ASAMI®

Climate in your hand ™

CATALOGUE 2024 edition

Energy Efficiency Class A+++

R410A

INVERTER

CONTENTS

MISSION

Our mission is the growth of both our employees and our clients, manifesting as personal growth and professional advancement in the field of HVAC. Furthermore, we are committed to providing sustainable solutions in the HVAC field that contribute to environmental preservation.

THE COMPANY

We have more than 20 years of experience in HVAC business and our firm has been continuously developing on the markets of Central and Northern Europe. Our ambition is to co-create the ecosystem in which every user – the final one together with all the other business partners- gains his goals and succeeds.
Our offer of devices is based on the optimal relation between technical parameters and reliability and the price. What we also keep in mind is the harmony with nature.

WHAT MAKES US DIFFERENT?

We believe in prioritizing quality over shortcuts. Our commitment to excellence means that we only offer certified HVAC products, ensuring that our customers receive reliable, safe, and compliant solutions that meet the highest industry standards.
Knowledge is power, and at our HVAC company, we strive to deepen the technical expertise of both our team and our customers. We offer training programs, workshops, and educational resources to enhance understanding and promote best practices in HVAC and Industrial Refrigeration.
When it comes to HVAC projects, we prioritize efficiency without compromising on environmental responsibility. Our team carefully assesses each client's needs, providing tailored solutions that minimize energy waste and reduce greenhouse gas emissions.
We believe that informed decisions drive positive change. Through continuous learning and knowledge sharing, we empower our customers to make environmentally conscious choices, fostering a collective effort towards a more sustainable future.

OUR VALUES

Our firm is created on the basis of such qualities:

Professionalism. We are engineers offering high standard advice. We are also busi¬ness people who recommend what you should invest in and how to optimize the costs of investment and operation. Listening carefully to our clients' needs we offer solutions which guarantee successful completion of their goals.

Partnership. We are certain that the 'win-win' business is the best business. We want the users of our products to be happy and satisfied with long-lasting operation without any problems. We have been building competent network of dealers and service partners who will be close enough to supervise investment processes and operation. We care for the long-term satisfaction of our clients and business partners.

Constant innovation combined with simplicity. We are able to appreciate the elegance of classic solutions and we propagate verified good techniques. We are constantly improving our products and services not forgetting about the processes and the structures of the firm. Our policy is the dialog with our employees and business partners which should lead us to regular increase in the quality of our product and relation. Preserving the simplicity of solutions we obtain most possible reliability.

Humanity. At our company, we prioritize humanity and genuine human connections. We go beyond transactions to build strong, meaningful relationships with our clients, taking the time to understand their unique needs and concerns. By fostering open communication and empathy, we ensure that our solutions are tailored to meet the human aspects of our clients' requirements.

Honesty is the bedrock of our customer interactions. We firmly believe in transparent and straightforward communication, ensuring our customers receive accurate information and realistic expectations. We take pride in being upfront about any challenges or limitations, as we value the trust our customers place in us. Our commitment to honesty empowers our clients to make well-informed decisions and fosters long-lasting partnerships built on integrity.

Punctuality is a hallmark of our service commitment. We understand the importance of timeliness in meeting our customers' requests, and we strive to deliver on time, every time. Our efficient scheduling and dedicated team ensure that deadlines are met, allowing our clients to rely on us with confidence. We value our customers' time and make it a priority to promptly respond to their needs, ensuring a smooth and hassle-free experience with our company.

Loyalty is the foundation of our business, and we take pride in building long-lasting relationships with our customers. From the first interaction and throughout our journey together, we prioritize their satisfaction and success. Our unwavering commitment to quality, reliability, and personalized attention fosters trust and loyalty among our clientele. We are dedicated to being a dependable partner, continuously seeking to add value and adapt our services to meet their evolving needs. Through these enduring relationships, we aim to be the go-to HVAC solution provider for our customers, ensuring their continued confidence and satisfaction with our services.

QUALITY

Manufacturing

Our devices are manufactured in one of the most modern plants in the HVACR industry. The manufacturing facility in the Zuhai province, where Asami devices are manufactured, was established as result of an agreement between companies setting out world standards in the industry.

Therefore, the plant uses the best practices in the world both in terms of quality and cost effectiveness. The plant employs over **8000** engineers and is the biggest plant in the air-conditioning industry in the world. Nowadays, there is 9 production bases around the world, 7 are located in China, another 2 in Brazil and Pakistan, with more than 70,000 employees.

Components

Asami products use only tested components ensuring reliability, low energy consumption and silent operation. We use the following components:
- Hitachi (Japan), Mitsubishi Electric (Japan), Gree – compressors
- Danfoss, Sanhua – electronic expansion and other valves
- Gree – ventilators, heat exchangers.

Certificates

Efficiency

The energy efficiency of a number of HVAC systems is measured by SEER, which is the seasonal energy efficiency ratio for cooling mode, and SCOP, which is the seasonal coefficient of performance for heating mode. They help consumers make informed choices, encourage the adoption of energy-efficient technologies, and contribute to cost savings and reduced environmental impact.

To measure the energy consumption of a unit, in cooling mode throughout a standard cooling season, SEER uses a set indoor temperature, along with different outdoor temperatures and load capacities to simulate real-world conditions, as defined by the EN 14825 standard. SEER is calculated at the following conditions:

Air source:

CAPACITY	100%	74%	47%	21%
OUTDOOR TEMPERATURE	35°C	30°C	25°C	20°C

Water source:

CAPACITY	100%	74%	47%	21%
OUTDOOR TEMPERATURE	30°C	26°C	22°C	18°C

For an average EU climate, the occurrence of each outdoor temperature condition is computed by 1 °C temperature intervals (also called temperature bins) and a weighted average efficiency over the cooling season is computed as the ratio of the whole cooling energy supplied divided by the total electricity consumption.

$$SEER = \frac{\sum_j h_j \times P_C(T_j)}{\sum_j h_j \times \frac{P_C(T_j)}{EER(T_j)}}$$

Where:

- Tj = the bin temperature
- j = the bin number, with j {1,2,...n} n the amount of bins
- PC(Tj) = the cooling capacity to be supplied for the corresponding temperature Tj
- hj = the number of bin hours occurring at the corresponding temperature Tj
- EER(Tj) = the EER value of the unit for the corresponding temperature Tj

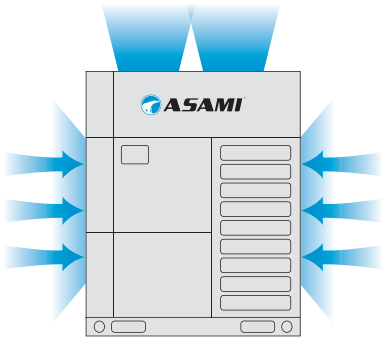
OUTDOOR UNITS


ASAMI

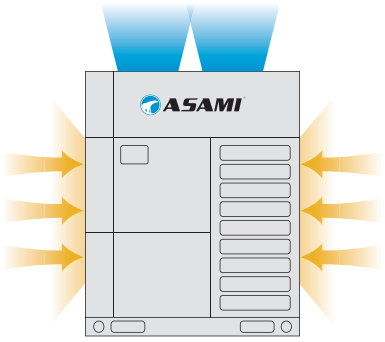
MULTIPLE PREVENTION TECHNOLOGIES

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

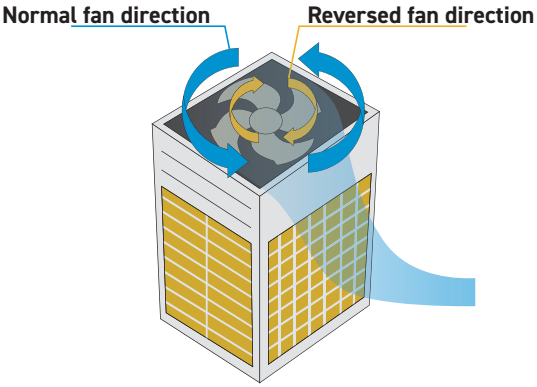


Auto-clean status

* This function should be customized.

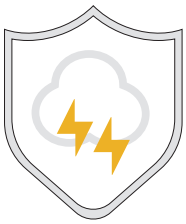
Wind Prevention Function

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.

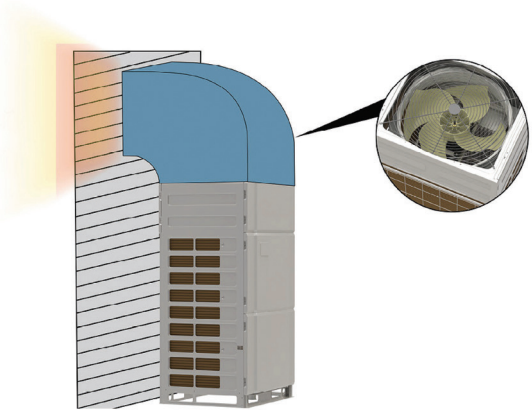


Snow Prevention Function

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.

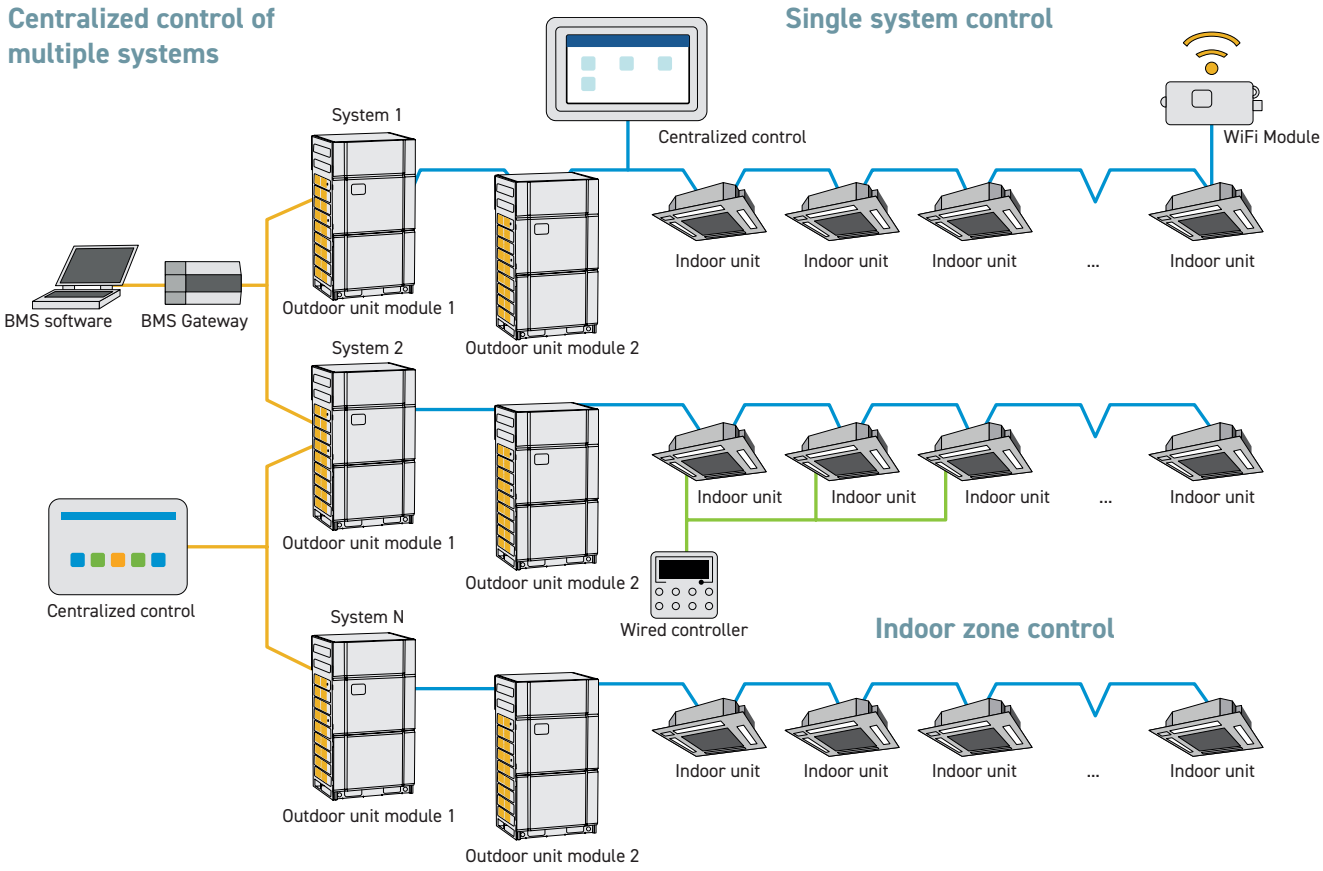
HIGH STATIC PRESSURE DESIGN

- New diversion cover: Effectively coupled with fan blades, the flow field is more uniform.
- The air-out grille with vortex streamline distribution, less wind resistance.
- High external static pressure design facilitates engineering application and mechanical floor design.
- High-efficiency motor, powerful output and highest static pressure up to 110Pa (ex-factory standard).



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.



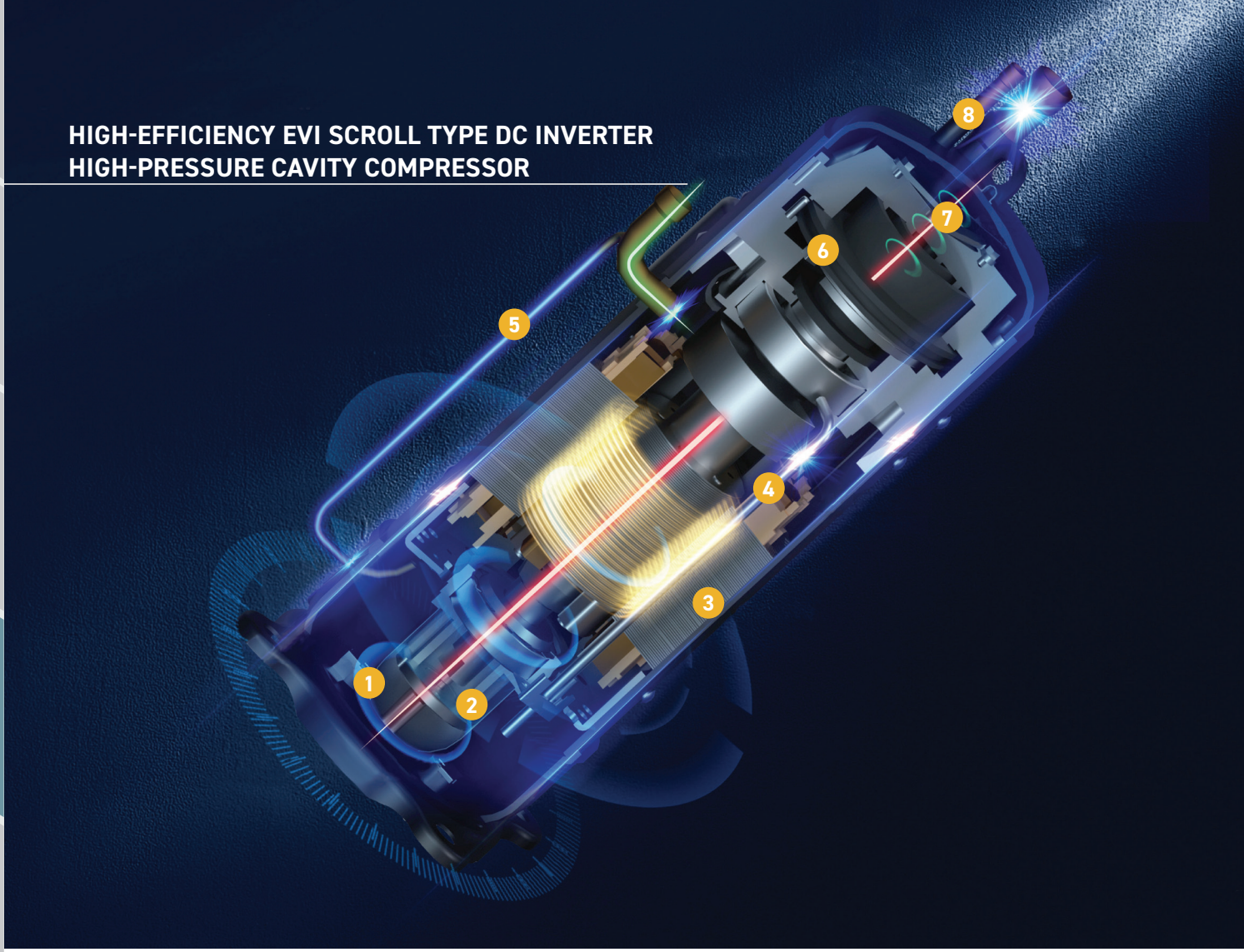
First Formulated CAN+ Communication Protocol

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 oncepts 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.

HIGH-EFFICIENCY EVI SCROLL TYPE DC INVERTER HIGH-PRESSURE CAVITY COMPRESSOR



1 Oil pump filter
Filtrate the impurities to ensure the supplied oil is clean.

2 Positive displacement gear pump
Ensure necessary oil supply under the revolving speed to improve the reliability of compressor.

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

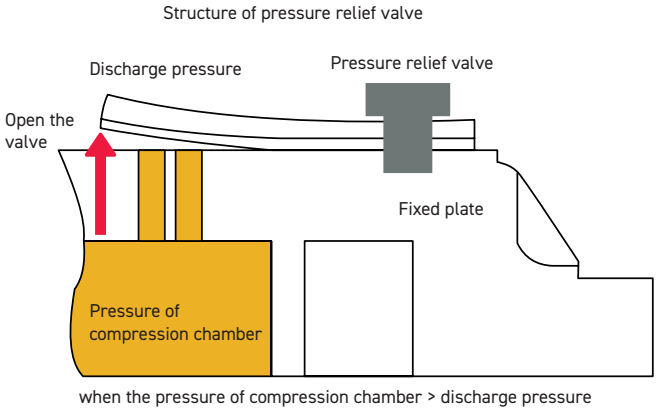
4 Internal oil circulation structure
Internal circulation of lubricating oil to reduce over-heat losses and oil discharge rate and to improve efficiency and reliability.

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

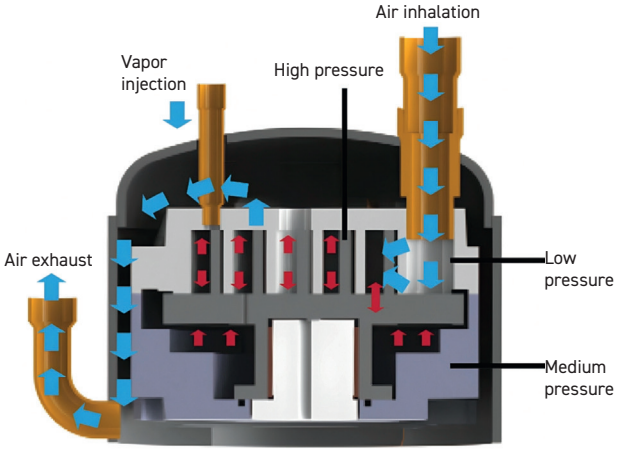
7 Release valve

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



8 EVI Technology

Reinforce system capacity, widen operating range and accelerate heating.



DIVERSIFIED BACKUP OPERATION

BASIC MODULE EMERGENCY FUNCTION

AMV6 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.

- **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.

- **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.

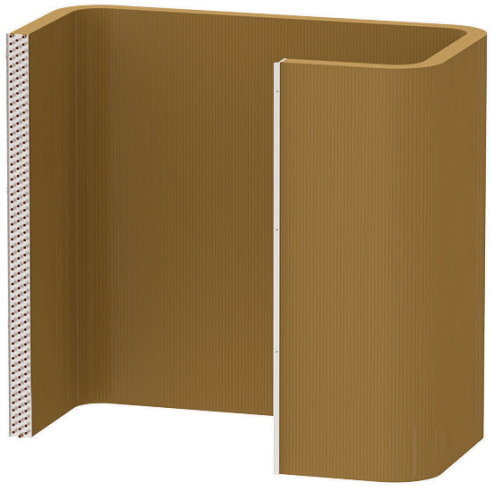
* Only for some temperature sensors.

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.

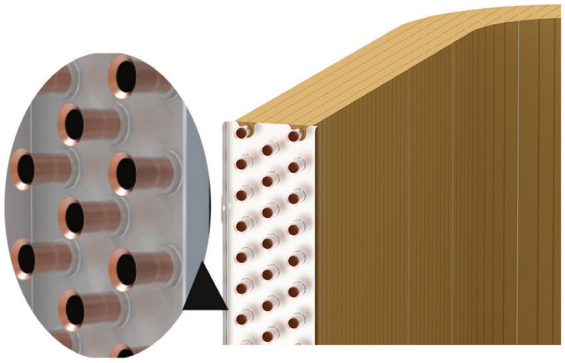
Note:
· Applicable for some models.



MULTI-ROW SMALL DIAMETER DESIGN

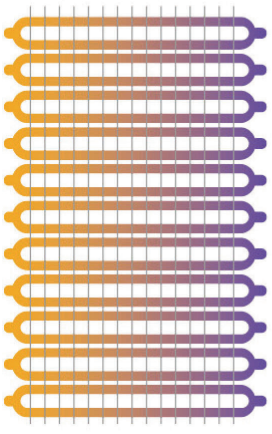
The refrigerant pipe adopts ϕ7mm and 3-row design, which can reduce the flowing resistance of refrigerant inside the pipe and effectively increase the heat exchange area of refrigerant, so as to optimize and improve the heat exchange efficiency.

Note:
· Applicable for some models.

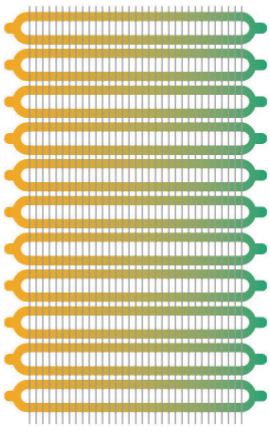


Small Pitch Corrugated Heat Exchanger Fins

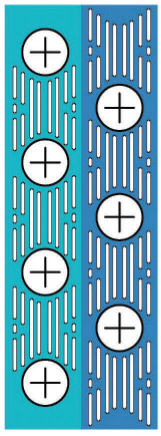
Small pitch corrugated fins are used to increase the effective area between fins and the air, for more sufficient heat exchange of refrigerant and higher heat exchange efficiency.



Others



AMV6



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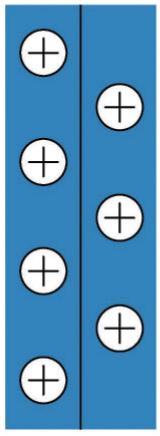
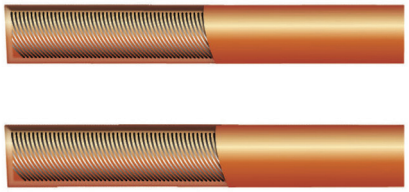


AMV6

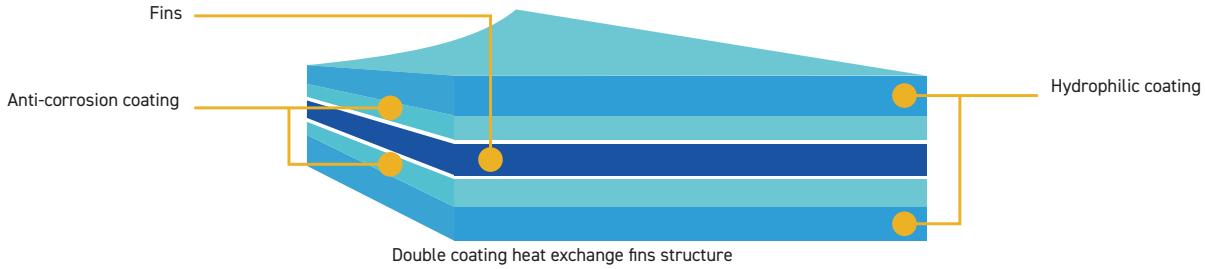
INTERNAL SCREW THREAD DESIGN OF COPPER TUBE

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.



MULTI-FUNCTIONAL HEAT EXCHANGER FINS

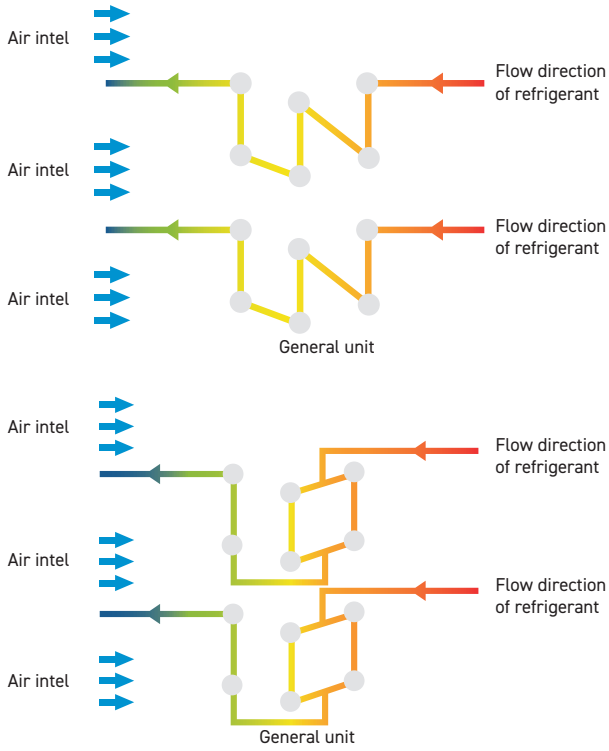
The heat exchanger fins adopt double-sided double-effect coating and hydrophilic membrane design so that the unit is not easy to get frosted and the condensate water or water from defrosting can flow down more quickly; the anti-corrosion coating isolates the pollutants and dust from air to protect the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

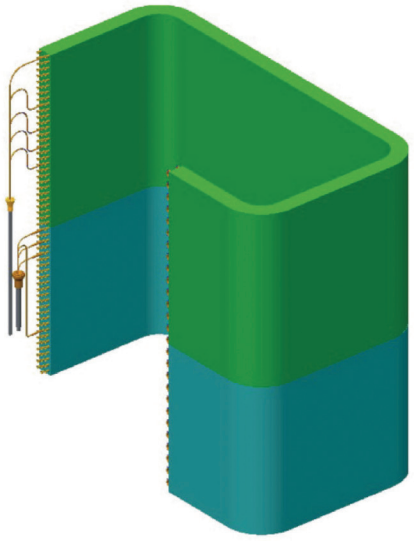


Double coating heat exchange fins structure

DIVISIONAL HEAT EXCHANGE FLOW PATH

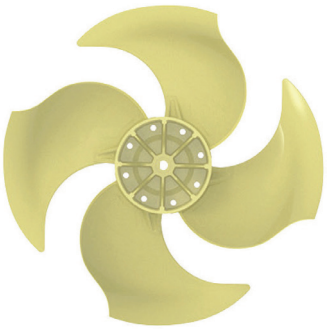
According to the feature of wind field, the flow path of heat exchanger adopts divisional design for more reasonable flow division. Design according to 1-2-2-1 flow path for higher exchange efficiency.



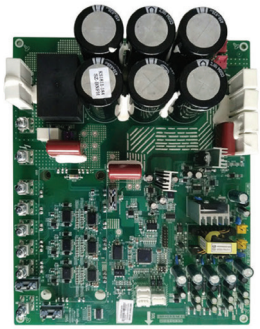


MULTIPLE PROFESSIONAL NOISE REDUCTION TECHNOLOGIES

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



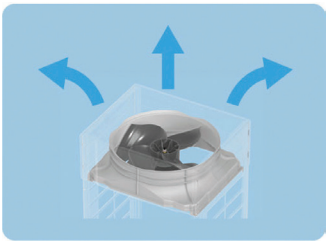
2 Intelligent Noise Reduction Converter
IGBT adopts exciting voltage and control carrier frequency switching technology to actively reduce electromagnetic noise.



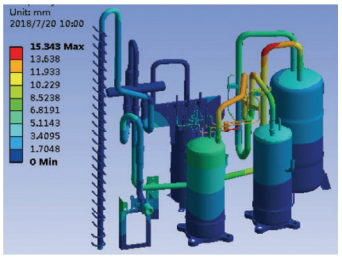
3 Quiet Throttling Component
The quiet expansion valve with special structural design meets the needs of pressure-reducing flow distribution and can minimize the throttle noise.

4 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%.

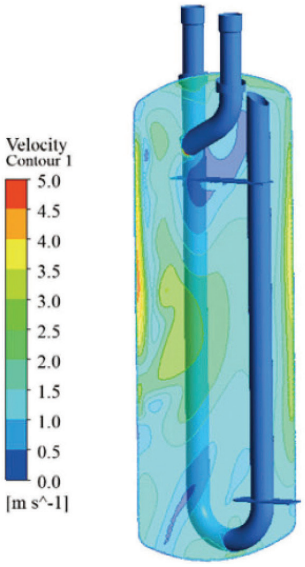
5 New Streamline Grill and Immersed Layout Air Duct
The general air duct system of unit goes down to form an immersed layout, which can effectively reduce the fan noise.



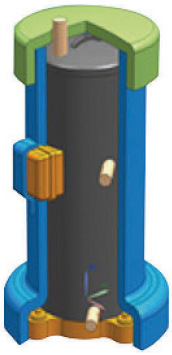
6 **Pipeline Simulation Shock Absorption Design**
Pipeline is designed based on ANSYS to effectively reduce the vibration of pipes.



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.



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.

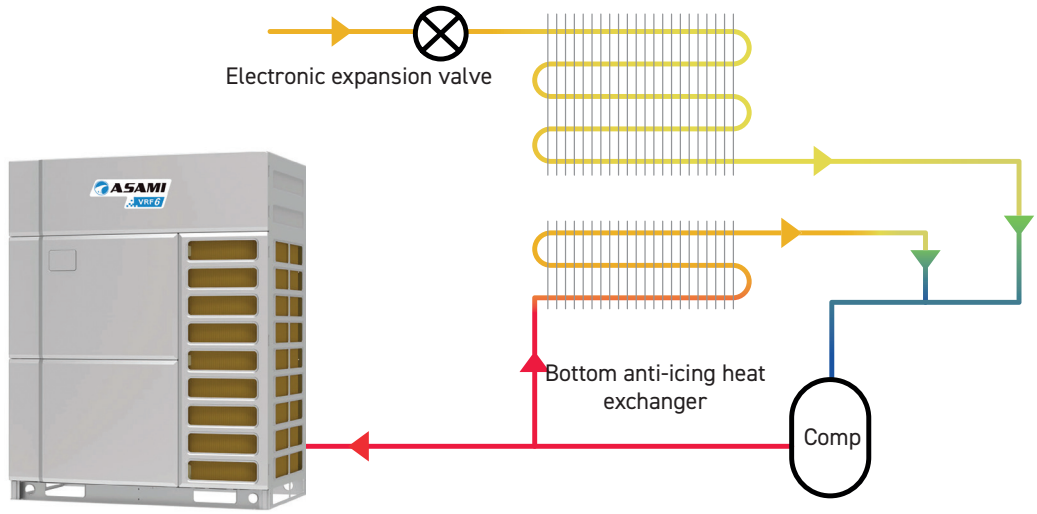

Sound absorption material


Metal sound insulation cover

Note:
* Configuration of some models

LOW-TEMPERATURE ANTI-FREEZING CONTROL

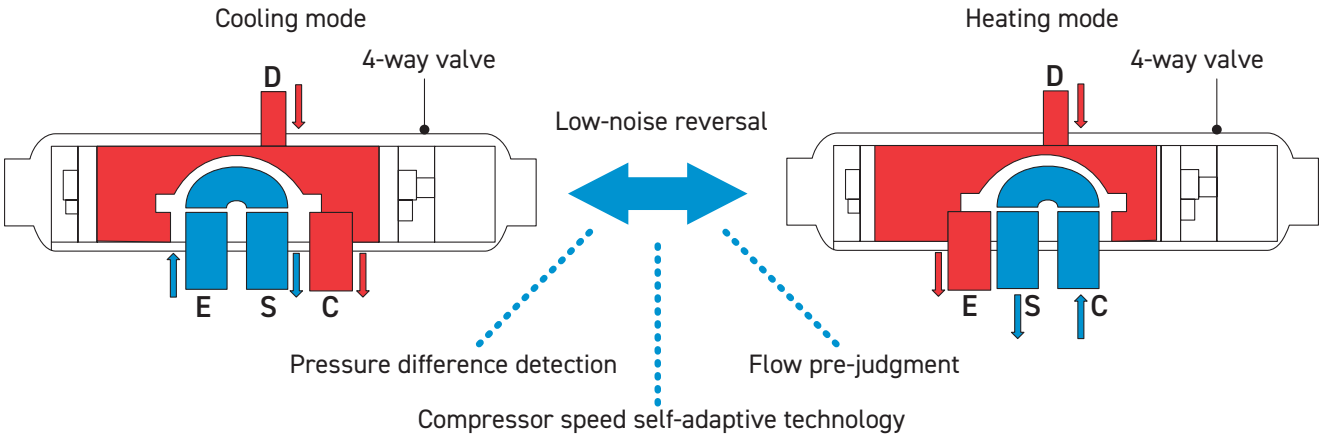
To ensure smooth water drainage and reliable operation under low temperatures, a special bypass is added at the bottom of the heat exchanger for anti-freezing control.



Special gas bypass at the bottom

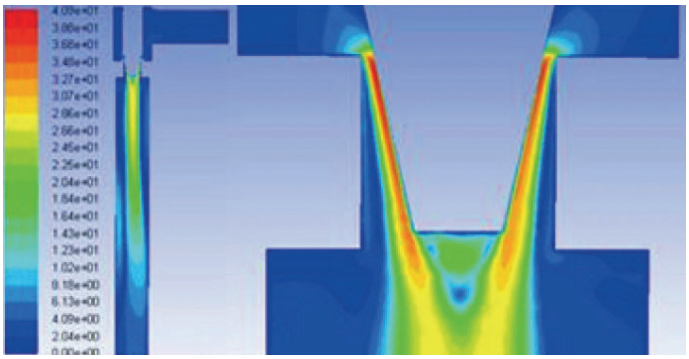
LOW-NOISE OPERATING TECHNOLOGY

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.



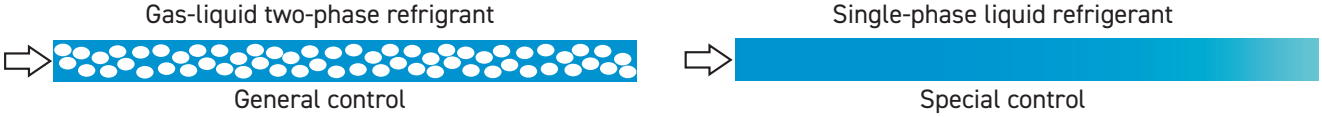
REFRIGERANT FLOW NOISE REDUCTION TECHNOLOGY

AMV6 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

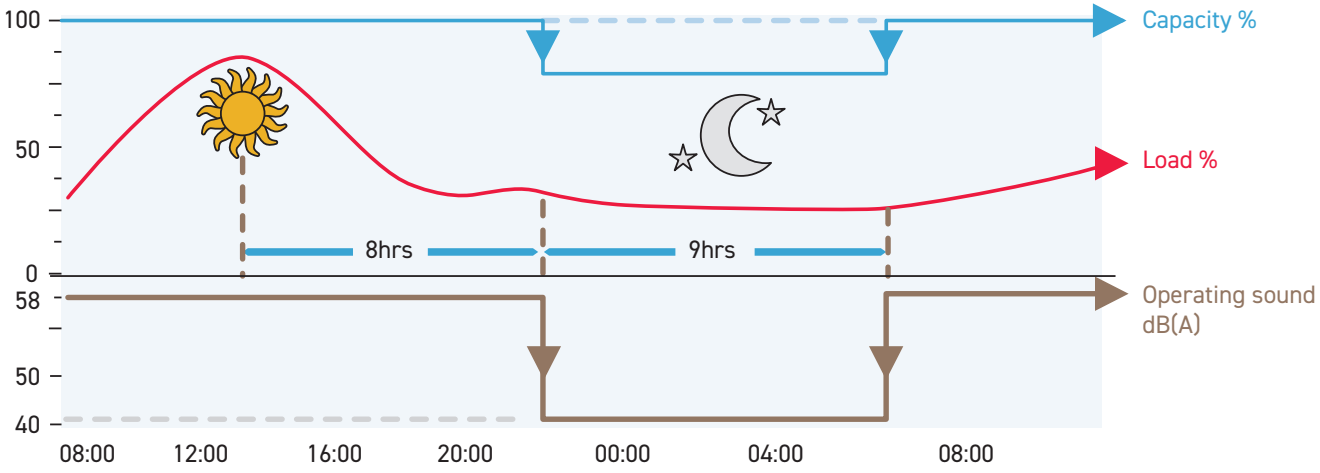
According to the mechanism of refrigerant flow noise, high-efficiency sub-cooling and sub-heating technologies are used in cooling and heating operation to fundamentally control the single-phase state of the refrigerant in the flow process.



13 QUIET MODES

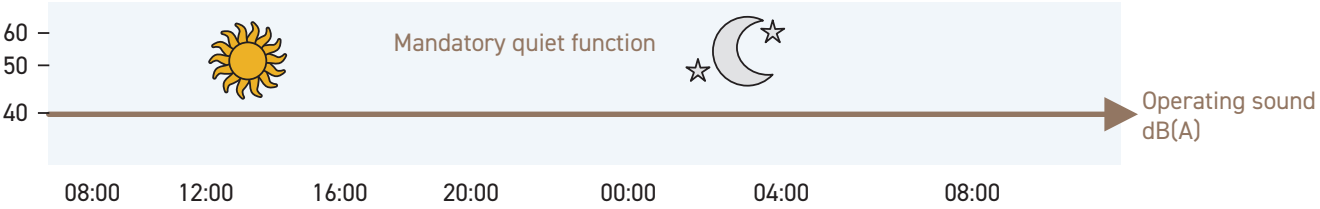
Night Quiet Function

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.



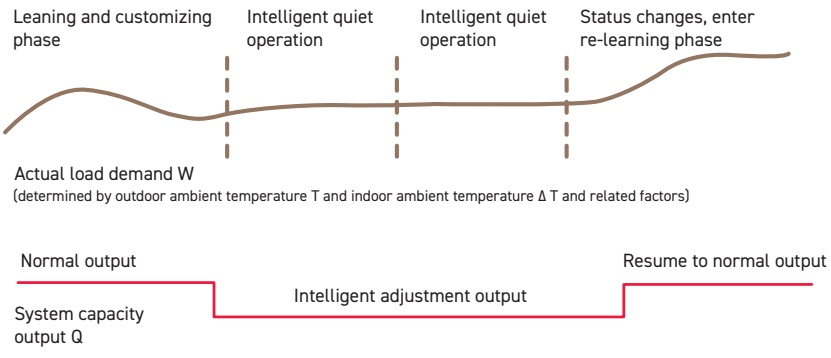
Mandatory Quiet Function

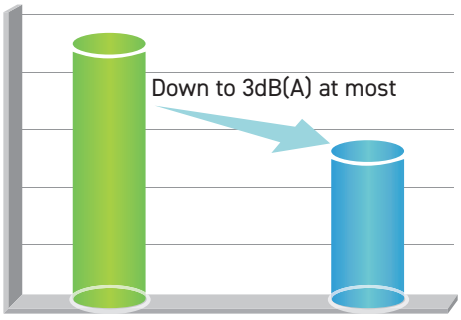
When the unit is installed in an environment with high noise requirements, it needs to operate silently during the day or night. Then you can choose three mandatory settings of quiet modes to ensure that the unit operates in low noise mode at any time, and the noise value can be as low as 40dB (A).



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.

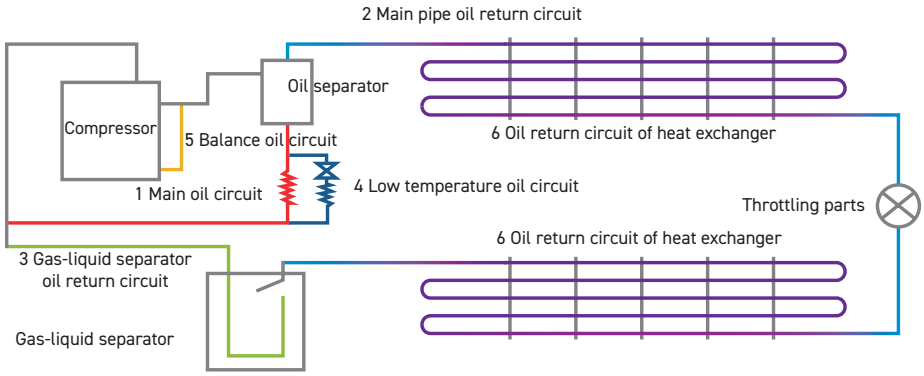




PRECISE OIL CONTROL FOR STABLE OPERATION OF COMPRESSOR

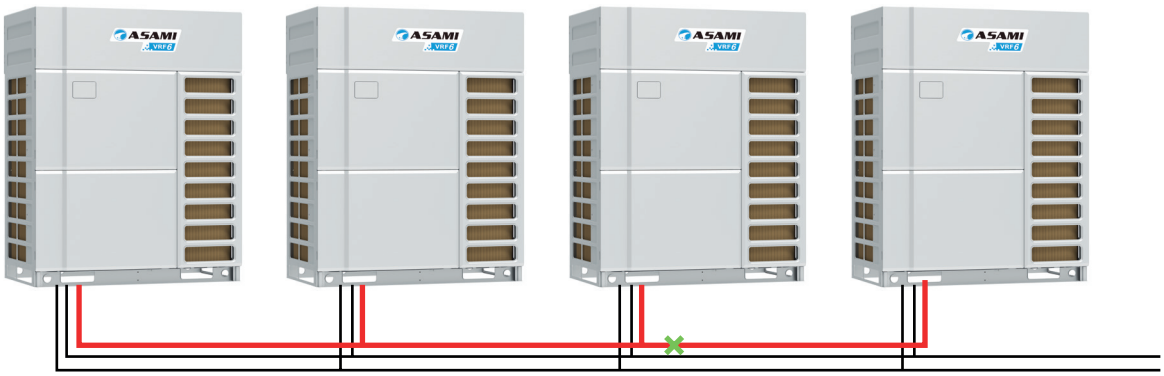
OIL RETURN CONTROL TECHNOLOGY

Multiple Oil Circuits Management
Six oil circuits ensure smooth and reliable oil passage.



*The above data is the test value of our company

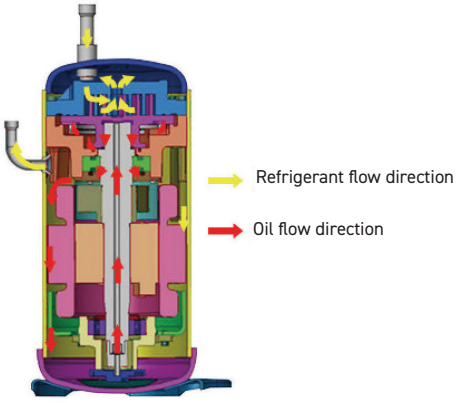
Self-balancing Control Without Oil Balancing Tube
Advanced oil balancing control method, no external oil balancing pipeline is required between modules, and the installation is simple and fast. By collecting and calculating the capacity output and threshold conditions between each module, the distribution of refrigeration oil between the modules is automatically controlled to ensure stable operation of the system.



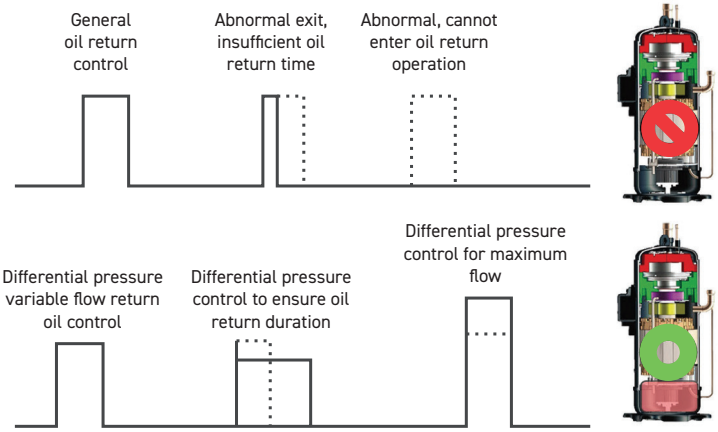
China Patent No. 201510307364.9 “Oil Balancing Control Method of Air Conditioning System“

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.

Compressor internal oil circulation



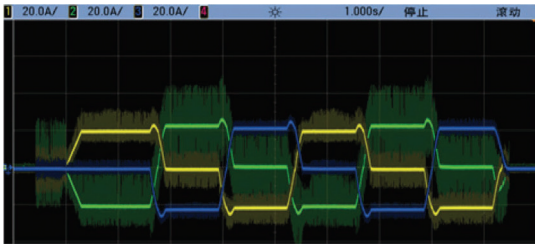
When the oil is insufficient, poor lubrication results in compressor wear

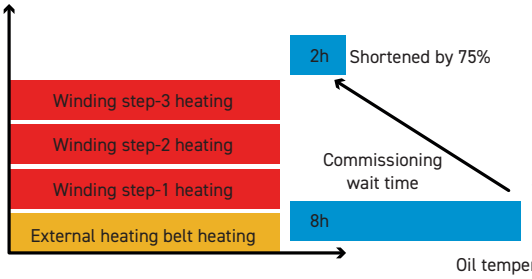


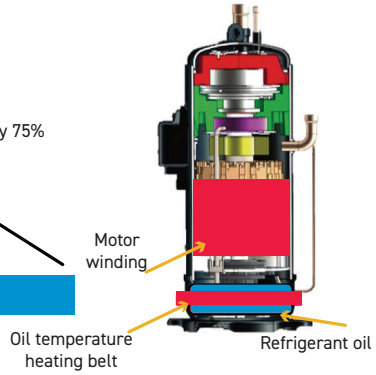
DOUBLE HEATING SOURCE OIL TEMPERATURE CONTROL TECHNOLOGY

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.

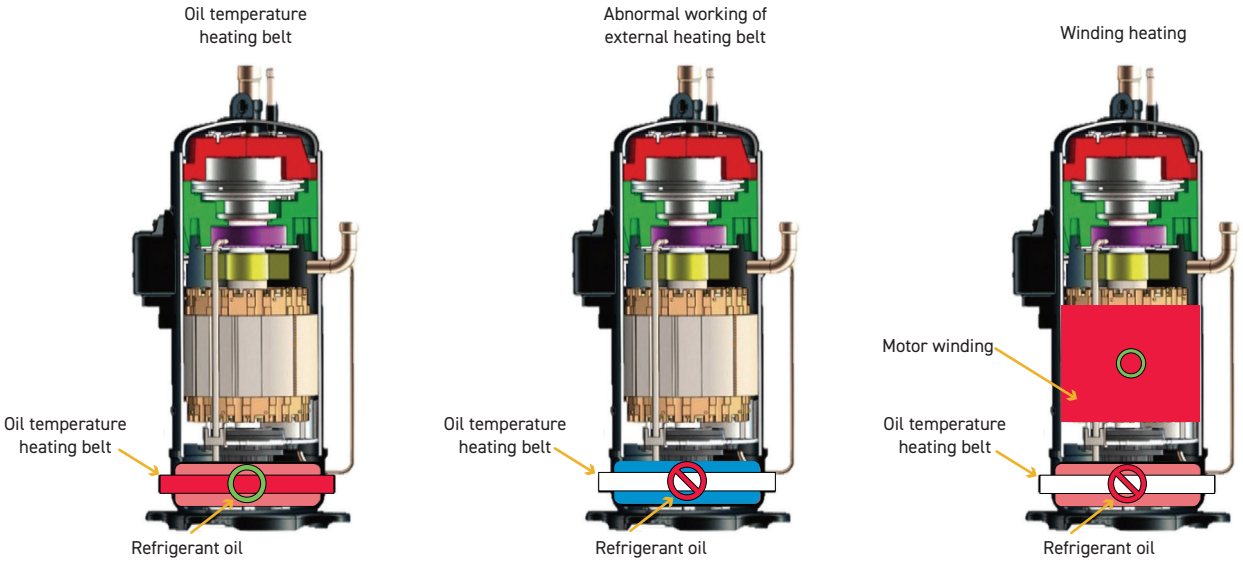






BACKUP HEATING

Under the condition that the external heating belt works abnormally in the AMV6 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.



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.

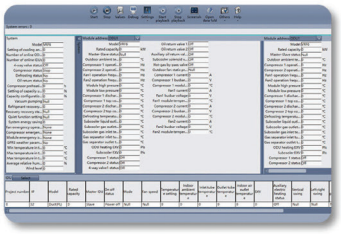
Note: There should be less than 3 indoor units that are powered off at the same time within the same cooling system.

DIVERSIFIED BACKUP OPERATION

EFFICIENT MULTIPLE COMMISSIONING METHODS

Diversified commissioning methods to meet different needs of project for higher commissioning efficiency.

One button commissioning
One button to enter commissioning, no other operations, simple and fast



AMV commissioning system
Clear interface, detailed data, and more professional analysis

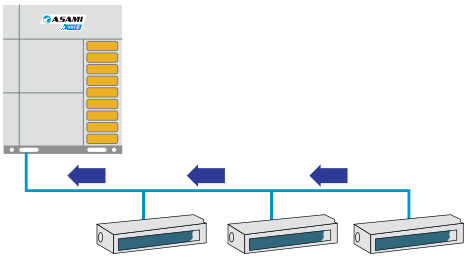
Multi-functional debugger,
Quick connection, no special PC required; data storage space (4GB), no external storage required

DEBUGGING BEFORE INSTALLING WIRED CONTROLLER

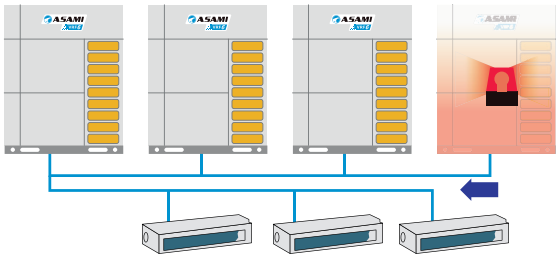
Before the completion of the project, in order to avoid damage to the wired controller during the construction process, the system can be debugged without installing the wired controller. After the entire project construction is completed, the wired controller can be installed and put in use, which can reduce unnecessary engineering loss.

NEW GENERATION REFRIGERANT RECOVERY FUNCTION

The new generation of indoor unit refrigerant recovery and module refrigerant recovery functions can effectively recover the refrigerant of the indoor unit or the faulted outdoor unit during after-sales maintenance, reducing refrigerant waste and saving maintenance time.



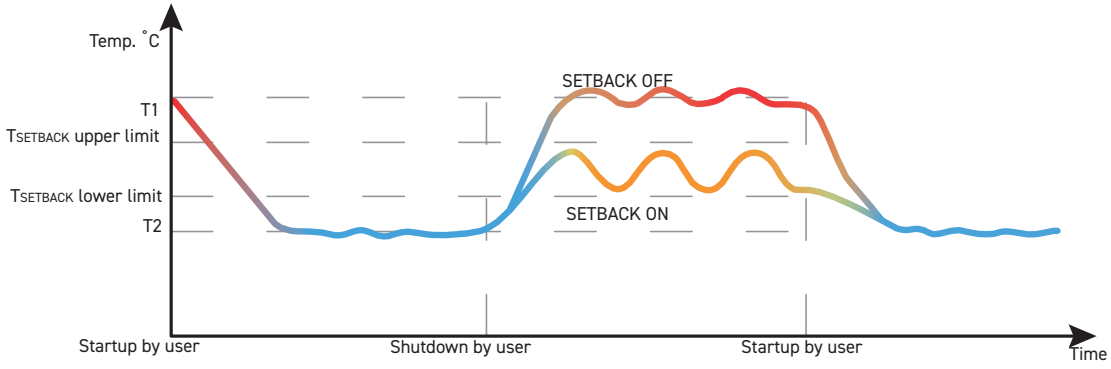
Indoor unit refrigerant recovery



Module refrigerant recovery

SET BACK FUNCTION

On occasions with high comfort requirements, such as star-rated hotels, high-end office areas, etc., the unit can start the SET BACK function, even if the unit is turned off, it can also automatically determine the indoor temperature and automatically start operation to ensure the required temperature control under unmanned state, improving the comfort of use.



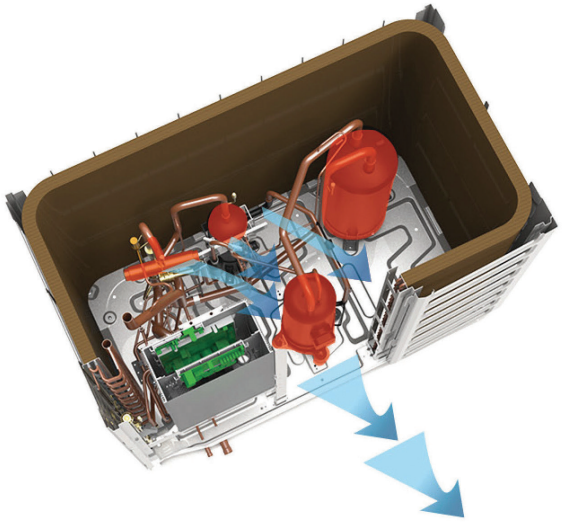
EFFICIENTLY MAINTAINED STRUCTURAL LAYOUT

AMV6 integrated electronic control layout, with reserved maintenance space for higher maintenance efficiency.

1. Commissioning window, no need to remove the panel, you can conduct commissioning and troubleshooting during operation.

2. The electronic control components are highly integrated, the component structure is miniaturized, and there is more space for maintenance.

3. Front-mounted valve assembly design, fast and reliable piping installation.



Large space for convenient maintenance

PANEL LIFTING FUNCTION

Ordinary panel cleaning requires the hiring of professionals to clean, and the use of auxiliary tools is required for the operation, which has high maintenance cost and low safety.

AUTOMATIC GRILLE LIFTING TECHNOLOGY

Convenient Cleaning Function
Air-in grille adopts two-way suspension lifting technology to realize grille lifting function. Users can clean the filter by themselves.

Grille Lifting Control
Through suspension self-locking technology, two modes stepless lifting and default lifting are realized, and the maximum descending distance can reach 3.3 meters.

In order to prevent users from entering the cleaning mode by mistake, symmetric encryption technology is adopted to give users a better and comfortable experience.

Note: It needs to be customized, and it can be used with 360° air discharge cassette type indoor unit.

AMV6 BASIC

AMV6 heat pump multi VRF unit adopts air-makeup enthalpy-adding compressor, brand new dual zone heat exchanger and CAN+ system control proposal. Seasonal energy efficiency of the whole is greatly improved, with SEER and SCOP improved by up to 20% and 30% respectively.

R410A

PRODUCT DATA

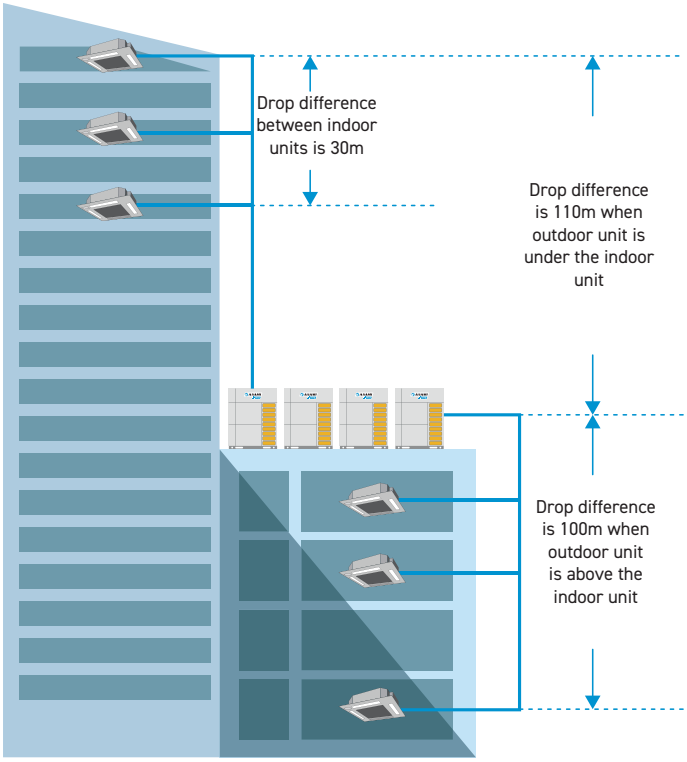
MODEL			AMV6-0224	AMV6-0280	AMV6-0335	AMV6-0400	AMV6-0450	AMV6-0504	AMV6-0560	AMV6-0615
Cooling capacity	Max.	kW	22.4	28.0	33.5	40.0	45.0	50.4	56.0	56.0
Heating capacity	Max.	kW	25.0	31.5	37.5	45.0	50.0	56.5	63.0	69.0
SEER	Ducted *	-	7.10	6.59	6.31	6.68	6.17	6.06	5.97	5.97
	Cassette *	-	7.80	6.26	6.58	6.66	6.34	6.06	5.67	5.67
SCOP	Ducted *	-	4.62	4.80	4.40	4.80	4.84	4.19	4.11	4.11
	Cassette *	-	4.50	4.75	4.66	4.44	4.44	3.71	3.71	3.71
Power supply		V/Ph/Hz	380-415V 3N ~ 50/60HZ							
Min. circuit/Max. fuse current		A	23.0/25	23.5/25	24.1/25	37.5/40	39.3/40	47.0/50	48.0/50	49.0/50
Max. input power		kW	12.87	13.15	13.50	21.00	22.00	26.30	26.85	27.41
Maximum drive IDU NO.		unit	13	16	19	23	26	29	33	36
Refrigerant Charge volume		kg	5.5	5.5	7.5	7.5	7.5	8.3	8.3	8.3
Sound pressure level (cooling)		dB(A)	56	57	59	59	60	61	62	63
Sound power level (cooling)	Cassette *	dB(A)	82	86	86	88	93	88	94	94
Connecting pipe	Liquid	mm	Φ 9.52	Φ 9.52	Φ 12.7	Φ 12.7	Φ 12.7	Φ 15.9	Φ 15.9	Φ 15.9
	Gas	mm	Φ 19.05	Φ 22.2	Φ 25.4	Φ 25.4	Φ 28.6	Φ 28.6	Φ 28.6	Φ 28.6
Dimension (W*D*H)	Outline	mm	930 × 775 x 1690			1340 x 775 x 1690				
	Package	mm	1000 × 830 × 1855			1400 × 830 × 1855				
Net weight/Gross weight		kg	220/230	220/230	240/250	300/315	300/315	350/365	350/365	355/370

*The data is Eurovent compliant.

The ODU operation temperature range is -5~55C in cooling and -30~24C in heating. The data is measured under following conditions. Cooling: Indoor temp. 27C DB, 19C WB, and outdoor temp. 35C DB. Heating: Indoor temp. of 20 C DB and outdoor temp. of 7C DB, 6C WB.
Sound pressure level was measured at a distance 1m.

DIMENSIONS

AMV6 combines high drop pressure control technology, indoor unit drop identification technology, intermediate pressure adjustment technology, tube length self-correction technology, and deep subcooling technology to increase the length of piping and improve the air conditioning effect.

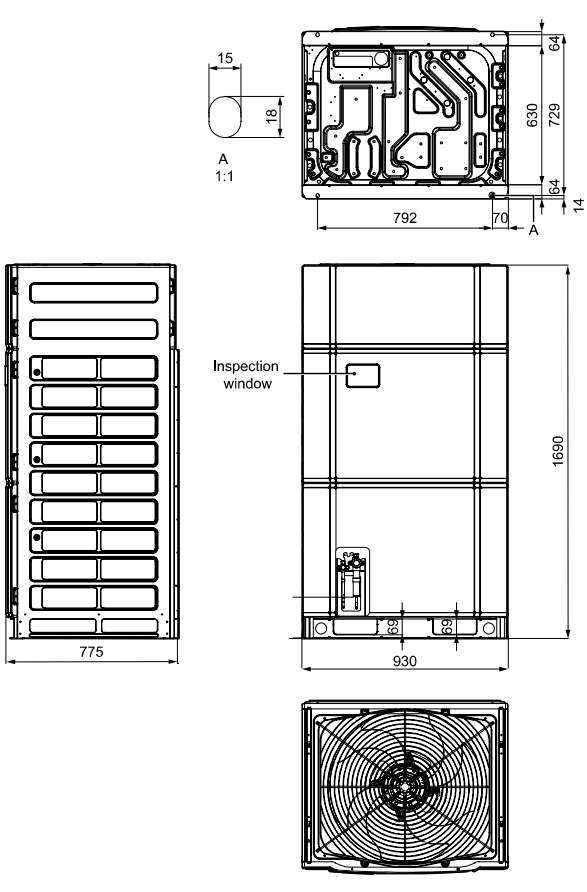


- The maximum actual single pipe length is 200m, the maximum equivalent single pipe length is 240m, and the maximum piping length is 1,000m.
- The maximum length after the first branch pipe is 120m *.
- The maximum drop of indoor and outdoor units is 110m* (100m when the outdoor unit is in upper position) *.
- The maximum drop between indoor units is 30m.

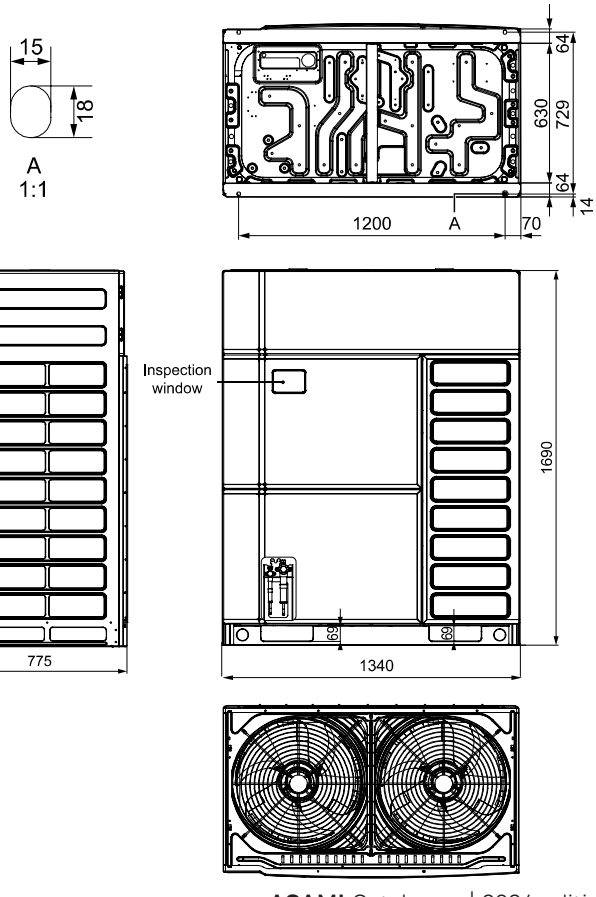
* Please consult technical staff for details.

DIMENSIONS

Models AMV6-0224-0335



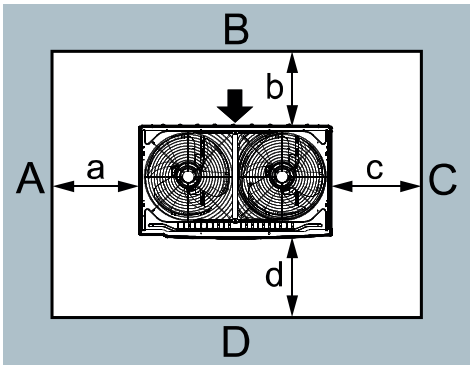
Models AMV6-0400-0615



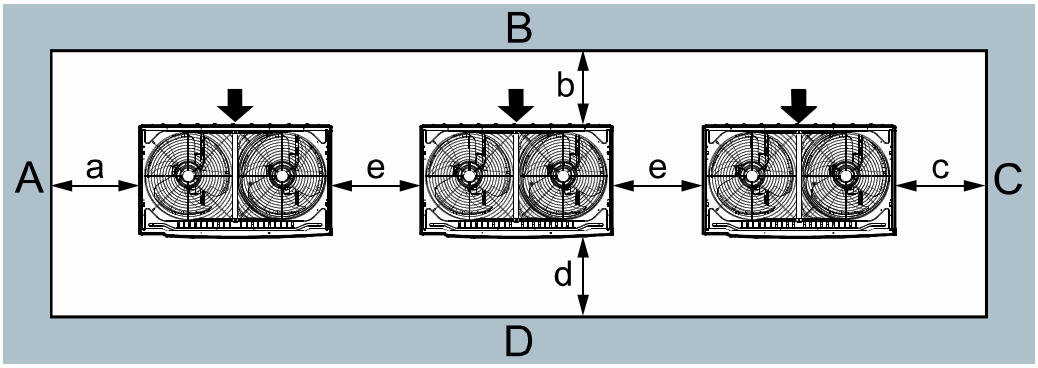
INSTALLATION

The installation space of the unit should consider the maintenance space of the unit and the ventilation of the unit. Select an installation method according to the actual situation.

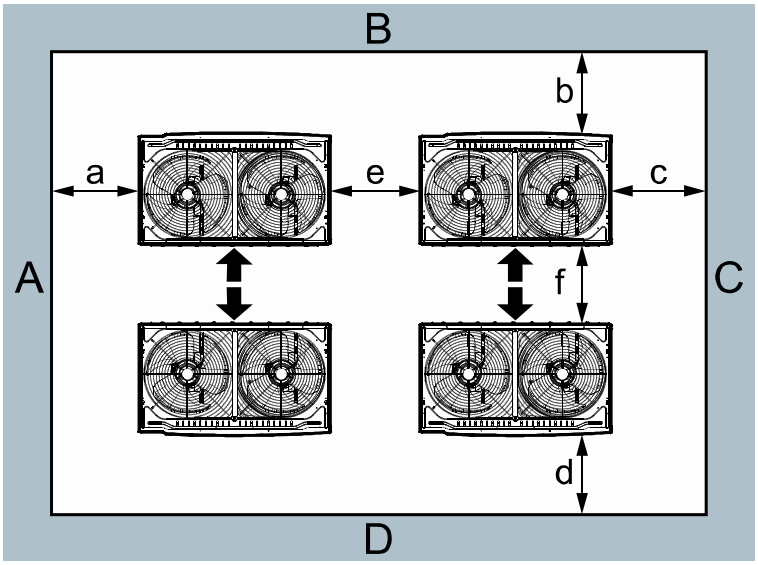
- Situation 1



- Situation 2



- Situation 3



Situation	A+B+C+D	A+B
Situation 1	a ≥ 300 b ≥ 100 c ≥ 100 d ≥ 500	a ≥ 300 b ≥ 300
Situation 2	a ≥ 300 b ≥ 100 c ≥ 100 d ≥ 500 e ≥ 100	a ≥ 300 b ≥ 300 e ≥ 400
Situation 3	a ≥ 300 b ≥ 500 c ≥ 100 d ≥ 500 e ≥ 200 f ≥ 900	-

HEAT STORAGE MODULE

The heat storage module is used in the VRF system and can assist the unit to defrost. The module adopts heat storage defrosting technology, which is suitable for cold areas, especially coastal cities and high humidity areas in winter.

During the defrosting process of traditional air conditioning system, the heat exchanger absorbs heat from of the room, so the indoor temperature drops by 2...7°C, and the user's comfort experience is poor. With the VRF system with heat storage module, part of the heat will be stored in the heat storage module during the heating process. The system absorbs heat from the heat storage module during defrosting process. The temperature of the heat exchanger of the indoor unit does not drop, so the indoor temperature fluctuation is small and the user's comfort experience is good.

MODEL			ARZ180L/A-T
Heating capacity	Max.	kW	18
Power input		W	5
Current input		A	0.05
Maximum fuse current		A	6
Power supply			220-240V 1 phase ~ 50HZ
Piping interface	Liquid pipe	mm	Φ 6.35
	Gas pipe	mm	Φ 12.7
Outline Dimensions (W×D×H)		mm	730x450x220
Net weight		kg	31.5

According to the capacity of outdoor unit, the number of heat storage modules is calculated.

After a heat storage module is full of heat, it can meet the requirements of one 18kw unit for once heat storage and defrosting.

The total capacity of heat storage modules should be within 90%~150% of that of the outdoor unit.

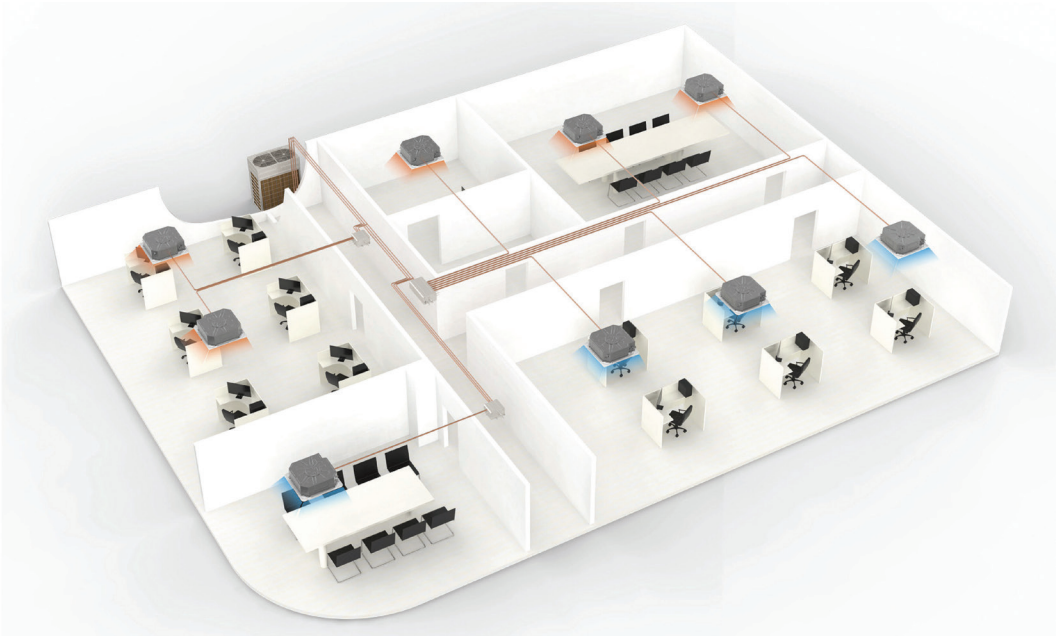
AMV6 HEAT RECOVERY

CONTINUOUS HEATING

AMV6 HR is designed with a continuous heating system. In case of modular combination, different modules can defrost in turn to reduce indoor temperature fluctuation, witch will further improve the level of heating comfort.

WHY CHOOSE VRF HEAT RECOVERY SYSTEM

- **Demand**
  In a large open space (such as an office), there may be different demands for cooling and heating due to locations, personal preferences or special requirements (For example, the living area requires heating while the storage room requires constant cooling). The heat recovery system can set up cooling and heating simultaneously in different areas of the same system based on user demands.



Energy Saving

The heat recovery system has multiple operating modes, among which the main unit cooling, main unit heating and total heat recovery can realize the heat recovery function. Under heat recovery mode, the system will provide the cooling energy absorbed by the heating side directly to the cooling side, which can reduce the capacity output of the outdoor unit and greatly improve the energy saving effect. Under total heat recovery mode, the system can achieve the optimal energy-saving performance and the energy efficiency of the system will be 3-4 times higher compared to other conventional operating modes.

Flexible

The heat recovery system is designed to have the features of a heat pump system with unique heat recovery function. It can run in cooling, heating or other operating modes flexibly according to a specific installation location, environmental changes and comfort requirements, so as to meet user demands in real time.

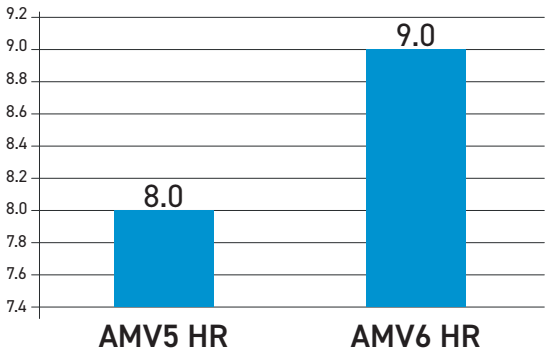
Multiple Functions in One Unit

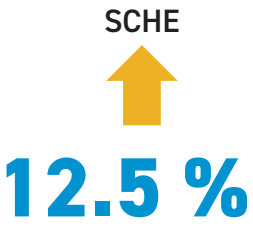
This unit can perform air cooling, air heating, and water heating simultaneously, satisfying customers various needs for air conditioning, hot water and floor heating. It is a comprehensive solution for customers.

High Energy Efficiency - SCHE up to 9.0

It adopts heat recovery energy-saving control technology, high-efficiency enthalpy-adding DC inverter compressor and high-efficiency DC motor to optimize its capabilities. In the state of heat recovery, its comprehensive energy efficiency (SCHE*) can be 9.0, which is more energy-saving.

*SCHE (Simultaneous Cooling & Heating Efficiency): the ratio of the total capacity of the system (heating and cooling capacity) to the effective power when operating in heat recovery mode.





CONTINUOUS HEATING

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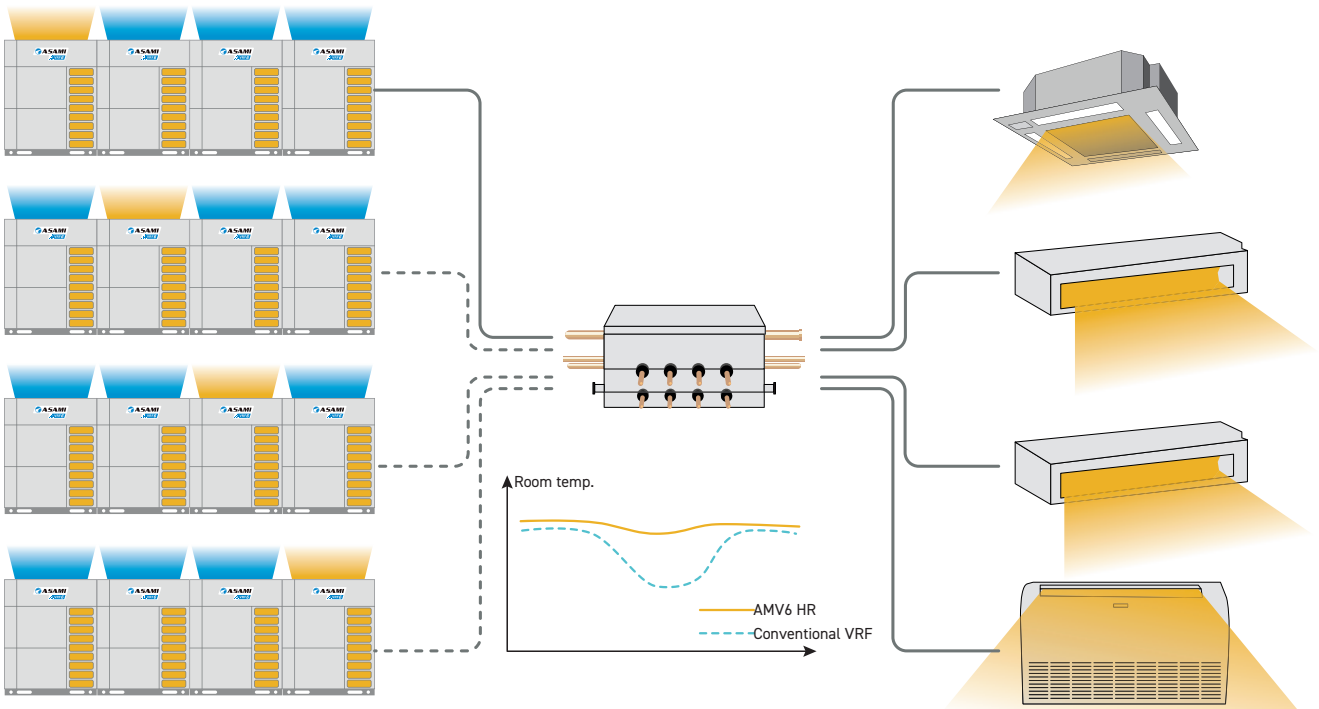


Outdoor units defrost in turn

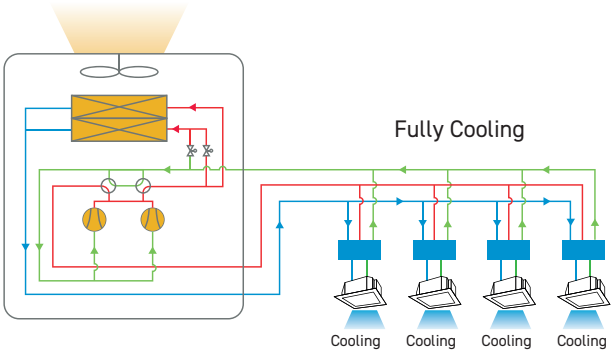
Indoor units continue with heating

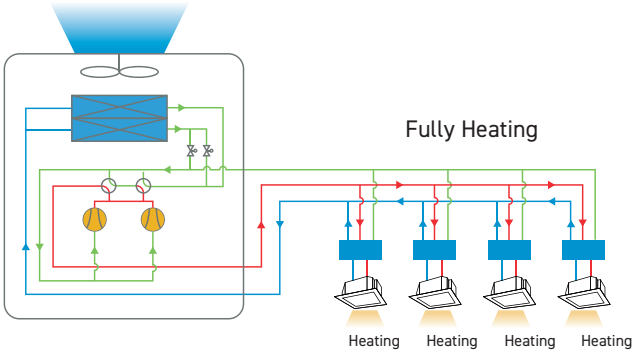
*Applicable to partial models

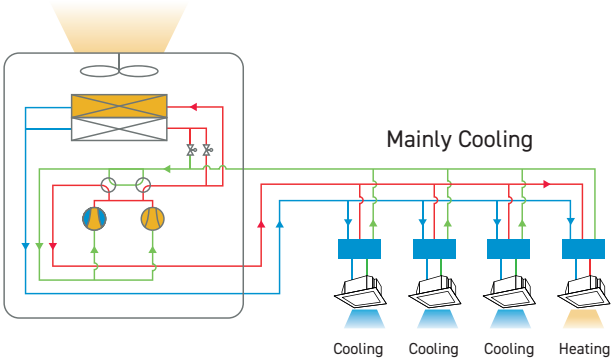
*This function must be set in the field. When this function is set, continuous heating will be activated under certain ambient temperature conditions.

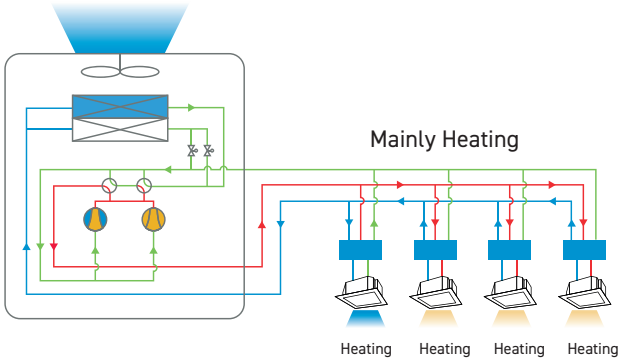
HIGH ENERGY EFFICIENCY

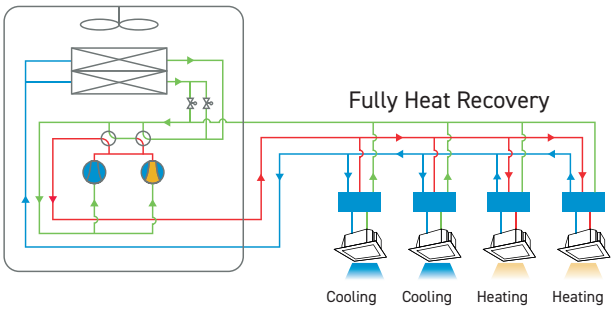
AMV6 heat recovery system enables multiple operation modes for meeting various needs of users. Among them, mainly cooling, mainly heating and fully heat recovery modes include heat recovery function. Under the heat recovery mode, the system can directly offer the cooling capacity absorbed at the heating side to the cooling side for reducing outdoor unit's capacity output to greatly improve the energy-saving effect.

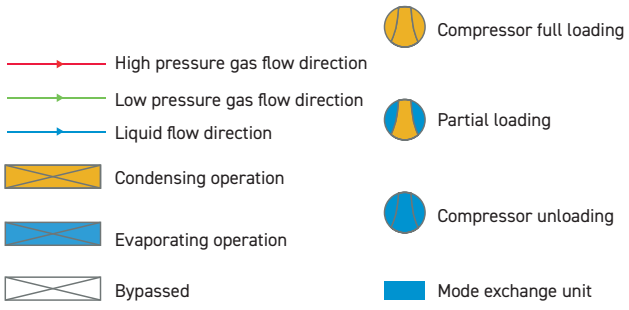












PROJECT SELF-ADAPTIVE CONTROL

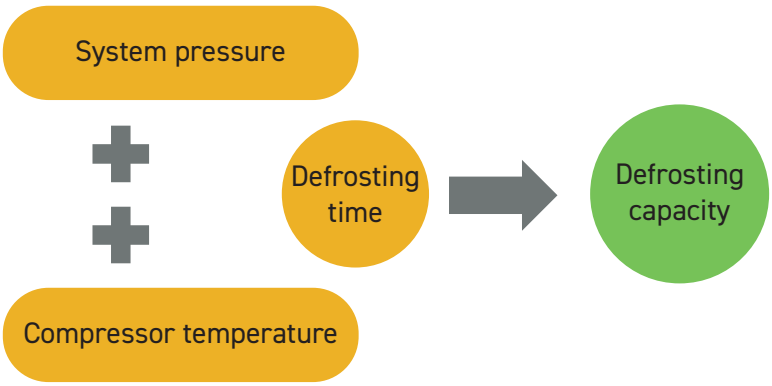
VARIABLE DEFROSTING CYCLE CONTROL

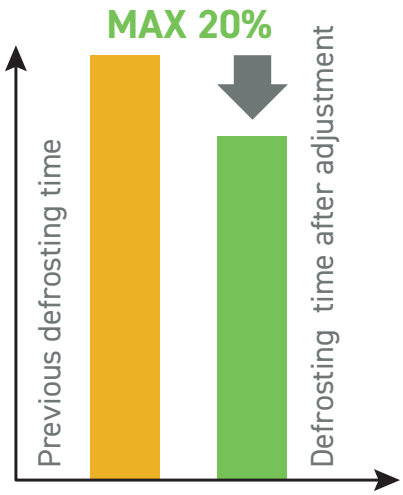
The unit can define the frost degree according to the defrosting time change under different circumstances and then adjust the defrosting cycle automatically to improve the accuracy of defrosting.

VARIABLE DEFROSTING CAPACITY CONTROL

The speed of defrosting is closely related to the output of compressor. Generally, when the unit is defrosting, the output capacity of compressor is fixed, which may lead to long defrosting time or failure to defrost normally in actual use.

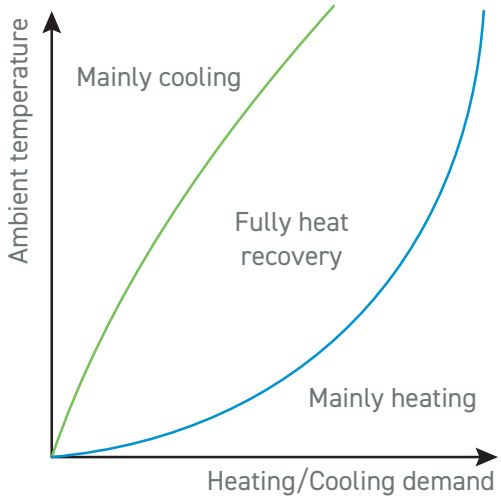
In order to realize stable and rapid defrosting, AMV6 HR can automatically change the output capacity during defrosting through real-time parameter learning and judgment.





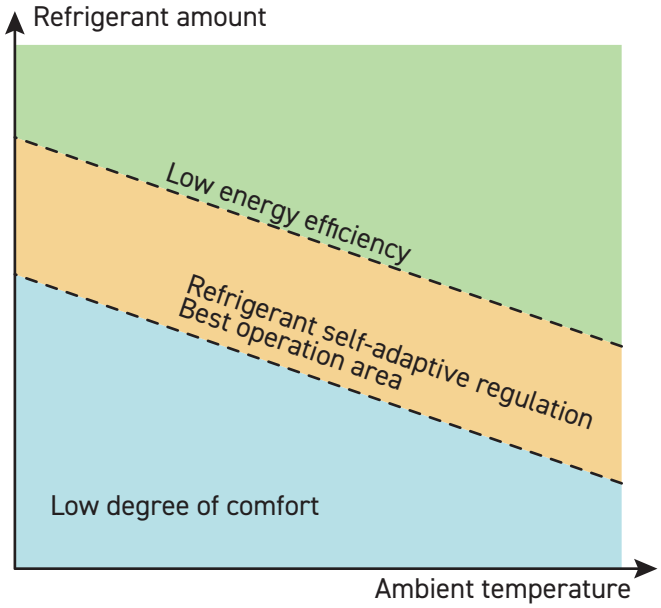
INTELLIGENT HEAT RECOVERY CONTROL

AMV6 HR adopts intelligent heat recovery control technology. Under heat recovery mode, it can intelligently switch among mainly cooling mode, fully heat recovery mode and mainly heating mode according to the operating condition and load. Under high temperature, the operation of indoor units in cooling mode will be given priority; under low temperatures, the operation of indoor units in heating mode will be given priority. This is to achieve the best energy efficiency while ensuring user comfort.



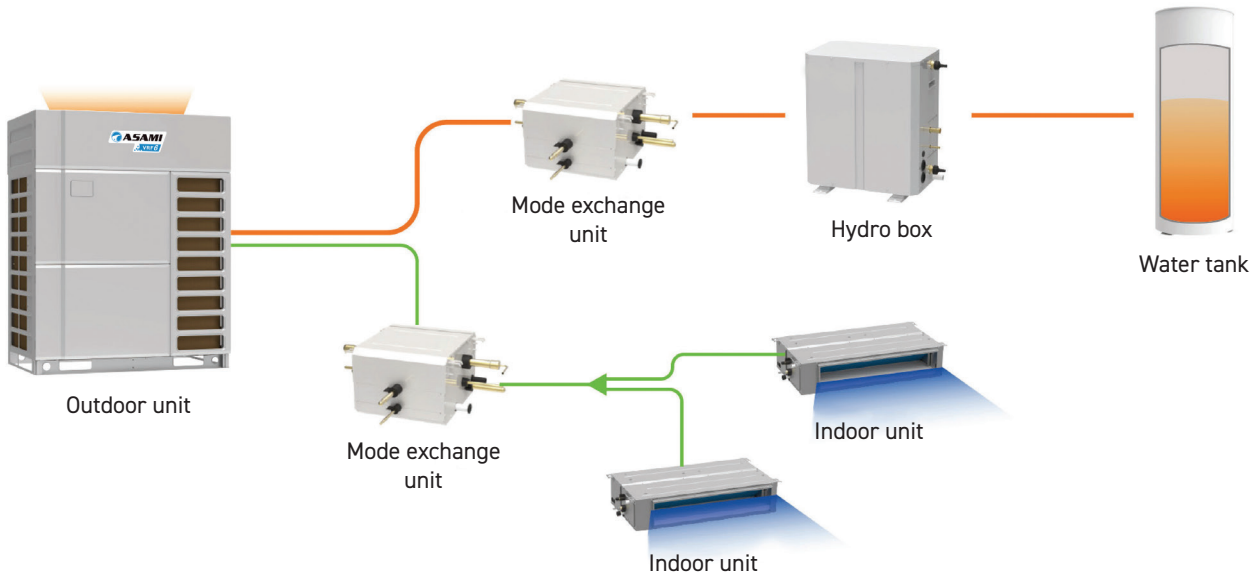
REFRIGERANT SELF-ADAPTIVE REGULATION TECHNOLOGY

AMV6 HR adopts refrigerant self-adaptive regulation technology. When the ambient temperature or the load of indoor unit changes, it will automatically adjust the amount of system refrigerant circulation according to the output demand of outdoor units. This technology can prevent energy efficiency decrease in cooling caused by excess refrigerant and maintain the comfort degree in heating by preventing refrigerant insufficiency so that the unit can always run in a healthy, energy-saving and comfortable state.



AUTO HEAT RECOVERY FUNCTION OF COOLING

In summer, when the unit is in cooling mode, even if the hydro box is shut down, it can still recover waste heat according to the water temperature of the water tank, and transfer the heat to the water rather than discharge it into the atmosphere. In summer, you can enjoy not only cool air but also free hot water.



Note: This function defaults to be on before ex-factory. It can be turned off in setting.

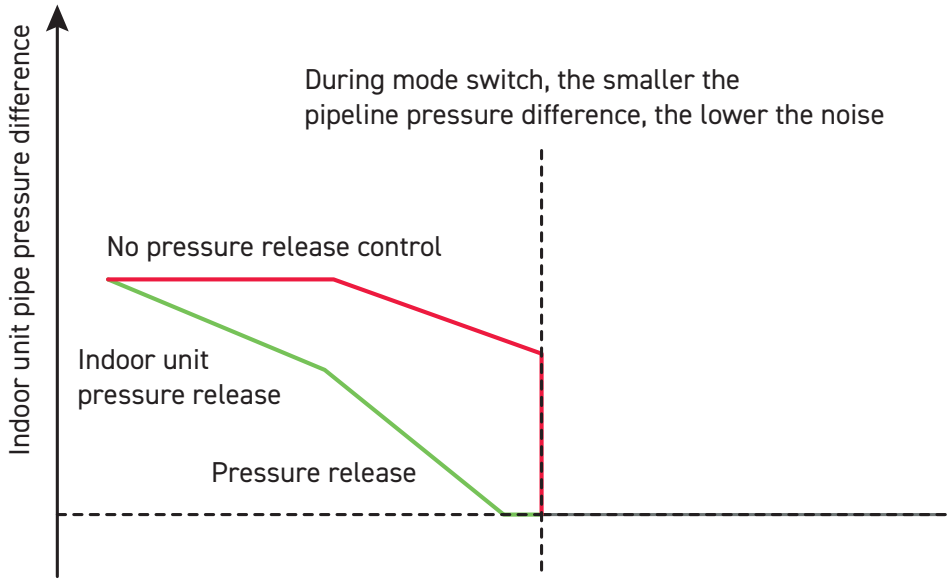
MODE EXCHANGE UNIT

HIGH-EFFICIENCY SUB-COOLING DESIGN

In a heat recovery system, refrigerant flow between indoor units may produce noise due to insufficient sub-cooling degree, which will affect the cooling performance. For our new generation mode exchange unit, it adopts a noise reduction design and the solenoid valve and electronic expansion valve are combined to realize intelligent control, which can provide sufficient sub-cooling degree for refrigerant in indoor units, ensuring the high-efficiency and low-noise operation of indoor units.

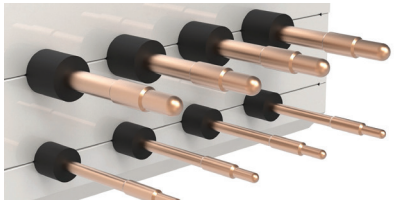
NOISE REDUCTION DESIGN OF MODE EXCHANGE UNIT

The noise of mode exchange unit is mostly caused by the large pressure difference between the indoor unit pipeline and the outdoor unit pipeline during mode switch. The new generation mode exchange unit adopts preliminary pressure release control technology. By combining preliminary indoor unit pressure release control with preliminary bypass pressure release control, the indoor unit pipeline pressure can be quickly balanced during the mode switch of indoor units, avoiding the noise caused by the switching pressure difference and ensuring the quiet and rapid mode switch of indoor units.



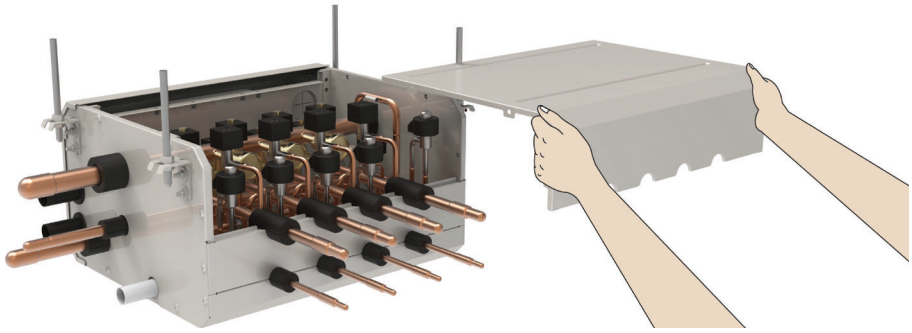
ONE-PIECE CONNECTION PIPE DESIGN, EFFICIENT AND SAFE

The connection pipe is designed with a variable diameter spinning sealing, for easy installation and less installation time. It can satisfy requirements for different pipe size in engineering pipe connection. There's no need to remove the sealing cap through welding, which is safer. Less oxide is produced, and the system is cleaner.



STRUCTURE FOR EFFICIENT MAINTENANCE

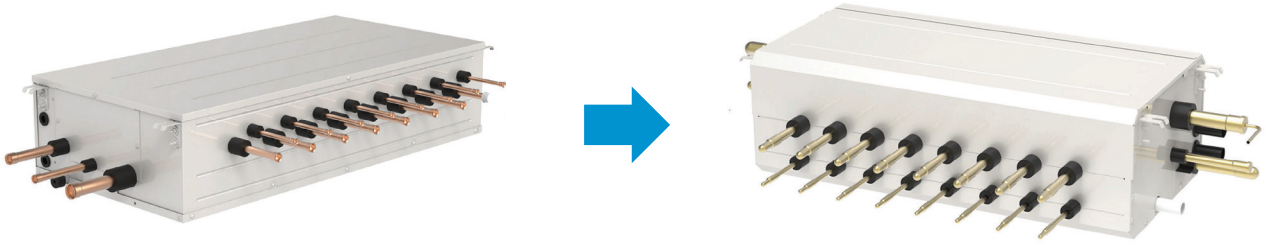
The L-shape integrated upper cover plate is designed so that there's a better view and enough operation space for the inspection and maintenance of pipes and valves when the upper cover plate is removed.



WIDE CAPACITY RANGE

The new generation mode exchange unit adopts high refrigerant flow design and the connectable indoor unit capacity is significantly increased. A maximum of 16kW can be connected to a single branch, which is 13% higher than before; and the maximum capacity connected to multiple branches is 85kW, which is 25% higher.

An increase of 13% in capacity allowed for a single branch; an increase of 25% in capacity allowed for a single mode exchange unit



Note: For two branches in parallel, the maximum capacity of connectable indoor units is 28kW.

PRODUCT DATA

MODEL				NCHS1D	NCHS2D	NCHS4D	NCHS8D
Number of branches			unit	1	2	4	8
Max. number of connectable IDUS		Per batch	unit	8	8	8	8
		Total	unit	8	16	32	64
Max. capacity of connectable IDUS		Per batch	kW	16	16	16	16
		Total	kW	16	28	45	85
Sound Pressure Level			dB(A)	38	39	43	44
Power supply			V/Ph/Hz	220-240V ~ 50/60Hz			
Power comsumption		Cooling	W	14	25	32	90
		Heating	W	14	25	32	90
Piping connections	ODU	Liquid	mm	Φ 9.52	Φ 9.52	Φ 12.7	Φ 15.9
		High pressure gas	mm	Φ 19.05	Φ 19.05	Φ 22.2	Φ 22.2
		Low pressure gas	mm	Φ 22.2	Φ 22.2	Φ 28.6	Φ 28.6
	IDU	Liquid	mm	Φ 6.35/9.52	Φ 6.35/9.52	Φ 6.35/9.52	Φ 6.35/9.52
		Gas	mm	Φ 12.7/15.9	Φ 12.7/15.9	Φ 12.7/15.9	Φ 12.7/15.9
Dimension (WxDxH)		Outline	mm	340×388×250	340×388×250	460×388×250	784×388×250
		Package	mm	863×624×298	863×624×298	979×624×303	1300×624×288
Net weight/Gross weight			kg	12/17.5	14.5/20.5	20.6/27	33/42

*Sound pressure level measured at 1m distance.

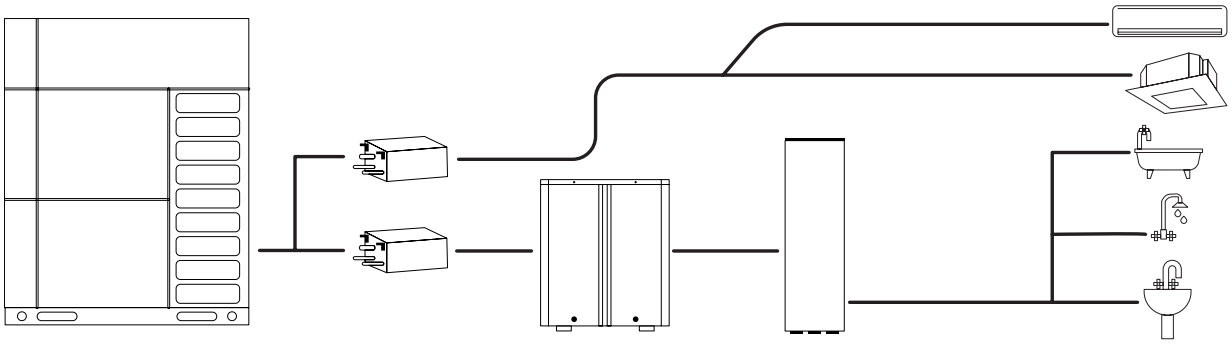
WIDE CAPACITY RANGE

There are two capacity options for a single unit: 16kW or 30kW, which can satisfy different engineering requirements.

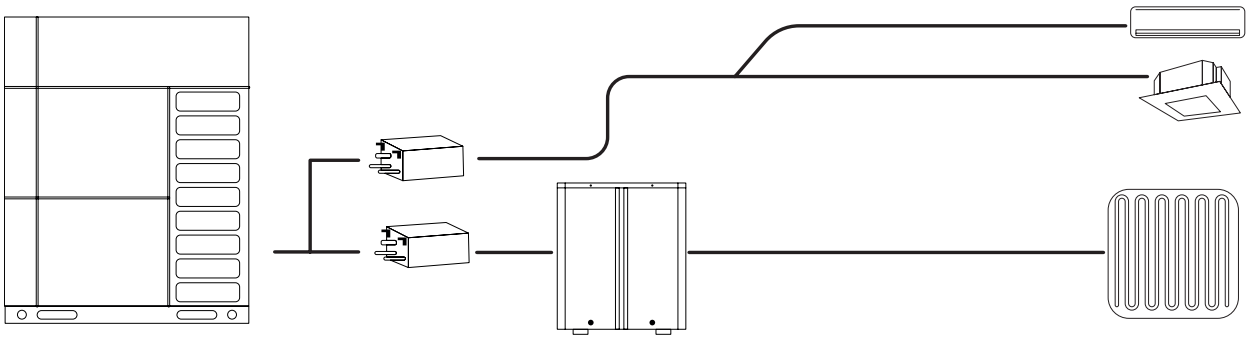
DOUBLE FUNCTIONS

The hydro box can be connected to the water tank and floor heating independently or simultaneously. It is equipped with a new generation matrix wired controller, through which you can set hot water function or floor heating function. Two functions in one machine, satisfying customers' various needs.

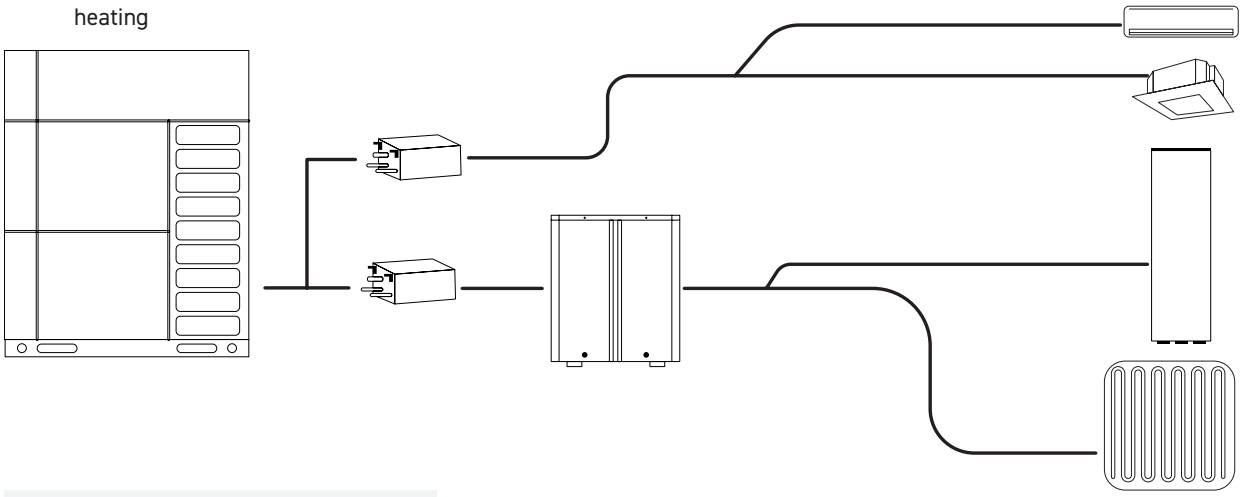
Hot water



Floor heating



Hot water & floor heating



Note: Wired controller model: XE70-11/H.

INTELLIGENT HYDRO BOX ANTI-FREEZING DESIGN

When the hydro box is stopped and water temperature is below 0°C, the plate heat exchanger may be freezing and broken, which will affect the safe operation of the entire system. In AMV6 HR, we adopt an intelligent step-by-step anti-freezing strategy so that the hydro box will implement different anti-freezing control logics according to its actual status, running time and water side temperature, providing safe and anti-freezing protection while maintaining the level of comfort indoors.

NEW TYPE XE70-11/H WIRED CONTROLLER

It is a brand new matrix type wired controller of touch control. It is esigned with a new interaction logic, which makes the controller easy to use; the matrix screen allows the display to be more visually pleasing and rich, concise but not simple.

- Touch buttons with rich functions
- Simple appearance
- With weekly timer, easy to use

HIGH-TEMPERATURE STERILIZATION FUNCTION

This product is with high-temperature sterilization function. When it is activated, it can effectively remove bacteria. The water tank temperature can be heated to 70°C. High-efficiency sterilization is included to care for the health of users.

PRODUCT DATA

MODEL			NRQR16L/A-T	NRQR30L/A-T
Hot water heating capacity		kW	4.5(3.6~16)	4.5(3.6~30)
Max setting temperature of domestic hot water		℃	55(35~55)	55(35~55)
Floor heating capacity		kW	16	30
Max setting temperature of floor heating		℃	45(25~45)	45(25~45)
Power supply		V/Ph/Hz	220~240V-1ph-50Hz	220~240V-1ph-50Hz
Heat exchanger	Type	-	Plate heat exchanger	Plate heat exchanger
	Quantity	-	1	1
	Rated water flow	L/min	46	86
	Pressure drop	kPa	27.5	82
Water system connection	Diameter of inlet/outlet water pipe	mm	Φ 25	Φ 25
	Thread specification	-	G1	G1
Refrigerant system connection	Gas pipe	mm	Φ 15.9	Φ 22.2
	Liquid pipe	mm	Φ 9.52	Φ 9.52
Outline dimension (WxDxH)		mm	515 × 330 × 606	515 × 330 × 606
Net weight/Gross weight		kg	36	40

AMV6 HEAT RECOVERY

The AMV6 Heat Recovery Series integrates multiple functions of cooling, heating, water heating and floor heating, featuring powerful functions and convenient operation. It adopts DC inverter enthalpy-adding compressor and brand new high-efficiency heat exchanger, to achieve -25°C ultra-low ambient temperature heating, continuous heating and other functions for more energy savings and higher energy efficiency.

R410A

PRODUCT DATA

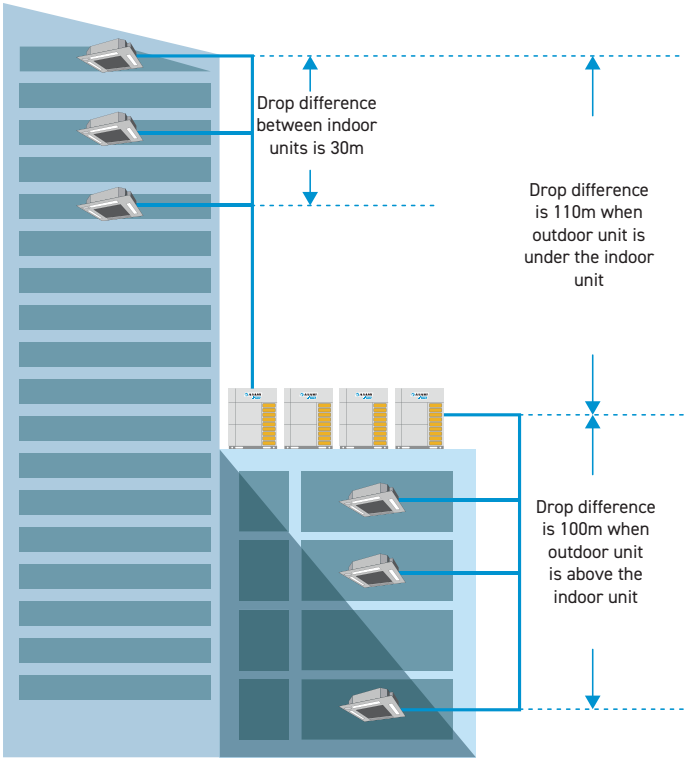
MODEL			AMV6-0224/HR	AMV6-0280/HR	AMV6-0335/HR	AMV6-0400/HR	AMV6-0450/HR	AMV6-0504/HR	AMV6-0560/HR	AMV6-0615/HR
Cooling capacity	Max.	kW	22.4	28.0	33.5	40.0	45.0	50.4	56.0	61.5
Heating capacity	Max.	kW	25.0	31.5	37.5	45.0	50.0	56.5	63.0	69.0
SEER	Ducted *	-	7.00	6.70	6.55	6.90	6.46	6.48	6.32	6.32
	Cassette *	-	7.24	6.45	6.66	6.18	6.15	6.68	6.35	6.35
SCOP	Ducted *	-	4.32	4.57	4.74	4.44	4.41	4.25	4.15	4.15
	Cassette *	-	4.29	4.43	4.37	4.44	4.50	4.34	4.34	4.34
Power supply		V/ Ph/ Hz	380-415V 3N ~ 50/60HZ							
Min. circuit/Max. fuse current		A	23.0/25	23.5/25	24.1/25	37.5/40	39.3/40	47.0/50	48.0/50	49.0/50
Maximum drive IDU NO.		unit	13	16	19	23	26	29	33	36
Refrigerant Charge volume		kg	8.2	8.5	9.6	11.1	11.6	12.8	12.8	13.3
Sound pressure level (cooling)		dB(A)	60	61	63	63	63	63	63	64
Sound power level (cooling)	Ducted *	dB(A)	80	82	84	91	91	88	88	88
	Cassette *	dB(A)	80	84	86	87	94	87	89	89
Connecting pipe	Liquid	mm	Φ 9.52	Φ 9.52	Φ 12.7	Φ 12.7	Φ 12.7	Φ 15.9	Φ 15.9	Φ 15.9
	High pressure gas	mm	Φ 15.9	Φ 19.05	Φ 19.05	Φ 22.2	Φ 22.2	Φ 25.4	Φ 25.4	Φ 25.4
	Low pressure gas	mm	Φ 19.05	Φ 22.2	Φ 25.4	Φ 25.4	Φ 28.6	Φ 28.6	Φ 28.6	Φ 28.96
Dimension (W*D*H)	Outline	mm	930 × 775 x 1690			1340 x 775 x 1690				
	Package	mm	1000 × 830 × 1855			1400 × 830 × 1855				
Net weight/Gross weight		kg	243/253	243/253	256/266	325/340	325/340	385/400	385/400	385/400

*The data is Eurovent compliant.

The ODU operation temperature range is -10~55C in cooling, -25~24C in heating and -20~35C in water heating mode.
The data is measured under following conditions. Cooling: Indoor temp. 27C DB, 19C WB, and outdoor temp. 35C DB. Heating: Indoor temp. of 20 C DB and outdoor temp. of 7C DB, 6C WB.
Sound pressure level was measured at a distance 1m.

DIMENSIONS

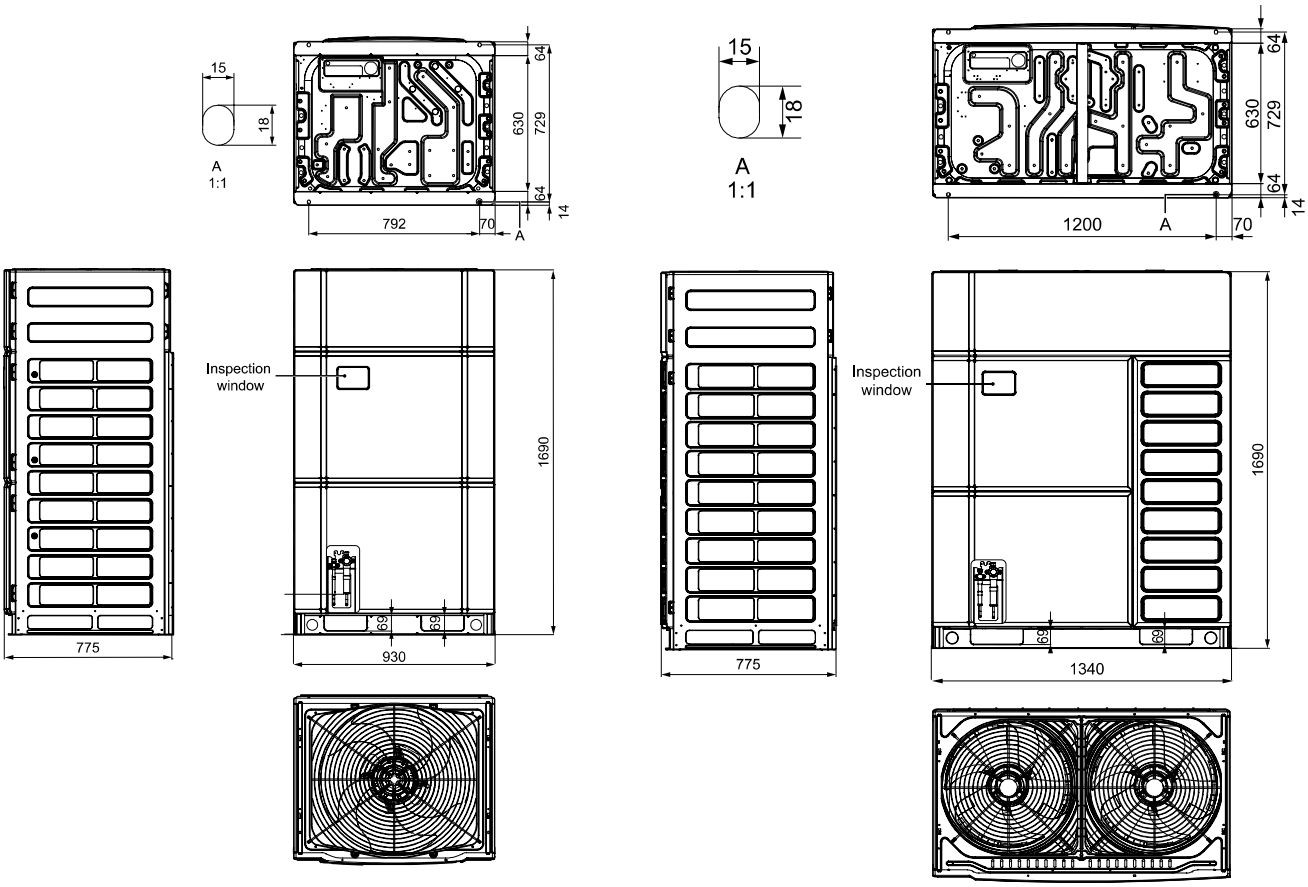
AMV6 HR combines high drop pressure control technology, indoor unit drop identification technology, intermediate pressure adjustment technology, tube length self-correction technology, and deep subcooling technology to increase the length of piping and improve the air conditioning effect.



- The maximum actual single pipe length is 200m, the maximum equivalent single pipe length is 240m, and the maximum piping length is 1,000m.
- The maximum length after the first branch pipe is 120m *.
- The maximum drop of indoor and outdoor units is 110m* (100m when the outdoor unit is in upper position) *.
- The maximum drop between indoor units is 30m.

* Please consult technical staff for details.

DIMENSIONS



AMV 5 MINI

PRODUCT DATA

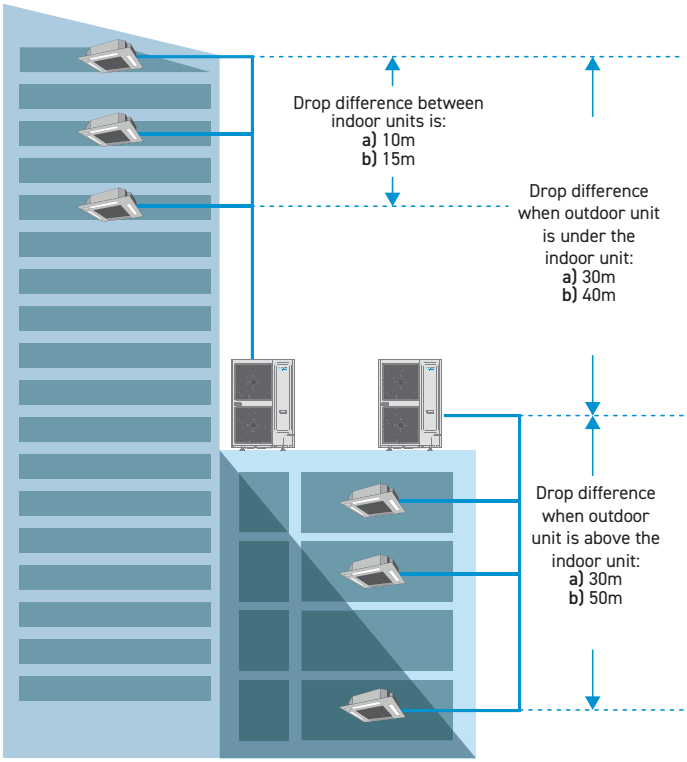
R410A

MODEL			AMV5-080/M	AMV5-0100/M	AMV5-0120/M3	AMV5-0140/M3	AMV5-0160/M3
Cooling capacity	Max.	kW	8	10	12.1	14	16
Heating capacity	Max.	kW	9	11	14	16.5	18
SEER	Ducted	-	5.12	5.12	6.7	6.88	6.96
	Cassette	-	5.12	5.12	6.7	6.79	6.55
SCOP	Ducted	-	3.8	3.8	3.97	4.24	4.04
	Cassette	-	3.8	3.8	3.93	4.24	4.06
EER			3.90	3.70	3.99	6.74	6.36
COP			4.74	4.40	4.28	4.44	4.44
Power supply		V/Ph/Hz	220-240/1/50 & 208-230/1/60		380-415/3/50		
Max. circuit/Fuse current		A	25	25	14	16	16
Maximum drive IDU NO.		unit	4	5	7	8	9
Refrigerant Charge volume		kg	1.8	1.8	3.3	3.3	3.3
Sound pressure level		dB(A)	56	56	57	58	58
Sound power level		dB(A)	68	69	72	73	76
Connecting pipe	Liquid	mm	Φ 9.52	Φ 9.52	Φ 9.52	Φ 9.52	Φ 9.52
	Gas	mm	Φ 15.9	Φ 15.9	Φ 15.9	Φ 15.9	Φ 19.05
Dimension (W*D*H)	Outline	mm	980x360x790		900x340x1345		
	Package	mm	1097x477x937		998x458x1500		
Net weight		kg	80	80	112	112	112

The ODU operation temperature range is -5~52C in cooling and -20~27C in heating.
The data is measured under following conditions. Cooling: Indoor temp. 27C DB, 19C WB, and outdoor temp. 35C DB.
Heating: Indoor temp. of 20 C DB and outdoor temp. of 7C DB, 6C WB.
Sound pressure level was measured at a distance 1m.

PIPING

AMV5 MINI combines high drop pressure control technology, indoor unit drop identification technology, intermediate pressure adjustment technology, tube length self-correction technology, and deep subcooling technology to increase the length of piping and improve the air conditioning effect.

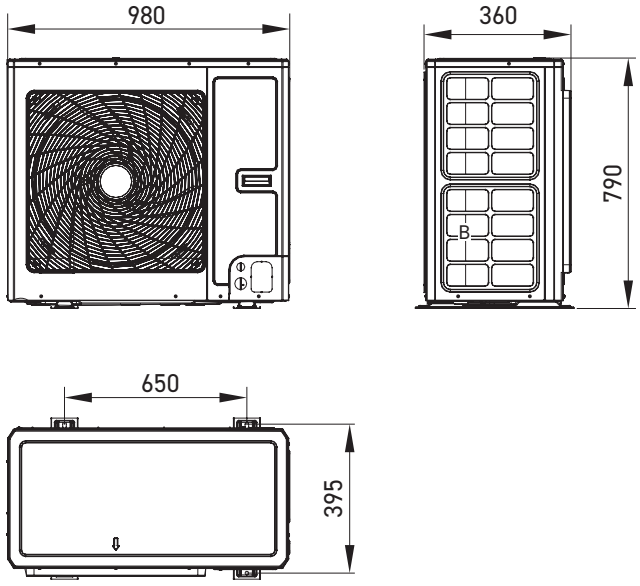


Units **a)**: AMV5-080/M ir AMV5-0100/M
Units **b)**: AMV5-0120/M3, AMV5-0140/M3, AMV5-0160/M3

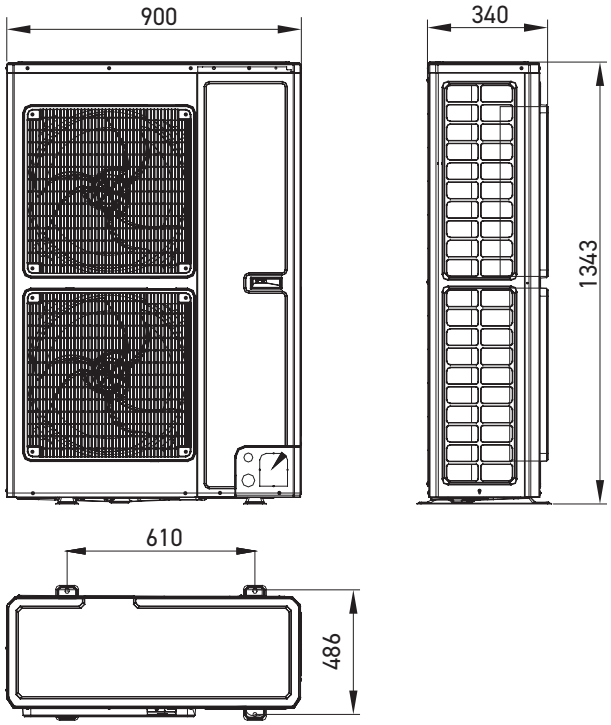
- The maximum actual single pipe length is **a)** 100m, **b)** 120m, the maximum equivalent single pipe length is **a)** 120m, **b)** 150m, and the maximum piping length is **a)** 250m, **b)** 300m.
- Drop difference between indoor units is:
  a) 10m
  b) 15m
- Drop difference when outdoor unit is under the indoor unit:
  a) 30m
  b) 40m
- Drop difference when outdoor unit is above the indoor unit:
  a) 30m
  b) 50m

DIMENSIONS

AMV5-080/M ir AMV5-0100/M



AMV5-0120/M3, AMV5-0140/M3, AMV5-0160/M3



AMV5 SLIM

AMV5 SLIM units feature a slim and compact design, allowing for easy installation in limited spaces. With advanced inverter technology, high energy efficiency, and low noise operation, the AMV5 Slim outdoor units deliver powerful cooling and heating performance while maintaining a comfortable and quiet environment.

R410A

PRODUCT DATA

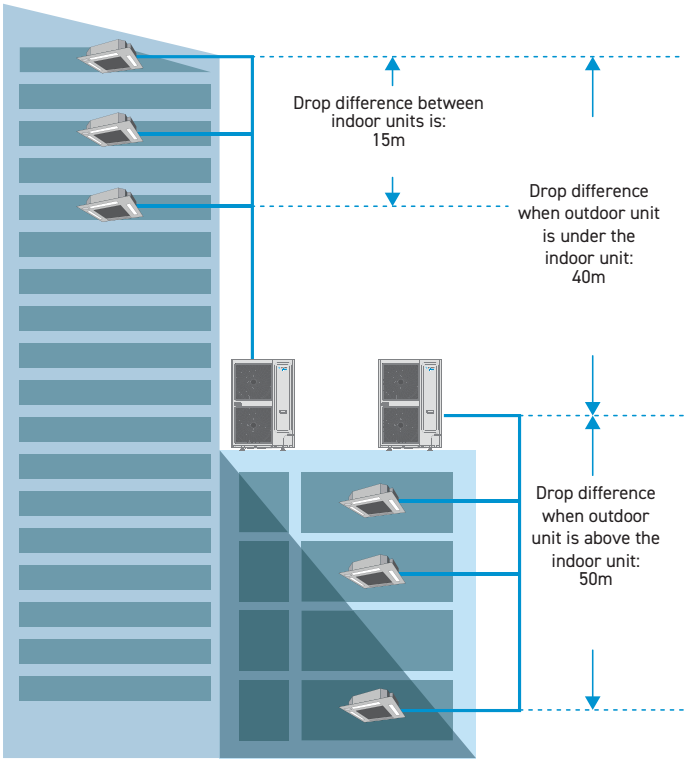
MODEL			AMV5-0224/S	AMV5-0280/S1	AMV5-0335/S1
Cooling capacity	Max.	kW	22.4	28.0	33.5
Heating capacity	Max.	kW	24.0	28.0	33.5
SEER	Ducted *	-	6.85	6.36	7.16
	Cassette *	-	6.82	6.28	6.29
EER			2.81	2.05	2.07
SCOP	Ducted *	-	4.27	4.68	4.69
	Cassette *	-	4.31	4.53	4.16
COP			3.10	3.20	3.02
Power supply		V/Ph/Hz	380-415V 3N ~ 50/60HZ		
Min. circuit/Max. fuse current		A	17.2/20	22.5/25	24.5/32
Maximum drive IDU NO.		unit	13	17	20
Refrigerant Charge volume		kg	5.5	7.1	8.5
Sound power level (cooling)	Ducted *	dB(A)	78	80	80
	Cassette *	dB(A)	78	80	81
Connecting pipe	Liquid	mm	Φ 9.52	Φ 9.52	Φ 12.7
	Gas	mm	Φ 19.02	Φ 22.2	Φ 25.4
Dimension (W*D*H)	Outline	mm	940 × 320 x 1430	940 × 460 x 1615	940 × 460 x 1615
	Package	mm	1038 × 438 × 1580	1038 × 578 × 1765	1038 × 578 × 1765
Net weight/Gross weight		kg	133/144	163/175	174/187

*The data is Eurovent compliant.

The ODU operation temperature range is -5~52C in cooling and -20~27C in heat
The data is measured under following conditions. Cooling: Indoor temp. 27C DB, 19C WB, and outdoor temp. 35C DB.
Heating: Indoor temp. of 20 C DB and outdoor temp. of 7C DB, 6C WB.

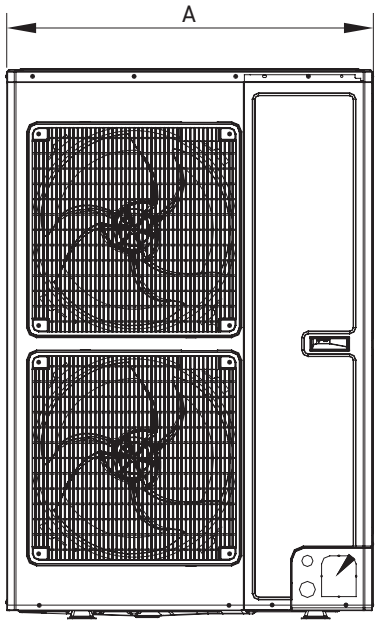
PIPING

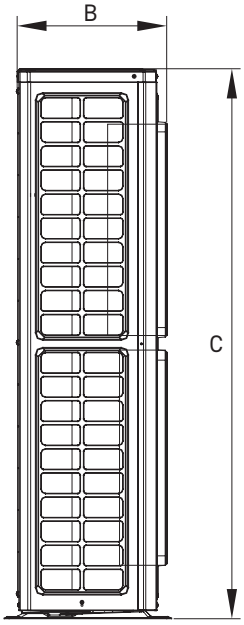
AMV5 SLIM combines high drop pressure control technology, indoor unit drop identification technology, intermediate pressure adjustment technology, tube length self-correction technology, and deep subcooling technology to increase the length of piping and improve the air conditioning effect.



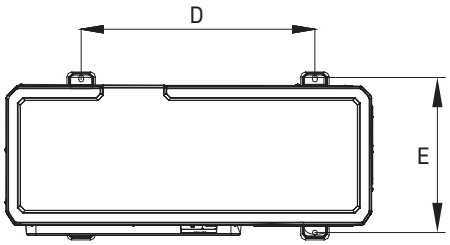
- The maximum actual single pipe length is 120m, the maximum equivalent single pipe length is 150m, total piping length is 300m.
- Drop difference between indoor units is 15m
- Drop difference is 40m when outdoor unit is under the indoor unit.
- Drop difference is 50m when outdoor unit is above the indoor unit.

DIMENSIONS





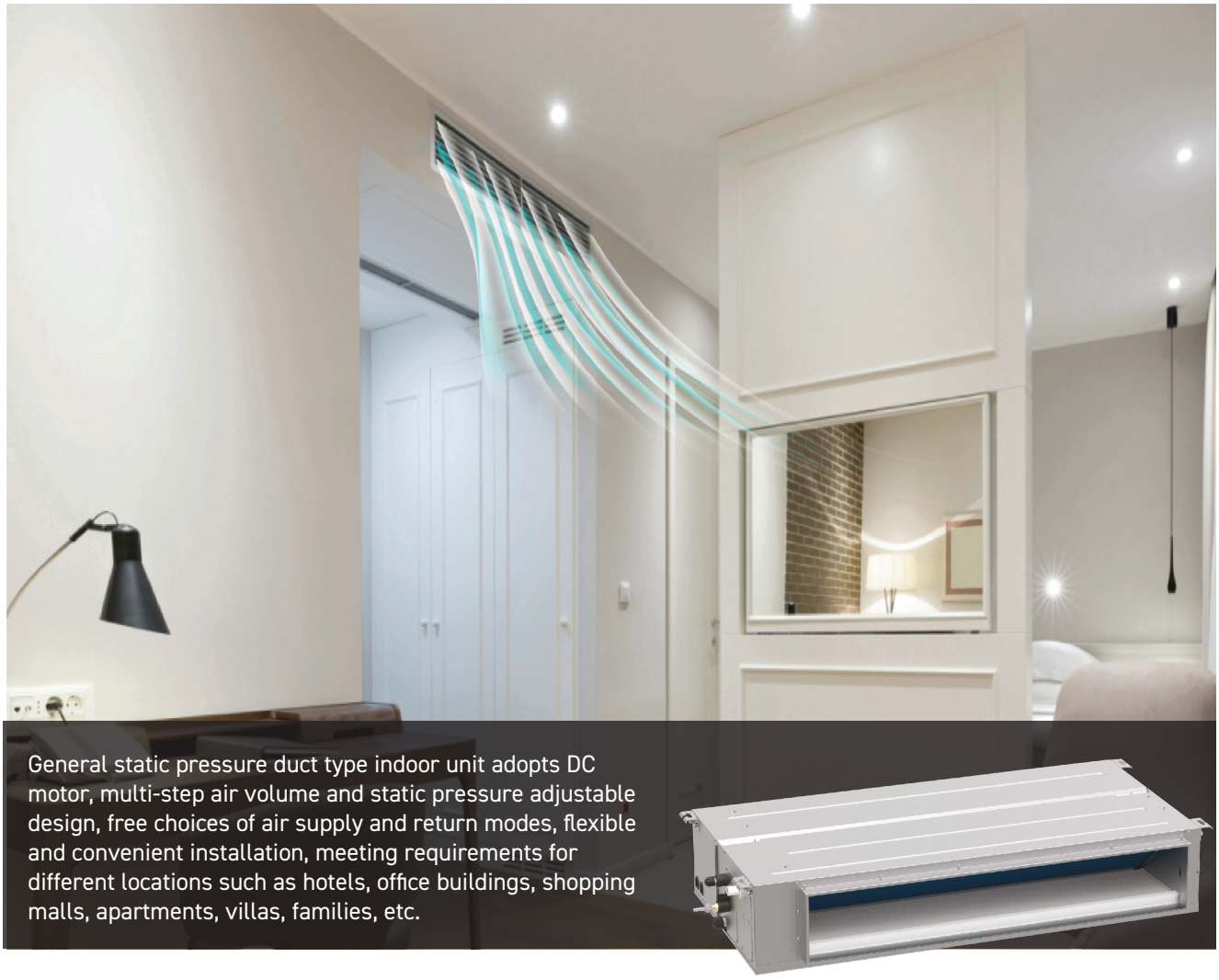
MODEL	A	B	C	D	E
AMV5-0224/S	930	320	1430	632	350
AMV5-0280/S1	940	460	1615	610	486
AMV5-0335/S1	940	460	1615	610	486



ASAMI®

INDOOR UNITS

DUCT TYPE UNITS
GENERAL STATIC PRESSURE DUCT TYPE INDOOR UNIT



General static pressure duct type indoor unit adopts DC motor, multi-step air volume and static pressure adjustable design, free choices of air supply and return modes, flexible and convenient installation, meeting requirements for different locations such as hotels, office buildings, shopping malls, apartments, villas, families, etc.

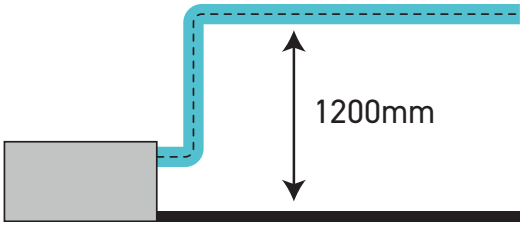
MODEL			AMV6-22SLD	AMV6-28SLD	AMV6-36SLD	AMV6-45SLD	AMV6-56SLD	AMV6-71SLD
Capacity	Cooling	kW	2.20	2.80	3.60	4.50	5.60	7.10
	Heating	kW	2.50	3.20	4.00	5.00	6.30	8.00
Power supply		V/Ph/Hz	220-240V ~ 50Hz & 208-230V ~ 60Hz					
Power Consumption		W	28	28	37	40	55	55
Airflow volume (H/M/L)		m^3/h	450/350/200		550/400/300	750/550/400	850/700/550	1100/850/650
Rated Current	Cooling	A	0.2	0.2	0.3	0.3	0.4	0.5
	Heating	A	0.2	0.2	0.3	0.3	0.4	0.5
ESP		Pa	15/0 ~ 30					
Sound pressure level (H/M/L)		dB(A)	30/25/22	30/25/22	31/27/25	33/29/27	35/31/29	37/32/30
Connecting pipe diameter	Liquid	mm	Φ 6.35	Φ 6.35	Φ 6.35	Φ 6.35	Φ 9.52	Φ 9.52
	Gas	mm	Φ 9.52	Φ 9.52	Φ 12.7	Φ 12.7	Φ 15.9	Φ 15.9
Drain pipe	External dia.	mm	25	25	25	25	25	25
	Thickness	mm	2.5	2.5	2.5	2.5	2.5	2.5
Dimension (WxDxH)	Outline	mm	710×462×200	710×462×200	710×462×200	1010×462×200	1010×462×200	1310×462×200
	Package	mm	1008×568×275	1008×568×275	1008×568×275	1308×568×275	1308×568×275	1608×568×275
Net weight/Gross weight		kg	18.5/23.5	18.5/23.5	19/24	24/30	25/31	31/37.5

*Sound pressure level measured at 1,4 m distance.

The data is measured under following conditions. Cooling: Indoor temp. 27C DB, 19C WB. Heating: Indoor temp. 20C DB.

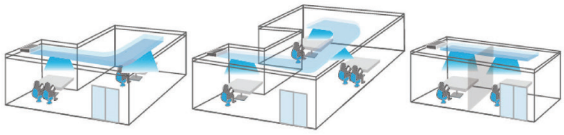
Standard Fitting 1,200mm Condensate Water Lift Pump

Pump drainage height can be up to 1,200mm, vertical installation height of the unit can be flexibly adjusted, with high engineering adaptability.



80Pa High Static Pressure Design, Multi-step Static Pressure to Adjust

The highest static pressure can be up to 80Pa, which is applicable to different installation locations to ensure cooling and heating effect. With wide static pressure range and 5 notch of adjustable external. static pressure, the engineering design and application is more convenient and fast.



Control system lineup

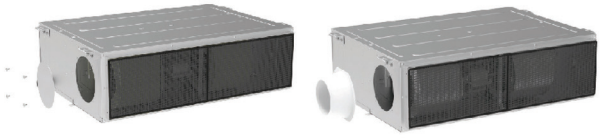
STANDARD
Wired controller XE7A-24/H

DC Motor Design, Low Noise Operation

The brushless DC motor realizes stepless speed adjustment, and can set the automatic quiet mode through wired controller to make the operation quieter.

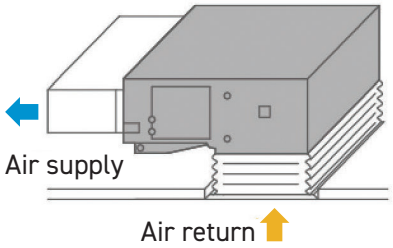
Fresh Air Introduction Function

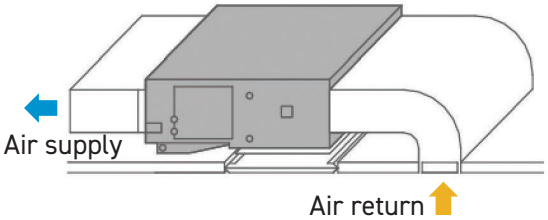
It can be connected to the fresh air duct to introduce fresh air from outside to ensure fresh indoor air.



Flexible Installation

According to the construction and use requirements, flexibly choose different return air ways and supply static pressure.





HIGH PRESSURE DUCT TYPE UNIT

High static pressure duct type unit, with large air volume, wide static pressure adjustment range and maximum static pressure, can be up to 250Pa; long air supply distance can be widely used in places where it is necessary to connect air pipes to achieve long-distance air supply, such as hotels, office buildings, shopping malls, factories.

MODEL			AMV6-90HD	AMV6-112HD	AMV6-160HD	AMV5-224HD*	AMV5-280HD*
Capacity	Cooling	kW	9.0	11.2	16.0	22.4	28.0
	Heating	kW	10.0	12.5	18.0	25.0	31.0
Power supply		V/Ph/Hz	220-240V~ 50Hz & 208-230V~ 60Hz				
Power Consumption		W	170	170	240	800	900
Airflow volume (H/M/L)		m^3/h	1800/1450/1250	2000/1600/1400	2500/2000/1750	4000/3600/3200	4400/4000/3600
Rated Current	Cooling	A	1.4	1.4	1.8	3.7	4.1
	Heating	A	1.4	1.4	1.8	3.7	4.1
ESP		Pa	90/0 ~ 200	90/0 ~ 200	90/0 ~ 200	100/50 ~ 200	100/50 ~ 200
Sound pressure level (H/M/L)		dB(A)	42/38/34	43/39/36	45/43/40	54/52/49	55/52/50
Connecting pipe	Liquid	mm	Φ 9.52	Φ 9.52	Φ 9.52	Φ 9.52	Φ 9.52
	Gas	mm	Φ 15.9	Φ 15.9	Φ 19.05	Φ 19.05	Φ 22.2
Drain pipe	External dia.	mm	Φ 25	Φ 25	Φ 25	Φ 25.0	Φ 25
	Thickness	mm	2.5	2.5	2.5	2.5	2.0
Dimension (WxDxH)	Outline	mm	1400×700×300			1483×791×385	1686×870×450
	Package	mm	1601×813×365			1578×883×472	1788×988×580
Net weight/Gross weight		kg	54/61		54,5/61,5	82/104	105/140

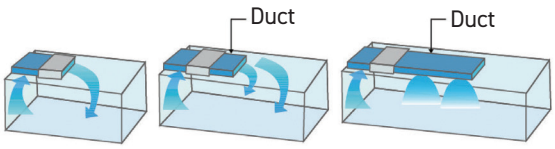
***Note: These models are without water pump.**

*Sound pressure level measured at 1,4 m distance.

The data is measured under following conditions. Cooling: Indoor temp. 27C DB, 19C WB. Heating: Indoor temp. 20C DB.

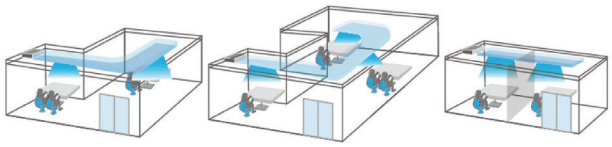
High Static Pressure Design, Multi-stage Static Pressure to Adjust

There are 9-stage adjustable external static pressure. The highest static pressure can reach 200Pa. Engineering design and engineering application is more convenient and fast.



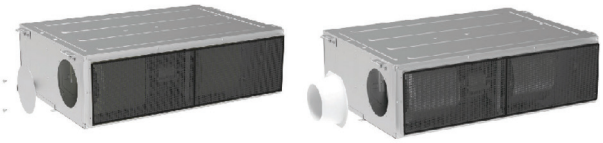
Long-distance Air Supply

Support long-distance air supply to serve multiple air supply areas and satisfy complicated layout and locations, creating comfortable environment.



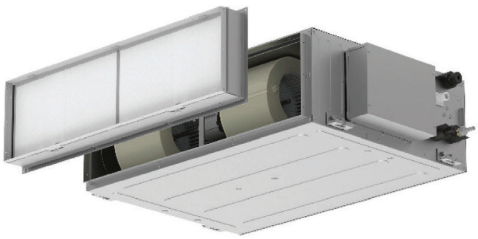
Fresh Air Introduction Function

It can be connected to the fresh air duct to introduce fresh air from outside to ensure fresh indoor air.



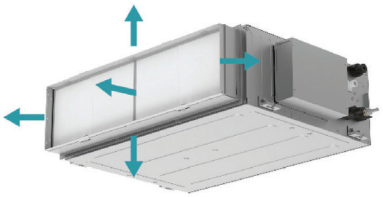
High Efficiency Filtration

Optional high-efficiency filter device can effectively filtrate PM2.5, with small performance attenuation.



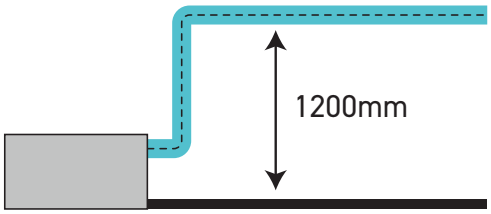
Multi-directional Removable Filter

The filter can be disassembled from 5 directions (the arrow below shows the direction of the removable filter). Installation and maintenance are convenient and fast.



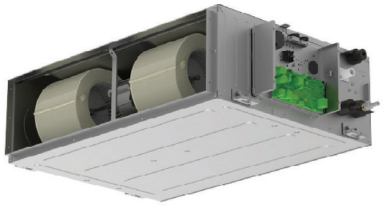
Standard Fitting 1,200mm Condensate Water Lift Pump

The pump drainage height can be up to 1,200mm, and the vertical installation height of the unit can be flexibly adjusted, with high engineering adaptability.



Convenient Maintenance

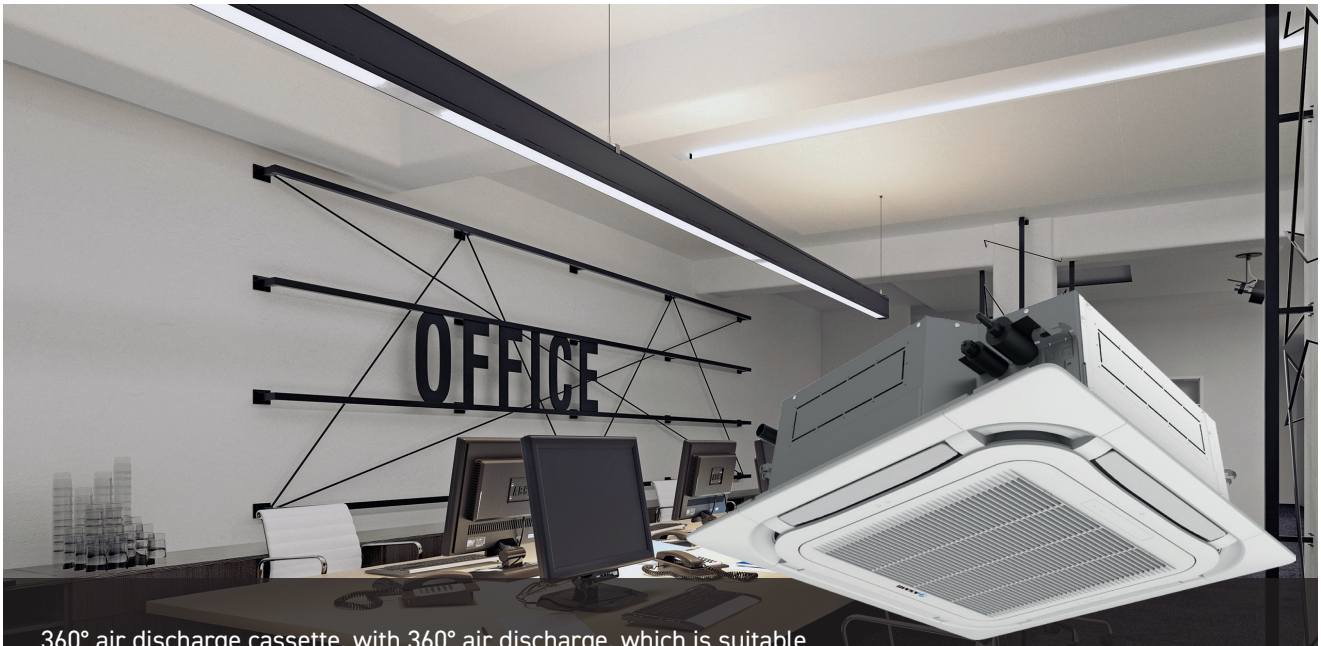
External hanging electric box design for convenient maintenance.



Control system lineup

STANDARD
Wired controller XK46

360 ° CASSETTE INDOOR UNIT



360° air discharge cassette, with 360° air discharge, which is suitable for different places such as hotels, office buildings, shopping malls, apartments, villas, and families. The all-round discharge cassette type indoor unit's air louver can be independently controlled to realize a new air flow form. The air supply range is wide and temperature distribution is more uniform, bringing a comfortable environment experience. With optional human sensory function, the control is more intelligent and user-friendly.

MODEL				AMV6-22C	AMV6-28C	AMV6-36C	AMV6-45C	AMV6-56C
Capacity		Cooling	kW	2.2	2.8	3.6	4.5	5.6
		Heating	kW	2.5	3.2	4.0	5.0	6.3
Power supply			V/Ph/Hz	220-240V~ 50Hz & 208-230V~ 60Hz				
Power Consumption			W	26	26	26	26	35
Airflow volume (H/M/L)			m^3/h	800/700/600				950/850/750
Rated Current		Cooling	A	0.2	0.2	0.2	0.2	0.2
		Heating	A	0.2	0.2	0.2	0.2	0.2
Sound pressure level (H/M/L)			dB(A)	33/30/28	33/30/28	33/30/28	34/30/28	37/33/30
Connecting pipe		Liquid	mm	Φ 6.35	Φ 6.35	Φ 6.35	Φ 6.35	Φ 9.52
		Gas	mm	Φ 9.52	Φ 9.52	Φ 12.7	Φ 12.7	Φ15.9
Drain pipe		External dia.	mm	Φ 25	Φ 25	Φ 25	Φ 25	Φ 25
		Thickness	mm	2.5	2.5	2.5	2.5	2.5
Main body	Dimension (W×D×H)	Outline	mm	840×840×240	840×840×240	840×840×240	840×840×240	840×840×240
		Package	mm	963×963×325	963×963×325	963×963×325	963×963×325	963×963×325
	Net weight/Gross weight		kg	27.0/35.0	27.0/35.0	27.0/35.0	27.0/35.0	28.0/36.0
Panel	Model			TF06	TF06	TF06	TF06	TF06
	Dimension (W×D×H)	Outline	mm	950×950×65	950×950×65	950×950×65	950×950×65	950×950×65
		Package	mm	1033×1020×110	1033×1020×110	1033×1020×110	1033×1020×110	1033×1020×110
	Net weight/Gross weight		kg	6.0/9.5	6.0/9.5	6.0/9.5	6.0/9.5	6.0/9.5

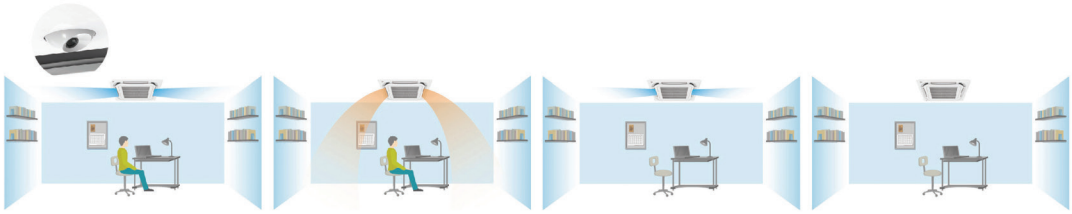
MODEL				AMV6-71C	AMV6-90C	AMV6-112C	AMV6-140C	AMV6-160C
Capacity		Cooling	kW	7.1	9.0	11.2	14.0	16.0
		Heating	kW	8.0	10.0	12.5	16.0	18.0
Power supply			V/Ph/Hz	220-240V~ 50Hz & 208-230V~ 60Hz				
Power Consumption			W	60	85	115	115	170
Airflow volume (H/M/L)			m^3/h	1150/950/850	1250/1000/900	1650/1300/1100		2000/1800/1430
Rated Current		Cooling	A	0.4	0.4	0.6	0.6	1.2
		Heating	A	0.4	0.4	0.6	0.6	1.2
Sound pressure level (H/M/L)			dB(A)	37/34/31	39/37/34	43/41/39	43/41/39	51/48/42
Connecting pipe		Liquid	mm	Φ 9.52	Φ 9.52	Φ 9.52	Φ 9.52	Φ 9.52
		Gas	mm	Φ15.9	Φ 15.9	Φ 15.9	Φ 15.9	Φ 19.05
Drain pipe		External dia.	mm	Φ 25	Φ 25	Φ 25	Φ 25	Φ 25
		Thickness	mm	2.5	2.5	2.5	2.5	2.5
Main body	Dimension (W×D×H)	Outline	mm	840×840×240	840×840×240	840×840×290	840×840×290	840×840×290
		Package	mm	963×963×325	963×963×325	963×963×379	963×963×379	963×963×379
	Net weight/Gross weight		kg	28.0/36.0	29.0/37.0	33.0/42.0	33.0/42.0	36.0/44.0
Panel	Model			TF06	TF06	TF06	TF06	TF06
	Dimension (W×D×H)	Outline	mm	950×950×65	950×950×65	950×950×65	950×950×65	950×950×65
		Package	mm	1033×1020×110	1033×1020×110	1033×1020×110	1033×1020×110	1033×1020×110
	Net weight/Gross weight		kg	6.0/9.5	6.0/9.5	6.0/9.5	6.0/9.5	6.0/9.5

*Sound pressure level measured at 1,4 m distance.

The data is measured under following conditions. Cooling: Indoor temp. 27C DB, 19C WB. Heating: Indoor temp. 20C DB.

360 ° Overall Temperature Field Identification

Intelligent sensory function control and high temperature field recognition accuracy can avoid cold wind blowing. people, make warm wind follow people and prevent direct blowing to the human body; when it detects that no one is indoors, it automatically adjusts the set temperature; if there is no one indoors for long, the unit will be automatically shut off.

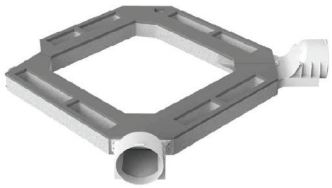


Note: This function should be customized and needs to be used with wired controller XE70-33/H.

360° Surrounding Airflow

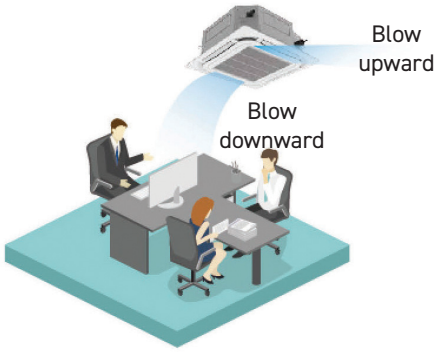
Wide air supply range, more uniform temperature distribution and more comfortable experience.

Optional fresh air fitting can effectively introduce 8 ~ 10% of outdoor fresh air and improve indoor comfort.



Independent Swing Control

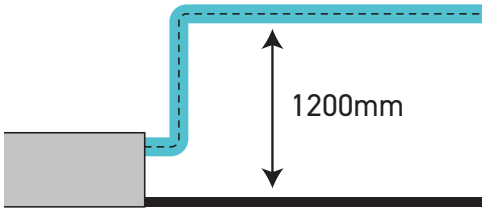
The four air louvers can be controlled independently, and the air supply direction can be adjusted independently to achieve different angle combinations to avoid direct air blowing.



Note: This function should be customized and needs to be used with wired controller XE70-33/H.

DC Quiet Condensate Pump

The pump drainage lifting height can be up to 1,200mm, and vertical installation height of the unit can be flexibly adjusted, with high engineering adaptability.



Optional lifting panel, and the intel grille adopts two-way suspension lifting technology to realize the lifting function of the grille. User can clean the filter by himself thanks to convenient maintenance.

Control system lineup

STANDARD
Wireless controller YAP1F

* Optional fitting, please consult engineering and technical personnel.

360 ° COMPACT CASSETTE INDOOR UNIT

360° air discharge compact cassette, 6 models in the whole series, capacity range: 1.5kW ~ 5.6kW. Newly designed 360° air outlet panel can achieve 360 surrounding airflow, for wider air supply range, more uniform air distribution and temperature field, and more comfortable user experience. It can be widely used in households, hotels, restaurants, offices, meeting rooms and other places.

MODEL				AMV6-15CC	AMV6-22CC	AMV6-28CC	AMV6-36CC	AMV6-45CC	AMV6-56CC
Capacity		Cooling	kW	1.5	2.2	2.8	3.6	4.5	5.6
		Heating	kW	1.8	2.5	3.2	4.0	5.0	6.3
Power supply			V/Ph/Hz	220-240V~ 50Hz & 208-230V~ 60Hz					
Power Consumption			W	30	30	30	30	45	45
Airflow volume (H/M/L)			m^3/h	460/420/370	500/460/370	570/480/420	620/550/480	730/650/560	
Rated Current		Cooling	A	0.15	0.15	0.15	0.15	0.23	0.23
		Heating	A	0.15	0.15	0.15	0.15	0.23	0.23
Sound pressure level (H/M/L)			dB(A)	33/30/25	36/31/25	36/33/28	39/37/35	43/41/39	43/41/39
Connecting pipe		Liquid	mm	Φ 6.35	Φ 6.35	Φ 6.35	Φ 6.35	Φ 6.35	Φ 9.52
		Gas	mm	Φ 9.52	Φ 9.52	Φ 9.52	Φ 12.7	Φ 12.7	Φ 15.9
Drain pipe		External dia.	mm	Φ 25	Φ 25	Φ 25	Φ 25	Φ 25	Φ 25
		Thickness	mm	2.5	2.5	2.5	2.5	2.5	2.5
Main body	Dimension (W×D×H)	Outline	mm	570×570×265	570×570×265	570×570×265	570×570×265	570×570×265	570×570×265
		Package	mm	698×653×295	698×653×295	698×653×295	698×653×295	698×653×295	698×653×295
	Net weight/Gross weight		kg	17.5/22.5	17.5/22.5	17.5/22.5	17.5/22.5	17.5/22.5	17.5/22.5
Panel	Model			TF05	TF05	TF05	TF05	TF05	TF05
	Dimension (W×D×H)	Outline	mm	620×620×47.5	620×620×47.5	620×620×47.5	620×620×47.5	620×620×47.5	620×620×47.5
		Package	mm	701×701×125	701×701×125	701×701×125	701×701×125	701×701×125	701×701×125
	Net weight/Gross weight		kg	3.0/4.5	3.0/4.5	3.0/4.5	3.0/4.5	3.0/4.5	3.0/4.5

*Sound pressure level measured at 1,4 m distance.

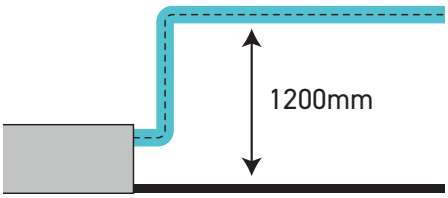
The data is measured under following conditions. Cooling: Indoor temp. 27C DB, 19C WB. Heating: Indoor temp. 20C DB.

360° Surrounding Airflow

The newly designed 360° surrounding airflow has a wide air supply range, more uniform airflow organization and temperature distribution, avoiding partial hot and cold, and providing a more comfortable user experience.

DC Quiet Condensate Pump

The high-lift DC quiet condensate pump is adopted, which has lower operating power and better sound quality. The maximum lifting height is 1,200mm, the installation design is more flexible, and it is convenient for the layout of engineering drain pipe.



Newly Designed Air Ducts and Blades for Lower Operating Noise

Internal air ducts and blades adopt new fluid simulation design, which allows lower operating noise under the same air volume. Noise is as low as 25dB(A).

Multiple Protection Functions

The unit is designed with multiple protection functions to achieve safe and reliable long-term operation, including water full protection, anti-freezing protection, fan error protection, etc.

Control system lineup

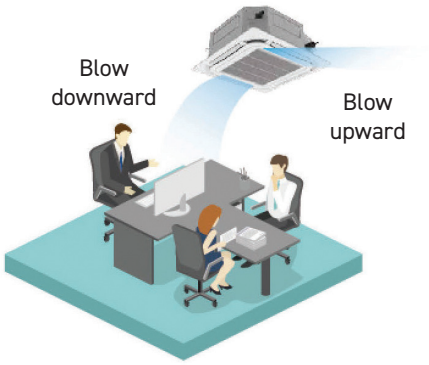
STANDARD
Wireless controller YAP1F

Compact Design

With compact structural design, unit body is smaller than the previous generation, and the installation area is smaller.

Independent Swing Control

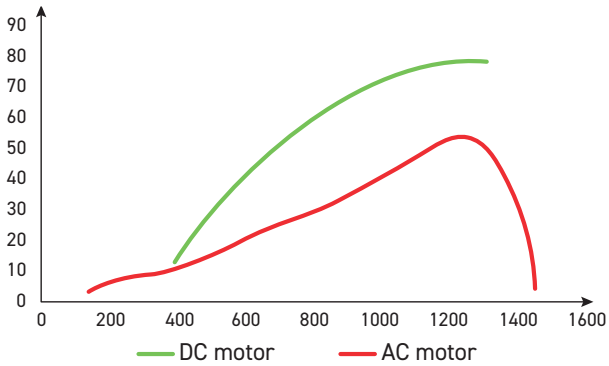
The four air louvers can be controlled independently, and direction of air supply can be regulated independently to achieve different angles of air supply and avoid direct. wind blowing to people.



Note: This function should be customized and needs to be used with wired controller XE70-33/H.

DC Motor Design

The fan adopts high-efficiency DC motor to realize stepless speed regulation. Compared with ordinary AC motor, it can achieve effective energy conservation of about 30%.



WALL-MOUNTED TYPE INDOOR UNIT

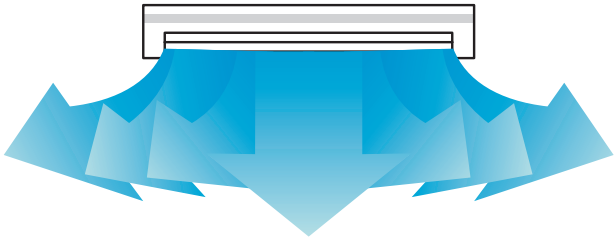
MODEL			AMV6-15WM	AMV6-22WM	AMV6-28WM	AMV6-36WM	AMV6-45WM	AMV6-56WM	AMV6-71WM	AMV6-90WM	AMV6-100WM
Capacity	Cooling	kW	1.5	2.2	2.8	3.6	4.5	5.6	7.1	9.0	9.5
	Heating	kW	1.8	2.5	3.2	4.0	5.0	6.3	7.5	10.0	10.5
Power supply		V/Ph/Hz	220-240V~ 50Hz & 208-230V~ 60Hz								
Power Consumption		W	20	20	20	25	35	50	65	80	100
Airflow volume (H/M/L)		m^3/h	500/440/300			630/460/320	850/580/500	1100/850/650	1200/850/650	1550/1050/800	1650/1100/900
Rated Current	Cooling	A	0.1	0.1	0.1	0.12	0.17	0.24	0.31	0.41	0.41
	Heating	A	0.1	0.1	0.1	0.12	0.17	0.24	0.31	0.41	0.41
Sound pressure level (H/M/L)		dB(A)	35/33/30	35/33/30	35/33/30	38/35/31	43/40/37	43/41/37	44/41/37	49/46/40	52/48/40
Connecting pipe	Liquid	mm	Φ 6.35	Φ 6.35	Φ 6.35	Φ 6.35	Φ 6.35	Φ 6.35	Φ 6.35	Φ 6.35	Φ 6.35
	Gas	mm	Φ 9.52	Φ 9.52	Φ 9.52	Φ 12.7	Φ 12.7	Φ 15.9	Φ 15.9	Φ 15.9	Φ 15.9
Drain pipe	External dia.	mm	Φ 20	Φ 20	Φ 20	Φ 20	Φ 20	Φ 20	Φ 20	Φ 20	Φ 20
	Thickness	mm	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Dimension (WxDxH)	Outline	mm	845×209×289				970×224×300	1078×246×325		1350×258×326	
	Package	mm	976×281×379				1096×308×395	1203×338×425		1496×357×433	
Net weight/Gross weight		kg	10.5/12.5	10.5/12.5	10.5/12.5	10.5/12.5	12.5/15.5	16/19	16/19	20/24	20/24

*Sound pressure level measured at 1,4 m distance.

The data is measured under following conditions. Cooling: Indoor temp. 27C DB, 19C WB. Heating: Indoor temp. 20C DB.

Easy Installation
It adopts wall-mounted installation, no need occupying floor space and no need to suspend the ceiling. Refrigerant pipe can be installed flexiblely.

Automatic Up and Down Swing Design
With up and down swing function, air louver can realize automatic control, air supply range is increased and air supply is uniform, creating a comfortable working and living environment.



Wide Air Supply
The wind can be naturally and evenly distributed to all corners of the room.

Uniform Temperature Distribution and High Comfort
The temperature field is evenly and reasonably distributed, the heating airflow can directly reach the ground,warming the entire room, greatly improving human comfort.

Washable Filter
With long-term filter, which can be disassembled and cleaned for easy maintenance.

Removable Panel
Panel of the indoor unit can be easily slid in or out, disassembly is simple and easy, which is easy to clean and the appearance of indoor unit can be kept clean and new.

Powerful and Fast
Using intelligent temperature control technology, with powerful and rapid cooling/heating function, can make the indoor temperature quickly reach the set temperature.

Quiet Design
Using high-efficiency cross-flow fan blades, noise of the whole unit is greatly reduced.

Multiple Protection Functions
Anti-freezing protection, fan motor built-in overload protection, temperature sensor error protection.

Control system lineup

STANDARD
Wireless controller YAP1F

FLOOR CEILING TYPE INDOOR UNIT

Floor ceiling type indoor unit has two installation methods: floor mounted and ceiling mounted. It is suitable to multiple applications such as hotels, office buildings, shopping malls, apartments, villas, households, etc.

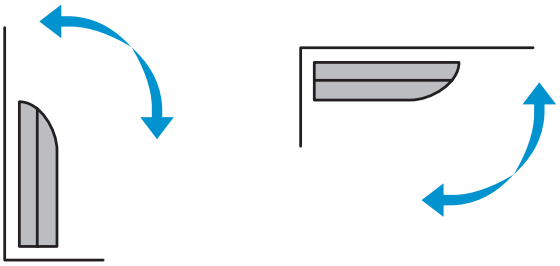
MODEL			AMV6-28FC	AMV6-36FC	AMV6-56FC	AMV6-71FC	AMV6-90FC	AMV6-112FC	AMV6-140FC
Capacity	Cooling	kW	2.8	3.6	5.6	7.1	9.0	11.2	14.0
	Heating	kW	3.2	4.0	6.3	8.0	10.0	12.5	16.0
Power supply		V/Ph/Hz	220-240V~ 50Hz & 208-230V~ 60Hz						
Power Consumption		W	35	35	55	80	120	120	150
Airflow volume (H/M/L)		m^3/h	600/500/450		750/650/600	1350/1200/1050	1550/1400/1250	1800/1600/1400	2000/1750/1600
Rated Current	Cooling	A	0.2	0.2	0.3	0.4	0.7	0.7	0.8
	Heating	A	0.2	0.2	0.3	0.4	0.7	0.7	0.8
Sound pressure level (H/M/L)		dB(A)	36/32/29	36/32/29	42/39/36	44/41/38	47/44/41	47/44/41	49/45/43
Connecting pipe	Liquid	mm	Φ 6.35	Φ 6.35	Φ 9.52	Φ 9.52	Φ 9.52	Φ 9.52	Φ 9.52
	Gas	mm	Φ 9.52	Φ 12.7	Φ 15.9	Φ 15.9	Φ 15.9	Φ 15.9	Φ 15.9
Drain pipe	External dia.	mm	Φ 17	Φ 17	Φ 17	Φ 17	Φ 17	Φ 17	Φ 17
	Thickness	mm	1.75	1.75	1.75	1.75	1.75	1.75	1.75
Dimension (WxDxH)	Outline	mm	870×665×235				1200×665×235	1570x665x235	
	Package	mm	973×770×300				1303×770×300	1669×770×300	
Net weight/Gross weight		kg	24/29	24/29	25/30	32/38	33/39	41/48	43/50

*Sound pressure level measured at 1,4 m distance.

The data is measured under following conditions. Cooling: Indoor temp. 27C DB, 19C WB. Heating: Indoor temp. 20C DB.

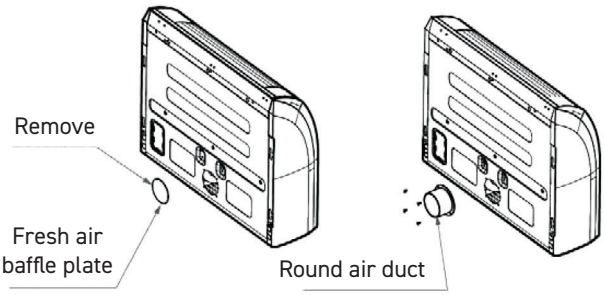
Flexible Installation

The unit can be floor mounted or ceiling mounted; the flexible and convenient installation method can give customers more installation choices. When floor mounted, the installation is more convenient.



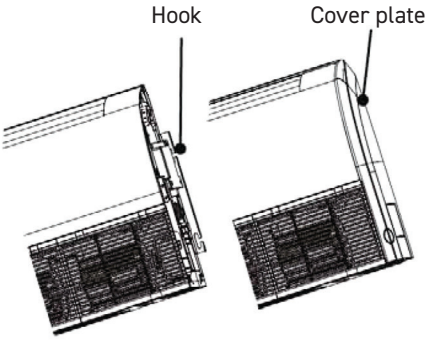
Fresh Air Intake

Fresh air duct can be connected to introduce fresh air into the room from the outside.

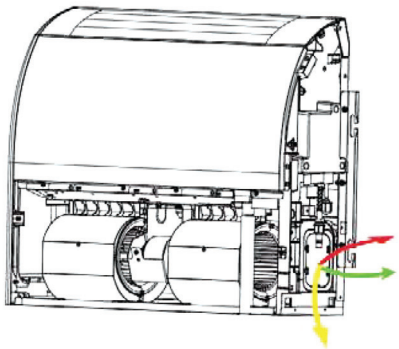


Easy Installation

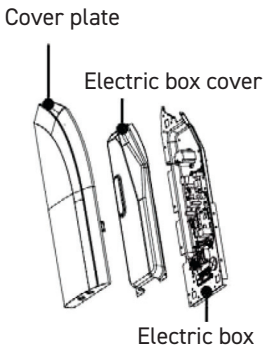
Adjust the angle of the air deflector to avoid affecting the ceiling near the air outlet.



1) Concealed hook design, beautiful appearance;



2) Multi-directional outlet method can adapt to different installation sites;



3) The concealed design of the side electrical box, Wire can be connected by disassembling the cover.

Quiet Design

The new low-noise fan blade cooperates with the DC motor and excellent soundproof air distribution structure to ensure that the air supply is even and smooth, creating a quiet and comfortable environment.

Control system lineup

STANDARD
Wireless controller YAP1F

AHU-KIT

The AHU kit with the air handling unit can be used as a multi VRF indoor unit to connect to a multi VRF system, so that the air handling unit has the functional advantages of multi VRF unit.
AHU-KIT consist of EXV Box, Control Box, Wired controller and temperature sensors.

MODEL				GMV-N71U/C-T			GMV-N140U/C-T			GMV-N280U/C-T					GMV-N560U/C-T		
Defaulted capacity of exfactory	Capacity			71			140			280					560		
	Cooling		kW	7.1			14.0			28.0					56.0		
	Heating		kW	8.0			16.0			31.5					63.0		
Adjustable capacity	Capacity			45	56	71	90	112	140	224	280	335	400	450	504	560	840
	Cooling		kW	4.5	5.6	7.1	9.0	11.2	14.0	22.4	28.0	33.5	40.0	45.0	50.4	56.0	84.0
	Heating		kW	3.6	6.3	8.0	10.0	12.5	16.0	25.0	31.5	37.5	45.0	50.0	56.5	63.0	94.5
Power input			W	8			8			8					8		
Power supply			V/Ph/Hz	220-240V~ 50Hz & 208-230V~ 60Hz													
Size of connection pipe	AHU-KIT (exfactory pipe size)		mm	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ15.9	Φ15.9	Φ15.9
	Air handling unit	Liquid pipe	mm	Φ6.35	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ9.52	Φ12.7	Φ12.7	Φ12.7	Φ15.9	Φ15.9	Φ19.05
		Gas pipe	mm	Φ15.9	Φ15.9	Φ15.9	Φ15.9	Φ15.9	Φ15.9	Φ19.05	Φ22.2	Φ25.4	Φ25.4	Φ28.6	Φ28.6	Φ28.6	Φ31.8
	Connection method			Brazing Connection													
Outline dimension (W×D×H)	EXV box		mm	203×326×85			203×326×85			203×326×85					246×500×120		
	Control box			334×284×111			334×284×111			334×284×111					334×284×111		
Package dimension(W×D×H)			mm	539×461×247			539×461×247			539×461×247					759×645×180		
Net weight			kg	10.5			10.5			10.5					13.0		
Gross weight			kg	13.5			13.5			13.5					17.5		
Loading quantity	40'GP		unit	990			990			990					702		
	40'HQ		unit	1100			1100			1100					756		

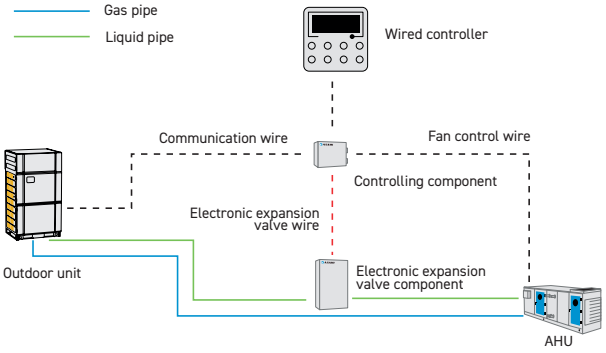
Note:
1. Up to 3 AHU-KIT units can be modulated to achieve total cooling capacity up to 252kW and total heating capacity up to 283,5 kW.
2. Cooling capacity test conditions: indoor 27˚C DB/19˚C WB, outdoor 35˚C DB.
3. Heating capacity test conditions: indoor 20˚C DB, outdoor 7˚C DB/6˚C WB.
4. The actual heating capacity depends on the outside air temperature.
   For more accurate data, please contact ASAMI engineers.

Connection

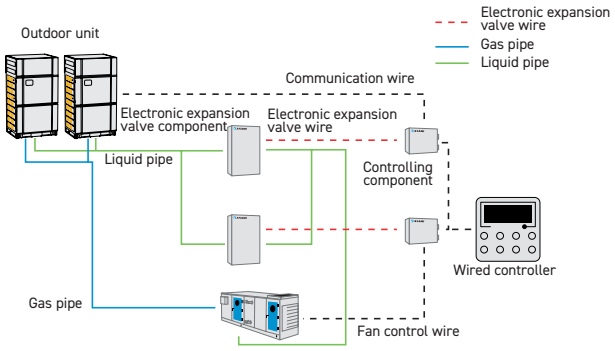
The AHU-KIT with the air handling unit can be used as a multi VRF indoor unit to connect to a multi VRF outdoor unit. The connection is limited by the outdoor unit. There are the following three types of connections:

One to One

The AHU-KIT with the air handling unit can be connected with multi VRF outdoor units in one-to-one way. Total capacity of the AHU-KIT should be between 50% and 110% of the outdoor unit's capacity.



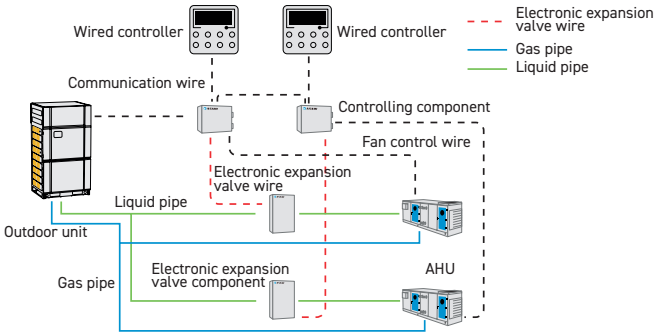
AHU-KIT one to one (single unit) connection (7.1kW ⩽ capacity ⩽ 84kW)



AHU-KIT one to one (parallel) connection (84kW <capacity ⩽ 252kW)

One to Many (Only DX AHU Unit)

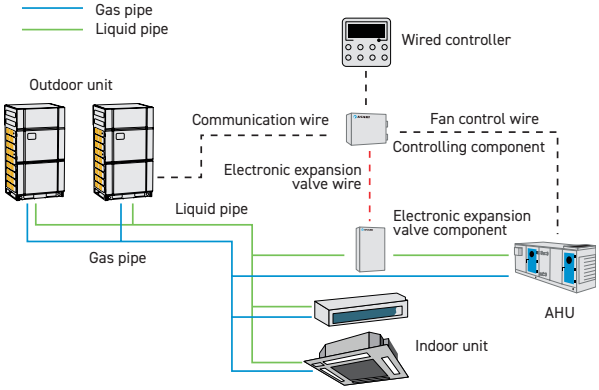
Multiple sets of AHU-KIT-air handling units can be connected to one multi VRF outdoor unit. Total capacity of the AHU-KIT should be between 50% and 110% of the outdoor unit's capacity. (Take one for two as an example)



AHU-KIT one to more connection (2.8kW ⩽ capacity ⩽ 84kW)

One to Many (DX AHU Unit + AMV Indoor Unit)

The AHU-KIT and ordinary multi VRF indoor unit can be connected into the same multi VRF outdoor unit. Total capacity of the AHU-KIT and the ordinary multi VRF indoor unit is between 50% and 110% of the outdoor unit's capacity, and total capacity of the AHU-KIT cannot exceed 30% of the outdoor unit's capacity.



AHU-KIT one to more (mixed) connection (2.8kW ⩽ capacity ⩽ 28kW)

Features:

The two components are designed independently, and the installation is convenient. The control component is installed indoors and electronic expansion valve can be installed indoors or outdoors, with flexible engineering design.

A variety of model combinations can expand the capacity range to meet the requirements in most occasions. With fault signal to ensure safe and reliable operation.

The outdoor unit is used as cooling and heating sources, no additional cooling and heating sources are required.

Access to variable refrigerant control system, using DC inverter control technology.

Can connect to the third party's controller to set on/off, modes, temperature and related parameters of the units.

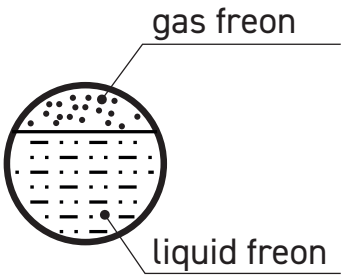
ACCESSORIES

ASAMI®

PIPING

Liquid freon contains gas bubbles. This may be the reason that not all of the indoor units receive necessary amount of liquid refrigerant, and as a result fail to reach the designed cooling capacity. For this reason, it must abide by these rules below.

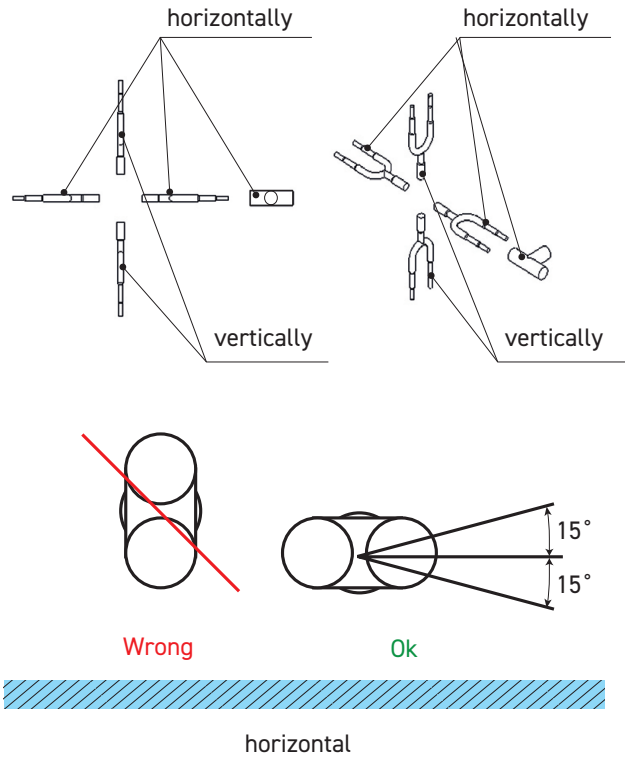
Use only original branching joints



Every pipe is filled with gas and liquid freon.
This is the reason why branching pipes should be place in particular way (so both form of freon filled every pipe).

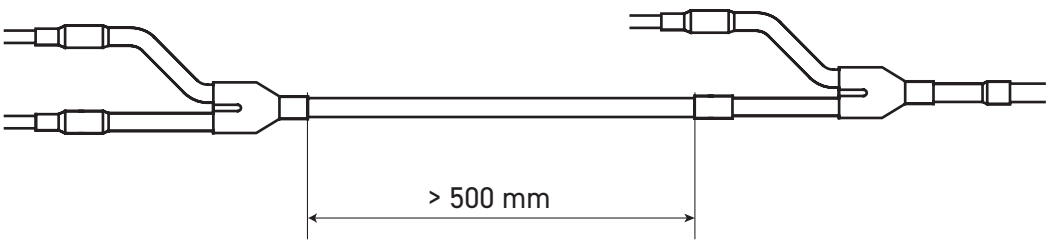
The branch pipe can only placed horizontally

Meanwhile, two branch pipes must be on the same plane.



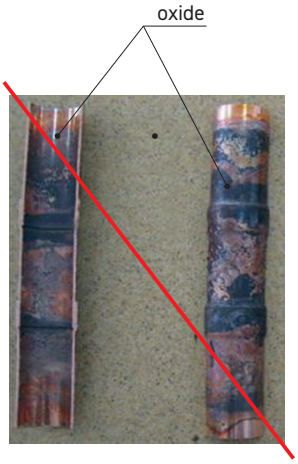
Placement of branch pipe

The spacing between two branch pipes must be over 500mm, the spacing between two bends must be over 500mm, and the spacing between branch pipe and bend point must also be over 500mm.



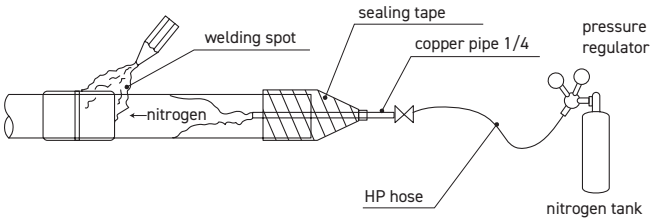
Piping welding

If nitrogen is not applied for protection during welding, there will be oxide on the copper pipe. If the oxide enters refrigerant system, it will damage valve and compressor.



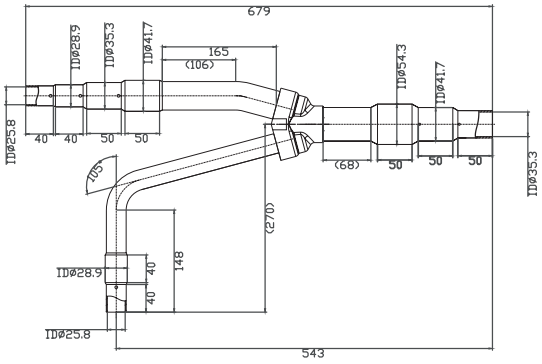
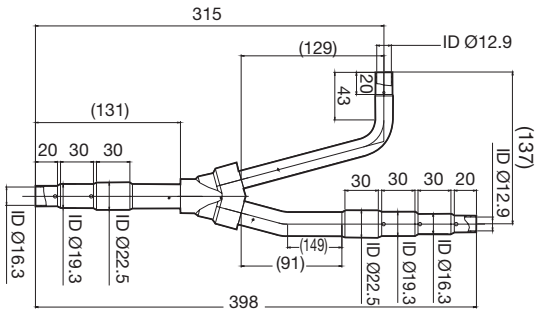
weld without nitrogen Wrong

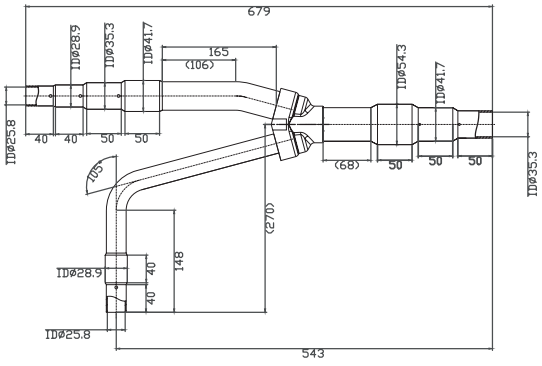
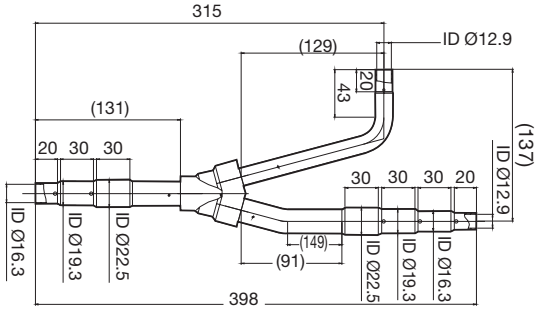
weld using nitrogen Correct



Method: refer to the following diagram. The pressure of nitrogen is 0.5 ± 0.1 kgf/cm2.

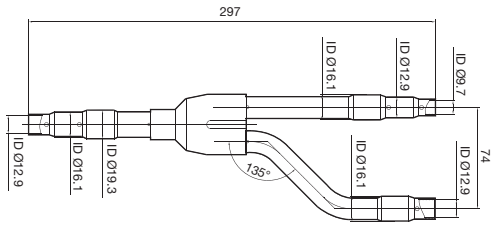
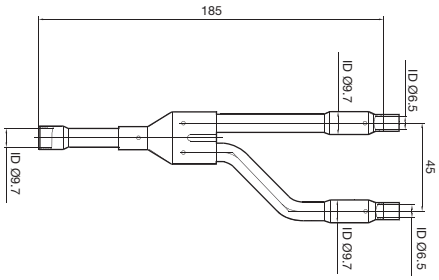
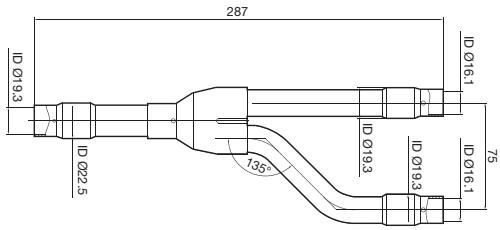
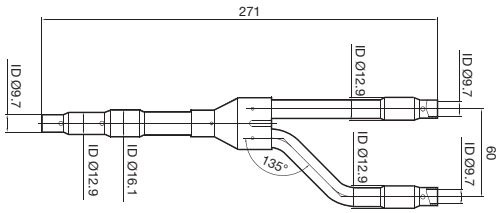
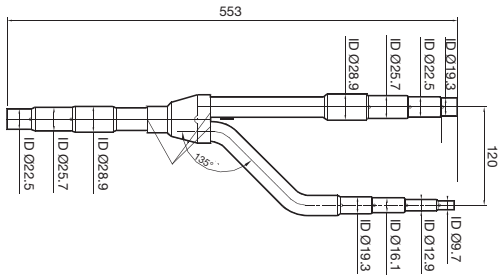
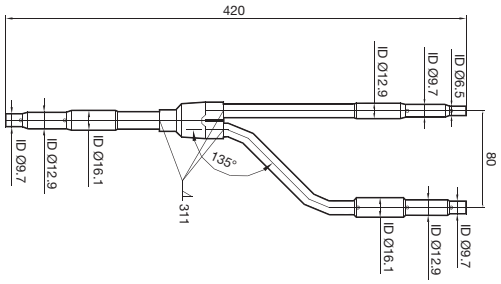
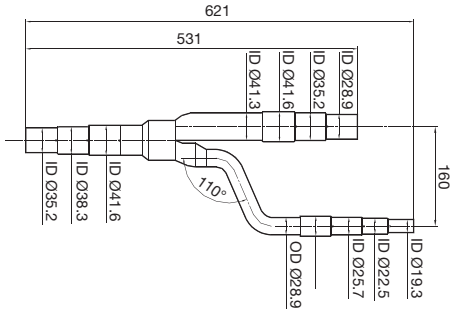
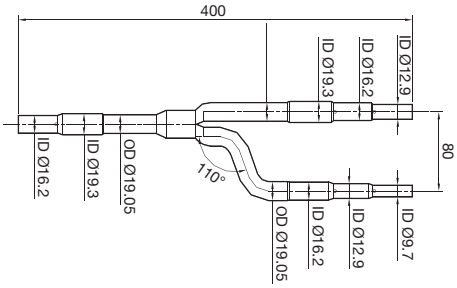
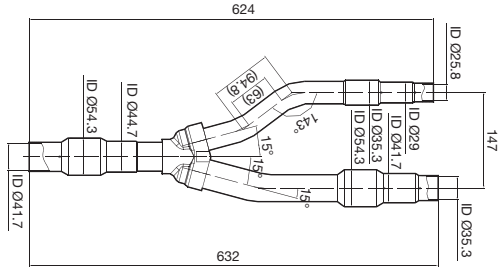
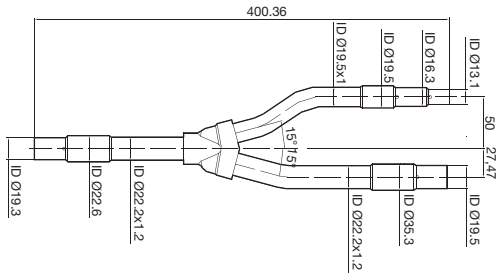
Note: cover the left side of copper pipe and reserve a little space.

For AMV6 outdoor Units		
Model	Appearance	
	Gas pipe	Liquid pipe
ML01/A		

For AMV6 Heat Recovery Outdoor Units		
Model	Appearance	
	Low and High pressure Gas pipe	Liquid pipe
ML01R		

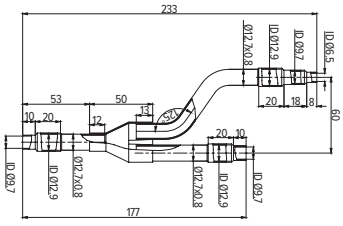
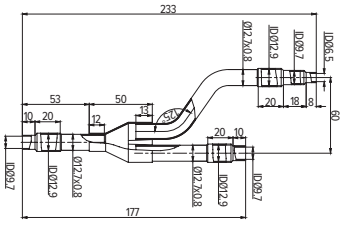
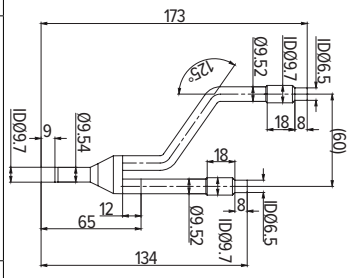
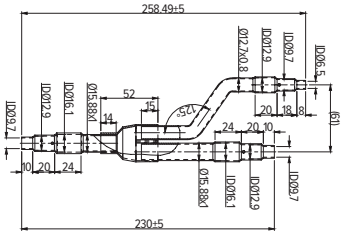
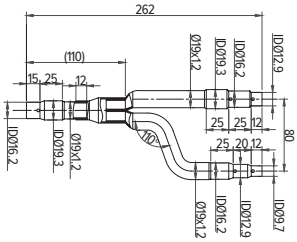
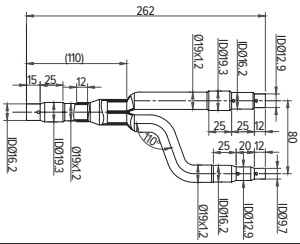
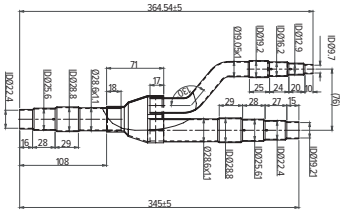
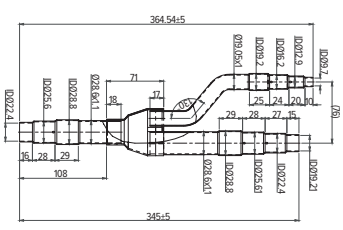
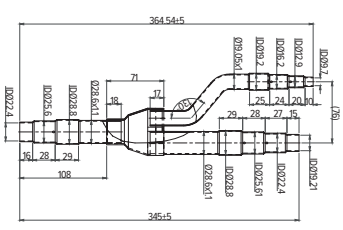
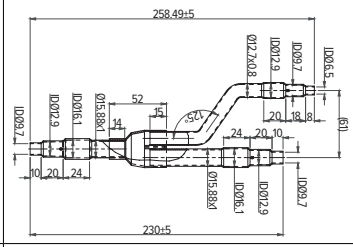
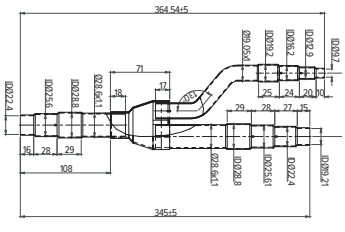
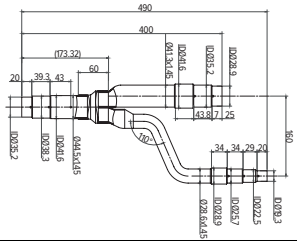
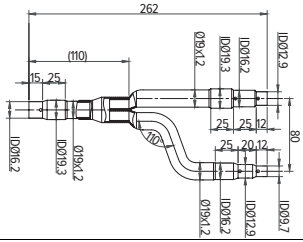
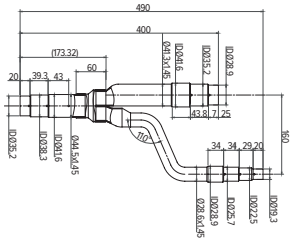
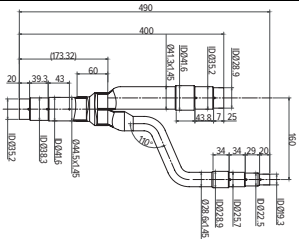
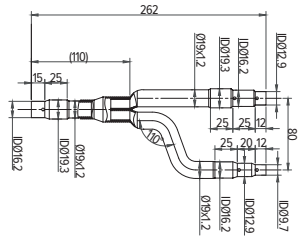
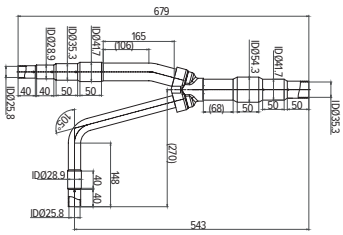
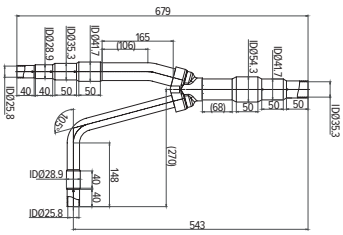
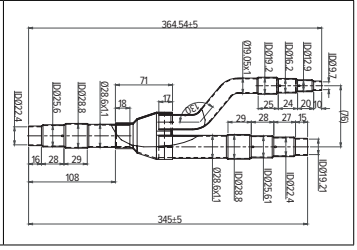
Branching joint (For AMV5 and AMV6 units)

Branch joints used in 2-pipe VRF systems

For Outdoor Units and Mode Exchanger			
Model	Modules capacity X/kW	Appearance	
		Gas pipe	Liquid pipe
FQ01A/A	X < 20		
FQ01B/A	20 ≤ X ≤ 30		
FQ02A	30 ≤ X ≤ 70		
FQ03A	70 < X ≤ 136		
FQ04A	136 < X ≤ 272		

Branching joint (For AMV6 HR units)

Branch joints used in 3-pipe VRF systems

For Outdoor Units and Mode Exchanger				
Model	Total capacity of the downstream indoor units X(kW)	Appearance		
		High-pressure gas pipe	Low-pressure gas pipe	Liquid pipe
FQ01Na/A	X ≤ 5.0			
FQ02Na/A	5.0 < X ≤ 22.4			
FQ03Na/A	22.4 < X ≤ 28.0			
FQ04Na/A	28.0 < X ≤ 68			
FQ05Na/A	68 < X ≤ 96			
FQ06Na/A	96 < X ≤ 135			
FQ07Na/A	135.0 < X			

CONTROLLERS

Function	Classic wired controller	Large matrix wired controller	Hotel Wired controller	Remote controller	Remote Signal Receiving Panel	Linkage Controller
	XE7A-24/HC	XE70-33/H	XK79	YAP1F	JS13	LE60-24/H1
Dimensions (mm)	112 × 112	112 × 112	86 x 86	/	86 × 86	95 × 63
Display	Positive segment LCD	Positive segment LCD	Positive segment LCD	Positive segment LCD	LED	LED
Backlight	✓	✓	✓	×	/	/
One controller for multiple units/ group control (One controller controls 16 IDUs at most)	✓	✓	✓	×	✓	✓
One unit with not only one controller / subsidiary controller (one IDU can be controlled by two wired controllers)	✓	✓	✓	×	✓ (It can operate with the master wired controller as an auxiliary device)	✓ (It can operate with the master wired controller as an auxiliary device)
Mode	✓ (auto, cooling, drying, fan only, heating, floor heating, 3D heating, space heating)	✓ (auto, cooling, drying, fan only, heating, floor heating, 3D heating, space heating)	✓ (auto, cooling, drying, fan only, heating, floor heating, 3D heating, space heating)	✓ (auto, cooling, drying, fan only, heating)	×	×
Fan speed	✓ (7 speeds: auto, low, medium-low, medium, medium- high, high, turbo)	✓ (7 speeds: auto, low, medium-low, medium, medium- high, high, turbo)	✓ (7 speeds: auto, low, medium-low, medium, medium- high, high, turbo)	✓ (7 speeds: auto, low, medium-low, medium, medium- high, high, turbo)	×	×
Clock display and setting	✓	✓	✓	✓	×	×
Countdown timer	✓	✓	✓	×	×	×
Clock timer	✓	✓	✓	✓	×	×
Weekly timer	×	✓	×	×	×	×
Child lock (buttons lock)	✓	✓	✓	✓	×	×
Up&Down swing	✓	✓	✓	✓	×	×
Left&Right swing	✓	✓	✓	✓	×	×
Sleep	✓	✓	✓	✓	×	×
Filter cleaning indication	✓	✓	✓	×	×	×
Save	✓	✓	✓	×	×	×
X-Fan	✓	✓	✓	✓	×	×
Quiet	✓	✓	✓	✓	×	×
Absence (8°C heating)	✓	✓	✓	✓	×	×
Low-temperature drying	✓	✓	✓	✓	×	×
Access detection	×	×	×	×	×	✓
Unit parameters query	✓	✓	✓	×	×	×
Unit parameters setting	✓	✓	✓	×	×	×
Error display	✓	✓	✓	×	✓	×
Remote signal	✓	✓	✓	×	✓	✓
Power-off recovery (default to be effective for overseas models and ineffective for domestic models)	✓	✓	✓	×	✓	✓
Indoor temperature query	✓	✓	×	×	×	×
I-Feel	×	/	×	✓	×	×
Set back	✓	×	×	×	×	×
Independent swing for cassette units	×	✓	×	×	×	×
APP control	✓	×	×	×	×	×
Temperature control with a precision of 0.5°C	✓	×	×	×	×	×

Note: ✓ means available; × means not available; / means not applicable

Wired Controllers XE7A-24/HC

- Large screen, moisture-proof flat base structure, simple design for flexible installation;
- With LCD backlight display and touch buttons;
- Clock can be displayed and set, with 24h timer ON/OFF function (countdown and clock timer);
- 7 fan speeds, up & down swing and left & right swing;
- Working modes include auto, cooling dry, fan, heating floor Heating, 3D heating and space heating;
- Functions include sleep, quiet/auto quiet, energy-saving, x-fan, low-temperature dehumidifiying absence in heating, filter cleaning reminder, auto cleaning, etc;
- Engineering parameters can be viewed and set;
- Hidden infrared remote control receiving device works with the infrared remote controller;
- Set temperature precision down to 0.5°C;
- Up to 2 wired controllers for 16 units, which is more flexible for use; a maximum of 16 indoor units can be controlled simulta- neously via one master controller and one slave controller;
- WiFi function and APP remote control: after networking, user can control units remotely through an APP in a smart phone.

Wired Controller XE70-33/H

- Elegant and concise appearance;
- Touch buttons with back lighting LCD;
- Detect ambient temperature precisely;
- Chinese and English display can be switched;
- With project parameters viewing and setting functions;
- 7 fan speeds, up & down swing and left & right swing;
- Applicable to multi VRF air conditioner and fresh air unit with evaporator;
- With service hotline inquiry and after-sales phone number record functions;
- With weekly timer function, multiple weekly timer can be set; under weekly timer function, mode, temperature and fan speed can be preset;
- Master and slave wired controllers can be set; simultaneous control over several IDUS is available; can simultaneously control 16 sets of IDUS at most;
- Sleep, quiet/auto quiet, light, energy saving, drying, memory, low-temperature dehumidifying, absence in heating, and filter cleaning reminder functions can be set.

Wired Hotel controller XK79

- Small and fashionable appearance with thickness only of 12mm;
- Back lighting LCD with black background and white words;
- Eight touch buttons;
- Clock can be displayed and set in countdown and clock timer;
- Besides normal functions, other functions such as low-temperature dehumidifying, absence in heating, controllable auxiliary heating in dehumidifying and filter cleaning reminder can also be set;
- Door control system can be connected.

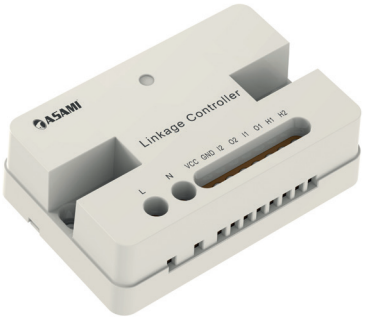
CONTROLLERS

Controller YAP1F

- Can be switched in auto, cooling, dry, fan and heating modes;
- Besides turbo mode, 6 fan speeds can be set;
- Up & down swing and left & right swing;
- Available functions: child lock, drying, health, turbo, sleep, light, absence,
- I-feel and timer;
- Clock display and indoor/outdoor ambient temperature viewing functions;
- I-feel function can be set for the unit. When I-feel is turned on, the unit can monitor the temperature at the location of user (around the remote controller) at real time to adjust indoor temperature for improving the comfort.

Linkage Controller LE60-24/H1

The linkage controller LC60-24/H1 is generally used with wired controllers to control AC units; when needed, it can also be individually connected to control the units. It has the following features:



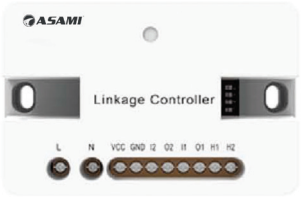
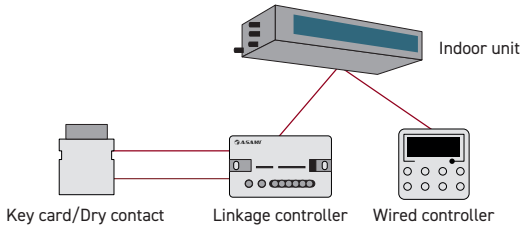
- Flexibility to be installed in most places indoors, with no impact on indoor decoration;
- Access control detection, with two types of power input: AC 100-240V~50/60Hz or DC 5-24V;
- Dry contact signal detection, with two groups of dry contacts, which can be used to switch on/off indoor units via passive signals such as fire alarm and the opening and closing of windows;
- Up to 2 controllers for 16 units, which is more flexible for use; a maximum of 16 indoor units can be controlled simultaneously via one master controller and one slave controller.

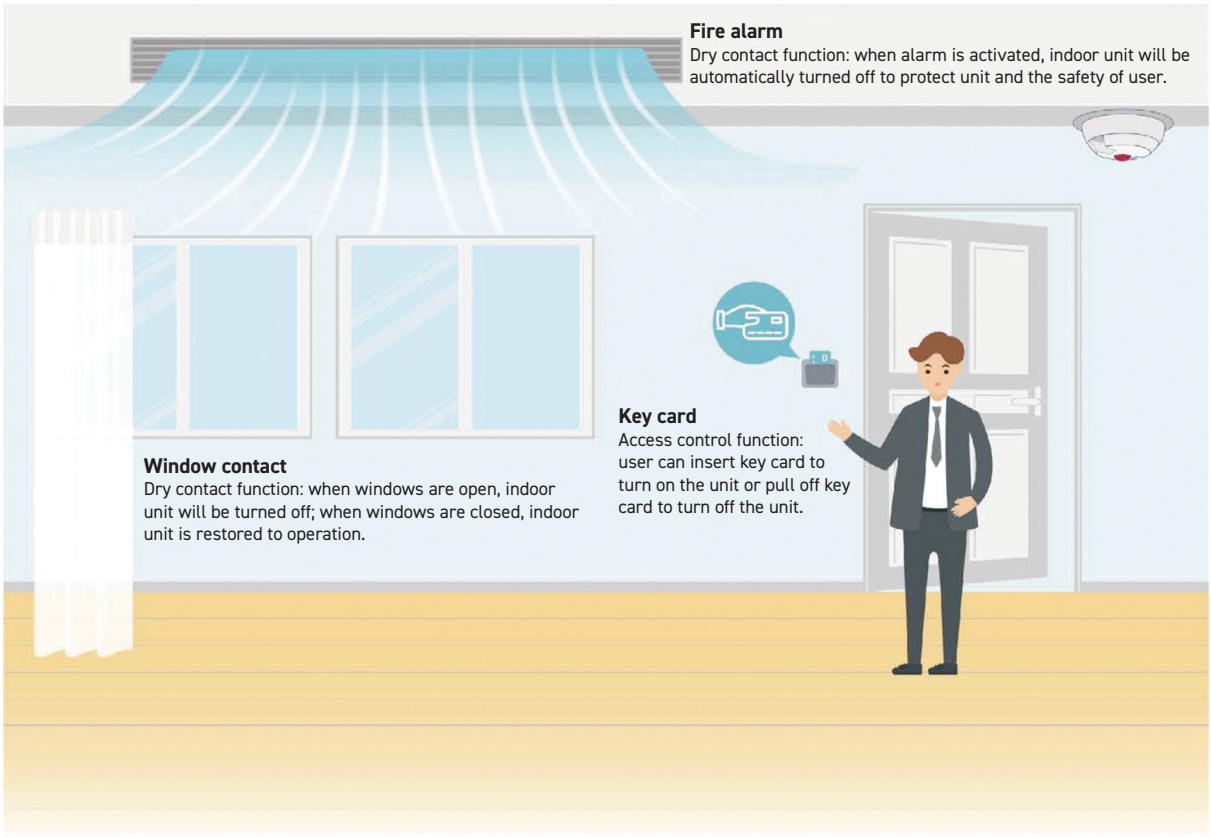
Remote Signal Receiving Panel JS13

- Receive common remote controller functions;
- Simple appearance and integrated design;
- Precise set temperature control with the precision down to 0.5°C (remote controllers with a temperature control precision of 0.5°Care required);
- Up to 2 controllers for 16 units, which is more flexible for use; a maximum of 16 indoor units can be controlled simultaneously via one master controller and one slave controller;
- Hidden infrared remote control receiving device works with the infrared remote controller.

KEY CARD INTERFACE MODULES

Indoor unit connects access control system through linkage controller LE60-24/H1 to realize unit off by removing the access card or unit on by inserting the access card, which is suitable for occasions such as hotels, where the access control linkage is needed to control the air conditioner.
Moreover, linkage controller LE60-24/H1 provides two groups of dry contacts, which can be used to switch on/off indoor units via signals such as fire alarm and window closing/opening.

Model	Linkage Controller LE60-24/H1
Appearance	
Wiring diagram	 Note: It's used with different models of wired controller or independently connects indoor unit for operation.
Access control interface	4.3 inch
Dry contact interface	480 × 272
Dimensions (HxWxD) (mm)	Capacitor touch
Power supply	100-240V AC
Applicable range	128 × 86 × 11



CENTRAL CONTROLLERS

Centralized Controller CE52-24/F(C)

- Elegant and fashionable appearance;
- Color LCD, fine display and true color;
- 7-inch capacitive touch screen for easy operation;
- Up to 255 units can be centrally controlled;
- Connectable with network of indoor units or outdoor units;
- Independent power supply in 100~240V wide voltage range;
- Embedded installation in wall with projecting thickness only of 11mm;
- With project setting, parameter viewing, malfunction record and access management functions;
- Shielding function of single unit, group and all IDUS (shielding on/off, mode, temp setting, etc.), long-distance control at will; Provide naming of indoor units, selection of icons and personalized settings of centralized controller (setting background, backlight, etc.);
- With various functions: centralized control (control all indoor units), group management (support DIY grouping), schedule management (setting of several schedules, support special schedule setting such as holiday) and single indoor unit control (on/off, mode, temp setting, fan speed, quiet, swing control, etc.).

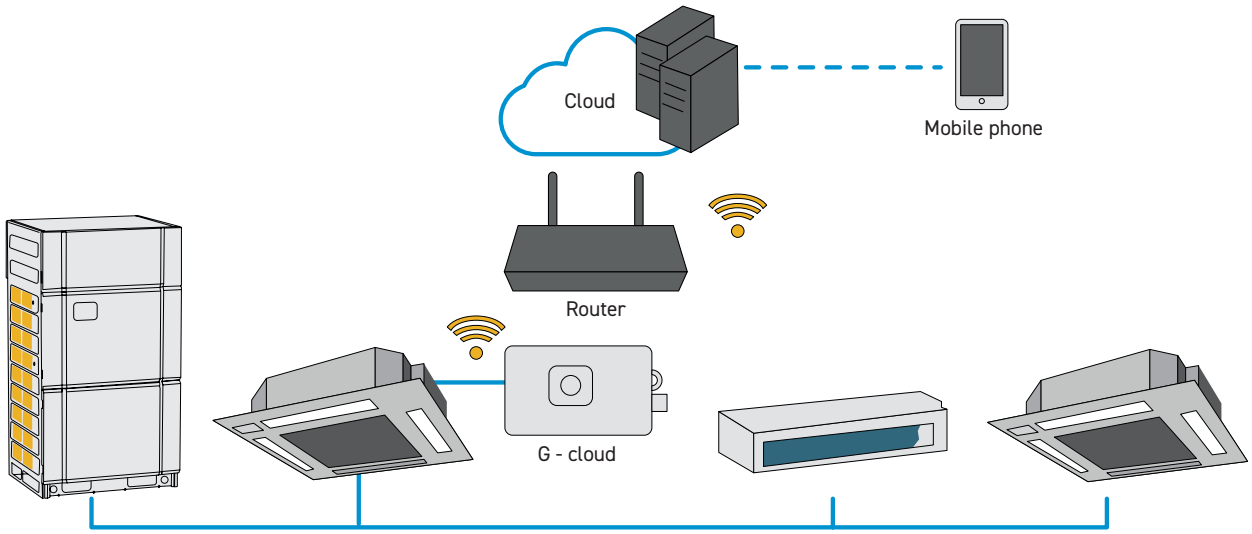
E-Smart Zone Controller CE54-24/F(C)

- Colorful LCD;
- Elegant and fashionable appearance;
- 4.3-inch capacitive touch screen for easy operation;
- Support maximum 32 indoor units, with powerful function;
- Indoor or outdoor unit network can be connected, simple and flexible;
- Embedded installation in wall with projecting thickness only of 11mm;
- 100~240V super wide voltage for independent power supply, stable and reliable;
- Support naming for indoor units, and icon selection, realizing individuation management;
- With long-distance shield function (shield on/off, mode, temperature, etc.) for single unit, group and all indoor units;
- With functions of engineering setting, parameters view, malfunction view and authority management, easy for debugging and maintenance;
- With single indoor unit control (including general functions and advanced functions), group indoor units control (including general functions and advanced functions), group management (supporting DIY group), single indoor unit and group indoor units timer functions; (general functions: ON/OFF, Mode, Temperature, Fan, Swing, etc; advanced functions: Save, Sleep, Absence, Quiet, Turbo, etc.).

G-CLOUD

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.

- Easy control of on-off, mode and temperature.
- Ventilation, drying, sleep, energy saving functions can be set.
- 10 on/off preset appointments are available, support weekly timer function.
- 8-step fan speed control (quiet, automatic, low, medium and low, medium, medium and high, high, turbo).

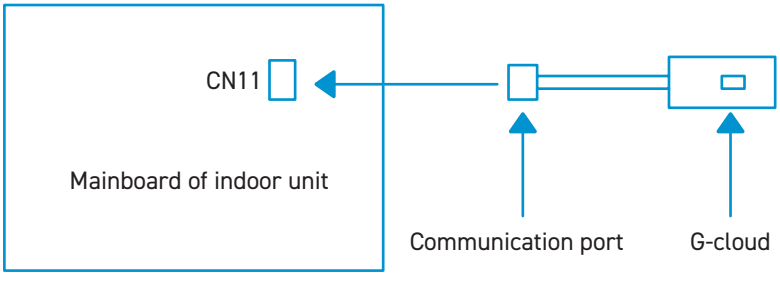


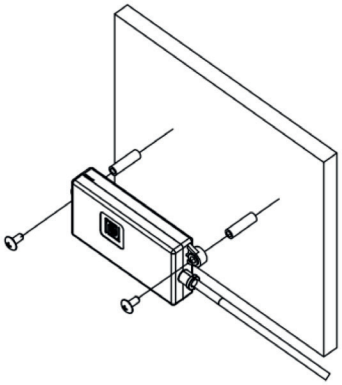
> “Gree +” APP Control

The “Gree+” APP of mobile phone can easily control the air conditioner anytime and anywhere. It can be controlled in the house or remotely when going out. You are no longer worried about where to find the remote controller or forget- ting to turn off the air conditioner when you go out.

Small Size and Convenient Installation

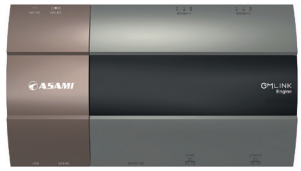
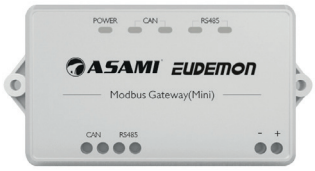
G-cloud is small in size and flexible in installation. You can connect the G-cloud to the CAN interface of any indoor unit in the multi VRF system (it is recommended to be close to the router) and fix it.





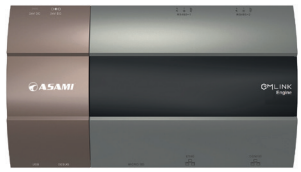
BUILDING PROTOCOL GATEWAY

Modbus Gateway

Name	Model	Key Parameters	Application	Photo
VRF Protocol Gateway	ME30-24/D1 (BM)	Capacity: 255 sets of indoor unit (within 16 systems) Protocol: Modbus RTU, Modbus TCP	It is generally used in large buildings such as office buildings, commercial streets, hospitals, and rail transits to connect to BAS to achieve centralized management of air conditioner.	
Modbus Gateway (Mini)	ME30-24/E6 (M)	Capacity: 128 sets of indoor units (within 16 systems) Expansion port: No Protocol: Modbus RTU	It is generally used for small and medium-sized projects such as villas and apartment buildings. It is used for docking with BAS systems or smart home systems. Since there is no I/O interface, the capacity is small, and it is a low-cost solution.	
H2M Gateway	ME31-33/EH1 (M)	Capacity: 1-16 sets of indoor units Expansion port: No Protocol: Modbus RTU	Generally, it is an intelligent solution for hotel and household environment. The indoor unit directly connects to the controller of the hotel room RCU or the residential smart home system.	

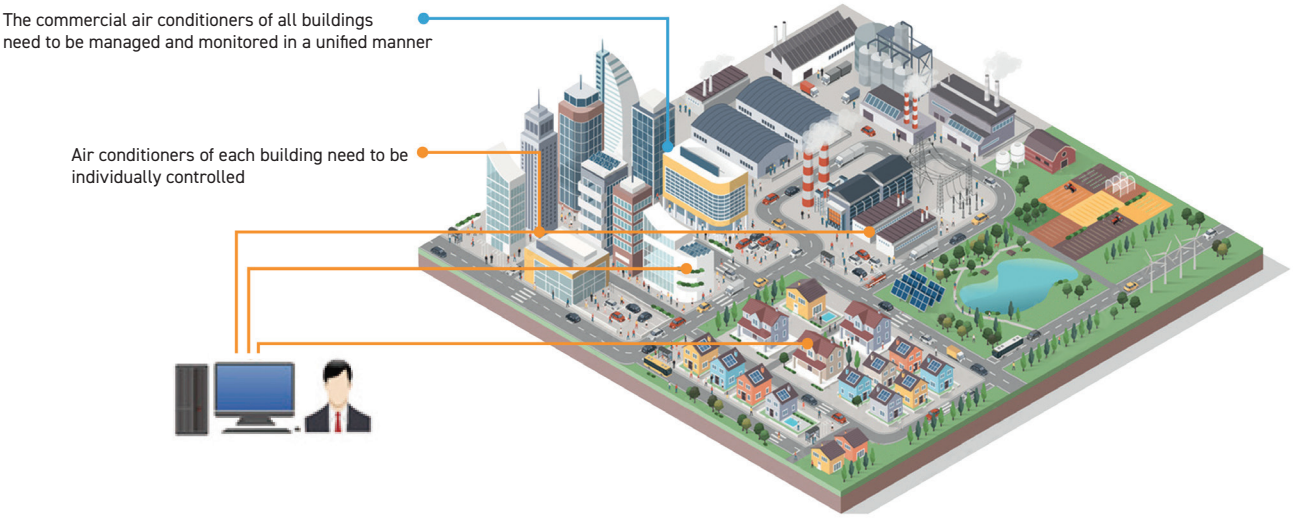
BACnet Gateway

BACnet features high communication efficiency, flexible protocol and convenient debugging. Gree BACnet gateway can realize the conversion of multi VRF unit' s CAN protocol data into BACnet protocol data, as a bridge for data exchange between air conditioner and BAS.

Name	Model	Key Parameters	Application	Photo
VRF Protocol Gateway	ME30-24/D1 (BM)	Capacity: 255 sets indoor unit Protocol: BACnet	Mainly used in the docking of medium and large building automatic control projects.	

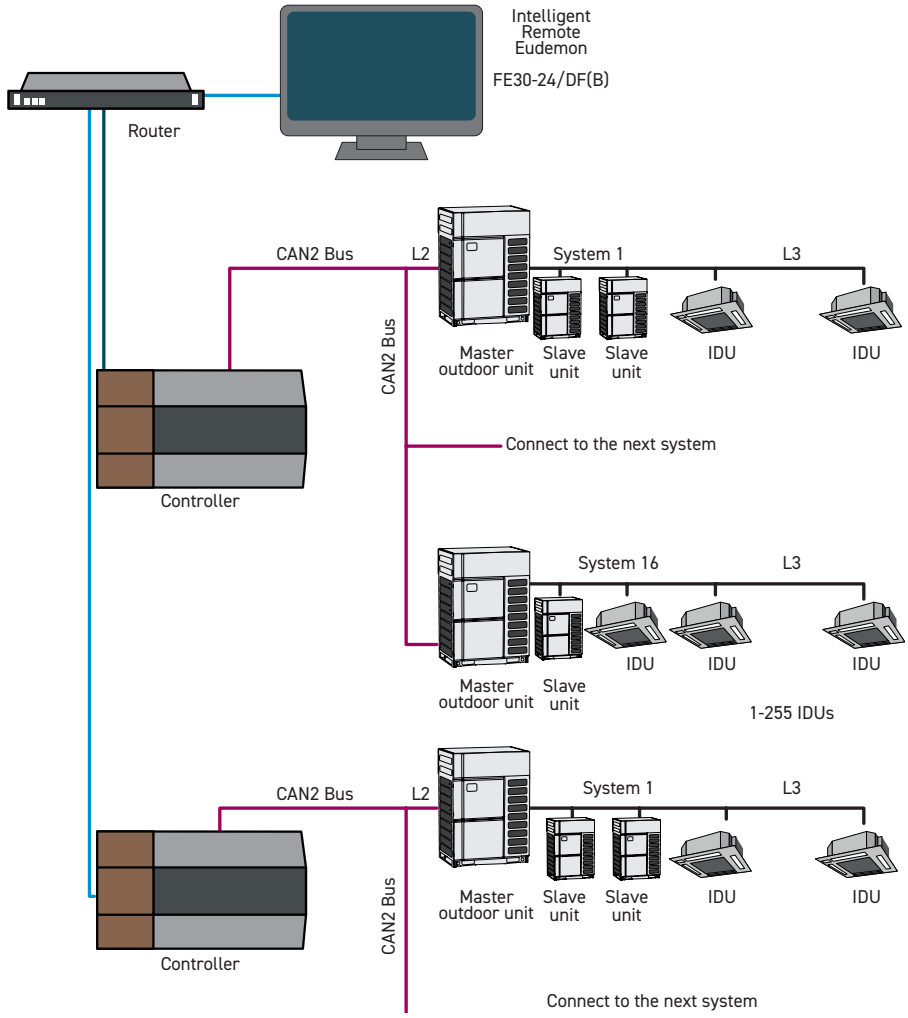
INTELLIGENT REMOTE EUDEMON

Intelligent Remote Eudemon provides intelligent operation and maintenance services based on the cloud platform, meeting the demands of integrated monitoring of equipment in multiple locations.



Intelligent Remote Eudemon adopts world-leading CAN+ multi VRF unit's communication technology and com- bines with distributed processing methods to ensure that the system has the characteristics of high availability, easy expansion, and easy networking, and can meet the air conditioning monitoring requirements in multiple scenes.

System composition:
(1) Computer
Install monitoring software
(2) Controller
Connect the unit to realize communication between the unit and computer
(3) Router (switch)
Network equipment



*Notes:
(1) One controller can connect 16 systems or 255 sets of indoor units;
(2) The communication bus between the unit systems is CAN2 bus.

ASAMI®

ADVICES

COMPRESSOR COOLING SYSTEM

The closed cycle of the most standard compressor cooling systems is composed of 4 main elements, combined with each other by a pipeline.

The system includes circulation of a cooling agent in the form of liquid or steam, the agent is moved by a compressor (1) with an electric engine.

The compressor takes the cooling agent steam and compresses it, simultaneously performing the work of the electric engine. The work turns into heat, by heating the steam it raises the temperature. The steam temperature increases above the environment (ambient) temperature and amounts to between 60 and 90°C. Now, the steam
enters the condenser (2). The condenser is washed by external air.

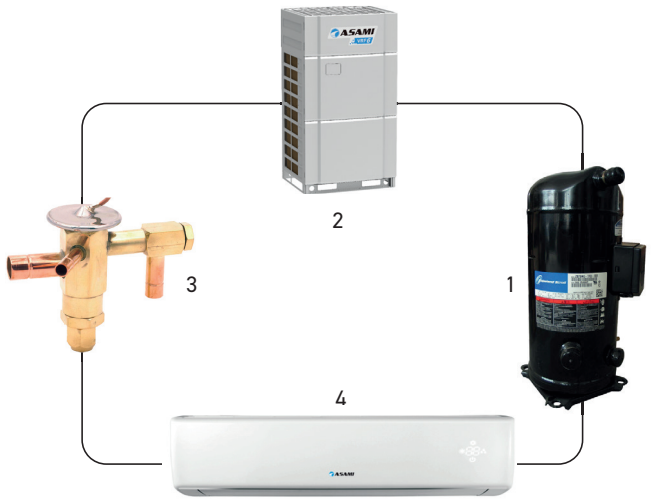
As result, the cooling agent steam gives away heat and is condensed, i.e. turns into liquid. The condensation process occurs at a fixed temperature and pressure (which was created by the compressor).

Now it is time to lower the liquid's temperature, the process of damping (reduction) is used for this purpose.

The liquid goes through the valve (3), called the thermostatic expansion valve (EXV), and as result, the freon pressure and temperature are lowered. During this process, the freon liquid turns into a humid saturated steam (a mixture of dry steam and liquid drops).

The thermostatic expansion valve (3) can be opened more or less by regulating in a small range the temperature of the cooling agent. In point (4), the humid saturated steam enters the evaporator, where it starts to heat up and the drops of liquid freon start to vaporise by taking the heat of the cooled object - in case of an air conditioner or air
handling unit with direct vaporisation coil, it is air, while in the case of water chiller it is water.

The temperature of freon vaporisation cannot by lower than 0°C due to the risk of freezing the water condensate, therefore the temperature of the agent's vaporisation is usually set between 3 and 11°C. Next, the cycle is repeated.

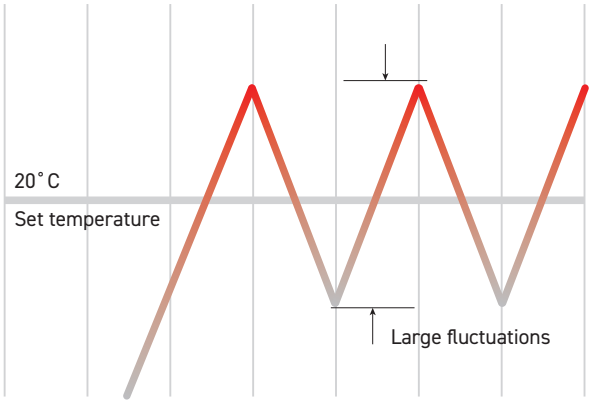


Compressor Cooling System
1. Compressor
2. Condenser
3. EXV velve
4. Evaporator

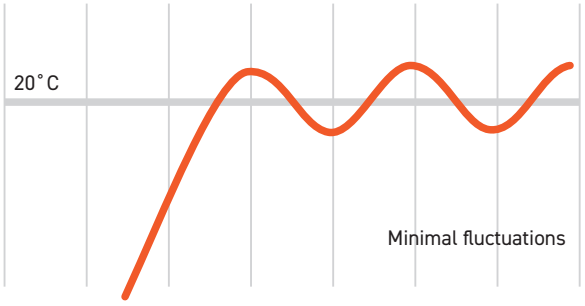
INVERTER COMPRESSOR COOLING SYSTEM

Regulation of the cooling power in a classic cooling system is performed with the use of a compressor, which is periodically operational with the maximum cooling power or is turned off entirely.

Conventional Air Conditioner



Since 1990, other solution has been used for regulation of the cooling power. The compressor was equipped with an inverter, allowing for change of rotation speed of the compressor's engine and as result - a smooth change of the cooling power.



The benefits of such a system are as follows:

- High comfort in the air-conditioned room - air temperature set point is maintained with a higher accuracy , air temperatures fluctuation in air-conditioned room is minimal
- Lower noise level - decrease of the rotation speed of a compressor which is not working at full capacity, especially noticeable at night
- Energy consumption savings in comparison to the ON/OFF cooling system during 24 hours even 50%
- Elimination of the number of stop-start cycles extends the lifetime of the cooling system's components
- Low start electric currency
- The possibility of operation at low ambient temperature of the condenser, even below -20°C in cooling mode

COOLING AGENTS

The cooling agent, most often used in air conditioning installations, include a mixture marked by ASHRAE as R410A freon.

Refrigerant Diversity in Air Conditioning Systems

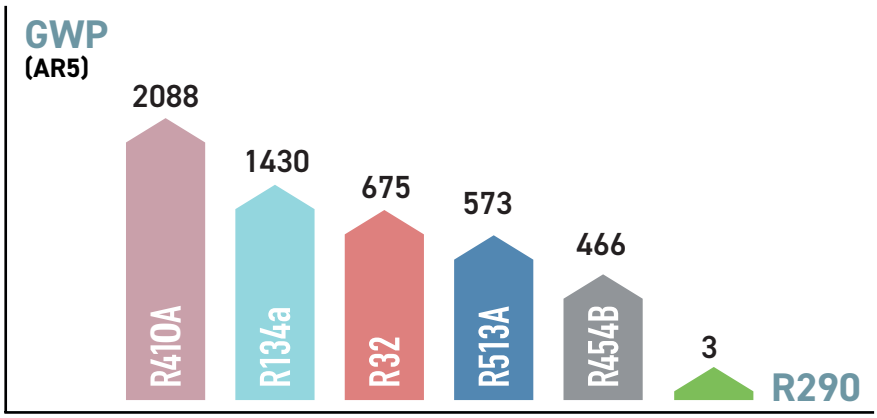
Air conditioning systems, including VRF (Variable Refrigerant Flow) systems, use a variety of refrigerants. One of the most commonly used refrigerants in VRF systems is R410A, classified as a Hydrofluorocarbon (HFC) refrigerant. HFC refrigerants have long been favored for their exceptional thermal properties.

Balancing Sustainability and Effectiveness

Nonetheless, there is growing global concern about the environmental impact of high Global Warming Potential (GWP) HFCs. Refrigerant like R410A has a 2088 value. The European Union (EU) has F-Gas Regulation No 517/2014 provides a phasedown of air conditioning systems with a GWP exceeding 750. While low GWP alternatives like R32, R454b, and R290 are available, it's important to note that these refrigerants are flammable and operate at higher working pressures, which may affect their efficiency.

R410A: Perfect Choice for VRF Systems

However, it's worth highlighting that, according to F-Gas Regulation Article No 11(1), air conditioning systems using R410A with charges greater than 3kg are not affected to F-Gas regulations. Therefore, R410A remains one of the preferred refrigerants for medium to high-capacity air conditioning systems.



GLYCOLS

In water chiller, freon during its vaporisation cools the water.

Cold water use as a cooling agent for such systems as air handling units, fan coils and other terminal units.

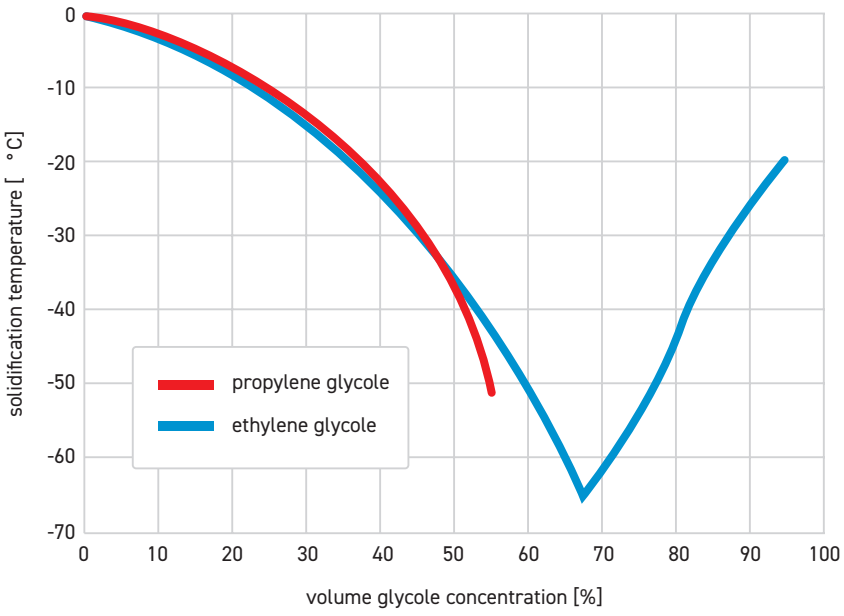
In order to prevent freezing during a winter period, these systems most often include a cooling agent in the form of not pure water, but its mixture with glycol - **propylene or ethylen**.

The type of used glycol and its concentration in the water mixture determine the temperature of solidification and other physical and chemical properties of the liquid. While specifying the required concentration of the glycol mixture, it is necessary to remember that the temperature of solidification of the used mixture must be lower almost 3 degrees from the ambient temperature.

Despite high popularity of both types of glycol, ethylene glycol is most often used. This is due to the lower viscosity coefficient in comparison to propylene glycol (30% of propylene glycol and water mixture has 100% higher hydraulic flow resistance in comparison to pure water), and lower costs.

However, ethylene glycol is a toxic substance. Propylene glycol in this case is characterised by significantly lower toxicity. Due to this fact, it is used in the food industry and in places where a potential leak could get in contact with drinks or food.

The figure presents the change of solidification temperature depending on the concentration of glycol in the water and glycol mixture.



Water and glycol mixture have a stronger corrosiveness than water. Inhibitors are used in order to protect the installation from damage and protect the liquid itself from glycol degradation.

Dosage of inhibitors can be performed directly into the installation and act as an element of the developed water treatment station. It is also possible to use ready-to-use mixtures of water, glycol and inhibitors, where the inhibitors comprise 4÷6% of the mixture.

MOLLIER AIR CONDITION DIAGRAM

The air surrounding us includes some amounts of water in the form of dry steam, which is preserved in the air mixture as gas.
The amount of water in air can be specified by two values:

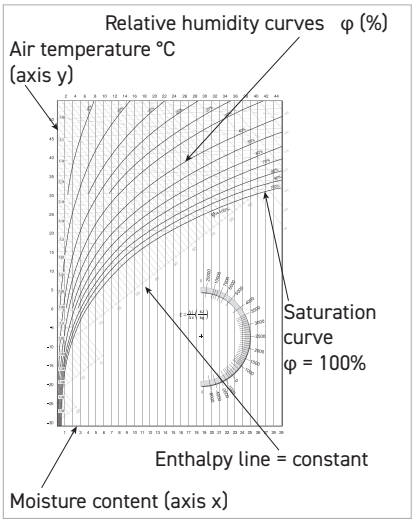
- moisture content "x" specified in grams of water per one kilogramme of air, the value is included into the "x" axis of the Mollier diagram

Depending on the air temperature, the moisture content in the has a limit value of („x„max - how much maximally of water steam can be dissolved in the air at a given temperature)

Air containing the maximum content of water steam at a given temperature is called saturated.

- relative humidity "ϕ" specified in "%" - it's the ratio of the amount of water steam in the air and the maximum amount of water steam for the air in a given temperature.

$$\phi = x/x_{max}$$



Sensible and Latent heat

During cooling of air in air conditioning system heat exchanger, the process proceeds at X=constant until the air reaches ϕ = 100% (from point 1 to point 2 on diagram No. 2).

In this part of cooling process, the air gives **sensible heat.**

In case of further air temperature lowering, the process of cooling shall proceed at the curve ø=100% until the required temperature is reached (point 3 on diagram No. 2).

At this part of cooling process, the air is not only cooled down but also starts to decrease the moisture content - water steam starts to condensate. Condensation energy (energy which was collected for vaporisation of water into the air) is emitted during this process.

This energy is called the **latent heat.**

The sum of sensible and latent heat is called total heat

Example.
Air is cooled down from point 1: 27°C and 60% humidity to point 3: 15°C For this we will use the energy

$$i_1 - i_3 = 63\ kJ/kg - 42\ kJ/kg = 21\ kJ/kg$$

As result of gains in heat in the room (insolation, people, lighting, other heat gains), the air has been again heated to 27°C point 4 on diagram No. 2.

For this purpose, the air shall take the energy

$$i_4 - i_3 = 53\ kJ/kg - 42\ kJ/kg = 11\ kJ/kg$$

The example shows that in order to cool down the air we need more energy than the air has collected to heat up to the primary temperature.

Therefore, it is necessary to remember that in order to calculate the cooling load of conditioning systems, it is necessary to include the **total heat power.**

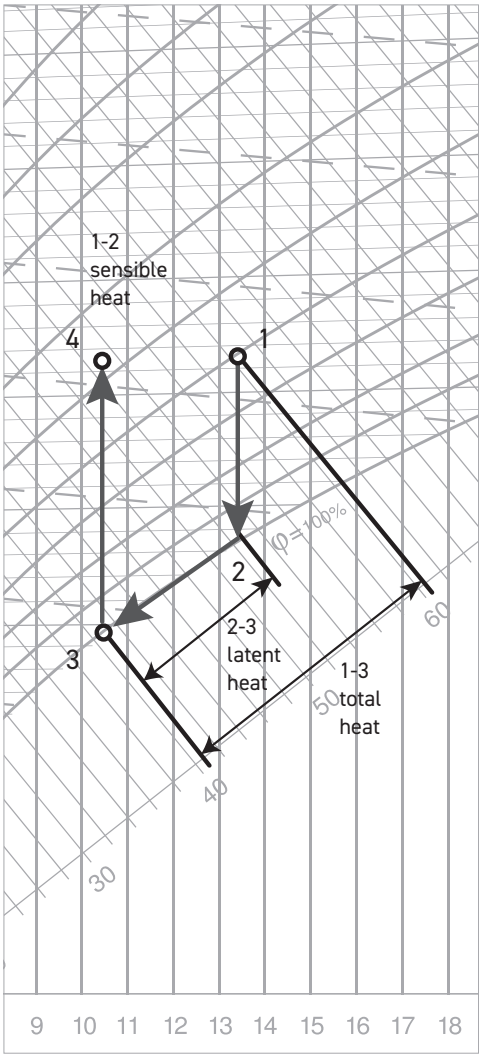


Diagram No. 2

To present an example, we shall take point 1 on diagram No. 3, temperature of 35°C and relative humidity of 50%, thus the air at this point includes only 50% of the humidity in steam form that is the maximum for this temperature.
The moisture content ,,x,, for this point is 19 grams of H2O in one kilogramme of air.

When we start to cool such air down, the temperature shall drop to the constant "x".

When the temperature shall be lowered to the point 1' on diagram, which is located on the relative humidity curve ϕ = 100%, this shall mean that the air in the temperature of point 1' (approx. 23°C) includes the maximum amount of water in the form of water steam for the given temperature. Temperature of the point 3 is called the **wet thermometer temperature, dew point temperature** is point 4.

Cooling air below this temperature shall result in formation of small water drops in the air, this is the way that dew is formed on exchangers in air conditioning systems.

In the example, we cool the air down to the temperature of 13°C this is point 2 on diagram No. 3.

Relative humidity at this point shall amount to 100% and the humidity content shall be 10 grams of H2O per kilogramme of air.

The difference in humidity content in point 1' and point 2 is the amount of the formed condensate, that is 19-10=9 grams of H2O per kilogramme of air.

- An example of how to count the amount of condensate for a particular expenditure of cooled air:

We cool the air down from the temperature t1=35°C, relative humidity ϕ1 = 50% and humidity content x1=19 g/kg . Air quantity Qv = 1000 m3/h. We cool the air down to t2=13°C.

For the calculation let us adopt the air density p = 1.2 kg/m3.

The air mass volume equals to:

$$Q_m = Q_v \cdot p = 1000 \cdot 1.2 = 1200 \text{ kg/h}$$

The difference in the air's humidity content in point "1" and point "2" is:

$$\Delta_x = x_1 - x_2 = 19 - 10 = 9 \text{ g/kg}$$

Amount of formed condensate "A" is:

$$A = Q_m \cdot \Delta_x = 1200 \cdot 9 = 10800 \text{ g/h} = 10.8 \text{ kg/h}$$

Therefore, during cooling of a given amount of air from temperature at point 1 to temperature at point 2 on diagram No. 3, there shall be 10.8 kilogrammes of condensate formed during an hour.

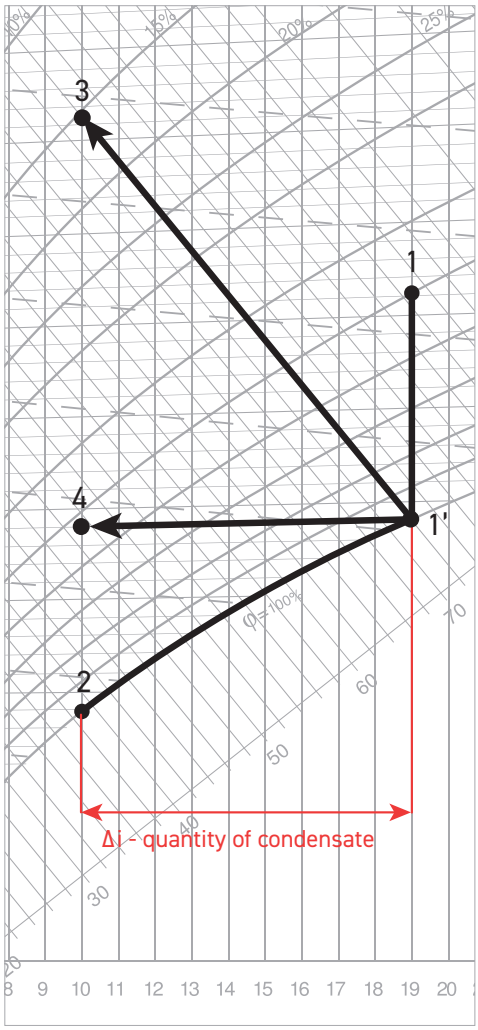


Diagram No. 3

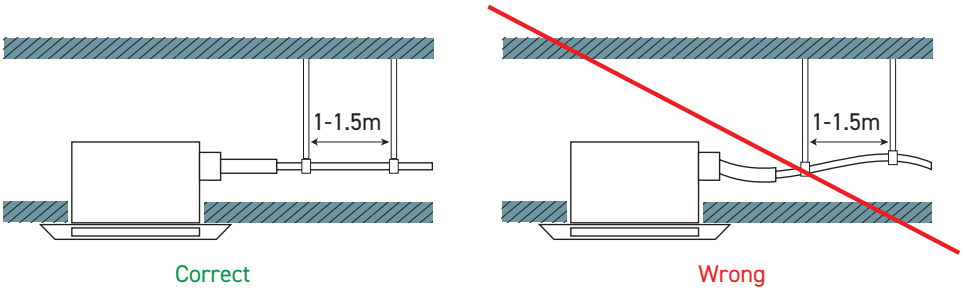
DISCHARGE OF CONDENSATE IN AIR CONDITIONING SYSTEMS

In order to discharge the condensate in air conditioning systems, it is recommended to design a gravitational system - the condensate is discharged without the use condensate pumps.

In case of lack of possibility of incorporation of a gravitational system for condensate discharge, a system with a condensate pump is used.

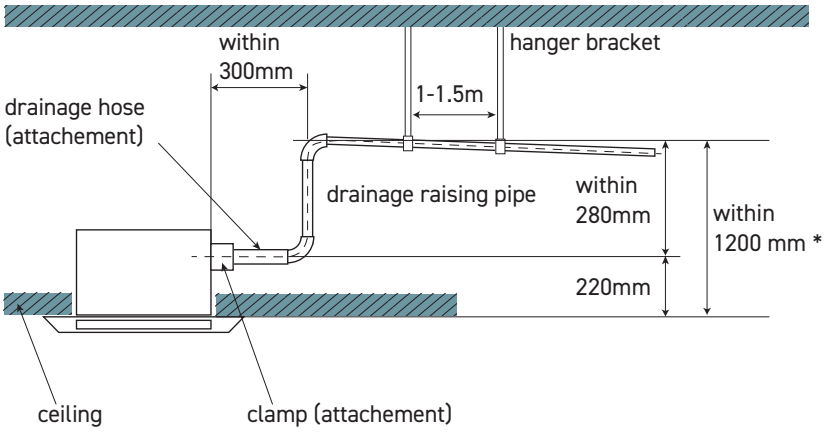
Note: a gravitational system for condensate discharge is more resistant to air contamination and easier in operation, thus rendering it more reliable.

- The decline for condensate pipes should be 1% or more (minimum decline of 1 cm per 1 metre of the pipeline length).
- The pipes must be fixed minimum every 1.5 m

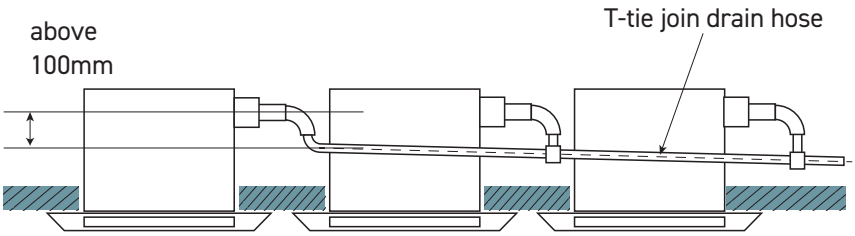


CORRE CT: 1/100 or mo re gradient

- Cassette type of air conditioner includes as standard integrated condensate discharge pump.

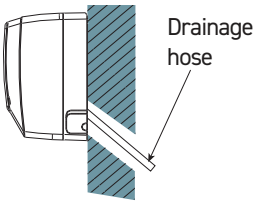


- *** Note: pump lifting height for cassette and duct type units is 1200mm.**
- The diameter of selected join hose should fits the capacity of all connected unit.

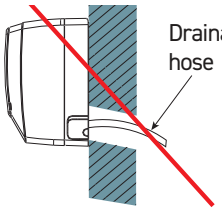


Connection of multiple cassettes to one condensate discharge pipe.

- Condensate discharge solutions for wall mounted air conditioner.



Correct



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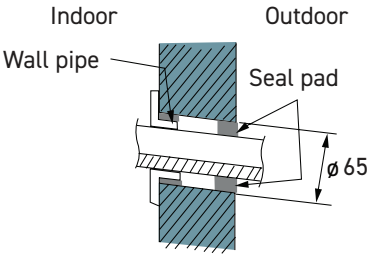
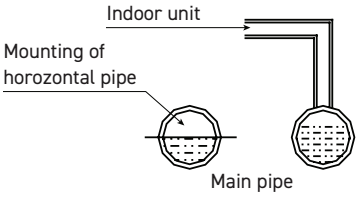


Entry of the pipe into the wall should be in an angle of 40°.

Solution with an externally incorporated condensate pump.

- Connections of condensate discharge pipes.



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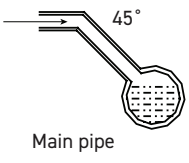

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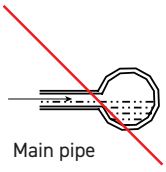
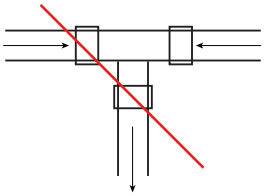
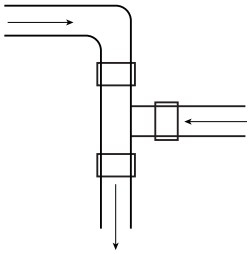


Wrong

- 3-way connections



Wrong connection



Correct connection

NOISE

Sounds are mechanical vibrations in an springy environment.

A human ear hears sounds distributed in the air - it feels air vibrations (air pressure changes). Thus, sounds are mechanical vibrations in an springy environment, which can be divided into:

- audible sound – vibrations with frequencies audible for the human ear, between 16 Hz and 20.000Hz (for example: for most musical instruments sounds are between 27.5Hz to 3000 Hz)
- ultrasounds - sounds of a frequency above the audible sounds frequency
- infrasounds – sounds of a frequency below the audible sounds frequency and are felt by a human as vibrations

Sound power

A value which tells us how much energy in acoustic waves is emitted by a given source.

Sound power level L_w

The sound power generated in HVAC installations is very low, it ranges from 0.0000001 W to 0.002 W, therefore due to practical reasons it is not specified in Watts but with a ratio of sound power and a very low reference power: that is in the Sound power level L_w:

$$L_w = 10\log\frac{P}{P_0}$$

L_w – Sound power level dB
P – sound power generated by the source (W)
P_0 – reference power, that is the human auditory threshold, which amounts to 10–12 (W).

Sound power level is a constant value and does not depend on the environment in which the source is located. Therefore, the Sound power level is used for acoustic calculations.

Sound power level examples:

Sound source	sound power P_{ac} watts	sound power level L_w dB re 10–12 W
Rocket engeen	**1.000.000 W**	180 dB
Turbojet engine	**10.000 W**	160 dB
Sirene	**1.000 W**	150 dB
Heavy truck engine or loudspeaker rock concert	**100 W**	140 dB
Machine gun	**10 W**	130 dB
Jackhammer	**1 W**	120 dB
Excavator, trumpet	**0.3 W**	115 dB
Chain saw	**0.1 W**	110 dB
Helicopter	**0.01 W**	100 dB
Loud speech, vivid children	**0.001 W**	90 dB
Usual talking, Typewriter	**10^{-5} W**	70 dB
Refrigerator	**10^{-7} W**	50 dB

Sound pressure level

The human ear receives the Sound power level in the form of air pressure changes, this value is called the Sound intensity level, however is most often presented in HVAC devices catalogues as the Sound pressure level.

$$L_p = 10\log\frac{P}{P_0}$$

L_p – sound pressure level dB
P – periodical sound pressure (result of sound power impact)
P_0 – sound pressure value, corresponding to the human auditory threshold (it is 0.00002 Pa)

The sound pressure level (sound intensity level) is specified in dB (the unit is called a Bell (B) in the honour of an inventor Graham Bell, (dB=1/10B).

The bottom auditory threshold in the dB scale amounts to 0dB, the sound intensity of approx. 120-140dB is the upper threshold, referred to as the pain threshold.

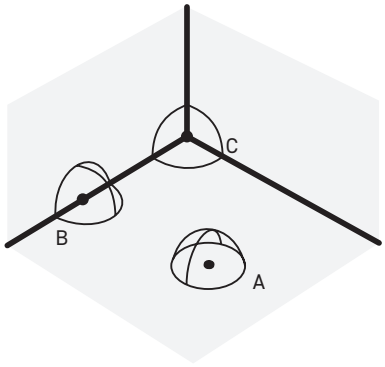
The sound pressure level is dependent on:

1. Distance to the sound source
The farther from the source, the smaller the pressure level. An approximate loss in sound intensity can be calculated from a simplified formula:

$$\Delta L = 20\log R+14$$

ΔL – intensity level loss
R – distance from the noise source

Example:
Sound power of an external unit of the system VRF = 70dB
Distance to an external unit of the system VRF = 10m
Approximate loss of sound intensity ΔL = 20 log 10 + 14 = 34dB
Sound intensity of an external unit of the system VRF = 70dB – 34dB = 36dB



A – 1 reflective surface +3dB,
B – 2 reflective surface +6dB,
C – 3 reflective surface +9dB

2. Space surrounding the sound source
If it shall be enclosed space, e.g. an engine room, the walls shall reflect the sound waves, in such a case the sound intensity might even increasein relation to the specified value.
Therefore, the sound pressure level (sound intensity) in catalogues is always specified in a specific distance from the sound source and in specific "virtual" space.

Sound level - dB(A)

Due to its structure, the human ear is not equally sensitive to various sound frequencies. The most perceived are frequencies at a level of 4000Hz. Frequencies at a level of 16-20Hz are practically non-audible

As result of long-term research, corrective filters have been developed, which allow for mathematical transfer of the human ear's perception. In HVAC systems, a filter named "A" was adopted - the most similar to the human ear's perception, and the measurement unit is (dBA):

This assumes that the sound power level corrected by the "A" filter curve is called the Sound level (also noise level).

Centre frequency Hz	Filter A (dB)
125	-16.1
250	-9.6
500	-3.2
1000	0
2000	+1.2
4000	+1.0
8000	-1.1
16000	-6.6

Calculation of the noise level for various sources

Calculation of the noise level for various sources:

$$L_{(sum)} = L_{(max)} + K$$

$L_{(sum)}$ – total noise level
$L_{(max)}$ – noise level of the loudest source
K – corrective factor depends on difference in noise of two sources Δ (dB)

$$\Delta = L_{(max)} - L_{(min)}$$

$L_{(max)}$ – noise level of the loudest source
$L_{(min)}$ – noise level of the most quiet source

Dependence of the corrective factor K on Δ specified in the table:

Difference in noise of two sources Δ (dB)	0	1	2	3	4	5	6	7	8	9	10
Corrective factor K (dB)	3	2.6	2.1	1.8	1.5	1.2	1	0.8	0.6	0.5	0.4

total noise level equals to: L(sum) = L(max)+K

If there are two noise sources of a difference of more than 10dB, the total noise level is adopted as for the loudest source.

If the project includes three or more noise levels, the calculations are conducted in pairs, from the lowest noise level to the highest.

Example 1.
The project includes two noise sources adjacent to one another, one has a level of 70dB, while the other has 65dB.

Δ = 70 - 65 = 5dB, corrective factor K (from the table) = 1.2dB
The total noise level of those two sources shall amount to
L(sum) = 70 + 1.2 = 71.2dB

Example 2.
The project includes three noise sources adjacent to one another, one has a level of 64dB, while the other has 70dB and the third one 75dB

For the purpose of calculations, we take the first pair with the lowest noise level:
Δ1 = 70 - 64 = 6dB, corrective factor K (from the table) = 1dB
The total noise level of the first pair shall amount to
L(sum) = 70 + 1 = 71dB

For the next pair we use the noise level from the previous calculation:
Δ2 = 75 - 71 = 4dB, corrective factor K (from the table) = 1.5dB
The total noise level of these sources shall amount to L(sum) = 75 + 1.5 = 76.5dB

THERMAL COMFORT CONDITIONS

Thermal comfort

Group of microclimate features, which results in good state of being of
a human. Thermal sensations of a human refer mainly to the heat
balance of the entire body. This balance is influenced by:

- human's activity
- human's clothing
- environment air temperature
- environment average radiation temperature
- air flow rate
- relative humidity

Long-term research shows that optimal conditions for people performing light work (e.g. office work) exist with simultaneous fulfilment of the following parameters of indoor air:

- **temperature: summer 23 – 26°C; winter 20 – 24°C**
- **relative humidity: 40 – 60% (max 35 – 65%)**
- **air rate in a people's occupied zone : 0.2 – 0.5 m/s**

Non-maintenance of any of the aforementioned parameters can result in a feeling of shortness of breath, sultriness or draught.

Apart from thermal sensation, an important element of comfort is also residence in clean air with an appropriate oxygen content.

An average statistical human needs 0.5 litre of oxygen for one inhale.

An average statistical human performs an average of 16 inhales per minute. This means that during an hour, a human needs a minimum of 480 litres of oxygen.

An average statistical human inhales air with oxygen content of approx. 20%, while exhaling air with oxygen content of approx. 16%

This means that the minimum amount of outdoor air for breathing is 12m3/h.

Recommended air demand depending on the performed work

Labour type:	Air demand Vk [(m^3/h) per person]
Office labor – non-smoking persons	20 ÷ 25
Office labor – smoking persons	30 ÷ 35
Light physical labor	45
Heavy physical labor	60

Recommended amount of air change rate public utility rooms

Room type:	Quantity of air exchange per hour [1/h]
Banks	3 ÷ 4
Coffee shops, bars, etc.	10 ÷ 12
Cafeterias	5 ÷ 10
Cinemas, theatres	5 ÷ 8
Conference halls	8 ÷ 12
Dance halls	6 ÷ 8
Garages	6 ÷ 8
Gyms	6 ÷ 12
Beauty salons	10 ÷ 15
Operation rooms	4 ÷ 6
Kitchens	15 ÷ 30
Laboratories	8 ÷12
Washing rooms	15 ÷ 30
Sanitary rooms, bathrooms, toilets	15 ÷ 30
Libraries	3 ÷ 5
Offices	4 ÷ 8
Photographic dark rooms	10 ÷ 15
Recording studios	10 ÷ 12
Restaurants	6 ÷ 10
School classes	2 ÷ 4

Note: please check air change rate requirements according to local law.

HEAT GAINS CALCULATIONS

The total heat gains include heat gains from the sun, lighting, people, machines, devices, etc.

$$Q = Q_W + Q_{WS} + Q_L + Q_P + Q_E + Q_D + Q_{In} + Q_B \ [W]$$

in which:
Q_W – gains from the sun via transparent barriers (windows) [W],
Q_{WS} – gains from the sun via non-transparent barriers (walls) [W],
Q_L – heat gains from lighting [W],
Q_P – heat gains from people [W],
Q_E – heat gains from electrical engines and machines [W],
Q_D – heat gains from other devices [W],
Q_{In} – heat gains due to air infiltration [W],
Q_B – gains through barriers of adjacent rooms [W].

Heat gains from people

Comprised of sensible and latent heat gains (i.e. humidity gains).
Sensible heat gains can be calculated from the following formula:

$$Q_P = ø \cdot n \cdot q_j \ [W]$$

ø – people residence coincidence factor (from 0.4 to 1.0),
n – number of people,
q_j – unitary heat flow delivered into the environment [W].

People residence coincidence factor depending on the room type

Room type:	Air demand Vk [(m³/h) per person]
Offices	0.75 ÷ 0.90
Hotels – reception desk, collective stay halls	0.40 ÷ 0.60
Supermarkets	0.80 ÷ 0.90
Industrial buildings	0.85 ÷ 0.95

Note: In small buildings and in theatres, cinemas – ø = 1.

Sensible heat gains from people depending on the activity and temperature in the room [W].

Activity	Action	Air temperature °C																				
		15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Small 0-200W	Rest in a sitting position	26	28	31	34	37	41	45	49	54	60	66	73	80	88	97	107	117	129	141	154	169
	Rest in a sitting position (e.g. spectator in a theatre, primary school student)	31	35	39	43	48	53	59	64	70	77	84	92	101	111	121	133	145	159	174	189	207
	Very light physical labour (e.g. office labour, designer, seamstress, crane operator, high school student)	41	46	52	58	64	71	78	85	93	101	110	119	128	137	146	156	166	176	186	196	207
	Light physical labour (e.g. salesmen, locksmith, welder, presser, hotel worker, student, university employee, supermarket employee)	66	74	83	92	100	109	119	128	137	147	157	167	177	188	199	210	221	233	244	257	269
Medium 200-300W	Medium hard physical labour (e.g. blacksmith, roller operator, turner, weaver, pharmacist, bank employee)	88	94	102	110	19	129	139	149	160	171	182	193	204	215	226	237	247	257	267	275	284
	Medium hard physical labour (e.g. coffee shop, restaurant waiter)	130	139	105	161	172	184	196	208	221	234	247	260	273	286	299	312	324	337	349	361	372
Large >300W	Hard physical labour (e.g. carrier, loader)	178	191	205	218	230	243	256	268	280	292	305	316	328	340	352	363	375	386	397	408	420
	Hard physical labour (e.g. dancing)	254	274	293	311	326	341	355	368	380	392	405	417	430	444	458	474	491	510	531	554	579

Latent heat gains (humidity gains)

$$W_P = ø \cdot n \cdot w_j$$

w_j – unitary flow of water steam delivered into the environment by a human depending on the activity and environment temperature [g/h].

Water steam gains depending on the activity and temperature in the room [g/h]

Activity	Action	Air temperature °C																				
		15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Small 0-200W	Rest in a sitting position	26	28	31	34	37	41	45	49	54	60	66	73	80	88	97	107	117	129	141	154	169
	Rest in a sitting position (e.g. spectator in a theatre, primary school student)	31	35	39	43	48	53	59	64	70	77	84	92	101	111	121	133	145	159	174	189	207
	Very light physical labour (e.g. office labour, designer, seamstress, crane operator, high school student)	41	46	52	58	64	71	78	85	93	101	110	119	128	137	146	156	166	176	186	196	207
	Light physical labour (e.g. salesmen, locksmith, welder, presser, hotel worker, student, university employee, supermarket employee)	66	74	83	92	100	109	119	128	137	147	157	167	177	188	199	210	221	233	244	257	269
Medium 200-300W	Medium hard physical labour (e.g. blacksmith, roller operator, turner, weaver, pharmacist, bank employee)	88	94	102	110	19	129	139	149	160	171	182	193	204	215	226	237	247	257	267	275	284
	Medium hard physical labour (e.g. coffee shop, restaurant waiter)	130	139	105	161	172	184	196	208	221	234	247	260	273	286	299	312	324	337	349	361	372
Large >300W	Hard physical labour (e.g. carrier, loader)	178	191	205	218	230	243	256	268	280	292	305	316	328	340	352	363	375	386	397	408	420
	Hard physical labour (e.g. dancing)	254	274	293	311	326	341	355	368	380	392	405	417	430	444	458	474	491	510	531	554	579

Note: For women, the values specified in table 2 and 3 must be decreased by 20%, while for children - by 20-40% depending on the age.

Electrical lighting heat gains

Typical heat emissions from various sources of electrical light, calculated by simplified method shown in table.

Emission of energy in relation to the floor surface [W·m^{-2}], including the energy requirement for the controls								
Incandescent lamps			Discharge lamps		Fluorescent lamp with a white light of 65 W			Lamps with fluorescent layer polyphosphoric 58 W
			mercury	sodum				
The light intensity in lux	Open luminaire	Diffused general lighting	Open luminaire		Colored plastic, built-in	Closed-filled dispersion	Ceiling panel with blinds	
150	19 ÷ 28	28 ÷ 36	4 ÷ 7	2 ÷ 4	4 ÷ 5	6 ÷ 8	6 ÷ 8	4 ÷ 8
200	28 ÷ 36	36 ÷ 50	-	-	6 ÷ 7	8 ÷ 11	9 ÷ 11	6 ÷ 10
300	38 ÷ 55	50 ÷ 69	7 ÷ 14	4 ÷ 8	9 ÷ 11	12 ÷ 16	12 ÷ 17	10 ÷ 16
500	66 ÷ 88	-	13 ÷ 25	7 ÷ 14	15 ÷ 25	24 ÷ 27	20 ÷ 27	14 ÷ 26
750	-	-	18 ÷ 35	10 ÷ 20	-	-	-	-
1000	-	-	-	-	32 ÷ 38	48 ÷ 54	43 ÷ 57	30 ÷ 58

Heat gains from devices

It is necessary to assume on the basis of actual heat gains of devices installed in the room. If there is lack of such information, the gains can be adopted according to table. Approximate heat gains from devices.

Device	Efficiency	Maximum power brought [W]	Power consumption during standby [W]	Recommended stream to balance heat gain [W]
Computer equipment and supplies				
Communication and transmission equipment		1800 ÷ 4600	80 ÷ 180	80 ÷ 180
Drives; storage		1000 ÷ 10000	1000 ÷ 6600	1000 ÷ 6600
Computer / CPU		2200 ÷ 6600	2200 ÷ 6600	2200 ÷ 6600
Minicomputer/ personal computer		100 ÷ 600	90 ÷ 530	90 ÷ 530
Laser printer	8 pages per minute	850	180	300
Line printer, very fast	5000 and more pages/minute	1000 ÷ 5300	500 ÷ 2550	1000 ÷ 4700
Computer terminal		90 ÷ 200	80 ÷ 180	80 ÷ 180
Copiers, printers				
Blue copy printer		1150 ÷ 12500	500 ÷ 5000	1150 ÷ 12500
Xerocopying printer (large)	30 ÷ 50 cpm	1700 ÷ 6600	900	1700 ÷ 6000
Xerocopying printer (small)	6 ÷ 30 cpm	160 ÷ 1700	300 ÷ 900	460 ÷ 1700
Photo typographic printer		1725	-	1520
Mail handling equipment				
Sorting machine	3600 ÷ 6800 pieces per minute	600 ÷ 3300	-	390 ÷ 2150
Labeller	1500 ÷ 30000 pieces per minute	600 ÷ 6600	-	390 ÷ 4300
Other				
Cash register		60	-	18
Machine with cold snacks and drinks		1150 ÷ 1920	-	575 ÷ 960
Coffee express	10 cups	1500	-	1050
Microwave		600	-	400
Document shredder	28 liters	250 ÷ 3000	-	200 ÷ 2420
Beverage cooler	30 liters per hour	700	-	1750

Heat gains from different electric devices

Type of device	Installed power [W]	Use time [min·h⁻¹]	Secreted water [g·h⁻¹]	Heat gains	
				Sensible heat [W]	Total heat [W]
Electric cooker	3000	60	2100	1450	3000
	5000	60	3600	2500	5000
Vacuum cleaner	200	15	-	50	50
Washing machine	3000	60	2100	1450	3000
	6000	60	4200	2900	6000
Centrifuge Rack	100	10	-	15	15
Compressor refrigerator 100 l	100	60	-	300	300
Compressor refrigerator 200 l	175	60	-	500	500
Iron	500	60	400	230	500
Radio	40	60	-	40	40
Apparatus for exposure	1000	60	-	1000	1000
TV set	175	60	-	175	175
Toaster	500	30	70	200	250
	2000	30	300	800	1000
Hair dryer	500	30	120	175	250
	1000	30	240	350	500
Plate for heating food	500	30	200	120	250
	1000	30	400	250	500
Grill	3000	30	500	1200	1500
Machine for permanent wave	1500	15	120	300	375
Sterillizer	1000	30	500	175	500

Heat gains from the sun via transparent barriers (windows)

In typical conditions, many HVAC specialists use the simplified tables allowing for calculation of heat gains via transparent barriers. the gains can be adopted according to table.

Source of heat gains	Amount	Ratio		
WINDOWS (heat gains from insolation)		external shades	internal shades	no shades
north-east side	m2 x	70	80	190
east side	m2 x	80	125	250
south-east side	m2 x	70	100	240
south side	m2 x	70	115	240
south-west side	m2 x	95	150	350
west side	m2 x	140	210	470
north-west side	m2 x	110	150	350
WINDOWS (heat gains from diffusion)				
single glass	m2 x	45		
double glass	m2 x	20		

However, in some cases, e.g. in rooms with large surfaces of transparent barriers and highly exposed to solar radiation, it is worth to conduct a detailed balance of the room's heat gains.

Heat gains from non-transparent barriers

Gains through the non-transparent barriers [W] by simplified method can be adopted according to the table on the next page.

Source of heat gains	Amount	Ratio	
WALLS (up to 3m of height)		**lightweight construction**	**heavy construction**
external northern wall	mb x	30	20
other external walls	mb x	60	30
walls between non air-conditioned rooms	mb x	-	30
ROOF			
insulated roof	m2 x	25	
non-insulated roof	m2 x	60	
CEILING			
between floors	m2 x	10	
FLOOR			
except the floor on the ground, over the basement	m2 x	10	

UNIT CONVERSION FACTOR

Power

Name of the unit	Marking	1 kW
British thermal unit /hour	BTU/h	3412.1
Horsepower	Hp	1.34
Mega joule/hour	MJ/h	3.6
Kilo calorie/hour	kCal/h	859.85

REFERENCE LIST

REFERENCE LIST

Vilkpėdės Hospital, Vilnius, Lithuania

Porsche car showroom, Vilnius, Lithuania

Lidostas Parks, Riga, Latvia.
Modern warehouse, production and office complex.

JYSK logistics center, Riga, Latvia

Valmiera Glass factory, Latvia

School in Kohtla-Järve, Estonia

Office in Vilnius str., Vilnius, Lithuania

Aerocity Loop Hotel, Vilnius, Lithuania

Kaunas Sports Hall, Kaunas, Lithuania

Lighthouse Coworking space, Klaipėda, Lithuania

M-Lab laboratories in KTU, Kaunas, Lithuania

Bussiness centre in Riga, Latvia

Ambulatory diagnostic center, Kaunas, Lithuania

Pack Klaipėda, Lithuania

Children's education center, Vilnius, Lithuania

Melga car service, Vilnius, Lithuania

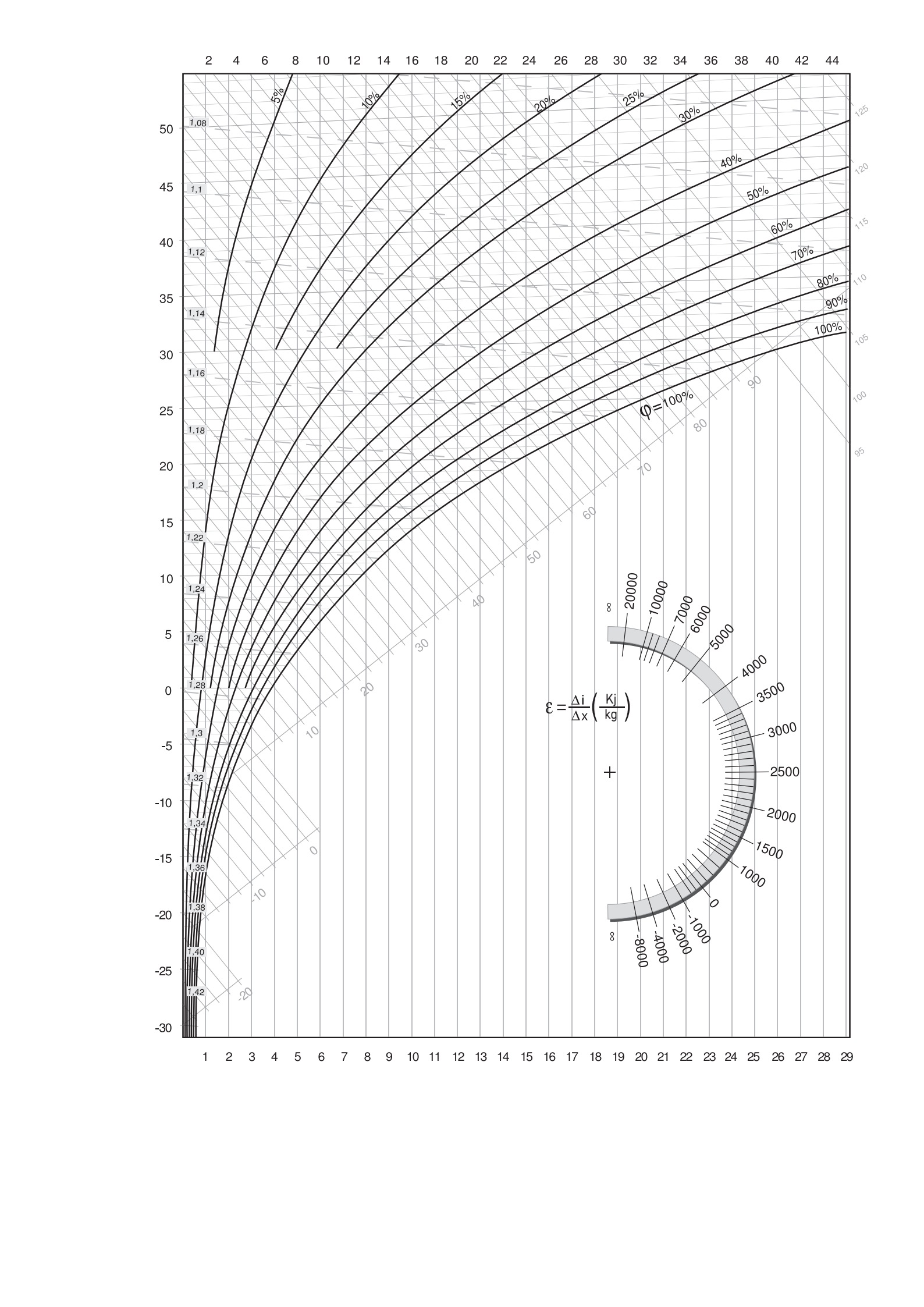
Kurbads ledus halle, Riga, Latvia.
Ice skating rink.

Rīgas Stradiņa University, Latvia

Kindergarten, Kaunas, Lithuania

Šlienava Primary school, Kaunas, Lithuania

NOTES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