at power grid side
HL	Low-voltage protection of fan's drive DC bus bar	GH	Photovoltaic DC\DC protection
HE	Phase-lacking of inverter fan	GC	Photovoltaic DC hardware overcurrent protection
HF	Drive charging circuit malfunction of fan	GL	Grid side hardware overcurrent protection
HJ	Failure startup of inverter fan	GE	High or low photovoltaic voltage protection

Error Code	Content	Error Code	Content
HP	AC current protection of inverter fan	GF	DC bus neutral-point potential unbalance protection
HU	AC input voltage of drive of inverter fan	GJ	Grid side module high-temperature protection
Gd	Grid side current sensor protection	GP	Grid side temperature sensor protection
Gn	Insulation resistance protection	GU	Charging circuit protection
Gy	Unrecoverable error of grid drive (photovoltaic)	Gb	Grid side relay protection

Debugging:

Error Code	Content	Error Code	Content
U0	Preheat time of compressor is insufficient	Cd	Communication malfunction between mode exchanger and ODU
U2	Wrong setting of ODU's capacity code/jumper cap	Cn	Malfunction of network for IDU and ODU of mode exchanger
U3	Power supply phase sequence protection	Cy	Communication malfunction of mode exchanger
U4	Refrigerant-lacking protection	C0	Communication malfunction between IDU, ODU and IDU's wired controller
U5	Wrong address for driving board of compressor	C1	Communication malfunction between main control and DC-DC controller
U6	Alarm because valve is abnormal	C2	Communication malfunction between main control and inverter compressor driver
U7	Power grid DRED0 response protection	C3	Communication malfunction between main control and inverter fan driver
U8	Short-circuit malfunction of IDU	C4	Malfunction of lack of IDU
U9	Malfunction of pipe-line for ODU	C5	Alarm because project code of IDU is inconsistent
UA	DC bus overvoltage protection at power grid side	C6	Alarm because ODU quantity is inconsistent
UH	DC bus undervoltage protection at power grid side	C7	Abnormal communication of converter
UC	Setting of main IDU is successful	C8	Emergency status of compressor
UL	Emergency operation DIP switch code of compressor is wrong	C9	Emergency status of fan
UE	Charging of refrigerant is invalid	CA	Emergency status of module
UF	Identification malfunction of IDU of mode exchanger	CH	Rated capacity is too high
UJ	FO protection for PV module	CC	Malfunction of lack of main control unit
Ud	Grid-connected driver board error	CL	Rated capacity is too low
Un	Communication malfunction between main control and inverter	CE	Communication malfunction between mode exchanger and IDU
Uy	Over-temperature protection for PV module	CF	Malfunction of multiple main control units
CU	Communication malfunction between IDU and the receiving lamp plate	CJ	Address DIP switch code of system is shocking
Cb	Overflow distribution of IP address	CP	Malfunction of multiple main wired controllers

Status:

Error Code	Content	Error Code	Content
A0	Unit waiting for debugging	n0	SE operation setting of system
A2	Refrigerant recovery operation of after-sales	n3	Compulsory defrosting
A3	Defrosting	n4	Limit setting for max. capacity/output capacity
A4	Oil-return	n5	Compulsory excursion of engineering code of IDU
A6	Heat pump function setting	n6	Inquiry of malfunction
A7	Quiet mode setting	n7	Inquiry of parameters

Error Code	Content	Error Code	Content
A8	Vacuum pump mode	n8	Inquiry of project code of IDU
AH	Heating	n9	Check quantity of IDU on line
AC	Cooling	nA	Heat pump unit
AL	Charging refrigerant automatically	nH	Heating only unit
AE	Charging refrigerant manually	nC	Cooling only unit
AF	Fan	nE	Negative sign code
AJ	Alarm for cleaning filter	nF	Fan model
AP	Debugging confirmation for startup of unit	nJ	High temperature prevention when heating
AU	Long-distance emergency stop	nU	Eliminate the long-distance shielding command of IDU
Ab	Emergency stop of operation	nb	Bar code inquiry
Ad	Limit operation	nn	Length modification of connection pipe of ODU
An	Child lock status	Ay	Shielding status

8 Maintenance and Care

Regular check, maintenance and care can extend unit's service life. Please have specialized person in charge of the management of air conditioners.

8.1 Outdoor Heat Exchanger

Outdoor heat exchanger shall be cleaned regularly, which is at least once every two months. You can use a dust catcher with nylon brush to clean away the dust on the heat exchanger. If compressed air source is available, it also can be used to clean the heat exchanger. Do not clean it with water.

8.2 Drain Pipe

Please check regularly whether drain pipe is blocked or not. Make sure condensate can be drained out smoothly.

8.3 Notice before Seasonal Use

- (1) Check whether air inlets and air outlets of indoor and outdoor units are blocked.
- (2) Check whether ground connection is reliable or not.
- (3) Check whether batteries in the remote controller are replaced or not.
- (4) Check whether air filter is properly installed.
- (5) If unit starts up after not operating for a long time, it should be power on 8 hours before operation starts so as to preheat the outdoor compressor.
- (6) Check whether outdoor unit is securely installed. If there is any problem, please contact Gree authorized service center.

8.4 Maintenance after Seasonal Use

- (1) Disconnect power of the entire system.
- (2) Clean the air filter and outer case of indoor and outdoor units.
- (3) Clean away the dust and obstacles on indoor and outdoor units.
- (4) If outdoor unit has rust, please apply some paint to it so as to prevent the rust from growing.

8.5 Parts Replacement

Parts and components can be obtained from nearby Gree office or Gree distributor.

WARNING

When you are conducting air tightness test and leakage test, do not mix oxygen, C₂H₂ or other dangerous gas into the refrigerant circuit. Otherwise, it may lead to danger. Use nitrogen or refrigerant to conduct the tests.

9 After-sales Service

If there's quality defect or other problems in the product, please contact Gree local after-sales service department for help.

Warranty must be based on the following conditions:

- (1) Product's initial startup must be performed by professional technicians from Gree service center or persons assigned by Gree.
- (2) Only Gree spare parts are used.
- (3) All instructions of unit operation and maintenance in this manual must be strictly followed according to set period and set frequency.
- (4) Any breach of the above conditions will disable the warranty.

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