




Technical Sales Guide


ERV+DX coil


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1 Safety Notices (Please be sure to follow)



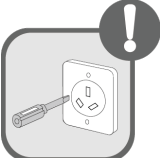





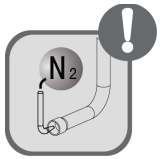







 **WANGER!** If you do not follow these instructions exactly, the unit may get severely damaged or cause personal injury or death.

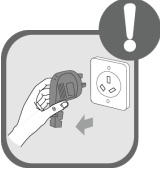



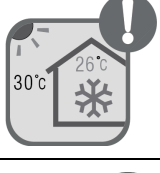
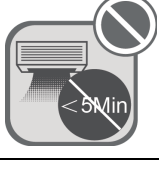
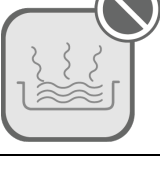

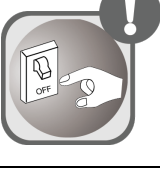
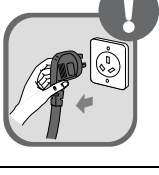
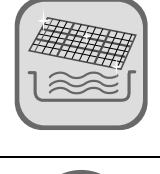


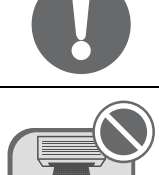


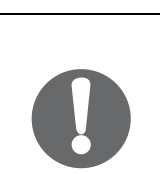



 **CAUTION!** If you do not follow these instructions exactly, the unit may have minor or moderate damage or cause personal injury.

 **NEVER ATTEMPT!** Improper operation may result in death or serious injury.

 **BE SURE TO OBSERVE!** Improper operation may lead to personal injury or property damage.

 **WARNING!** This product can't be installed in corrosive, inflammable, explosive or oily environments or places with special requirements (for example, a kitchen). Otherwise, the unit will not be able to operate normally, have a shorter service life, or even cause fire hazard or serious injury. As for such places, please adopt special air conditioners with anti-corrosive or anti-explosion feature.

	Please install the unit according to the instructions in this manual. Read this manual carefully before starting up or checking the machine.		Installation should be performed by the distributor or qualified technicians. Do not install the product by yourself. Improper installation may result in water leakage, electric shock or fire hazard
	Before installation, please check the power cord if it is in accordance with the specifications on the nameplate. Make sure the power is safe.		The air conditioner must be properly grounded through a power receptacle to avoid electric shock. The grounding wire shouldn't be connected with a gas pipe, water pipe, lightning arrester or a telephone line.
	When installing, specialized accessories and parts must be used; otherwise water leakage, electric shock, fire hazard may occur.		R410A refrigerant can produce poisonous gas once it meets fire, so please ventilate the room immediately if refrigerant leaks out during installation.
	A damaged power cord or connecting wire must be replaced with a specialized electric cable by a professional technician.		If the power cord is to be connected, please put back the cover of electric box after connecting the cord to avoid danger.
	Nitrogen must be charged according to technical requirements.		Connect power 8 hours before operation. Do not disconnect power if you want to stop the unit in a short period of time, e.g. in one night. (This is for protecting the compressor.)
	For units that adopt wired control, do not connect power until the wired controller is well installed. Otherwise, the wired controller cannot be used.		When installation is finished, please check and make sure the drain pipe, pipeline and electric wires are all well connected so as to avoid water leakage, refrigerant leakage, electric shock and fire hazard.
	Never start or stop the air conditioner by inserting or removing the power cord.		Never put your finger or any object into the air outlet or air grille.
	Children under the age of 12 and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge shall not operate this appliance.		Do not operate the machine with wet hands.

	Please turn the unit off and unplug the unit before cleaning. Otherwise, it may cause electric shock or personal injury.		Do not spray water on this product or wash the inside of the unit with water; otherwise, it will cause malfunction or electric shock.
	Do not expose this product directly to water or place it in a damp or corrosive environment.		Do not repair this product by yourself. Incorrect work will cause electric shocks or fire. Please contact GREE service center for repairs.
	During cooling mode, indoor temperature should not be set too low. Keep the difference between indoor temp and outdoor temp within 5°C.		Do not turn off the unit until it runs for at least 5 minutes. Otherwise, oil return of the compressor will be affected.
	Volatile liquid like thinner or gasoline will damage the appearance of this product. (Please use soft dry cloth and wet cloth with mild detergent to clean the outer case of the machine.)		When installation is finished, please check and make sure the power cable and communication wires are well connected so as to avoid electric shock, short circuit and fire hazard.
	When an abnormality (such as a bad smell) occurs, stop the unit at once and disconnect power. Then contact GREE service center. If the unit continues to operate despite abnormal condition, it may be damaged and cause electric shocks or fire.		For safety concern, if the unit is not used for a long time, please remove the power plug.
	Please clean the air filter regularly. Keep the air filter clean.		Install a bird screen or a similar device at the external air vent.
	The outdoor air inlet must be far away from the exhaust port of flammable gas.		The air inlet must be located in a place where backflow of exhaust air will not occur.
	A service port of specific size must be reserved according to the instructions of installation.		In order to avoid incomplete combustion, which may lead to intoxication, keep heating appliances away from the air flow of the unit.
	For pipe fan and partition wall fan, mind the air from the open air duct or other appliances that produce open fire flowing back into the indoor side.		Please verify completely before using the appliance in special places (for example, places where there are precision instruments, food and art works).
	For non-professionals, never touch the fan volute or other movable parts, as it may result in injury.		Due to the limitation of the detection principle of air quality detector, in places where humidifiers or aroma diffusers are used, the air quality detector will inevitably produce different deviations. This is a normal phenomenon.

2 Product

2.1 Outline Dimensions

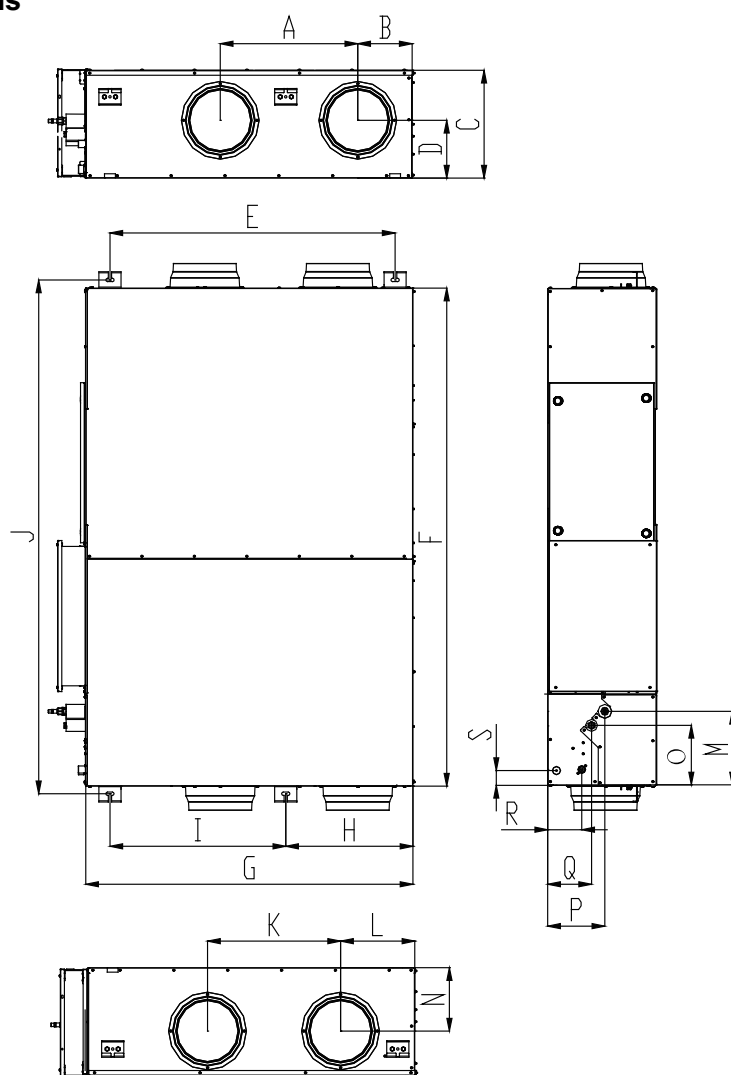


Figure 2-1 GMV-VDR10PH/SA-S GMV-VDR8PH/SA-S

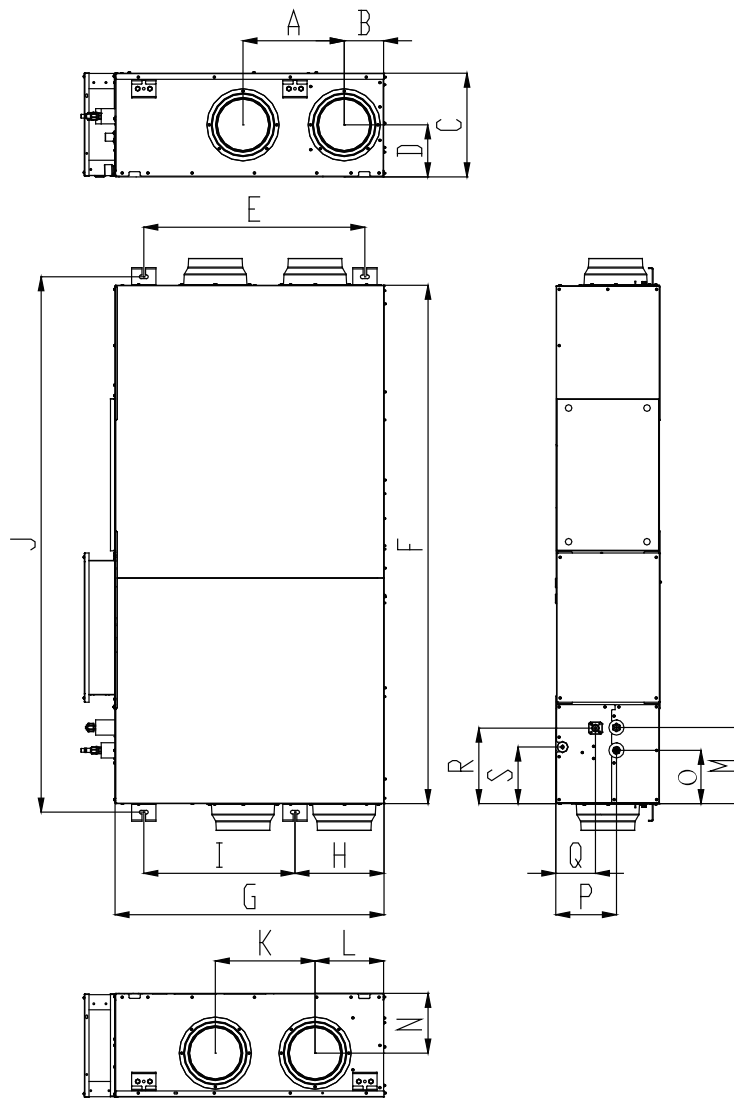


Figure 2-2 GMV-VDR5PH/SA-S

Table 2.1.1 Outline Dimensions

Measuring unit: mm

Model	A	B	C	D	E	F	G	H	I	J
GMV-VDR5PH/SA-S	333	130	340	170	727	1700	880	292	498	1762
GMV-VDR8PH/SA-S	498	197	390	210	1033	1800	1185	458	637	1861
GMV-VDR10PH/SA-S										
Model	K	L	N	M	O	P	Q	R	S	
GMV-VDR5PH/SA-S	328	226	196	250	175	200	130	247	185	
GMV-VDR8PH/SA-S	482	268	230	268	217	207	159	123	53	
GMV-VDR10PH/SA-S										



NOTE! Due to individual differences in production assembly, above figures may vary from those of the present products. Please refer to the actual dimensions of your product.

2.2 Performance Parameters

Table 2.2.1 Performance Parameters

Model	GMV-VDR5PH/SA-S	GMV-VDR8PH/SA-S	GMV-VDR10PH/SA-S
Power supply	220-240V~		
Rated frequency(Hz)	50/60		
Power input(W)	270	440	640
Cooling capacity(W)	8500	12000	14500
Heating capacity(W)	4000	10600	12000
Fresh air volume(m ³ /h)	500	800	1000
External static pressure (Pa)	150	150	150
Thermal efficiency(%)	73	74	73

Noise(dB)	55	59	62
Weight(kg)	120	158	158
Connection pipe size of duct type(mm)	200	250	250

**NOTES!**

- (1) Airflow volume data is the value tested under the condition of rated static pressure in high fan speed, subject to actual installation condition, there might be certain deviation.
- (2) The nominal static pressure is the static pressure tested acquiescently when leaving the factory, other high-level filter might affect unit performance parameter.

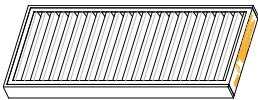
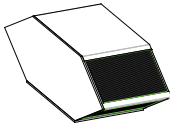
2.3 Parameters of Filter and Heat Exchange

Table 2.3.1 Performance parameter of filter core

Measuring Unit : mm

Model	GMV-VDR5PH/SA-S	GMV-VDR8PH/SA-S	GMV-VDR10PH/SA-S	Washable	Recyclable	Suggested replacement time
Rough filter	155×382×28	184×530×35		yes	no	Refer to the tips of wired controller after cleaning for 3 times
Heat exchanger core	268×386×382	330×450×522		no	no	2 years

Table 2.3.2 Filter and Heat Exchange

Rough filter (standard configuration)

Heat Exchange core




NOTE! Conduct cleaning and maintenance periodically for the fresh air side of filter and discharge side of filter.

3 Naming rules of product

3.1 Basic structure of model

GMV	—	□	□	□	□	□	□	□	/	□	□	□	□	□
1		2	3	4	5	6	7	8		9	10	11	12	13

3.2 Instruction for rules of model

Table 3.2.1 Instruction for rules of model

No.	Name	Instruction
1	product code	GMV
2	code of indoor unit	N- indoor unit V- energy-recovery ventilation unit
3	classification of residential unit and commercial unit	H- residential commercial: default
4	special functions	Y- solar energy Z- heating dry DC inverter - default
5	form of motor	D- DC motor AC motor: default
6	functional code	R- pure heat pump/ energy-recovery ventilation unit with cooling function L- cooling only unit X- fresh air unit W- dual heating source Q- heat recovery electric heating default: default
7	code of cooling refrigerant / air volume	Indoor unit: nominal cooling capacity / 100 (W) Energy-recovery ventilation unit: air volume/ 100 (m³/h)
8	classification of unit	PL-low static pressure duct type unit P-standard static pressure duct type unit PM-medium static pressure duct type unit PH-high static pressure duct type unit PB-thin duct type unit T- 4-way cassette type unit TX- compact cassette type unit (4-way air outlet) TD- 1-way cassette type unit TS- 2-way cassette type unit ZD- floor ceiling type unit A-Air handler ZK- combine unit C- console type unit G- wall-mounted unit ZA- horizontal concealed LA- vertical concealed

9	with water pump or not	S- with water pump
10	code of refrigerant	R410A default omitted
11	code of panel of wall-mounted unit	Use the panel code of residential product mode for export, such as "B3"
12	design serial number	Arrange according to the order of A, B, C.....
13	power supply	3 phase power-S



NOTE!“-S” in this series refers to the code of supplementary power supply.

4 Operating range of product

The recommended outdoor temperature range for operation is -25°C~48°C.

If the temperature of outdoor fresh air is over 48°C or less than -25°C, the inhaled fresh air may damage the internal components of unit, such as the heat exchange core freezes and destroys the internal structure of the unit body, the sensor damages, etc.

5 Installation of equipment

5.1 General specification

The user shall entrust professional HVAC engineer to conduct equipment model selection and engineering design, hire experienced construction company to complete the construction. The design and construction shall be consistent with related national stipulations and regulations. If engineering accidents occur due to incorrect installation, the user shall undertake the full responsibility. If equipment installation is not conducted according to stipulations and requirement and the device cannot operate normally, corresponding charges will be taken for product after-sales maintenance and services provided by our staffs.

This series of unit shall be used with multi VRF unit. It can be connected to the system by means of mixed connection. To avoid affecting the performance of indoor unit, the capacity sum of the connected fresh air unit and normal indoor unit shall between 50% ~ 100% of the capacity of outdoor unit. Among which, the capacity of the connected fresh air unit shall not exceed 30% of the capacity of outdoor unit; otherwise, it will affect user comfort, or even damage the unit.

5.2 Flow chart for engineering installation

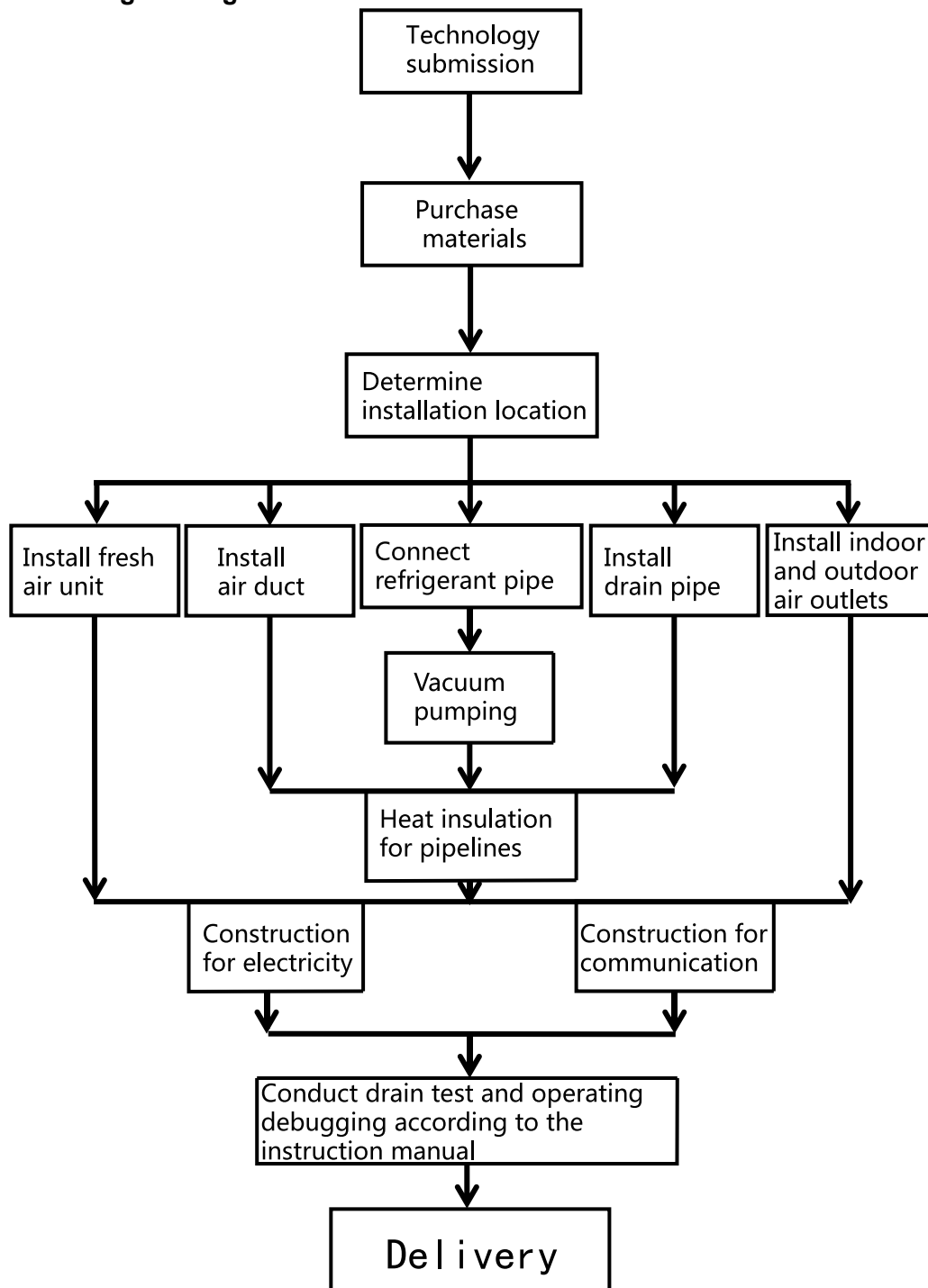




Figure 5-1 Flow chart for engineering installation

5.3 Preparation before installation

5.3.1 Safety requirements for installation and construction

- (1)  **WARNING!** Before the construction, all safety and related safety assessments must be carried out for all personnel involved in the installation and construction. In the event of violations, the relevant personnel must bear the responsibility.
- (2)  **WARNING!** During the entire installation and construction process, personal and property safety must always be placed first. The construction process must comply with relevant national safety regulations to avoid personal injury or property damage.

5.3.2 Importance of installation

Multi VRF fresh air system is a residential central air conditioning fresh air system. Some issues for the installation of the system may also impact the operating effect of the unit. Frequent problems that may occur during the installation are:

Table 5.3.1 Feedback table for problems of installation

No.	Installation problems	Influences
1	There are debris in the air duct (sands, dusts, etc.)	Impact the service life of filter, increase the initial resistance of air duct and filter.
2	Improper fixture of air duct or distortion	There is vibration or noise during operation of unit.
3	Heat insulation for air duct has not been well conducted	regions, condensation is likely to occur when the temperature difference between indoor and outdoor is large.
4	Installation space and inhalation space for fresh air unit is not sufficient	filter or maintaining motor may damage the indoor decoration or impact the air switch performance of unit due to sufficient space for maintenance.
5	Improper position of air inlet and outlet of fresh air unit	Not conducive to the arrangement of fresh air exhaust flow field
7	Wrong wire connection or invalid connection of linkage communication wire	system cannot report error normally and the unit cannot start up the linkage control.
8	Improper protection of linkage communication wire	communication wire is short-circuited or open-circuited, the unit reports communication error.
9	Heat insulation for refrigerant pipeline or condensate water pipeline does not meet the requirements	It is prone to condensation and dripping, destroying indoor decoration; in severe cases, it will cause overheating of the system and activate protection mode.
10	Condensate water pipeline is not well drained	It will cause water accumulation in indoor unit, affecting the normal operation of the system; water leak may damage the decoration of indoor unit.
11	Insufficient slope or incorrect connection of the condensate pipe	When the slope is inconsistent, it will cause water accumulation and water leakage in the indoor unit.
12	The refrigerant pipe is blocked or mixed with impurities and dust.	The cooling and heating effect of the unit is reduced; in severe cases, the compressor will be overheated for a long time; the impurities mixed into the lubricating oil will affect the lubrication effect and even burn the compressor.
13	Refrigerant piping exceeds piping requirements	The pipeline loss is too large, and the energy efficiency of the whole unit is reduced; it is not conducive to the long-term operation of unit. (Please refer to the instruction manual for configuration of outdoor unit)
14	Incorrect charging volume of refrigerant	The unit cannot properly control the flow distribution; the compressor is prone to conduct wet operation or overheating operation. (Please refer to the instruction manual for configuration of outdoor unit)
15	Refrigerant pipe leak	Insufficient circulating refrigerant in the unit, the cooling and heating effect of the unit is reduced; long-term operation is prone to cause overheating or even damage to the compressor.
16	No (nitrogen) or insufficient nitrogen charge when installing (welding) the refrigerant pipe	pipeline is blocked; the cooling and heating effect of the unit is reduced; the compressor is worn; in severe cases, the unit cannot operate normally or even burn the compressor.
17	Insufficient vacuum degree in the refrigerant piping system	The cooling and heating effect is degraded; protection often occurs thus the unit cannot work normally, and in severe cases, it will damage important parts such as the compressor.
18	Water is mixed into the refrigerant pipe	The compressor is prone to have copper plating, the efficiency is reduced, and abnormal noise is generated; the system is prone to occur ice blockage and cannot be operated normally.
19	Refrigerant piping specifications do not meet the configuration requirements	If the configuration specification is too small, the pipeline resistance will increase, which will affect the cooling and heating effect of the unit. If the configuration specification is too large, it will not only cause unnecessary waste, but also cause the system cooling and heating effect to decrease.

In order to ensure the quality of the installation, it is necessary to know whether the unit has special requirements for installation before installation. The relevant installer should have the corresponding engineering construction qualification. Otherwise, it must be trained by the professional technicians of the manufacturer and reach the standard before construction.

An electrician engaged in special operations during construction must have an operation permit and a corresponding vocational skill qualification certificate.

5.3.3 Cooperation

Quality of the engineering installation is inseparable from the cooperation with various professional personnel, which should be coordinated and meticulously organized with various fields such as architecture, structure, electrical, water supply and drainage,

fire protection and decoration. When the pipeline is arranged, it is necessary to avoid the automatic sprinkler of fire protection, and coordinately distribute it with electric, lighting fixtures and decorative surfaces, and arrange it reasonably.

(1) Requirements for construction

- 1) Special pipeline wells and wind shafts should be reserved, and the space for installation of equipment and related pipelines should be reserved as much as possible so that the equipment should be installed in the ceiling as much as possible.
- 2) Reserve holes and casings, pre-embedded pipe installation positions, etc.
- 3) The thread-through position of wall for the refrigerant pipe, duct pipe and drain pipe shall be reserved with holes or casing. Bearing girder must be laid with steel casing.

(2) Cooperation requirements for decoration engineering

- 1) Installation of the unit should not destroy the bearing structure and decorative style of the construction.
- 2) Style of air outlets and maintenance port should be comply with the decorative style.
- 3) Reserve installation space for indoor unit, air duct, refrigerant pipe, drain pipe, air outlets, maintenance port, wired controller, etc., the air supply or air return outlets should not be shielded; air supply outlet or air return outlet should not be too closed; maintenance port should facilitate the maintenance of unit; position of wired controller (if necessary) should be convenient to operate.
- 4) Indoor pipelines should adopt concealed installation by laying out inside the ceiling; all installation of pipelines should reduce the installation space as much as possible to avoid conflicting the decoration.


(3) Cooperation requirements for electricity

- 1) Reserve special route for electric wires, model of power supply and power consumption capacity should meet the using requirements;
- 2) If the air switch satisfies the requirements of unit or related national safety regulations.
- 3) If the regional power supply quality (including voltage fluctuation and interference clutter) meets the requirements of related national standard; if not, please actively cooperate to solve the problem.

5.3.4 On-site review of design drawings

The installation personnel should carefully read the design and drawings provided by the engineering designer, understand the design intent, review it according to the site conditions, and then write a detailed installation process.

Table 5.3.2 On-site review of design drawings

No.	Contents for confirmation	Results
1	<p>Capacity ratio of fresh air unit should not exceed 30% of the rated capacity of the outdoor unit. The total rated capacity of the indoor unit and the fresh air unit should be within 50% to 135% of the rated capacity of outdoor unit. If the rated capacity of the indoor units that are running at the same time exceeds 100% of the rated capacity of the outdoor unit, the actual capacity requirement cannot be met.</p> <p> NOTE! Exceedance of capacity will affect the using experience of users. The more Exceedance, the worse the system adjustment capability will be. When it exceeds 135% of configuration, it will even affect the reliability of the system. Please strictly comply with the capacity limit regulations.</p>	
2	<p>Whether the refrigerant piping design meets the operating requirements of unit:</p> <p>(1) Whether the total length of refrigerant pipelines meet the design requirements of unit.</p> <p>(2) Whether the height difference between indoor unit and outdoor unit meets the design requirement (please refer to related instruction of outdoor unit).</p> <p>(3) Whether the pipe diameter of cooling system and model of branch pipe meet the technical regulations (please refer to related instruction of outdoor unit).</p>	
3	<p>Whether the design of condensate water pipe meets the operating requirements of unit; draining method of condensate water of unit should be reasonable, slope of pipeline should meet the design requirements of unit.</p>	

4	Whether the total length of fresh air pipeline meets the design requirements of unit.	
5	Whether the installation position meets the installation space requirement of unit;	
	Whether the installation position of air outlets are reasonable; whether the position is conducive to the flow field distribution.	
	Whether sufficient space for maintenance has been reserved.	
6	Whether the installation of air duct meets the requirements (heat insulation, securement, etc.).	
7	Whether the air switch, specification of power cord, model, etc. satisfy the safety requirements of unit.	
8	Whether the manufacture, total length and control method of control wire meet the design requirements of unit.	



NOTE! Construction workers should strictly follow the design drawings. In the process of construction, if it is unable to meet the design requirements, it must be approved by the designer and form a written document (design change record).

5.3.5 Selection of installation materials

Materials and equipment used in the construction shall have a certificate of conformity and a test report. Products with fire protection requirements shall have fire test certificates and comply with the relevant national and relevant mandatory standards. In addition, if the user requests the use of environmentally friendly materials, all materials must comply with the relevant national environmental requirements and provide relevant certification.

Preparation of tools;

(1) The tools used for installation of ventilation ducts and unit are divided into: general electric tools, electric machinery and common tools for ventilation and air-conditioning. General electric tools include the following:

1) Hand drill :

Purpose: Hand drill is the most widely used tool. It is equipped with a twist drill, which is mainly used for drilling metal parts, and is also suitable for drilling wood, plastic parts, etc.

2) Electric hammer:

Purpose: With hard alloy electric hammer drill bit to drill, groove, and chisel the concrete, rock, brick wall, etc.

3) Impact drill:

Purpose: Impact drill has two motion forms. When adjusted to the rotating state, the twist drill can be used with the impact drill as an electric drill; when it is adjusted to the rotating and impact state, it can be equipped with a hard alloy impact drill, which is suitable for drilling brittle materials such as brick, concrete and ceramics.

4) Polisher (grinding machine):

Purpose: With fiber-reinforced linear grinding wheels for the grinding of metal parts and cutting of profiles, opening of the groove before welding and cleaning of the work piece burrs; with diamond cutting pieces, it can cut non-metallic materials, such as tiles, stones, etc.; with special grinding wheel can grind glass; with wire brush for rust removal; with rubber pad and round sandpaper for sanding.

Preparation of materials

(1) Pipe material:

- 1) Pipe material of fresh air duct can select PVC pipe and PE pipe. Common size for air duct: $\Phi 75\text{mm}$, $\Phi 110\text{mm}$, $\Phi 160\text{mm}$, $\Phi 200\text{mm}$, 250mm
- 2) Condensate water pipes can adopt UPVC pipe, PP-R pipe, PP-C pipe and hot-dip galvanized steel pipe.
- 3) Pipe material of copper pipe should select dephosphorized seamlessly drawn copper tube, and the tensile strength should not be less than 240kgf/mm^2 .

Table 5.3.3 Specification of copper pipe

R410A refrigerant system	
Outer diameter (mm/inch)	Wall thickness (mm)
Φ6.35(1/4)	≥0.8
Φ9.52(3/8)	≥0.8
Φ12.70(1/2)	≥0.8
Φ15.9(5/8)	≥1.0
Φ19.05(3/4)	≥1.0

Note**NOTES!**

- ① The inner and outer surfaces of the pipeline shall be free of pinholes, cracks, peeling, blistering, inclusions, copper powder, carbon deposits, green rust, dirt and severe oxide film, and obvious defects such as scratches, pits and spots are not allowed.
- ② After the inside of the copper tube is clean and dry, the nozzle must be tightly sealed with a cap, plug or tape.

(2) Sheet material:

Sheet materials are also the major materials for the production of duct components, usually galvanized steel, ordinary low carbon steel, stainless steel, aluminum and so on.

1) Galvanized steel

Performance: the galvanized steel sheet is galvanized as a protective layer on ordinary steel Q195, Q235A sheet, and its specifications are the same as ordinary steel sheets, and the thickness is generally 0.5 to 1.5 mm. Because the surface of the galvanized sheet is silver-white, commonly known as "white iron", its surface is corrosion-resistant, generally needs not to paint, and usually used in the air duct system in the humid environment without acid mist.

2) Ordinary low carbon steel plate

Performance: ordinary low carbon steel plate is Q235-B (GB700-1988) steel, which is supplied by sheet and coil after cold rolling or hot rolling. It has good plasticity and processing properties, commonly known as "black iron", which is easy to process and can be welded, but it is easy to rust and often needs to be painted to prevent corrosion.

3) Stainless steel plate

Performance: stainless steel plates contain a lot of chromium, nickel, and some also contain copper. It has high temperature resistance and corrosion resistance, and its surface is generally white. Stainless steel contains different alloying elements and different corrosion resistance to different media. Suitable stainless steel materials can be selected according to the corrosive medium. Stainless steel sheets are often used in ducted systems that require corrosion resistance in chemical environments.

4) Aluminum plate

Performance: aluminum plates are divided into industrial pure aluminum plate and aluminum alloy plate. Aluminum plate has light weight, and the surface is covered by a dense layer of aluminum oxide film, the color is silver-white. Aluminum has good plasticity, strong acid resistance, and is easy to be corroded by alkali and salt, which is often used in ventilation ducts for acid-resistant environments. The aluminum plate is soft and does not easily generate sparks during collision. It is mostly used for ventilation pipes with explosion-proof requirements.

(3) Insulation materials

Main functions of insulation materials are cold insulation or heat insulation. Loose fibers and porous materials are often used as insulation materials. At present, the commonly used insulation materials are polystyrene (self-extinguishing type), that is, PE insulation board and foam rubber insulation material.

1) Polyethylene foam (PEF):

Features: it adopts the most advanced foaming technology in the country, with excellent thermal insulation performance and is soft, light, fireproof and corrosion resistant. It is mostly used in the insulation materials for construction, refrigeration storage, air conditioning and other equipment and low temperature pipeline; construction is simple and convenient.

2) Rubber and plastic insulation cotton:

Features: the product is made of high-quality nitrile rubber PVC as the main material and a variety of high-quality auxiliary materials foamed by special process. This product is a high foaming closed-cell structure with soft texture, low density, low thermal conductivity, good weathering resistance, wide temperature range, shock absorption, sound absorption, flame retardant, waterproof, etc., no pollution is generated during production and use. It is a green product.

Specification requirements for rubber foam tube:

Specification Requirements for Rubber Foam Tube:		
Air duct	Heat insulation thickness	Material
Pipe diameter	≥15	Rubber foam tube, flame retardant grade B1 or above
Installation in the wet environment should increase the thickness of the insulation material		

(4) Specification requirements of boom and support (please take damping measures when connecting pipes):

- 1) Boom: M10 (the same size as the standard fitting nut of fresh air unit)
- 2) Channel steel: 5# or above
- 3) Angle steel: equal sides 30mm×30mm×3mm or above
- 4) Round steel: overΦ10mm

5.4 Electricity Connecting


5.4.1 Requirements for Electric Installation

- Install units according to national wiring codes.
- Power cord must be reliably secured to avoid stress on wire terminal. Please connect wire according to the standard and make sure the unit operate normally. The connection wire between indoor unit and outdoor unit must apply the required electric wire and avoid stress on wire terminal, otherwise fire hazard may be caused.
- If the power cord and connection wire are damaged, it shall be replaced by the professionals with specialized wire.
- The wire shall not touch the refrigerant pipe, the fan or other parts.
- All electric installation must be performed by qualified personnel in accordance with local laws, regulations and this manual.
- Units must be properly grounded to specialized grounding device in the building. Please ask professionals to install.
- Air switch and circuit breaker that can disconnect power of the whole system must be installed.
- During installation, please install all-pole disconnection device with contact separation not less than 3mm in the power supply circuit.
- The circuit breaker should have both magnetic trip and thermal trip functions so as to protect the unit when short circuit or overload occurs.

5.4.1.1 Grounding Requirements

- Reliable grounding must be ensured. The yellow-green wire inside the unit is a ground wire, so it shall not be used for other purposes nor shall it be cut. Do not tighten it with tapping screws; otherwise it will cause risk of electric shock.
- Power supply must provide reliable grounding terminal. Do not connect the ground wire to the following:
 1. Water pipe; 2. Gas pipe; 3. Drain pipe; 4. Other places that are deemed as not reliable by professional personnel.

Table 5.4.1 Grounding Requirements

 WARNING!	
Before installation and maintenance, please cut off power supply to avoid electric shock. Please use the wire according to related configuration requirement. Otherwise it may lead to unit malfunction and hazards such as electric shock and fire hazard.	
Special statement	
If the users alter the electric control system by themselves without prior consent of our company, our company will not bear any responsibility for the abnormal results caused by this.	

5.4.1.2 Wiring Requirement

Dimension of power cord and capacity of air switch:

Table 5.4.2 Wiring Requirement

Model	Power specification	Circuit breaker capacity (A)	Wire diameter (mm ²)	
			Ground wire	Ground wire
GMV-VDR5PH/SA-S	220 - 240V~ 50/60Hz	6	3x1.0	3x1.0

GMV-VDR8PH/SA-S				
GMV-VDR10PH/SA-S				

**NOTES!**

- ① Selection of circuit breaker and power cord in the above table is based upon unit's maximum power (maximum current).
- ② Specification of power cord is based on the working condition where ambient temperature is 40°C and multi-core copper cable (working temperature is 90°C, e.g. power cable with YJV cross-linked copper, insulated PE and PVC sheath) is lying on the surface of slot (IEC 60364-5-52). If working condition is changed, please adjust the specification according to national standard.
- ③ Specification of circuit breaker is based on the working condition where ambient temperature of circuit breaker is 40°C. If working condition is changed, please adjust the specification accordingly.
- ④ Install cut-off device near the unit. The minimum distance between each stage of cut-off device should be 3mm.

5.5 Wiring Work

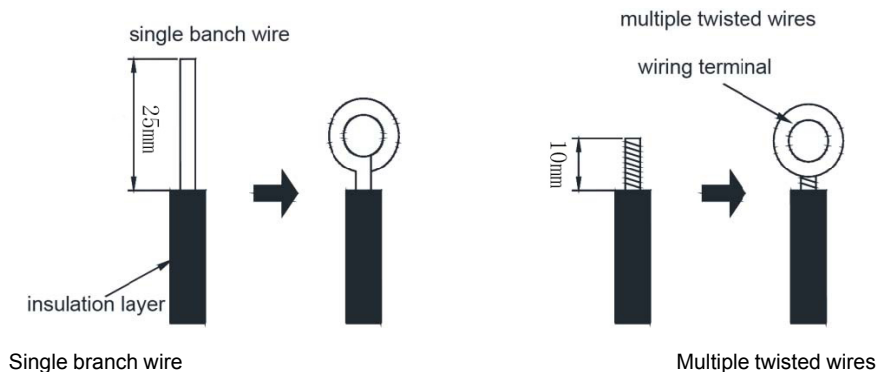
5.5.1 Connection of Wires and Wiring Board Terminals

(1) Connection of single branch wires

- 1) Use a stripper to strip away about 25mm of the insulation layer at the end of single branch line so that the single-core wire can be exposed.
- 2) Remove the wiring screws on the patch board.
- 3) Shape the tail of wire into ring by needle nose pliers, and keep the gauge of ring in accordance with screw.
- 4) Lead the screw across the circle of the single branch line and fix it on the wiring board.

(2) Connection of multi-twisted wires

- 1) Use a wired stripper to strip away about 10mm of the insulation layer at the end of multi-twisted wire.
- 2) Remove the screws on wiring board.
- 3) Use a round terminal fastener or pliers to securely fasten the round terminal with each core wire of the multi-core wire.
- 4) Confirm the position of each core wire on the round terminal and then use a screwdriver to tighten the terminal screw.



Connection of Power Cord :

- (1) The unit must be installed with circuit breaker independently which is used for short circuit protection and overload protection. The circuit breaker shall be closed in normal times.

(2) During operation, all outdoor units, fresh air units and outdoor units in the same system must be kept energized. Otherwise, the system cannot operate normally.

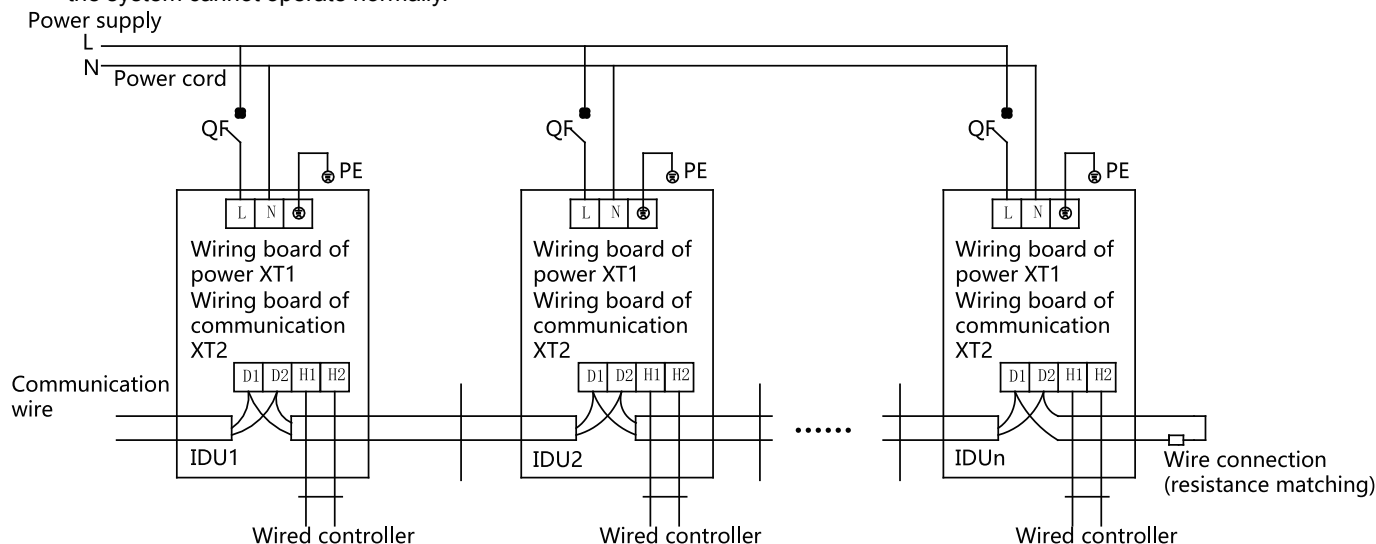


Figure 5-2 Diagram for System Electric Wiring



NOTE! Max indoor unit quantity n is according to the outdoor unit capacity. For more details, please refer to the unit capacity configuration.

5.5.2 Selection of Communication Wire

(1) Selection of Wired Controller Communication Wire

Table 5.5.1 Selection of Wired Controller Communication Wire

Type of wire	Total length of communication wire between unit and wired controller (m)	Wire diameter (mm ²)	Remarks
Light/Ordinary PVC sheathed twisted-pair copper core wire (PVVS)	L_{01} or $L_{02} \leq 10$	$2 \times 0.75 \sim 2 \times 1.5$	Total length of communication wire between unit and wired controller cannot exceed 10m
	$L \leq 250$		Total length of communication wire cannot exceed 250m
Shielded light/ordinary PVC sheathed twisted-pair copper core wire (RVVSP)	$L \leq 250$	$2 \times 0.75 \sim 2 \times 1.5$	If unit is installed in a place with intense magnetic field or strong interference, it's necessary to use shielded wire (RVVSP)

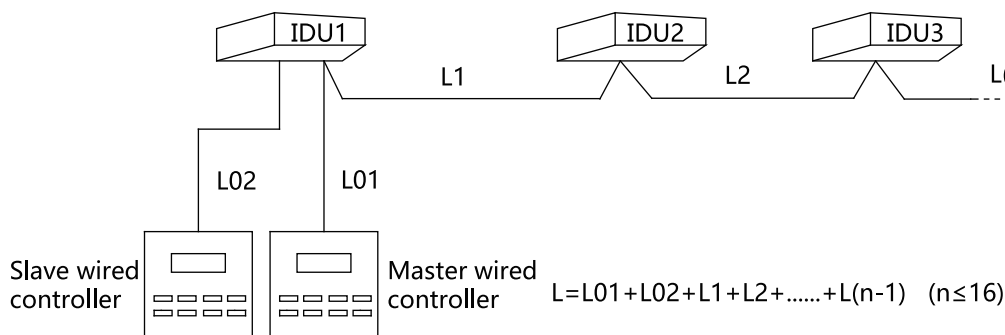


Figure 5-3 Diagram of Wired Controller Control Connection

(2) Selection of Communication Wire between Unit and VRF ODU

Table 5.5.2 Diagram of IDU and ODU Control Connection

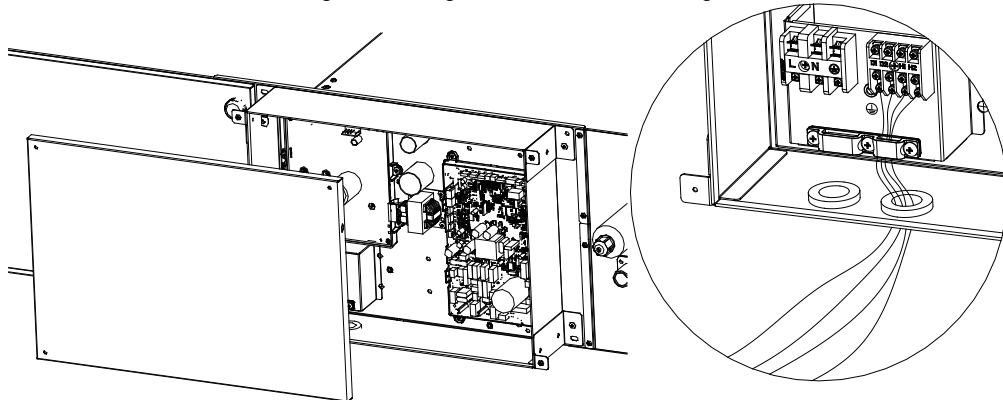
Type of wire	Total length of communication wire between unit and VRF ODU L (m)	Wire diameter (mm ²)	Remarks
Light/Ordinary PVC sheathed twisted-pair copper core wire (PVVS)	$L \leq 1000$	$\geq 2 \times 0.75$	The communication wire can be prolonged if the wire diameter is $2 \times 1 \text{ mm}^2$. But the total length of communication wire can't exceed 1500m
Shielded light/ordinary PVC sheathed twisted-pair copper core wire (RVVSP)	$L \leq 1000$	$\geq 2 \times 0.75$	If unit is installed in a place with intense magnetic field or strong interference, it's necessary to use shielded wire (RVVSP)

5.5.3 Connection of Communication Wire

Connection of Communication Wire between indoor unit and outdoor unit

- (1) Detach the electric box cover of indoor unit.
- (2) Let the communication wire go through the rubber ring.

Figure 5-4 Diagram of Electric Box Wiring



- (3) Connect the communication wire to terminal D1 and D2 of indoor 4-bit wiring board, as shown in the following figure.

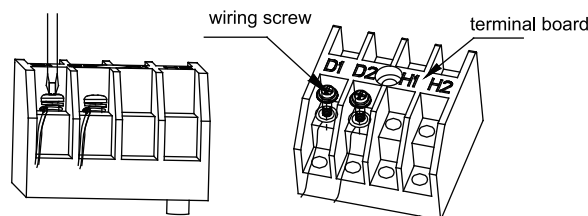


Figure 5-5 Diagram 1 of Wiring Board

- (4) Fix the communication cable with clamp of electric box.
- (5) In order to ensure the reliability of communication between IDU and ODU and the communication among each IDU, add a matched resistance (supplied in a package before ex-factory) on the wiring board of the last indoor unit in a series connection. The matched resistance should be connected in parallel between terminal screw D1 and D2, as shown in the following diagram.

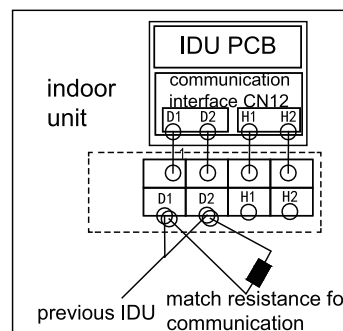


Figure 5-6 Diagram 2 of Wiring Board

Connection of Communication Wire of wired controller

- (1) Detach the electric box cover of indoor unit.
- (2) Let the communication wire of wired controller go through the rubber ring.
- (3) Connect the communication wire of wired controller to terminal H1 and H2 of indoor 4-bit wiring board.
- (4) Fix the communication cable of wired controller with clamp.

Wiring Instruction between Wired Controller and IDU Network

- (1) The communication between IDU and ODU and the communication among each IDU shall connect with D1 and D2.
- (2) The communication between IDU and wired controller shall connect with H1 and H2.
- (3) One indoor unit can connect two wired controllers (master wired controller and slave wired controller).

(4) One wired controller can control 16 indoor units in maximum at the same time.

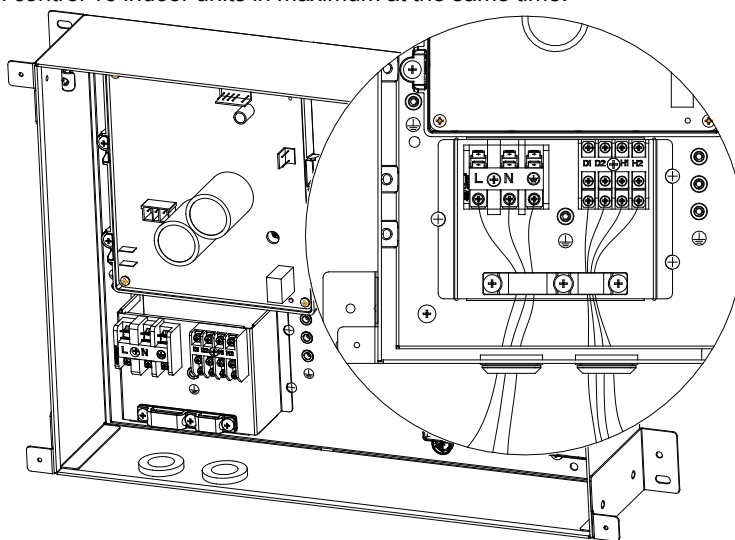


Figure 5-7 Diagram 3 of Wiring Board



NOTES!

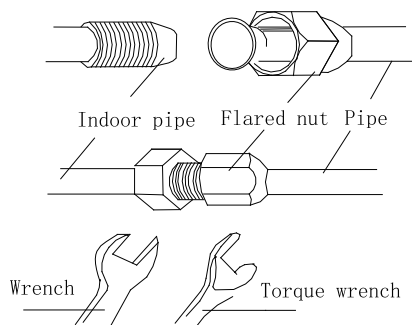
- (1) When one wired controller controls several indoor units at the same time, the indoor unit types must be identical. ERV+DX coil series wired controller can work with normal indoor units, but this wired controller can only be connected with the fresh air unit of this series and it is recommended that the indoor unit of this series shall not be set as master indoor unit.
- (2) When the indoor unit is controlled by two wired controllers, the addresses of the two wired controllers should be different through address setting. Address 1 is for master wired controller; Address 2 is for slave wired controller. Detailed setting please refer to the owner's manual of wired controller.

5.6 Installation for Pipeline

5.6.1 Installation for copper Pipeline

- (1) Direct the flared part of a copper pipe to the center of a screwed joint. Twist on the flared nut tightly by hand. See the diagram below.

Torque required for twisting a screw nut	
Pipe gauge (mm)	Twisting torque (N×M)
Φ6.35	15 ~ 30
Φ9.52	35 ~ 40
Φ12.7	45 ~ 50
Φ15.9	60 ~ 65



- (2) Use a torque wrench to twist on the flared nut until the wrench gives out a click sound.
- (3) The curvature of a pipe should not be too small; otherwise, the pipe may be cracked. Installers should use pipe benders to bend the pipes.
- (4) Use sponge to wrap the non-insulated connecting pipes and joints. Then tie them well with plastic tape.

5.6.2 Installation for Drain Pipes

Installation Requirement for Drain Pipes

- (1) Never connect the condensate drainage pipe with waste water pipes or other pipes that produce corrosive matters and peculiar smell; otherwise, the peculiar smell will enter into the room and the unit will be corroded.
- (2) Never connect the condensate drainage pipe with rainwater pipes; otherwise, the rainwater will flow back, resulting in property loss and personal injury.
- (3) The condensate drainage pipe must be connected to the drainage system specialized for the air conditioner.
- (4) The shorter the drainage pipe, the better it is. Keep it downward with an inclination of 1° ~ 2° or more so that the condensate can be easily drained away.

- (5) Apply thermal insulation for the drainage pipe. The insulation cotton used for thermal insulation of the drainage pipe is already provided in the package of accessories.

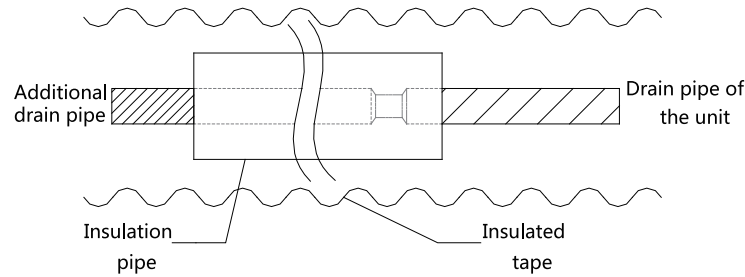


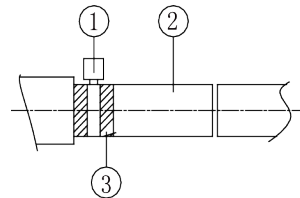
Figure 5-8 Thermal Insulation of Drain Pipes

- (6) If the drainage pipe is used for several appliances, the location of the drainage pipe should be 100mm lower than the drainage port of each appliance. In this case, use a thicker pipe.
- (7) Drain pipes are hard PVC types which can be bought locally. When connecting the pipes, insert the end of the PVC pipe into the drainage port and then use drainage hose and wire tie to tie them well. Do not use glue to fasten the drainage port and drainage hose.

Installation of Drainage Pipe

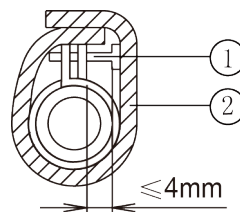
- (1) Insert the drainage hose into the drainage port and tie them with adhesive tape, as shown below.

1. Metal clamp (accessory)
2. Drainage hose (accessory)
3. Insulation cotton (accessory)

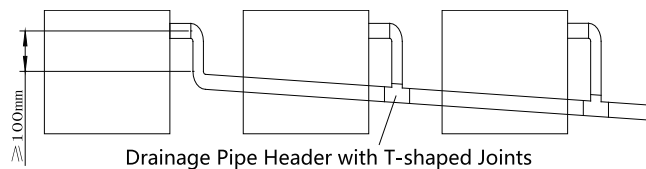


- (2) Twist on the pipe clamp. The distance between the nut and the hose is less than 4mm.
- (3) Gasket should be used for the thermal insulation of the pipe clamp and hose. (Thermal insulation should be done after the drainage test.) See the diagram below.

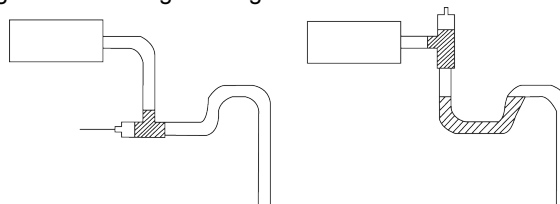
1. Metal clamp (accessory)
2. Insulation cotton (accessory)



- (4) If multiple drainage pipes are connected within a system, as show below, please select a drainage header that matches the capacity of the unit.

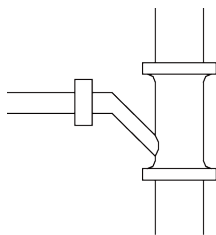


- (5) Please install water traps according to the following drawings.

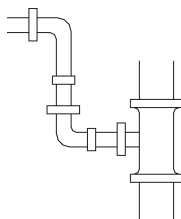


- (6) Each unit should have one water trap.
- (7) Water traps should be installed in a way that is easy for cleaning.
- (8) Horizontal pipes must not be connected with vertical pipes of the same level. Connect them in the following way:

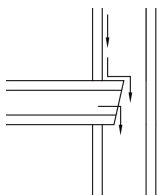
1) Below is the 3-way connection of drainage pipes:



2) Below is the connection of water bends:



3) Below is the connection of a horizontal pipe:



(9) Keep the drain pipe downward with an inclination of $1^\circ \sim 2^\circ$ or more. Therefore, install a supporter every 1000-1500mm.

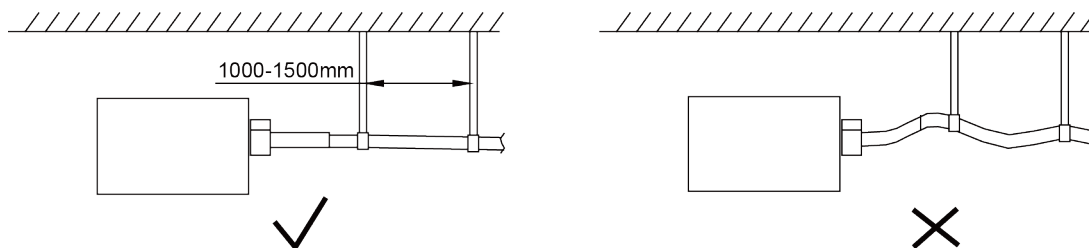


Figure 5-9

(10) Make sure the weight of drain pipes won't be borne by the unit.

5.7 Engineering Design

5.7.1 Engineering Design

(1) The inner filter and heat exchange filter core of the unit should be replaced periodically. To facilitate the maintenance of the key parts of the unit, please reserve some space for maintenance according to the following diagram. Dimensions of the maintenance space are as below.

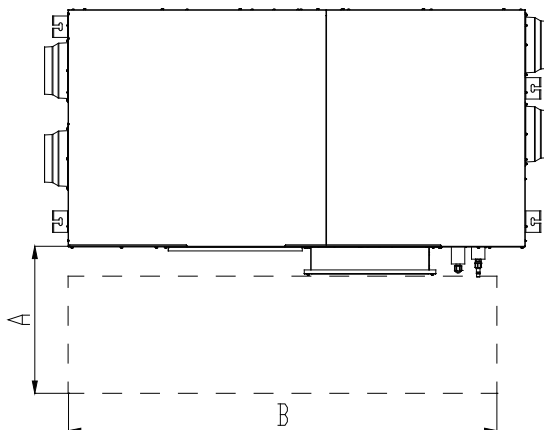


Figure 5-10 Maintenance Space

Table 5.7.1 Maintenance Space

Measuring unit: mm

Model	A	B	Pipe gauge
GMV-VDR5PH/SA-S	550	1725	200
GMV-VDR8PH/SA-S	680	1620	250
GMV-VDR10PH/SA-S	680	1620	250

Note

NOTE! Some parts of the unit may get loose during transport, so please check the screws of each part of the unit carefully before hoisting the unit, especially the movable parts.

(2) Positioning and Installation

- 1) You may place the package base (mounting cardboard) flat against the installation position. Install the unit according to the hole positions on the cardboard, as shown below.

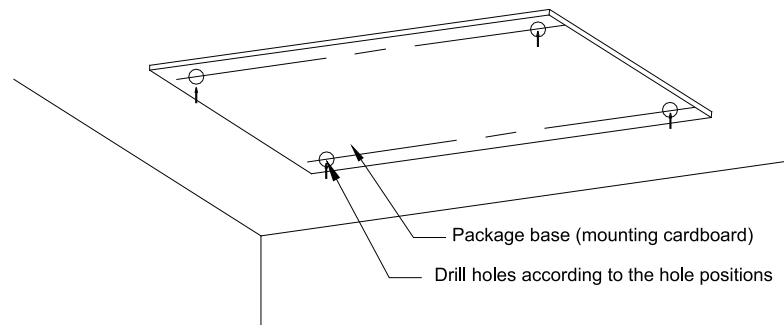


Figure 5-11 Hole Positions

- 2) When the unit is installed in place, use a level bar to adjust the levelness of the unit. Make sure the unit is horizontal from front to back and has an inclination of $0.5 \sim 1^\circ$ from side to side so that water can be drained through the drainage port.

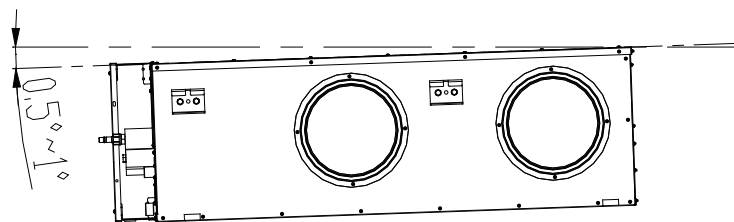


Figure 5-12 Inclination of the Unit

**NOTES!**

- (1) Make sure the installation location is strong enough to withstand the weight of the unit.
- (2) Add a spring rubber damping cushion if necessary.
- (3) The selected installation location won't affect water drainage and pipe connection.
- (4) If the unit is installed in a place where there is oil mist, oil gas or risk of leakage of inflammable gas, such as a kitchen, fire hazard may occur.
- (5) If the unit is installed in a humid place or near a bathroom, electric leakage or electric shocks may occur.
- (6) If radioactive or electromagnetic equipment is placed near the installation location, the unit may fail to work.
- (7) If the unit is installed in a place with high pH value or large voltage fluctuation, it may be damaged.
- (8) Power cables of indoor and outdoor units as well as connecting wires should be at least 1m away from TV and radios. This is to prevent the electric appliances from having image interference and noise. (If interference still occurs at a distance of 1m, please increase the distance or ask for professional help.).

5.7.2 Installation Requirement for Air Ducts

This product requires the user to prepare PVC ventilating ducts for outdoor air suction and indoor air discharge. Our unit adopts constant air volume control to ensure constant air volume within a certain range of pipe resistance. If the pipe resistance is beyond the designed value, air supply volume will be insufficient. Therefore, in order to prevent performance degrading due to improper pipeline design, please follow the principles recommended below during installation design.

- (1) The total length of air ducts should be based on the features of the using environment. The resistance of air ducts should not exceed the requirement for static pressure. Use non-flammable or in-combustible material.
- (2) Set as few bends as possible in the pipeline. For each pipeline, try to limit the number of bends under 3. Each bend should have a round curve instead of a right angle of 90°.
- (3) The inner surface of the pipeline is smooth, free of dust and wrinkles. The outdoor air inlet should be set in a place that is convenient for maintenance.
- (4) If you want the indoor noise to be as low as possible, you may add a silencer in the air ducts. The type of silencer should be selected based on actual requirements. Please consult professionals to select an applicable silencer. If the air ducts are equipped with a silencer, the air outlet noise will be lowered by 4~6 decibels.
- (5) When the unit is used in winter, the outside of the pipeline will be frosted after the dry and cold air enters the ducts; on the other hand, the inside of the pipeline will get easily frosted after the wet and warm air of the exhaust outlet enters the ducts.
- (6) The connecting ducts should be set with an inclination of not less than 0.03. The ducts should slant down to the outdoor side so that condensate and rainwater will not enter the unit.
- (7) If the unit is used in alpine regions or the air outlet is set in a place that faces the wind, please add an air damper to prevent the cold air from entering into the room.
- (8) Make sure the weight of air ducts will not be borne by the unit.
- (9) If necessary, use an air hose to connect the air suction duct and air discharge duct during engineering installation. When installing the hose, be sure it is smooth with no folds or sharp turns. The installation drawing is shown below.
- (10) Try to avoid using it if the resistance difference of pipeline at both sides of air outlet of fresh air unit is big.

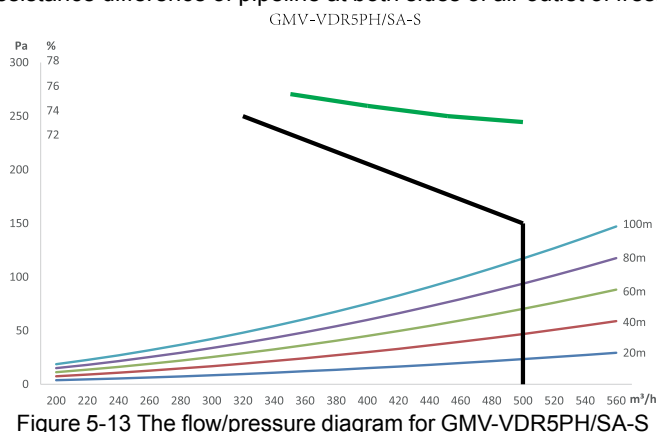


Figure 5-13 The flow/pressure diagram for GMV-VDR5PH/SA-S

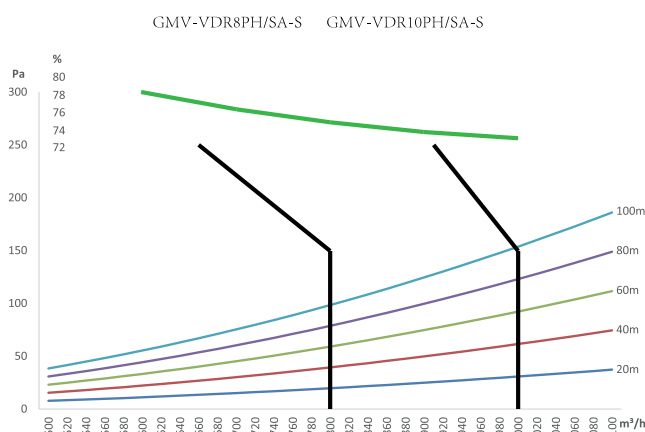


Figure 5-14 The flow/pressure diagram for GMV-VDR8PH/SA-S/GMV-VDR10PH/SA-S



NOTES!

- (1) The length of duct type on the curve is equal to that of straight pipe when friction coefficient is 0.02.
- (2) Before connecting air ducts, please finish the installation of the drainage system and test whether the drainage is normal.

5.8 Check and acceptance after installation

After installation, please check the items according to the following table.

Table 5.8.1 Engineering check and acceptance table

No.	Items for installation	Items for checking	Results
1	Unit	The unit has been effectively protected without damage	Passed <input type="checkbox"/> Not passed <input type="checkbox"/>
2	Air duct, air outlets	Check if the connection points of air duct is good without leak	Passed <input type="checkbox"/> Not passed <input type="checkbox"/>
		Check if the positions of air supply outlet and air return outlet are proper, if the air outlets are blocked.	Passed <input type="checkbox"/> Not passed <input type="checkbox"/>
		Check if the position and space for maintenance is proper. If there is space for air return and air intake.	Passed <input type="checkbox"/> Not passed <input type="checkbox"/>
3	Refrigerant pipe and drain pipe	Check if refrigerant pipe has completed the air proofness verification.	Passed <input type="checkbox"/> Not passed <input type="checkbox"/>
		Check if the drain pipe has completed the drain test.	Passed <input type="checkbox"/> Not passed <input type="checkbox"/>
4	Heat insulation	Check if the heat insulation thickness of air duct, refrigerant pipe and drain pipe meet the requirements.	Passed <input type="checkbox"/> Not passed <input type="checkbox"/>
		Check if the heat insulation of air duct, refrigerant pipe and drain pipe is well conducted.	Passed <input type="checkbox"/> Not passed <input type="checkbox"/>
		Whether the burning grade of heat insulation material meets the requirements of fire protection	Passed <input type="checkbox"/> Not passed <input type="checkbox"/>
5	Electricity	Check if the unit use a dedicated power supply and the power supply meets the nameplate requirements.	Passed <input type="checkbox"/> Not passed <input type="checkbox"/>
		Check if the overlap-connected power cord (if necessary) and air switch meet the requirements of unit.	Passed <input type="checkbox"/> Not passed <input type="checkbox"/>
		Check if the arrangement of wires is reasonable; make good protection for the pipelines.	Passed <input type="checkbox"/> Not passed <input type="checkbox"/>
		Check if the power cord and linkage communication wire are arranged separately.	Passed <input type="checkbox"/> Not passed <input type="checkbox"/>
		Check if the power cord, linkage communication wire and earth wire are correctly connected according to the wiring diagram.	Passed <input type="checkbox"/> Not passed <input type="checkbox"/>
Remarks			



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