

Note:

Gree is committed to continuously improving its products to ensure the highest quality and reliability standards, and to meet local regulations and market requirements.
All features and specifications are subject to change without prior notice.
All images provided in this catalogue are used for illustration purposes only.
Copyright© Gree Electric Appliances, Inc. of Zhuhai. All rights reserved.



VRF PRODUCT CATALOGUE



GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI

Contact add.: West jinji Rd, Qianshan, Zhuhai, Guangdong, China 519070

Tel: (+86-756)852 2218 Fax: (+86-756)866 9426

Email: gree@cn.gree.com Http://www.gree.com

HONG KONG GREE ELECTRIC APPLIANCES SALES LIMITED

Add.: Unit 2612, 26/F., Miramar Tower 132 Nathan Road, TST, Kowloon, HK

Tel: (852) 3165 8898 Fax: (852) 3165 1029

GC-2408-06



ABOUT GREE

Gree Electric Appliances, Inc. of Zhuhai was founded in 1991 and was listed on the Shenzhen Stock Exchange in November 1996. At the beginning, Gree was only a company that assembled residential air conditioners. Now it has grown into a diversified global technological industrial group that has expanded its business to household consumer goods and industrial equipment under three brands: GREE, KINGHOME and TOSOT.

2023

Gree's sales revenue in 2023 exceeded **29.08 billion** USD, up by **7.82%** year-on-year.

Gree entered into the list of Forbes Global 2000 again and **ranked 331, up 25 places compared with the previous year.**

2022

Gree has ranked the **487th** on the list of **Fortune Global 500.**

2019

Gree entered into **Fortune Global 500.** Gree's return on equity (ROE) ranked the first among the 129 Chinese enterprises on the list.

2018

Gree entered into the list of **Forbes Global 2000** again and ranked **No. 294**, moving up 70 places compared with the previous year.

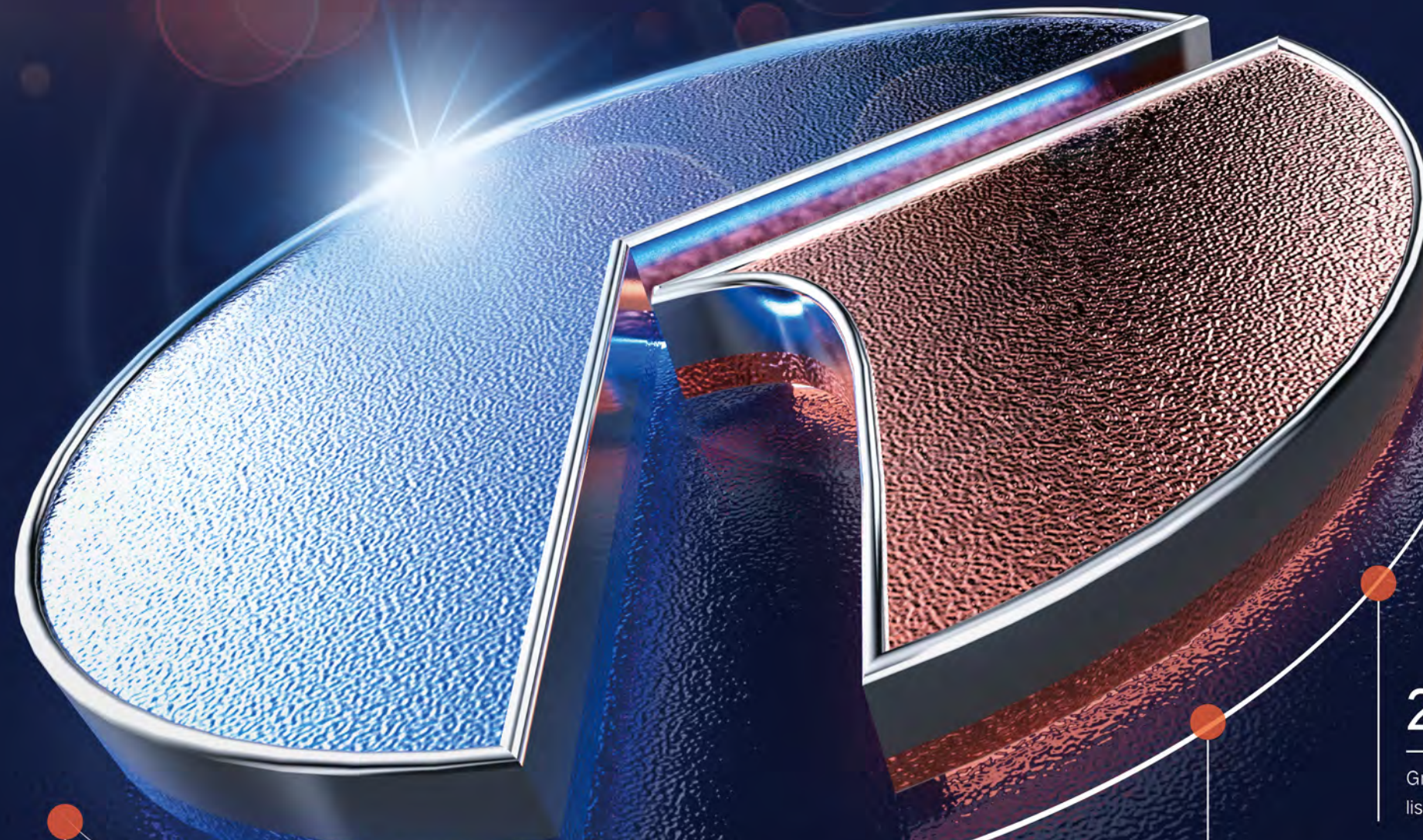
Gree's sales revenue exceeded **30.23 billion** USD.

2017

Gree's sales revenue exceeded **22.21 billion** USD.

2016

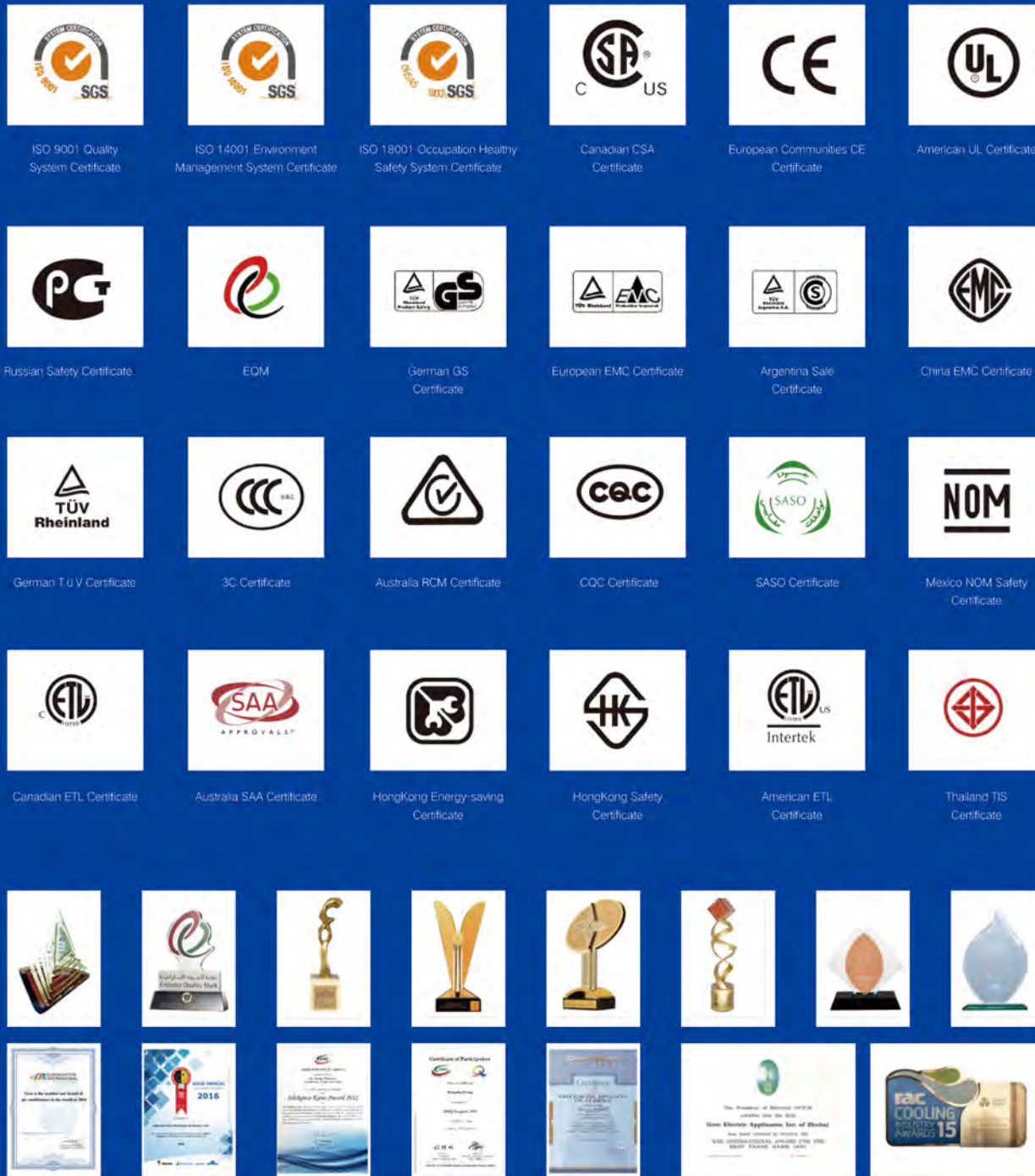
Gree's sales revenue exceeded **16.51 billion** USD.



Gree products are sold widely to more than 190 countries and regions.

Action makes the future and innovation makes achievement. Looking forward, Gree will press ahead with its business philosophy of passion, innovation and realization. We aim to build a centenary air conditioning enterprise and create a better life for humankind.

COMPANY AWARDS AND CERTIFICATES



CONTENTS

03

GMV6

77

GMV6 HR

111

GMV X Heat Pump

123

GMV X Cooling Only

137

Indoor Unit Features

169

Indoor Unit Specifications

187

Healthy Products

197

Intelligent Control

225

Project References

Development History

Development History of Multi VRF Air Conditioner (Heat Pump)

Year	Product	Features
1998	—	High-end VRF technology started to develop. Different from other domestic brands that directly purchased complete units and technologies from other countries, Gree insisted on independent innovation.
Dec. 1999	The first generation of intelligent multi VRF unit	One of the earliest manufacturers that entered the field of multi VRF unit in the domestic home appliances industry.
Jan. 2002	The second generation of GMV digital multi VRF air conditioner	Broke the monopoly of Japanese brands in the field of multi VRF unit, occupied the high-end market of multi VRF unit in the field of central air conditioner.
May 2004	The third generation of AC inverter multi VRF unit	Mastered inverter and stepless speed adjustment technology, realized new breakthrough in energy conservation of air conditioner.
Aug. 2008	The fourth generation of DC inverter multi VRF modular unit	Based on modular design, the capacity can range from 8 to 64HP. It broke the limit in the industry that a maximum of 3 modules were allowed, satisfying larger market demands.
Dec. 2012	GMV5 all DC inverter multi VRF unit	With brand new system design concept, it has achieved many breakthroughs in many aspects such as comfort, smart control, design freeness.
Oct. 2018	GMV6 multi VRF unit	With new generation industrial leading multi VRF unit CAN+ communication technology. Brand new system design, operating temperature can be up to 55°C, more suitable to the Middle East with high temperature, high humidity, high dryness, high altitude and foreland environment.

Development History of Multi VRF Air Conditioner (Heat Recovery)

Year	Product	Features
May 2006	The first generation heat recovery digital multi VRF air conditioner	Comfortable indoor cooling and heating, digital multi VRF heat recovery technology with independent intellectual property rights, and the five major operating modes can be switched freely, which further promoted energy-saving and environmental protection technologies for commercial air conditioners.
Nov. 2009	The second generation heat recovery multi VRF modular unit	Modular design concept, with DC inverter technology and sectional heat exchanger design, heat recovery energy efficiency improved by 30%, reaching the industrial leading level.
Dec. 2014	The third generation heat recovery multi VRF air conditioner (GMV5 HR)	Upgraded comfort and energy efficiency, heat recovery energy efficiency can be up to 8.0.
Dec. 2019	The fourth generation heat recovery multi VRF air conditioner (GMV6 HR)	Heat recovery energy efficiency can be up to 9.0, integrated with multiple functions such as cooling, heating, water heating, floor heating.

Technical Support

VRF Selector

Selection software is an essential tool for the sales of VRF system in overseas market. Gree has provided a smart, rapid and diversified selection software for customers in order to respond the urgent demand for export sales, meet the diversified needs of export market and enhance the competitiveness of Gree products in overseas market.

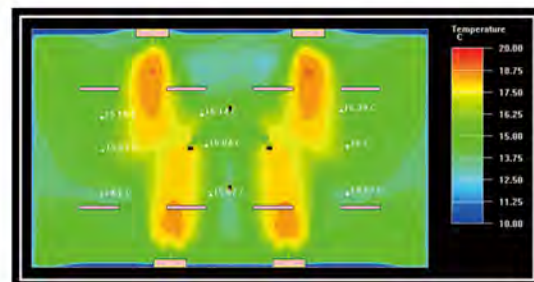
The software can find the suitable unit and piping through automatic calculation to get the most optimal scheme by combining the factors, such as the ambient temperature, operation site, reliability and comfort, etc. It has greatly improved the efficiency of software modeling by visual modeling and intelligent fast wiring.



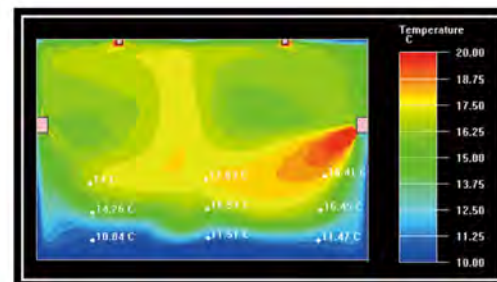
Simulation

Based on CFD-Fluent, Gree provides wind field/temperature filed simulation computing service for overseas customers. This technology is used to simulate and calculate complex flows that are incompressible to a highly compressible range. CFD-Fluent is based on the finite-volume algorithm of unstructured grids, and it has the gradient algorithm of grid nodes and grid cells at the same time.

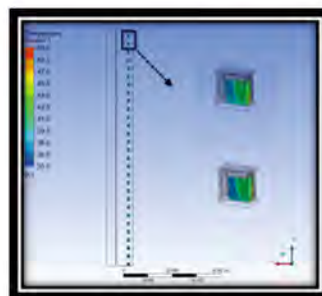
Gree can provide customers with professional wind field/temperature filed simulation computing services because it has rich research experience in transition and turbulence, heat transfer and phase transition, chemical reaction and combustion, multiple flow, noise, etc.



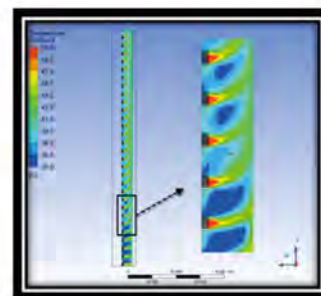
Simulated plane room temperature field distribution in a project



Simulated 3D room temperature field distribution in a project



Airflow simulation diagram



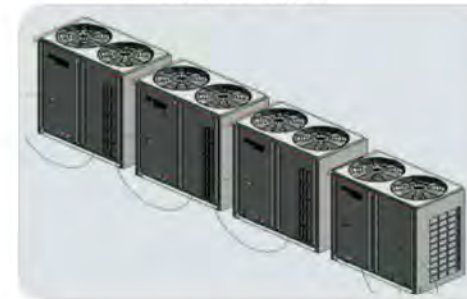
Building airflow simulation

BIM

Gree Overseas Technical Support Center provides building information modeling technical support in HVAC design for overseas projects and customers, and it is called BIM-revit for short.

At present, this Center has begun to take shape in the research of 3D modeling of HVAC system, unit data information, HVAC system informatization, electromechanical system informatization and system simulation operation in BIM-revit. It can provide a full range of technical support services for the owners on the aspect of visualization, refine and rationalization of HVAC system, production efficiency and cost-saving.

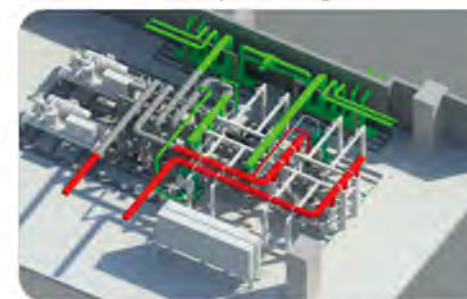
BIM model diagram



Outdoor unit rendergraph



Unit layout drawing

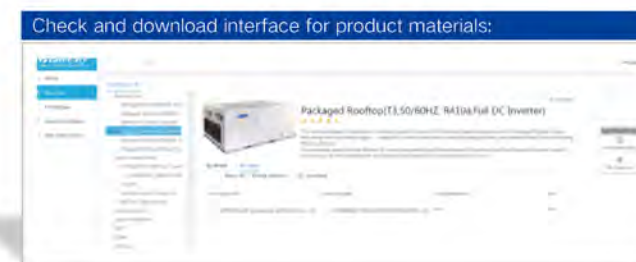


Installation effect diagram



Global Technology Service

GTS (Global Technology Service) is a technical support and service platform for overseas global customers. Customers can log in the system at any time to check or download corresponding materials, such as related materials for Gree commercial products, electronic catalogues and selection software. Customers can log in the system and submit project information to get technical support services.

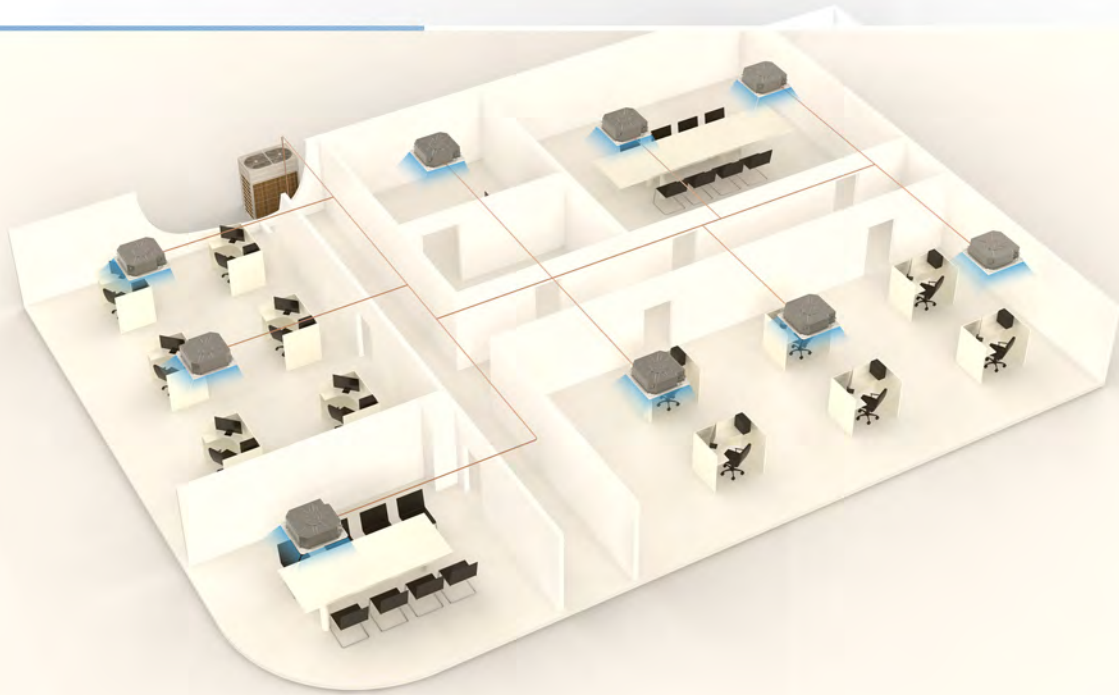


GTS system website: <http://gts.gree.com>

Why Choose VRF Heat Pump System

Demand

In a system without external constraints, if user requires only cooling or heating, then the heat pump system is a good choice.



Low Cost


If there is only cooling or heating demand, a VRF heat pump system is recommended for it is cost-saving and easy to maintain.

Flexible

Because of the characteristics of the VRF system (One outdoor unit can be connected to multiple indoor units), indoor units in different areas can be controlled independently, which is very flexible in use compared to common air conditioners.




GMV X Outdoor Unit Lineup

Series		Certification		Appearance										
GMV X (Heat pump) (380-415V 3N-50/60Hz)		CB												
HP														
8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
38	40	42	44	46	48	50	52	54	56	58	60	62	64	66
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
68	70	72	74	76	78	80	82	84	86	88	90	92	94	96
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
98	100	102	104	106	108	110	112	114	116	118	120	122	124	126
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
128	● means basic model ● means combination models													
●														

GMV X (Heat pump) :

1. Large capacity; maximum 36HP for a single unit and 128HP for combination units.
2. Adopt high-efficiency low-temperature enthalpy adding technology and new type compressor with big capacity.
3. Large high-efficiency G-shape heat exchanger.
4. Maximum subcooling degree is up to 35°C .

Series		Certification		Appearance										
GMV X (Cooling only) (380-415V 3N-50/60Hz)		CB												
HP														
8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
38	40	42	44	46	48	50	52	54	56	58	60	62	64	66
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
68	70	72	74	76	78	80	82	84	86	88	90	92	94	96
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
98	100	102	104	106	108	110	112	114	116	118	120	122	124	126
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
128	● means basic model ● means combination models													
●														

GMV X (Cooling only) :

1. Large capacity; max. 36HP for a single unit and 128HP for combination units.
2. Adopt brand new high-efficiency DC scroll compressor.
3. Adopt integrated G-shape heat exchanger; a heat exchanger is up to 4.2m.
4. Self-balancing control without oil balance pipe.



High-efficiency and Energy-saving

HPAC High-efficiency Alternate Control

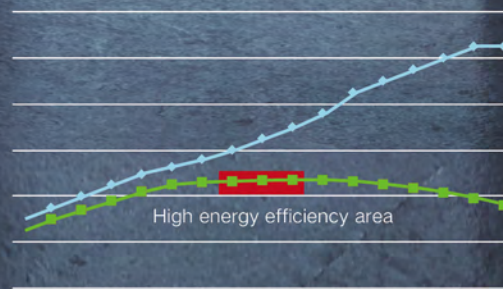
GMV6 adopts high-efficiency alternate control method to intelligently adjust the distributing method according to the demand of indoor load, which has ensured the service life of the integrated module, and improved the overall operating energy efficiency at the same time.

The best matching features exist among the compressor, indoor heat exchanger, and outdoor heat exchanger. It can automatically match the capacity of indoor and outdoor heat exchangers, and adjust in real time according to operating situation.



GMV5

GMV6-HPAC control



Capacity

Energy efficiency

High-efficiency and Energy-saving

High-efficiency enthalpy-adding inverter compressor, high-efficiency DC motor and new modular control way are adopted, which greatly improves the operation efficiency of the unit.



High-efficiency EVI Compressor



① High-efficiency EVI control technology

High-efficiency EVI compressor, which is developed according to the features of VRF unit, its 0-420Hz adjusting range can perfectly match with the whole unit, so as to excel the performance to the greatest extent.

② Release valve

Improving partial load energy efficiency, adapting to the condition of variable pressure ratio, upgrading compressor performance.

③ Improved asymmetric wrap

New asymmetric wrap is adopted and compressor efficiency is improved by reducing leakage and invalid suction superheat.

④ Dynamic oil balance structure

Advanced oil balance technology, with high reliability and flexible design without installation limit, which can realize parallel connection of compressors with different delivery capacity and revolving speed.

⑤ High speed

0~420Hz stepless inverter operation, wide adjustment range of capacity, precision can be up to 1Hz.

⑥ Oil pump filter

Filtrate the impurities to ensure the supplied oil is clean.

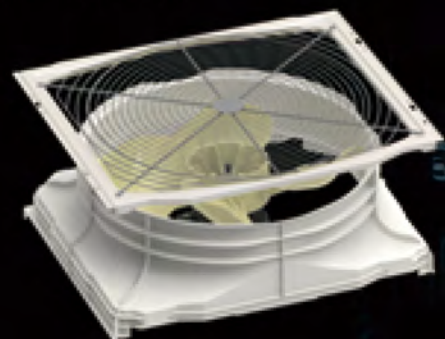
⑦ Positive displacement gear pump

Ensure necessary oil supply under the revolving speed, improve reliability of compressor.

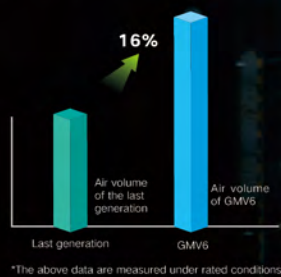
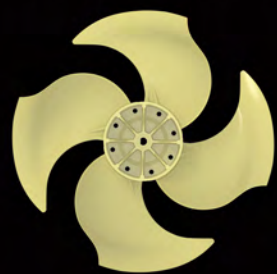
Large Air Volume and Low Noise Fan Blade

The "Reverse-S shape" tail design can effectively increase the working area of fan blades and greatly improve the air volume. The tail of the blade adopts the aircraft winglet design, which can effectively suppress the tip vortex caused by wing tip pressure difference and reduce noise.

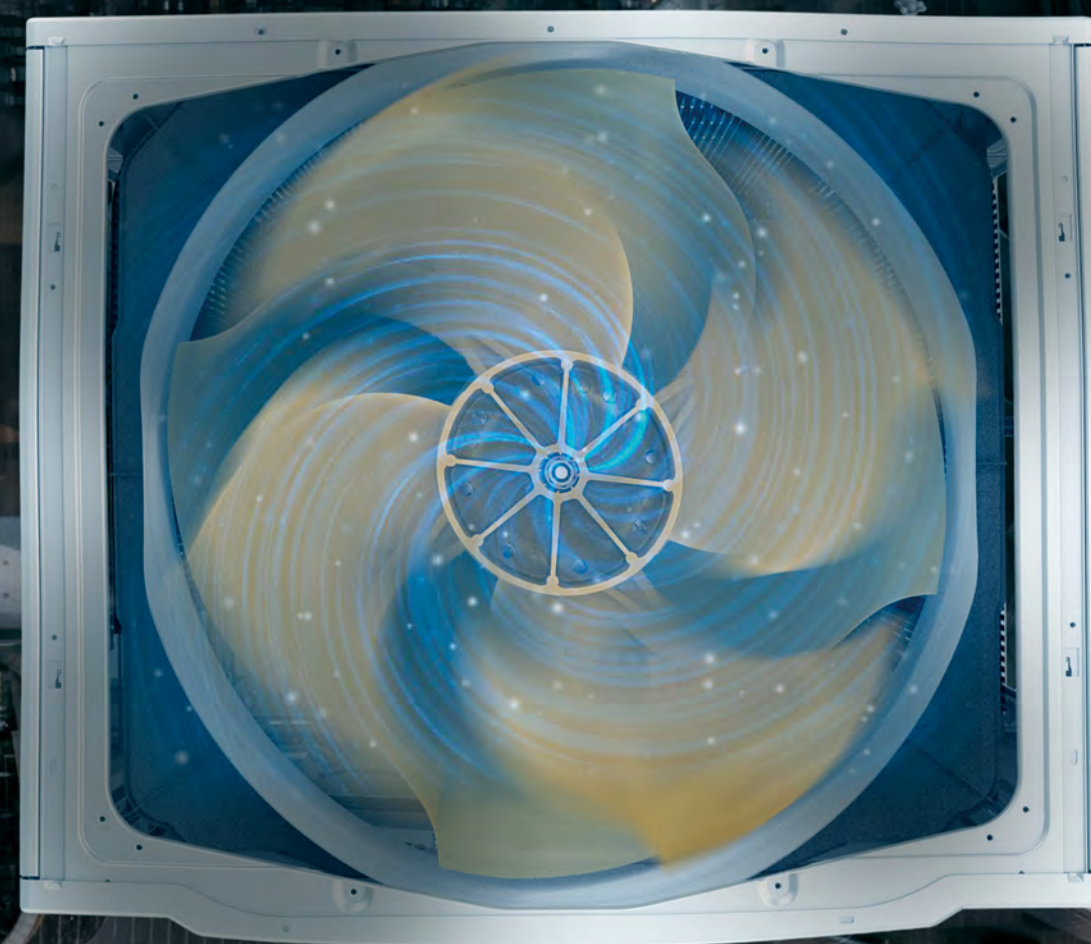
The new air-out grille design increases the air supply area by 7.8%.



The "Reverse-S shape" tail design, with 4-blade control and separate design of blade pressure surface and suction surface, effectively increases the working area of fan blades and greatly improves the air volume.



Note: Applicable for some models.



Multiple Prevention Technologies

Multiple prevention technologies: to protect the unit from corrosion, dust, wind, lightning and snow; to prolong the service life of the unit; to suit different environmental conditions.

Corrosion Prevention

- 1 The heat exchanger adopts acid-proof and highly anticorrosive black aluminum fins.
Neutral salt spray time is up to 2000 hours.
- 2 The sheet metal of the casing is coated with high weather resistance powder for corrosion prevention.
Neutral salt spray time is up to 1000 hours.
- 3 The surface of controller is coated with special protection material, which has good dampproof, mildewproof and anticorrosive performance.
- 4 The grille received the treatment of phosphating and electrophoresis, and is coated with high weather resistance powder to prevent corrosion.
- 5 The external part adopts fasteners made of zinc-nickel alloy for better anticorrosive performance.
- 6 The anti-corrosion motor adopts stainless steel shaft, and electrophoresis for the outer case, with IP55 protection level*².
- 7 Outer sealing material of the coil adopts stainless steel and electrophoresis*².
- 8 The surface of the pressure vessel adopts the treatment of phosphating and is coated with high weather resistance powder to prevent corrosion.



Corrosion Prevention

Note:

1. Applicable to GMV6 (GMV-**WM/H1-X) series. For special environments with acid, alkali and salt corrosion, the unit can be customized to provide more comprehensive protection. Please consult our sales representatives for more information.

2. Standard models GMV6(GMV-**WM/H-X) do not have this anti-corrosion treatment but can be customized if needed.

Multiple Prevention Technologies

Dust Prevention Function*

According to operating time of unit and real-time operating parameters, situation of heat exchanger can be estimated. When the accumulative dust of heat exchanger impacts the heat exchange efficiency, activating the backward operating function of fan can effectively remove the dust.



Normal operation status



Auto-clean status

*This function should be customized.

Wind Prevention Function

Before the unit is turned on, if the fan conducts backward operation due to adverse wind, it will adopt dynamic braking to stop the backward fan, and then turn on the unit according to normal program.



Lightning Prevention Function

Central air conditioning system has lightning protection and anti-surge function, which can effectively prevent the impact on air conditioning system due to instant overvoltage or overcurrent, so as to protect the personal and property safety of user.



Snow Prevention Function

In order to prevent the influence of snow accumulated on the top of the outdoor fan, the unit will automatically turn on the fan to clear the snow and ensure normal operation.

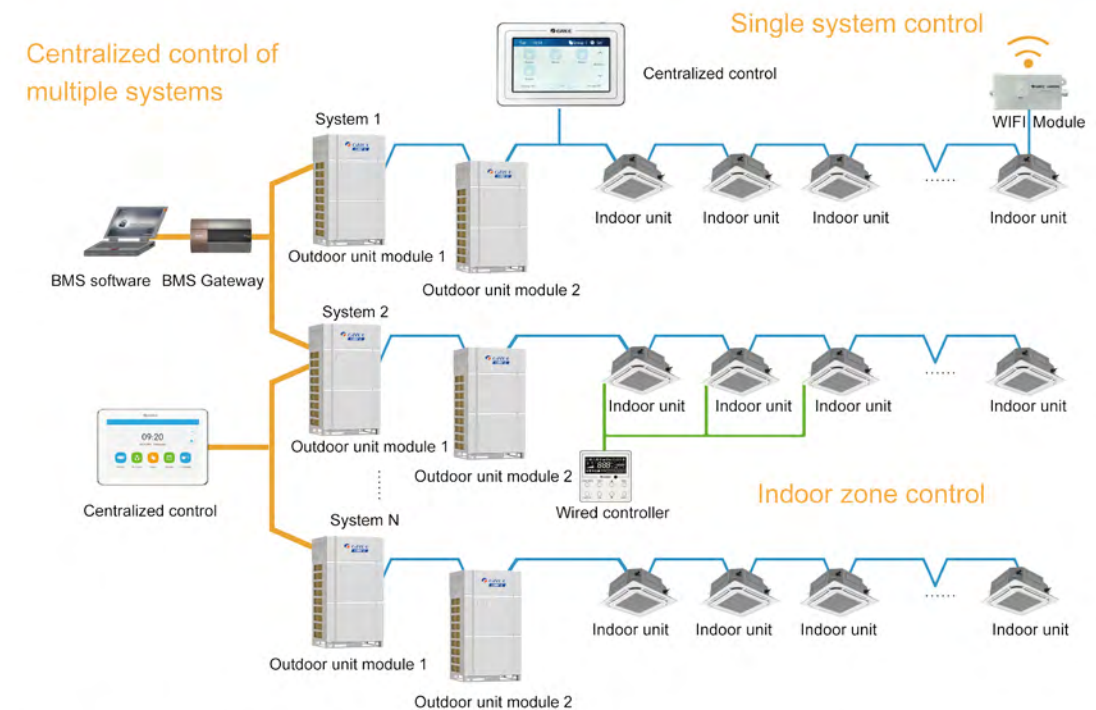


CAN+ Communication Technology



Innovative Stratification CAN+ Structure with Multiple Master Networks

Considering that the application of an air conditioning system requires multiple nodes, multistep control and intelligent expansion, we originally developed the stratification CAN+ structure with multiple master networks, which makes it possible for the number of nodes in a single system to be increased relatively by 56% and the response time for centralized control to be shortened by hundreds of times.



First Formulated CAN+ Communication Protocol

It is the first time to formulate and standardize CAN+ communication protocol: two-stage network universal design, data can be directly transferred; functional code, network address, data field and related core concepts are developed, realizing grading, classification and real-time transfer of communication data, satisfying the demand of intelligent expansion.



The First Nonpolarity CAN+ Communication Chip

CAN+ self-adaptive networking technology includes single chip automatic nonpolarity technology and all network automatic address distribution technology, which can realize automatic networking for hundreds of nodes of large multi VRF unit within 10 seconds, the newly increased nodes can be activated instantly once it is inserted, greatly improving the networking speed and expansion capability.



Intelligent Control and Management

New generation intelligent management and control solution, satisfying various demands of users.

Key Card Wired Controller



Centralized Controller



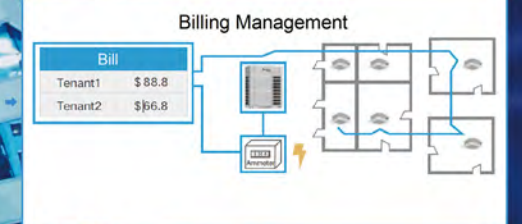
Gree Intelligent Remote Eudemon



Centralized Control



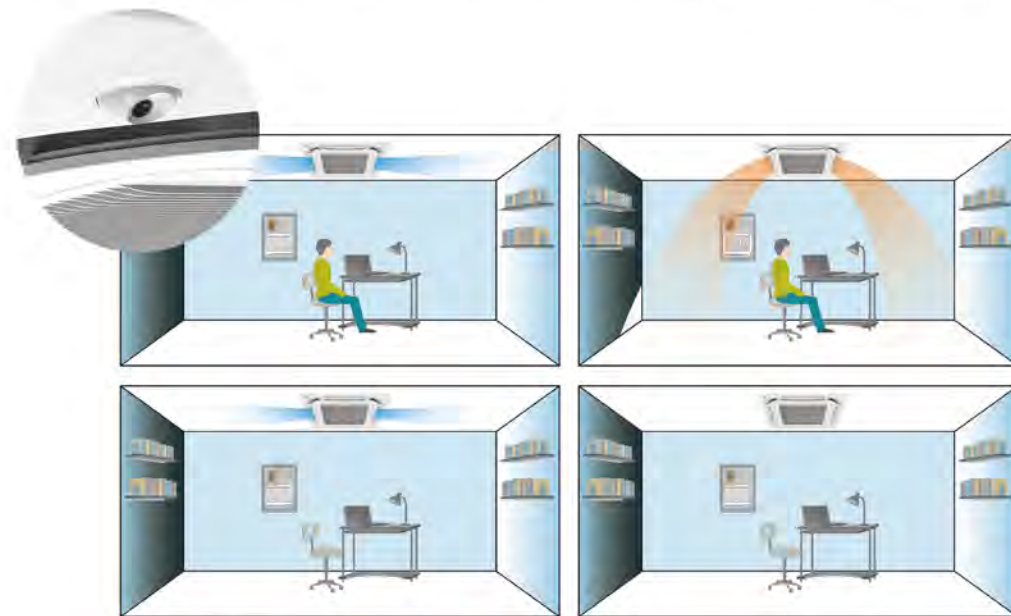
Billing Management



Intelligent Control and Management

Intelligent Sensing Function

Intelligent sensing function control, 360° panoramic temperature field identification; high precision of temperature field identification, achieving cold air prevention, warm air surrounding; multiple intelligent control, more well-proportioned temperature field, more energy-saving operation.



*This function should be customized.

Cloud Control

G-cloud is a compact WiFi controller, which connects G-cloud to the corresponding interface of any one of the multi VRF indoor units. Use mobile phone to download the "Gree+" APP, after simple network configuration, the multi VRF air conditioner can be easily controlled by the mobile phone anytime and anywhere. One set of multi VRF system only requires one G-cloud to realize the control of all indoor units under the system via mobile phone.

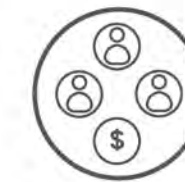


One G-cloud can control up to 80 sets of indoor units within one system

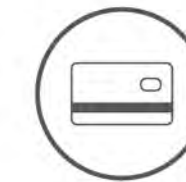
Intelligent Management



One button control



Billing system



Prepaid



Data analysis

Centralized Control: Centralized Control of Building Terminal

One button control, unified management of air conditioners for a building: Gree centralized controller can achieve unified management of the air conditioners of a whole building via one button, which saves time and power.



Long-distance Control: Distributed Centralized Control System

Restriction management, reducing waste of energy due to misoperation: restriction management can set restriction on the indoor unit to limit on/off status, temperature range, and modes.



Billing System: Reasonable Distribution of Electricity Billing

Billing system, clear management: Gree billing system for multi VRF unit can calculate and distribute the electricity via unique calculation mode to reasonably allocate the energy consumption and electricity fee.



Prepaid Automatic Withholding Mode

Prepaid automatic withholding mode is provided to satisfy the demands for lending of apartment and shops to prevent loss of lesser.

Export accountant bill, energy consumption report and energy-saving strategy push.

Data cloud backup, which can resume the engineering data and electricity data quickly.

Clean and Healthy Fresh Air

GMV6 can be matched with fresh air indoor unit and ERV system. Meanwhile, fresh air accessories, high-efficiency filter and other clean and healthy fresh air solutions are optional, to achieve dual functions of air conditioning and fresh air, and improve the indoor air quality obviously.



Clean and Healthy Fresh Air

Fresh Air System

Fresh air system satisfies multiple indoor fresh air supply demands.

Less investment: Combine air conditioning system and fresh air ventilation system, undertake partial fresh air load and reduce the initial investment of air conditioning equipment.

Less operating cost: By adopting DC inverter technology, output of refrigerant can be adjusted according to actual situation, ensuring stable air supply and avoiding small load and large power.

Less installation space: Indoor unit links with VRF fresh air indoor unit, reducing outdoor installation space.



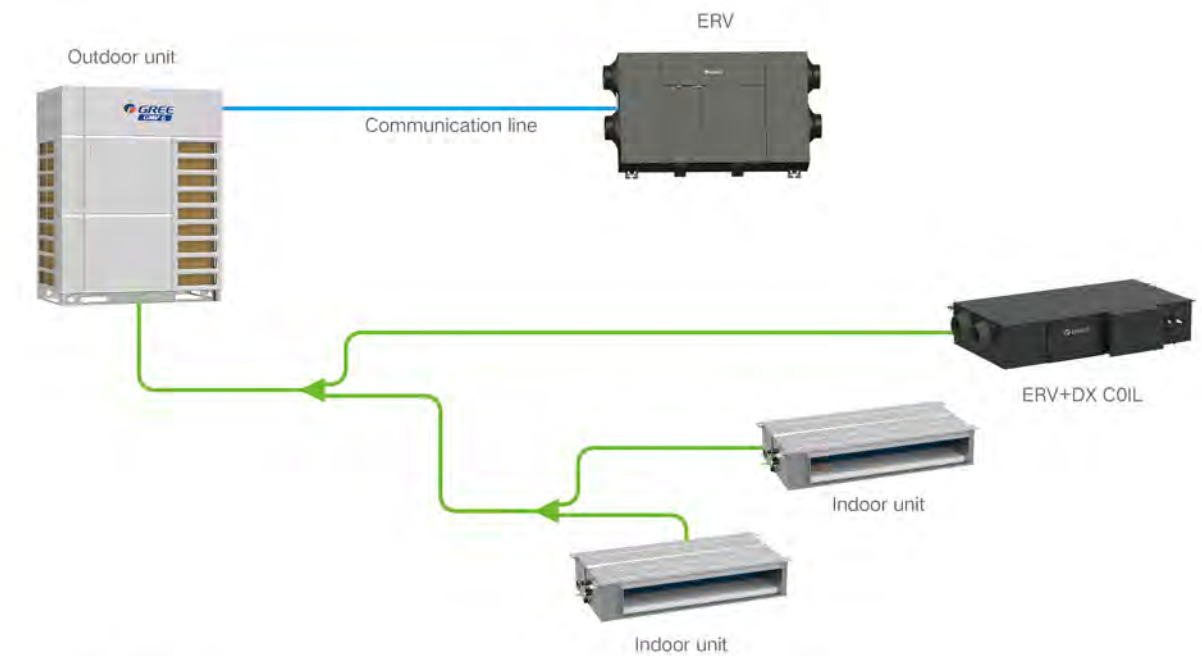
Fresh Air Accessory

The cassette type unit can work with fresh air accessories to efficiently introduce 8%~10% outdoor fresh air.



ERV System

GMV6 system can be connected to ERV and ERV+DX COIL, which can realize air conditioning with fresh air ventilation.

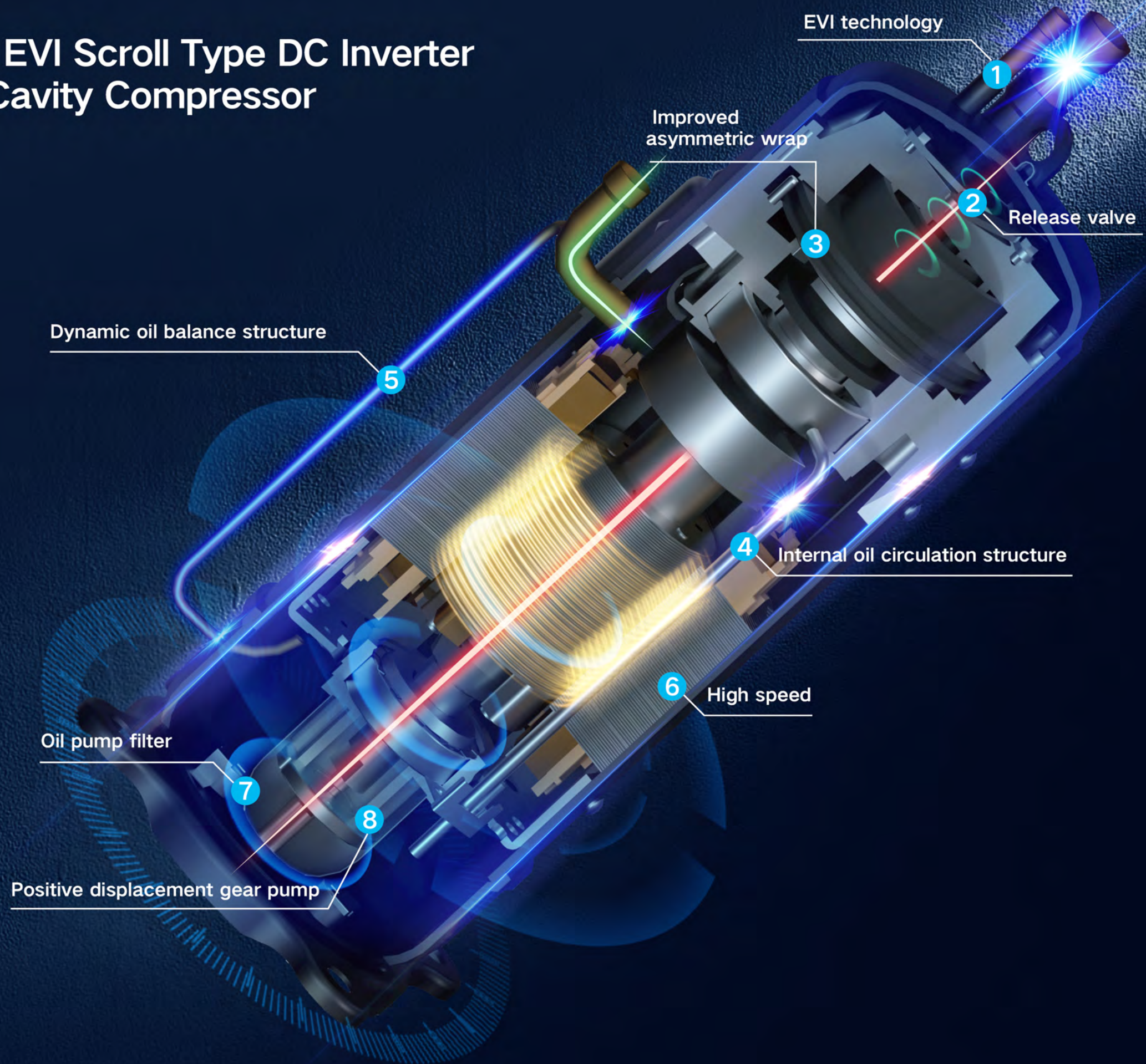


Clean System

Gree direct-expansion air handling unit can be connected to Gree VRF system, so that the air handling unit is with the functions of VRF system and can meet the cooling/heating requirement in large-scale spaces. This air handling unit can be equipped with purification devices with various filter grade for meeting the purification requirements of different occasions.



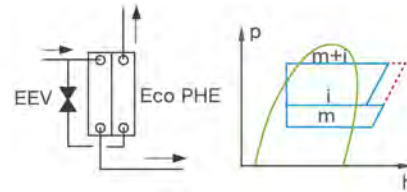
High-efficiency EVI Scroll Type DC Inverter High-pressure Cavity Compressor



High-efficiency Enthalpy Control Technology

High-efficiency Enthalpy Compressor

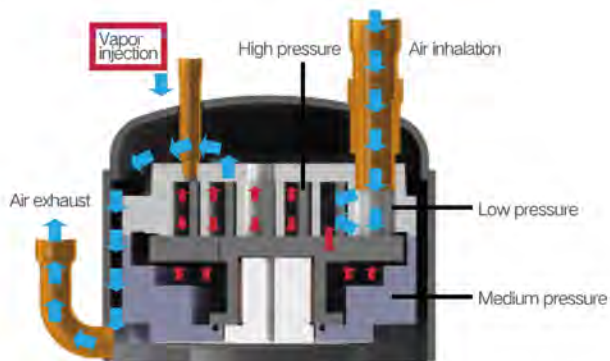
High-efficiency enthalpy compressor is developed according to the features of VRF unit, its 0-420Hz adjusting range can perfectly match with the whole unit; so as to excel the performance to the greatest extent.



High-efficiency EVI Scroll Type DC Inverter High-pressure Cavity Compressor

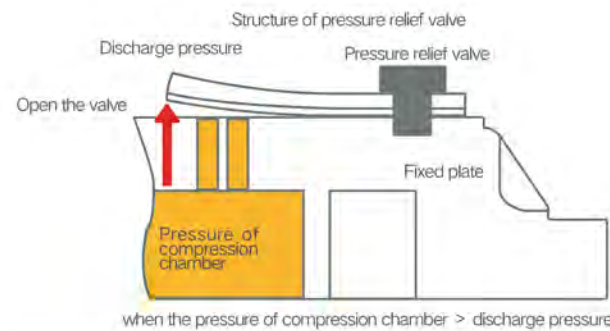
① EVI Technology

Reinforce system capacity, widen operating range and accelerate heating.



② Release valve

Improving partial load energy efficiency, adapting to the condition of variable pressure ratio and upgrading compressor performance.



③ Improved asymmetric wrap

New asymmetric wrap is adopted and compressor efficiency is improved by reducing leakage and invalid suction superheat.

④ Internal oil circulation structure

Internal circulation of lubricating oil to reduce over-heat losses and oil discharge rate and to improve efficiency and reliability.

⑤ Dynamic oil balance structure

Advanced oil balance technology, with high reliability and flexible design without installation limit, which can realize parallel connection of compressors with different delivery capacity and revolving speed.

⑥ High speed

0-420Hz stepless inverter operation, wide adjustment range of capacity and precision can be up to 1Hz.

⑦ Oil pump filter

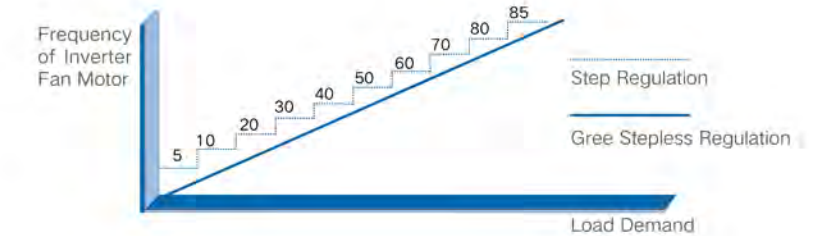
Filtrate the impurities to ensure the supplied oil is clean.

⑧ Positive displacement gear pump

Ensure necessary oil supply under the revolving speed to improve the reliability of compressor.

Sensorless DC Inverter Fan Motor

Adopt the DC inverter motor with high back electromotive force to realize stepless speed adjustment within 5-85Hz, the precision is 1Hz, with low operating current, low motor input power, and high efficiency.



Large Air Volume and Low Noise Air Duct

"Reverse-S shape" tail design can effectively increase the working area of fan blade, greatly improving the air volume. The blade tail adopts winglet design of the aircraft to effectively suppress the blade tip vortex caused by the pressure difference of wing tip and reduce the noise.



*China Patent 201820495665.8 Axial Fan Blade and Air Conditioner

*Applicable for some models.

*The above data are measured under rated conditions of unit

High-efficiency Heat Exchanger Design

G-shape Integrated Heat Exchanger

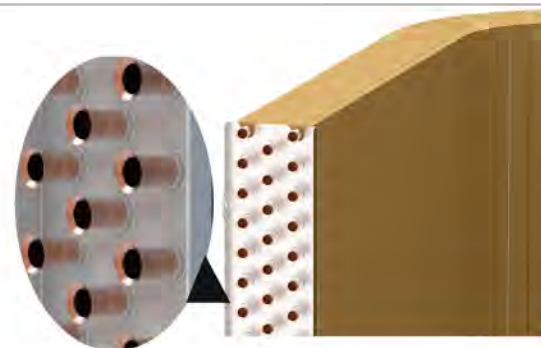


Molded at one time, the G shape integrated heat exchanger can improve space utilization and increase heat exchanger area and heat exchange efficiency.

*Note: Applicable for some models.

Multi-row Small Diameter Design

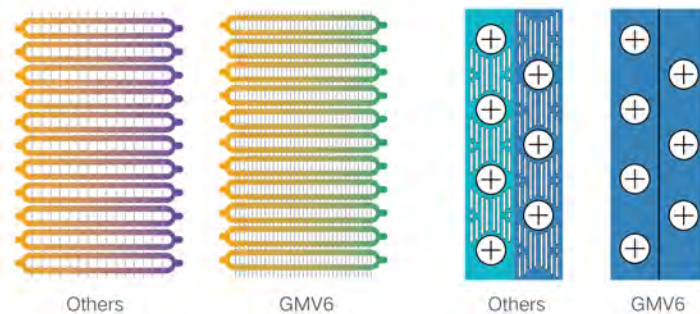
The refrigerant pipe adopts $\phi 7\text{mm}$ and 3-row design, which can reduce the flowing resistance of refrigerant inside the pipe and effectively increase the heat exchange area of refrigerant, so as to optimize and improve the heat exchange efficiency.



*Note: Applicable for some models.

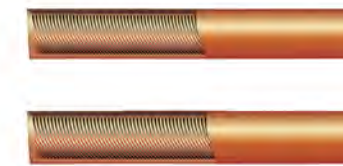
Small Pitch Corrugated Heat Exchanger Fins

Small pitch corrugated fins are used to increase the effective area between fins and the air, for more sufficient heat exchange of refrigerant and higher heat exchange efficiency.



Internal Screw Thread Design of Copper Tube

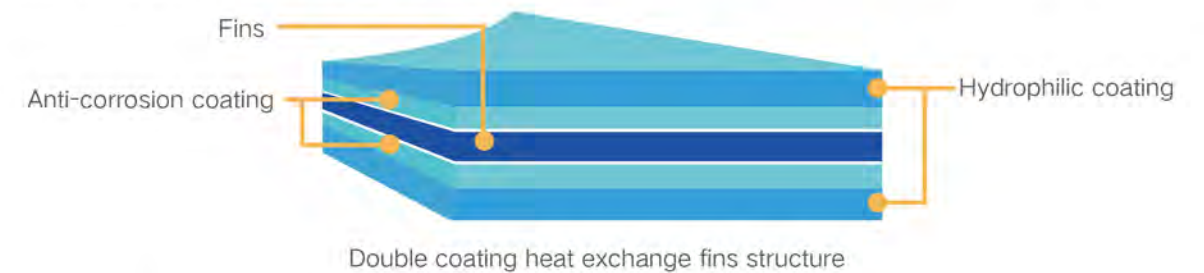
The refrigerant pipe adopts internal screw thread design to increase the contact area with the refrigerant, optimize the turbulent state of refrigerant flow and improve the heat exchange efficiency.



Internal screw thread high-efficiency heat exchange tube

Multi-functional Heat Exchanger Fins

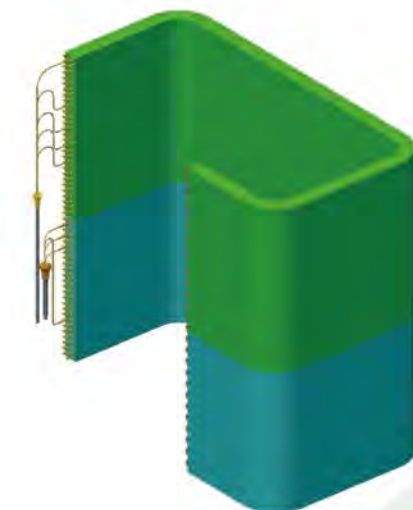
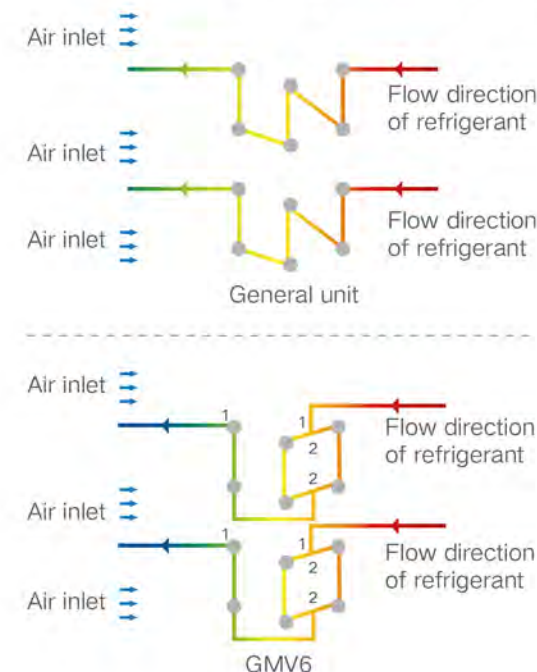
The heat exchanger fins adopt double-sided double-effect coating and hydrophilic membrane design so that the unit is not easy to get frosted and the condensate water or water from defrosting can flow down more quickly; the anti-corrosion coating isolates the pollutants and dust from air to protect the fins, with stronger corrosion resistance and better heat exchange effect.



Double coating heat exchange fins structure

Divisional Heat Exchange Flow Path

According to the feature of wind field, the flow path of heat exchanger adopts divisional design for more reasonable flow division. Design according to 1-2-2-1 flow path for higher exchange efficiency.



Multiple Energy-saving Modes

With the deepening of energy conservation and emission reduction, and the increasing requirements for urban electricity consumption, especially during the peak season of electricity consumption in summer, many cities will issue corresponding electricity curtailment measures. GMV6 has a variety of operating modes for users to choose, to meet the city's peak power consumption and power limit requirements.

Capacity Priority Mode

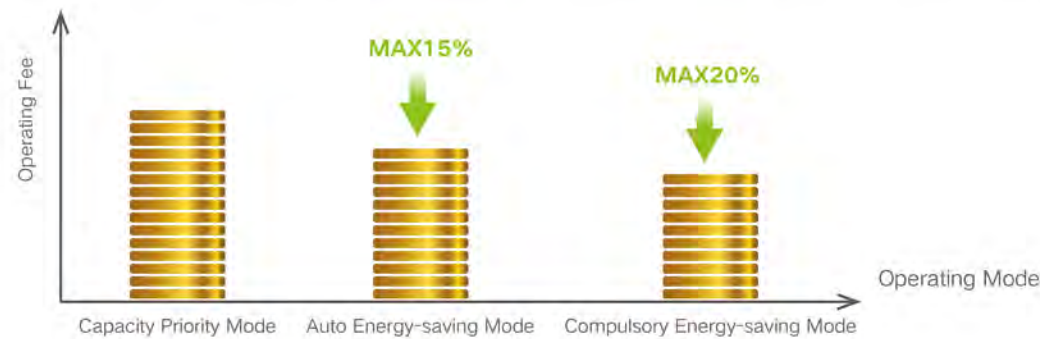
When the power supply is sufficient, it will satisfy the using capacity demand in priority. This mode is default mode.

Auto Energy-saving Mode

When this mode is activated, the system will automatically adjust the control parameters according to operating status, and automatically balance the capacity and energy consumption to realize the minimization of bilateral impact.

Compulsory Energy-saving Mode

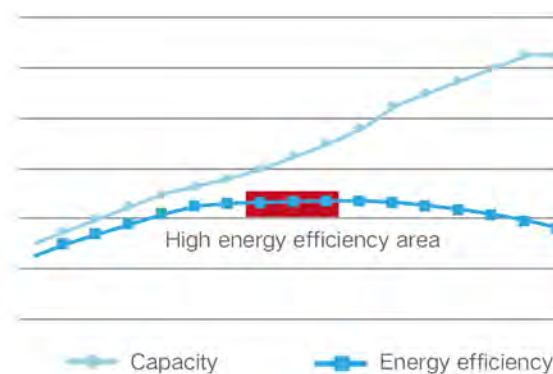
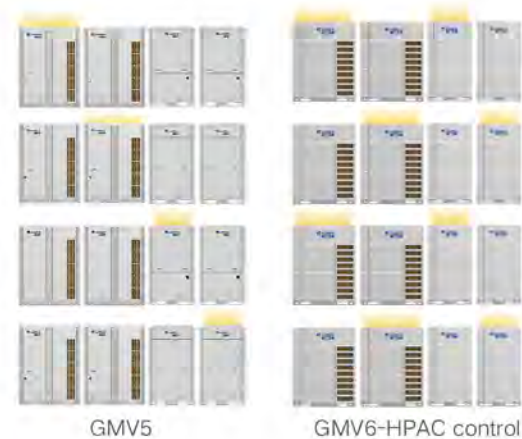
Compulsorily limit the output of outdoor unit to satisfy the using capacity demand in priority. 90% and 80% capacity proportion can be selected to limit the output according to the power consumption of unit and user demand.



HPAC High-efficiency Alternate Control

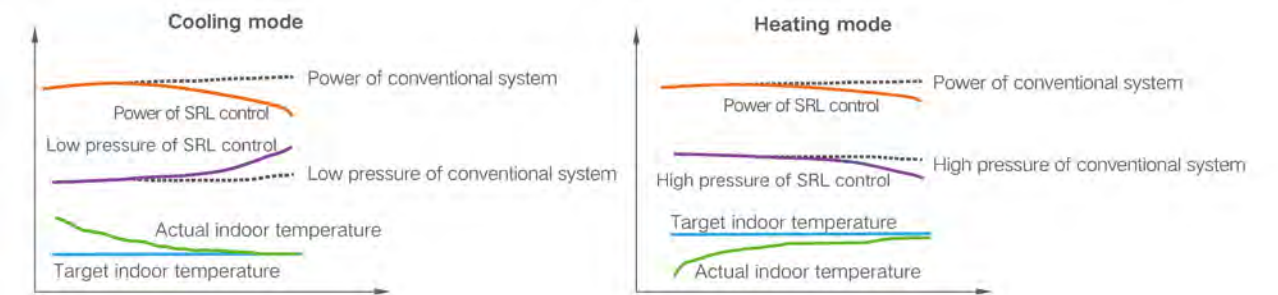
GMV6 adopts high-efficiency alternate control method to intelligently adjust the distributing method according to the demand of indoor load, which has ensured the service life of the integrated module, and improved the overall operating energy efficiency at the same time.

The best matching features exist among the compressor, indoor heat exchanger, and outdoor heat exchanger. It can automatically match the capacity of indoor and outdoor heat exchangers, and adjust in real time according to operating situation.



SRL(Self-reaction Load)Self-adaptive Control

SRL (Self-reaction Load) can intelligently detect and control pressure and temperature of system refrigerant according to user status and indoor temperature variation, so as to automatically adapt to indoor cold/heat load balance control of energy conservation.

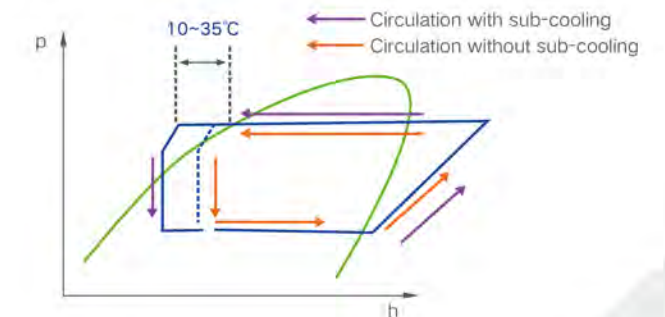


Variable Sub-cooling Design

With new generation of high-efficiency plate type sub-cooler and variable super-cooling degree control method, the maximum sub-cooling degree can reach 35°C, the unit's operation and engineering matching are greatly improved, and the effect is more obvious.

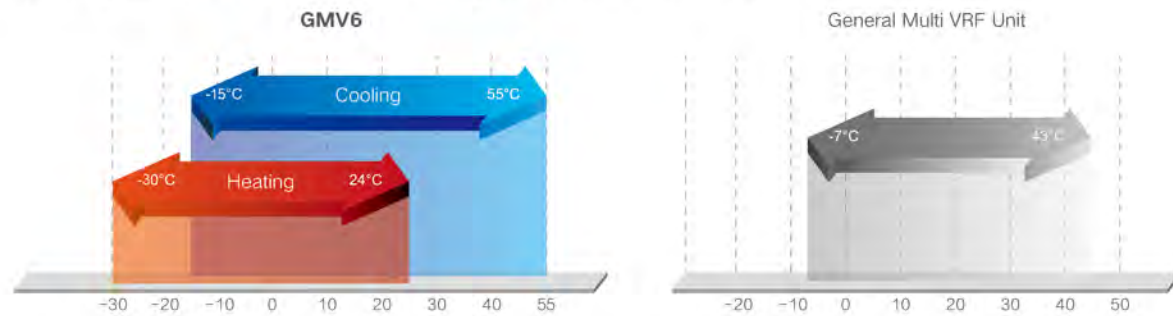
Problems with fixed sub-cooling and excessive sub-cooling:

With fixed sub-cooling degree, output of the unit cannot adapt to changes in load. When the system conducts excessive sub-cooling, performance of the whole unit is reduced, degree of superheat for the exhaust of compressor is insufficient, and the reliability is reduced.



Wide Operation Range

-30°C-55°C stable operation to provide users with comfortable environment in both cold and hot weather, operating ambient temperature for cooling can be as low as -15°C .



Note:
 1. The maximum operating temperature in cooling is 55°C while the minimum operating temperature in heating is -30°C . As different series have different operating ranges, please refer to the corresponding technical information.
 2. Cooling at -15~-5°C is conditional. Please inquire our engineers for more information. Generally, the lowest operating temperature for cooling is -5°C .

Integrated Mainboard

Adopt miniaturized design and new high-efficiency process to reduce the area of main board by 40% and the occupied space, increase the power density of inverter, and realize the diversification of functions.

Intelligent Design

Low power consumption control, auto address allocation, auto commissioning, error memory and inquiry;

High Reliability Design

It is designed with wide voltage protection, default phase protection, overload protection, anti-surge protection, anti-static protection and so on. Together with advanced moisture-proof, dust-proof and anti-corrosion design, the system is more stable and reliable.

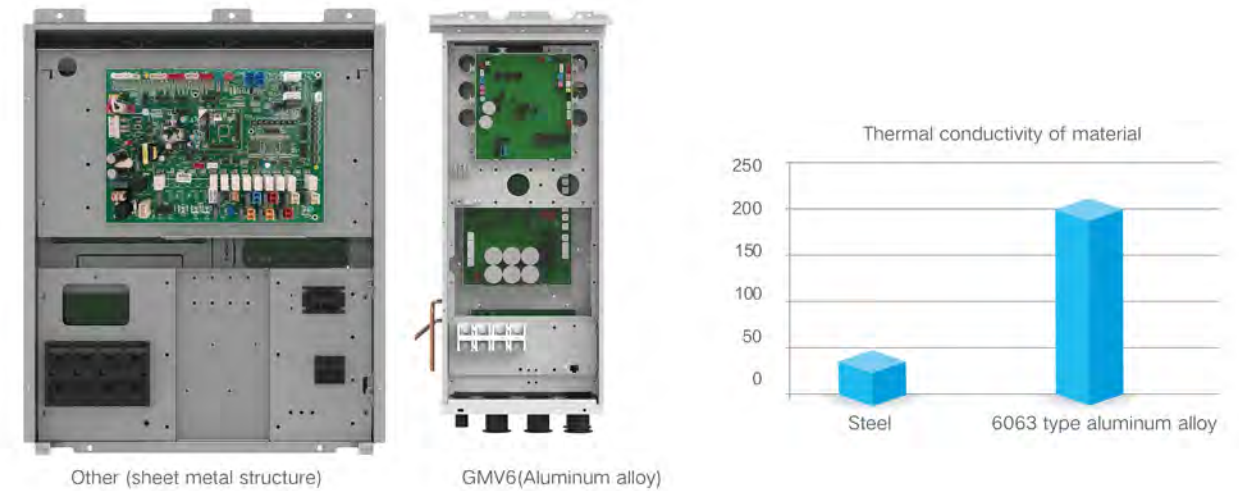
Advanced Production and Inspection Technology

The controller mainboard undergoes a series of strict production inspection processes such as SMT processing—AOI optical inspection—ICT online inspection—FCI functional test—DCT test and vibration and stress test. The rigorous manufacturing and inspection process ensure that the control mainboard can withstand high temperature and high humidity, abrasion and drop and other harsh environments.



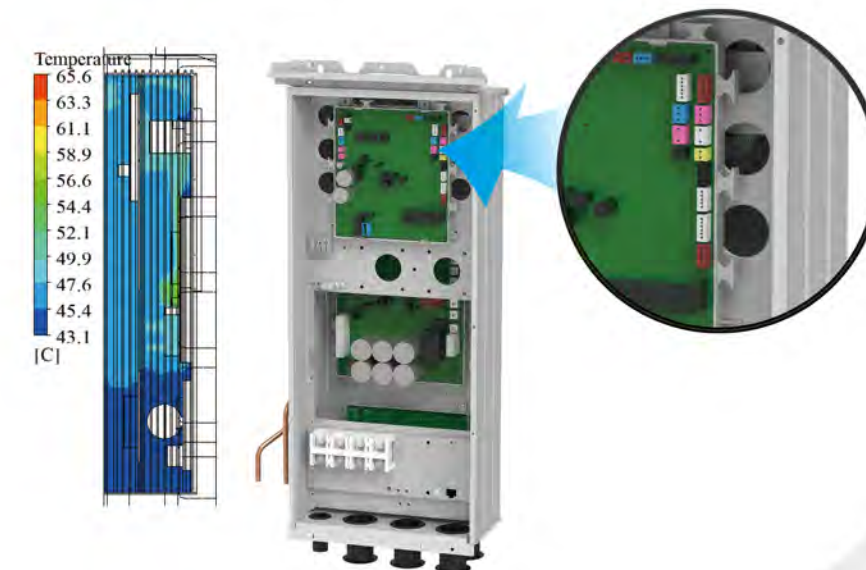
Integrated High-efficiency Heat Dissipation Electric Controller

Main body of electric box is made of 6063T5 aluminum alloy material with high thermal conductivity (the heat dissipation capacity is 4.5 times that of conventional steel plates). The integrated structure design reduces the overall volume by 35%. Installation and maintenance are more convenient.



*Chinese Patent for Utility Model No. ZL201720497732.5 Outdoor unit, Electric Box and its Box Subassembly of Air Conditioner.
 Note: Aluminum control box is not applicable for GMV6(GMV-**WM/G-F).

The main body of electric box adopts refrigerant for heat dissipation, cooperates with high thermal conductivity aluminum alloy material, and uses thermal simulation design to optimize the layout of inverter power components, thus reducing the internal temperature of inverter electric box by about 8°C , and improving the reliability of inverter components of large-capacity inverter compressor.



○ Quiet and Comfortable Experience

GMV6 adopts multiple professional noise-reduction technologies to improve the operation of the unit and create a quiet and comfortable environment.



Multiple Professional Noise Reduction Technologies

① Large Air Volume and Low Noise Fan Blade
Reverse S-shape tail design and aircraft winglet 4-blade design to achieve large air volume and low noise.



1

② New Streamline Grill and Immersed Layout Air Duct
The general air duct system of unit goes down to form an immersed layout, which can effectively reduce the fan noise.



2



④ Pipeline Simulation Shock Absorption Design
Pipeline is designed based on ANSYS to effectively reduce the vibration of pipes.

4



③ Intelligent Noise Reduction Converter
IGBT adopts exciting voltage and control carrier frequency switching technology to actively reduce electromagnetic noise.

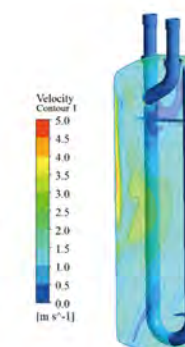
3

⑤ Quiet Throttling Component
The quiet expansion valve with special structural design meets the needs of pressure-reducing flow distribution and can minimize the throttle noise.



5

⑦ Quiet Gas-liquid Separator
It is a special low-noise and large-capacity gas liquid separator. The shape and angle of the gas-in and gas-out tubes are specially designed to reduce noise.



7

⑥ Enthalpy-adding Pulsation Noise Reduction
Design a special buffer to reduce the impact noise of refrigerant pulsation on the pipeline when spraying enthalpy by 90%.



6

⑧ Sound Absorption and Sound Insulation Design of Compressor
Adopt compound material with high sound absorption and insulation effect to reduce the noise of compressor effectively.



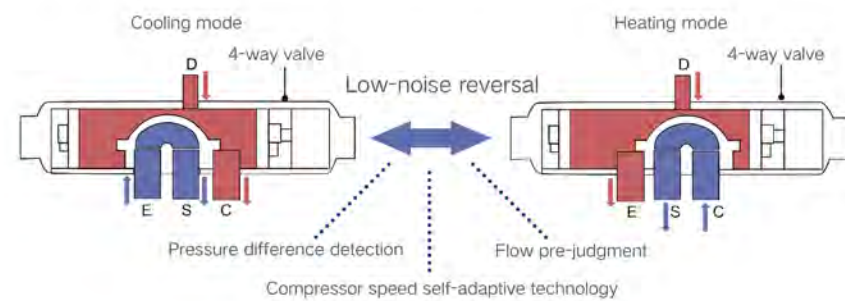
Sound absorption material Metal sound insulation cover

*Configuration of some models

Low-noise Operating Technology

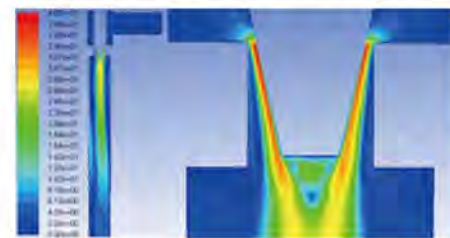
Low-noise Reversing Control Technology

The 4-way valve adopts low-frequency reversing design. Through the detection of reversing pressure difference and the prediction of flow, the compressor speed is adjusted accordingly during reversing, for small pulsation of refrigerant flow and effective noise reduction. The reversing control technology can not only improve the reliability of the 4-way valve action but also improve the comfort degree of the unit.



Refrigerant Flow Noise Reduction Technology

GMV6 adopts three refrigerant flow noise reduction technologies for overall control to further improve the operation. The gas-liquid two-phase refrigerant encounters throttling parts or elbows and abrupt cross-sectional areas of the flow channel during the flow process, turbulence will increase due to pressure changes and vortex shedding, cavitation noise and vortex noise are easily generated in the pipeline, and the abnormal sound of the noise will accelerate and deteriorate with the increase of the two-phase status.



Refrigerant Status Control

According to the mechanism of refrigerant flow noise, high-efficiency sub-cooling and sub-heating technologies are used in cooling and heating operation to fundamentally control the single-phase state of the refrigerant in the flow process.

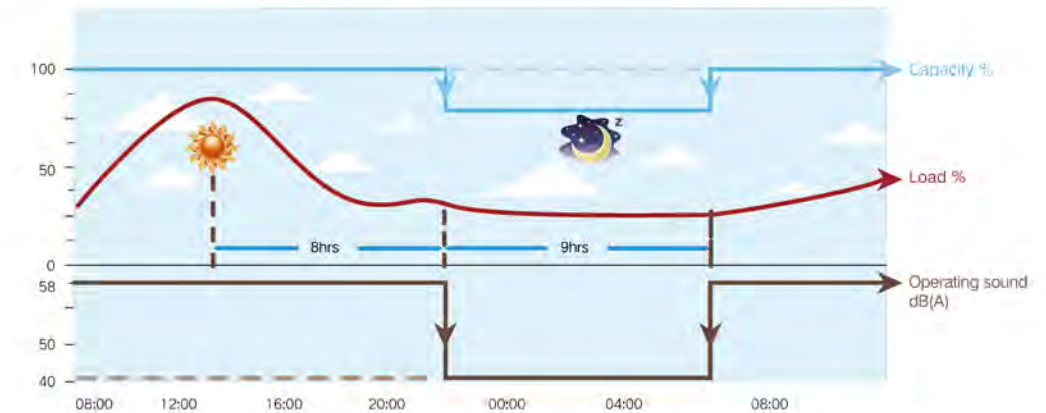


Quiet Technology

13 Quiet Modes

Night Quiet Function

The system can record the highest outdoor temperature. At night, the system will automatically turn to quiet mode. There are 9 quiet modes which can be set according to actual needs. For example, the unit can automatically enter night mode after working for 8 hours, and resume to normal operating mode after 9 hours.



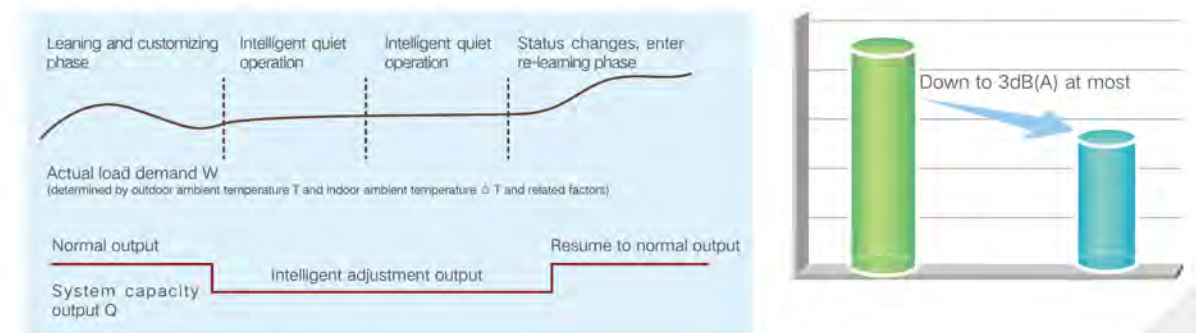
Mandatory Quiet Function

When the unit is installed in an environment with high noise requirements, it needs to operate silently during the day or night. Then you can choose three mandatory settings of quiet modes to ensure that the unit operates in low noise mode at any time, and the noise value can be as low as 40dB(A).



Intelligent Quiet Function

The unit can learn and customize user habits, and at the same time memorize the characteristics of user's habits. According to the user's using habit and actual load, it can automatically determine the output capacity of the system in the next 24 hours to achieve automatic quiet operation.

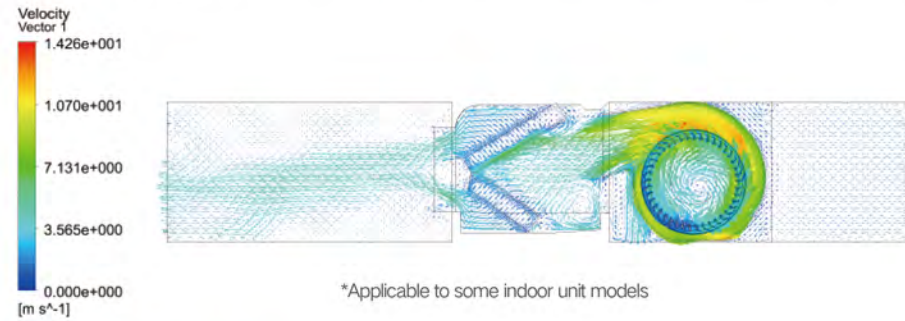


* Internal measurement value.

Indoor Unit Quiet Technology

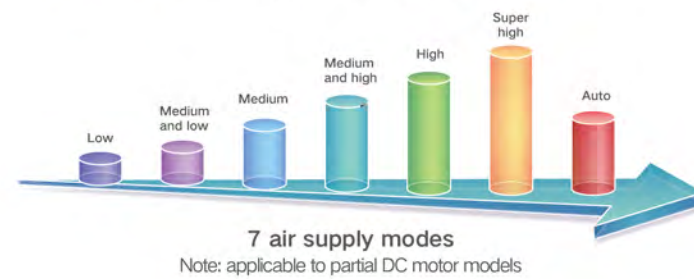
Indoor Quiet Air Duct Design

Heat exchanger of indoor unit adopts V-shape design for even and smooth air flow to create a quiet and comfortable environment.



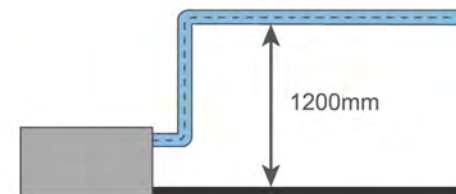
7 Fan Speeds for Selection

The indoor unit has 6 fan speeds (super high, high, medium and high, medium, medium and low, low) and auto fan speed for selection to satisfy different user demands.



Low-noise High Delivery Lift Water Pump Design

The indoor unit is equipped with a quiet water pump with delivery lift up to 1200mm, solving the drain problem of unit in low floors, with high engineering adaptability.



DC Motor Design

The indoor unit of GMV6 adopts DC motor design to realize stepless adjustment of revolving speed for lower noise operation. Auto quiet mode of indoor unit can be set via the wired controller and the unit will activate auto quiet function according to indoor temperature and the activity of occupants. Noise is as low as 22dB(A).



Stable and Reliable Operation

GMV6 adopts CAN+ communication, multiple oil circuits control and other technologies, which greatly improve the stability and reliability of the unit.

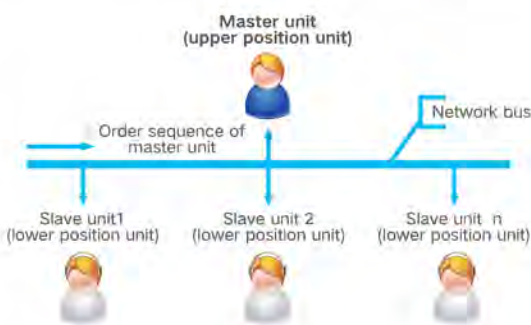


CAN+ Communication Technology

Current Situation for Communication Technology of Multi VRF Unit Industry

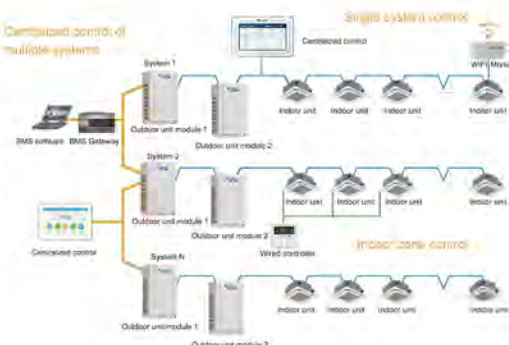
In the field of commercial VRF, as the installed capacity of the system increases, the number of connected indoor units also increases. Thus, the multi-system integrated control requires a highly stable communication network.

The current air conditioning communication technology adopts master-slave polling mechanism, which has the technical bottlenecks with low reliability, poor real-time performance, and poor extensibility, which restrict the development of intelligence; slow response of centralized control and low efficiency of control; communication is susceptible to interference, resulting in abnormal operation; expansion of functions and number of nodes are difficult.



Innovative Stratification CAN+ Structure with Multiple Master Networks

Considering that the application of an air conditioning system requires multiple nodes, multistep control and intelligent expansion, we originally developed the stratification CAN+ structure with multiple master networks, which makes it possible for the number of nodes in a single system to be increased relatively by 56% and the response time for centralized control to be shortened by hundreds of times.

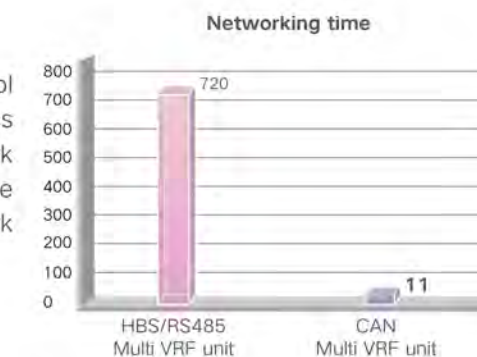


Technical Effect		CAN+ Network Structure	Traditional Network Structure
Real-time capability of interaction	Communication cycle of single system	<500ms	About 5s
	Preferential response	Microseconds	Seconds
	Centralized control response time	6s	10min
Reliability of interaction	Error isolation	Automatic	No
	Impact of node malfunction	Not rely on any node	Totally rely on master unit
	Sub-net scale	80 (it should be customized if over 80, 100 sets can be customized at most)	64
Expansibility	Intelligent equipment	Free access	Require bridge connection

First Formulated CAN+ Communication Protocol

It is the first time to formulate and standardize CAN+ communication protocol: two-stage network universal design, data can be directly transferred; functional code, network address, data field and related core concepts are developed, realizing grading, classification and real-time transfer of communication data, satisfying the demand of intelligent expansion.

Full network automatic address allocation technology: the protocol supports dynamic IP automatic allocation and full network addresses automatic offset, which realizes large-scale air conditioning network automatic networking without commissioning. The networking time is relatively shortened by more than 60 times, ensuring fast network distribution and free access to multiple online devices.



The First Nonpolarity CAN+ Communication Chip

Good Expansibility

- Instant use: new device can be accessed freely, with flexible engineering configuration;
- Centralized control: two-stage CAN+ communication network structure, no bridge device is needed between the systems, and the centralized control equipment can control up to 16 systems.

High-efficiency and Reliable

- Innovatively integrate the air conditioning control business with the bus arbitration mechanism to achieve second-level response of large centralized control system;
- With fault isolation function, the faulty node quits actively, and the network is not affected by the faulty node.

Convenient Installation Commissioning

- With automatic addressing function, the system automatically assigns addresses without manual DIP switch setting and networking, saving time and effort;
- The interface adopts non-polar design. Engineering wiring does not need to consider the positive and negative poles, which is safe and reliable.

Honors

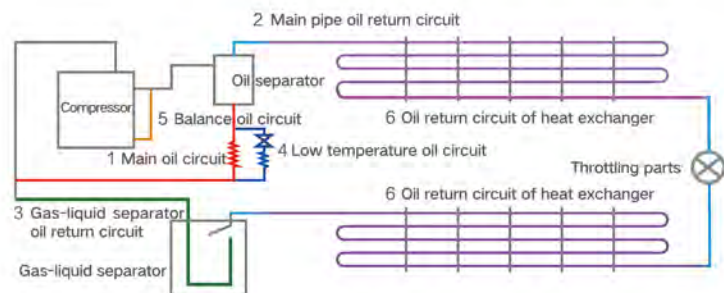
- In 2017, the project "Research and Application of CAN + Communication Technology Based on Multi VRF Unit" was accredited by the Chinese Association of Refrigeration and reached the "international leading" level;
- In 2018, the project "Research and Application of CAN + Communication Technology for Mult VRF Unit" won the Gold Medal at the 70th Nuremberg International Invention Exhibition in Germany;
- In 2018, the core patent of CAN + communication technology "Mult VRF Air Conditioning System ZL201410312939.1" won the Silver Award of China Invention Patent.

Precise Oil Control for Stable Operation of Compressor

Oil Return Control Technology

Multiple Oil Circuits Management

Six oil circuits ensure smooth and reliable oil passage.



*The above data is the test value of our company

Self-balancing Control without Oil Balancing Tube

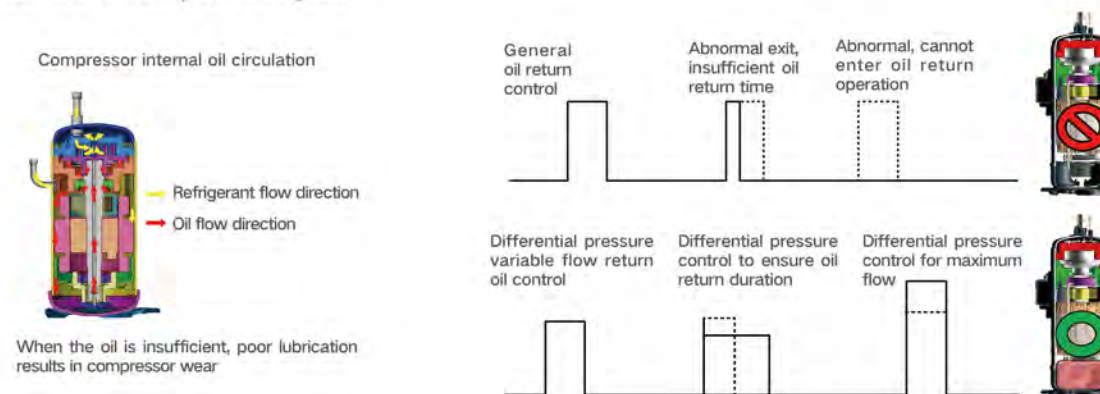
Advanced oil balancing control method, no external oil balancing pipeline is required between modules, and the installation is simple and fast. By collecting and calculating the capacity output and threshold conditions between each module, the distribution of refrigeration oil between the modules is automatically controlled to ensure stable operation of the system.



China Patent No. 201510307364.9 "Oil Balancing Control Method of Air Conditioning System"

Pressure Difference Type Variable Flow Oil Return Technology

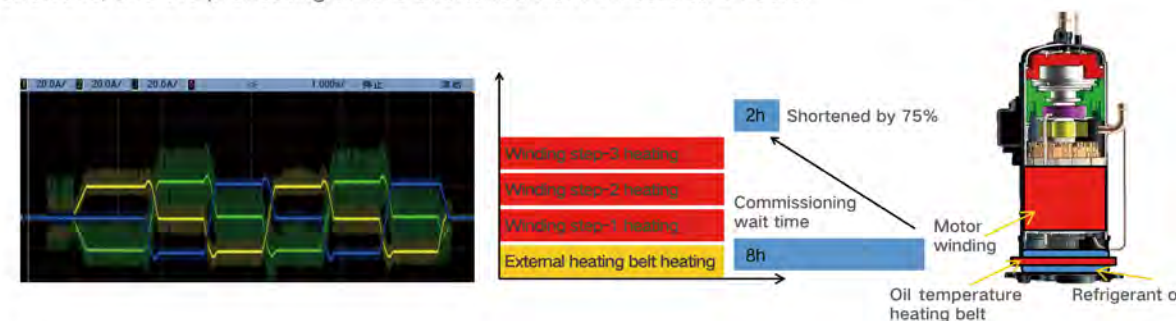
According to different operating conditions of the unit, on the premise of ensuring the reliability of the unit, the pressure difference control factor is introduced to conduct intelligent variable flow oil return operation according to the real-time operating parameters of the unit, to ensure the maximum return flow rate and duration, and to improve the reliability of unit again.



Double Heating Source Oil Temperature Control Technology

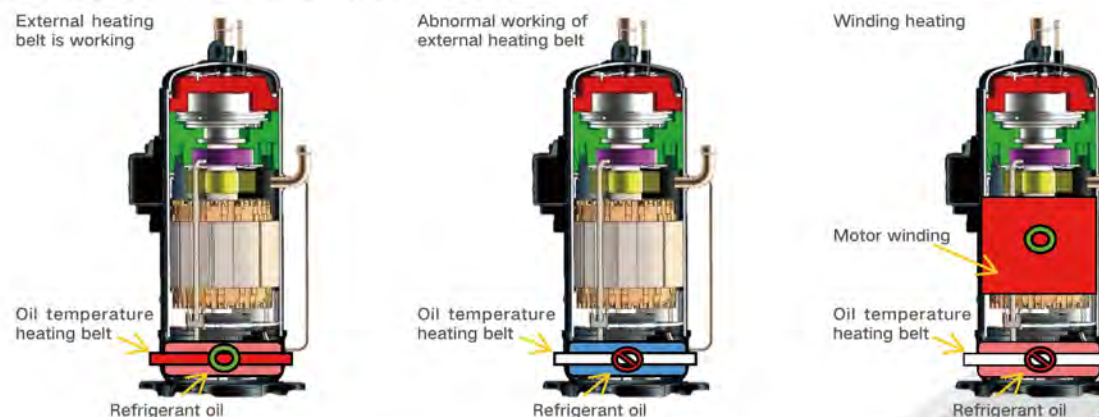
Under standby status, the compressor winding and external electric heating belt can independently or simultaneously conduct heating control of the refrigerant oil.

Variable control of motor winding heating power enables fast and safe start-up under different environmental conditions, and the preheating time is shortened from 8 hours to 2 hours.



Backup Heating

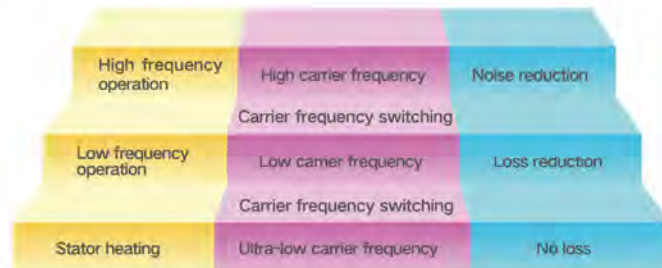
Under the condition that the external heating belt works abnormally in the GMV6 unit, the winding heating can also work normally to ensure the reliability of compressor. Ordinary units only have external electric heating control. Once the electric heating is faulted, the probability of damage to the compressor is greatly increased.



Self-adaptive Drive Technology

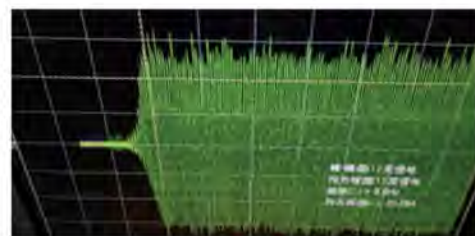
Variable Carrier Frequency Control Technology

According to the operating characteristics of compressor, the carrier frequency is automatically switched, and then high-frequency noise reduction and low-frequency loss reduction are realized, which can maximize the efficiency and reliability.

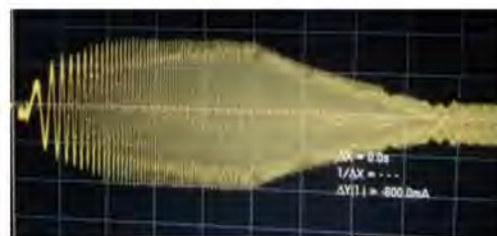


Strong Torque Start Control

No external balancing device is needed, and the compressor torque self-feedback and adjustment control are adopted. The compressor can be started during the system operation with a high pressure difference, effectively ensuring the continuity and stability of system operation.



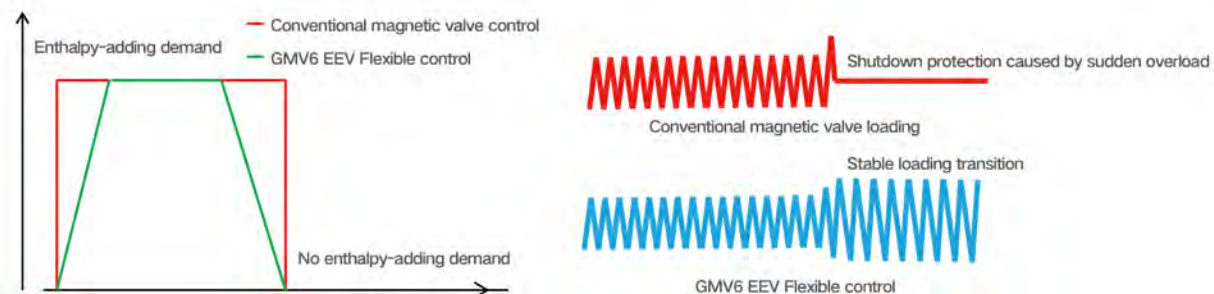
Conventional startup mode



GMV6 startup mode

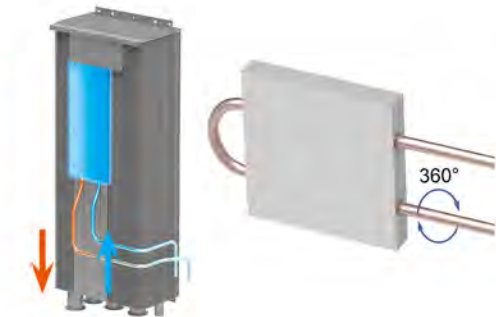
Flexible Enthalpy Loading Control

The general enthalpy-adding system adopts "0 ↔ 1" on-off method to switch between enthalpy-adding mode and non-enthalpy-adding mode. This will cause the compressor load to change drastically, which may lead to runaway and shutdown. In serious cases, the compressor may be damaged. The GMV6 unit uses the linear flow change feature of EEV to gradually increase the load during enthalpy-adding control to achieve flexible transition and ensure stable and continuous operation of the system.



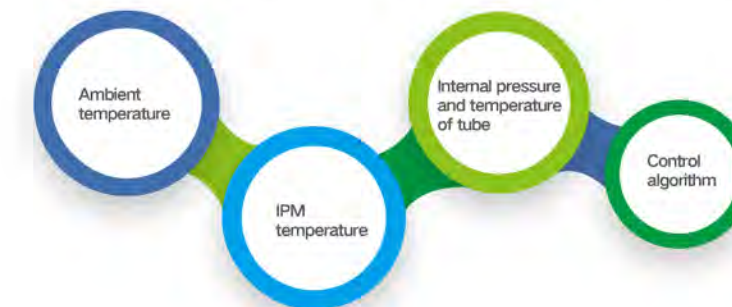
Sub-cooling Module Cooling Technology

The compressor drive IPM high-power device adopts sub-cooling 360° ring-shaped heat dissipation structure module cooling technology to ensure that the internal components work under relatively low temperature conditions. Compared with ordinary air-cooled heat dissipation, the internal temperature can be reduced by up to 8°C, and reliability raised dramatically.



Anti-condensation Control Algorithm for High Humidity Environment

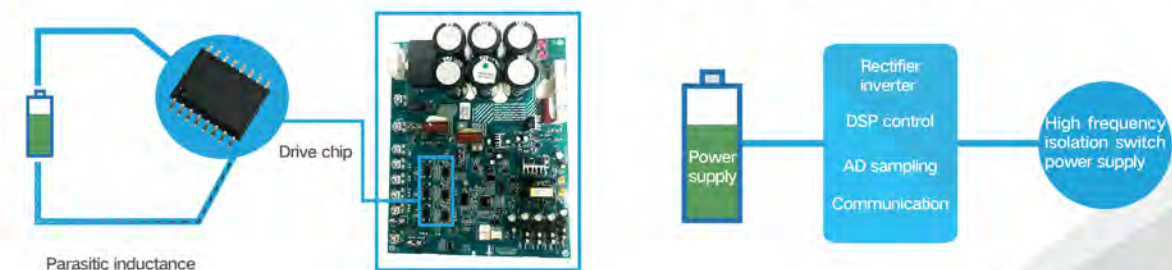
By detecting the ambient temperature, internal pressure and temperature of the tube, IPM temperature, etc., the anti-low temperature control algorithm for the high humidity environment is determined to prevent the condensation of internal components and avoid damage to the devices.



Anti-high Voltage Impact Technology

The greater the compressor capacity is, the greater the unit current will be, and influence of the parasitic inductance of the wiring will also increase; operating reliability of unit will decrease, and even the components will be damaged.

With high-voltage switch power supply and fully isolated drive technology, multiple output electromagnetic isolation is adopted to avoid mutual interference. The circuit protection function is synchronously isolated, and the desat setting can suppress transient peak current. Industrial-grade performance and high-power drive greatly improve safety and reliability.



Indoor Unit Emergency Maintenance Function

When a certain indoor unit of the system needs to be powered down for maintenance, the indoor unit can be turned off separately, while other indoor units can maintain normal operation.



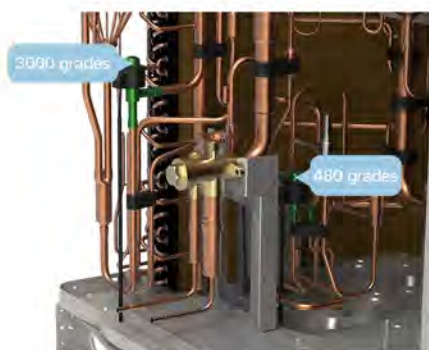
Note: There should be less than 3 indoor units that are powered off at the same time within the same cooling system.

Multi-electronic Expansion Valve Control Technology

Electronic expansion valve is one of the four basic components of the air conditioner. In addition to the throttling function, it can also adjust the refrigerant flow into the evaporator. The wider the adjustment range of the electronic expansion valve is, the higher the accuracy will be.

Outdoor Unit

The outdoor unit adopts double electronic expansion valves, the main electronic expansion valve is 3000 grade, and the subcooled electronic expansion valve is 480 grade, which can accurately control the flow between the modules of indoor unit and outdoor unit.

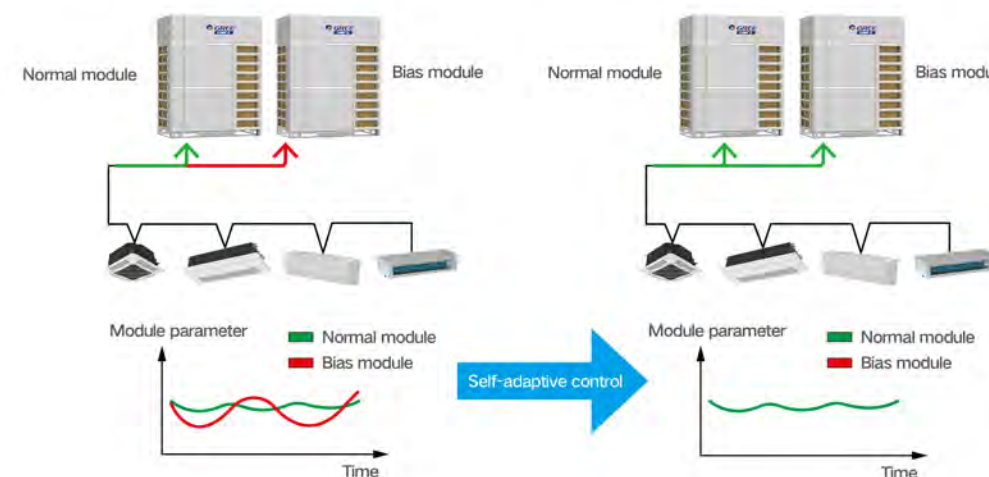


Indoor Unit

The quiet electronic expansion valve is used to accurately control the refrigerant flow, the adjustment is smooth and stable, and the comfort and reliability are improved.

Modular Engineering Piping Self-adaptive Control

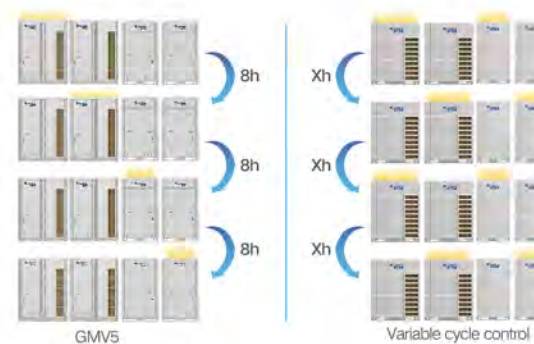
During the modular design of a project, the outdoor unit detects the parameters of each module, the system self-defines the bias current module, and memorizes the operating characteristics of the bias current module. Each module automatically adjusts the control methods and control thresholds of key components according to the difference in characteristics, and memorizes automatically to quickly reach a reliable and efficient operating state when it is restarted next time.



New Generation Intelligent Alternate Control Technology

Variable Cycle Module Alternate Control

GMV6 adopts a new modular control method to ensure the service life of the complete unit and improve the overall operating performance.



X refers to the variable cycle

Compressor Alternate Control

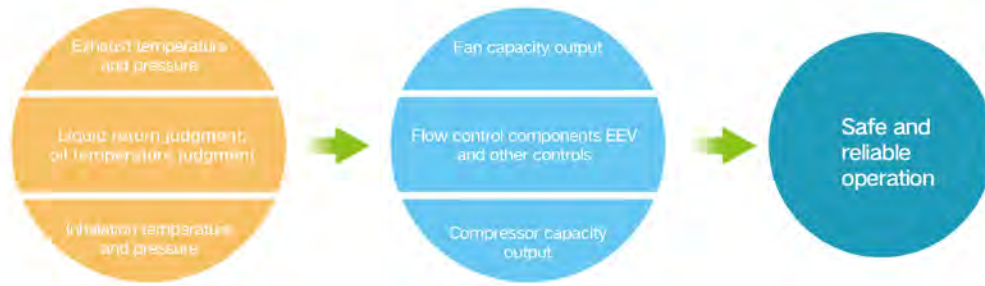
As for the system control, not only the overall service life of the modular design is considered, when the module is designed for multiple compressors, the internal compressors will also conduct rotation control to balance the operating service life of each compressor.



*Applicable to partial models.

Advanced Anti-liquid Impact Technology

High-efficiency large-capacity gas-liquid separator design for effective separation of refrigerant in gas and liquid state, to avoid large amount of refrigerant be directly inhaled into the compressor. At the same time, the liquid return judgment is combined with the inhalation and exhaust temperature and other parameters. The compressor, EEV and other components are adjusted in real time to effectively prevent the compressor from liquid impact.



Emergency Stop Function

Without remote monitoring, the outdoor unit can be directly connected to the fire alarm linkage signal to stop the operation of the whole unit immediately in an emergency to avoid greater losses.



VIP Function

In high-end hotels and other occasions, when the diesel generator is used for power supply temporarily, the outdoor unit can directly connect different power identification signals and send a signal of insufficient power supply to the system. At this time, only rooms set as VIPs such as presidential suites are allowed to use the air conditioner, other rooms are forbidden to use the air conditioner.



Diversified Backup Operation

Basic module emergency function

GMV6 can achieve a combination of four independent units. Each unit is a basic module. When a certain basic module is malfunctioning, other basic modules can achieve emergency operation, which reduces the influence of malfunction.



Fan emergency function

Some basic modules are designed with two fans. Gree control logic and optimized system design can ensure that when one of the fans is malfunctioning, the unit can still operate with the other fan, which reduces the influence to users due to sudden stoppage.



Compressor emergency function

For a basic module with two or more compressors, when one of the compressors is malfunctioning, the unit can still operate with other compressors, which reduces the influence of malfunction.



Sensor malfunction emergency function

The application field of VRF systems is complicated. When a temperature sensor malfunction occurs to the unit, the unit will enter back-up mode, which minimizes the influence of malfunction.

* Only for some temperature sensors.

