



10 **MULTI V™ III**
Heat Pump



20 **MULTI V™ III**
Heat Recovery



MULTI V™ series

Outdoor Units

MULTI V Inverter units are comprised of serially arranged refrigerant pipes connected to a single outdoor unit. It is an efficient system that can offer significant energy savings. It is relatively quick and easy to install as different types of indoor units, can be connected together.



22 MULTI V™
MINI



24 MULTI V™
SPACE III



26 MULTI V™
WATER III

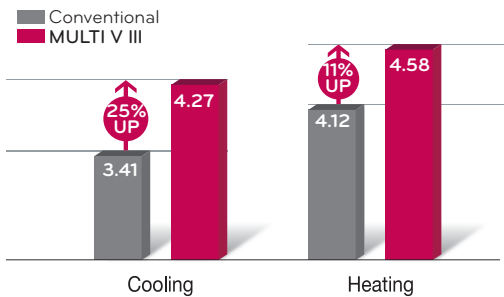


Energy saving and innovation

High cooling and heating COP

- High efficiency BLDC V-scroll inverter compressor
- High efficiency BLDC inverter fan motor
- High air volume fan
- Optimal heat exchanger distribution

COP Comparison (based on 8HP)



※ Coefficient of Performance (COP) = $\frac{\text{Cooling / Heating}}{\text{Energy consumption}}$

Therefore, the higher the COP of a product, the higher the cooling and heating capability of the unit and energy consumption is lower.

Maximum single unit capacity of 20 HP

MULTI V III offers a larger capacity of 20 HP for a single unit. There are two basic modules; one fan (up to 12 HP) and two fans (up to 20 HP), and they can be combined. One outdoor unit is usually enough to heat and cool a relatively large area and the unique design of the MULTI V III mean installation costs can be kept to a minimum.

Up to 20 HP Single Unit !



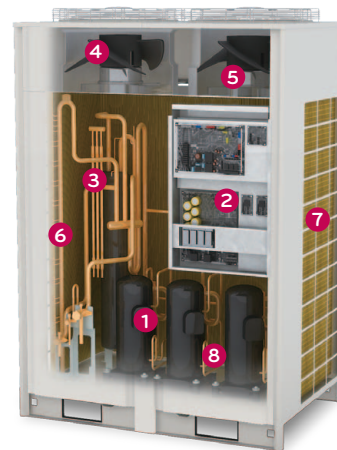
One Fan
8~12HP



Two Fan
14~20HP

Technical innovation for high COP

MULTI V III uses highly efficient components with advanced inverter and optimal cycle control technology. These features mean the system's overall performance has improved. The advanced technology utilised provide improved efficiency and energy savings.



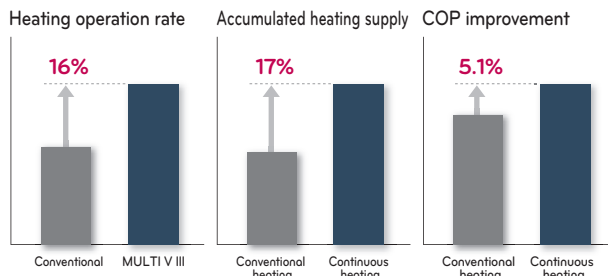
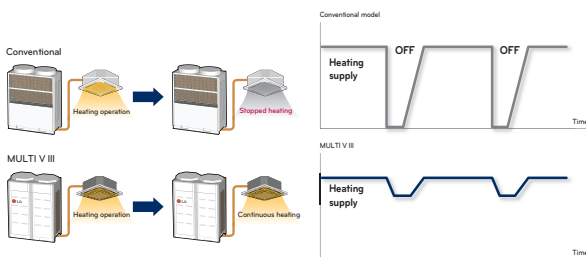
- 1 V-Scroll (LG BLDC inverter compressor)**
Energy efficiency increased by up to 11%, compared to the AC inverter compressor, by using the highly efficient LG BLDC inverter compressor.
- 2 Sine wave inverter control**
The efficiency of the compressor has been improved by using sine wave DC inverter control technology.
- 3 Cyclone sub-cooling circuit**
Cooling capability is improved through the use of a cyclone sub-cooling circuit.
- 4 Newly designed propeller fan**
Optimal heat exchange is achieved by using a high air volume and low noise fan.
- 5 LG BLDC inverter fan motor**
The highly efficient BLDC inverter motor is more efficient, compared to an AC motor.
- 6 Uniform distribution for the heat exchanger**
The efficiency of heat exchange performance is improved by reducing the heat exchanger's temperature deviation from 5°C to 1°C. This is done by using an optimal distributor design in the heat exchanger.
- 7 Wide louver fins for the heat exchanger**
The use of wide louver fins with an increased heat exchange area means efficiency is improved.
- 8 HiPOR™ (High Pressure Oil Return)**
Improves the system's COP by up to 5%

Convenience and Comfort

Continuous heating function*

Continuous heating is possible with this product. Usually, when heating is operational, freezing can occur in an outdoor unit's heat exchanger. When this happens, the normal way to solve this is to stop the indoor units and perform the defrost operation on the heat exchanger. However, as MULTI V III uses split defrost technology it can defrost and continue heating without stopping any indoor units. This improves efficiency and helps to maintain a warm indoor environment.

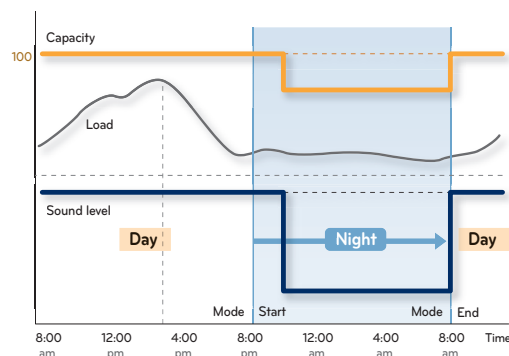
*Continuous heating function can be switched to defrost mode depending on the environmental conditions.



Night silent operation

Fan control and the real-time outdoor temperature detection technology, mean the product has a low-noise operation function that can be used at night. 9 steps of low-noise operation are possible to reduce disturbance during the night.

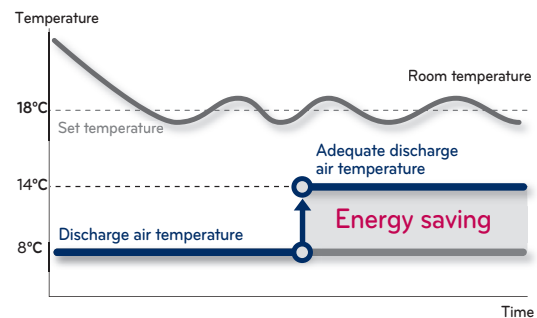
For more detailed information, please refer to the PDB.



Real-time smart operation

In situations where the heating/cooling load difference is large and if the performance on one side is high enough, performance on the other side can be overloaded. To control this, the product uses a real-time power saving operation algorithm. This enables the product to automatically decide on the operation status for the indoor units and automatically controls them to maintain an optimal operation level and reduce power consumption.

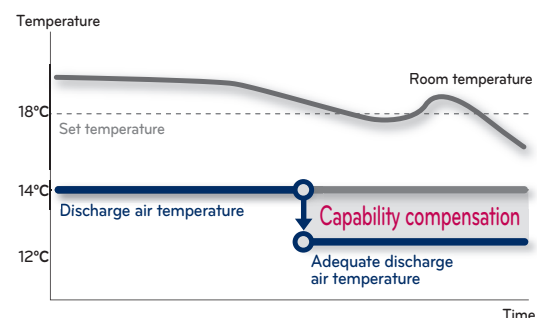
Real-time power saving operation control



Capability compensation operation

During heating or cooling the product automatically monitors the operational status and can if required perform the capability compensation operation on the indoor units. For example, if the refrigerant line that connects the indoor and outdoor units has been extended or the indoor heating and cooling load has increased, the indoor units may not be able to cool or heat successfully. In this instance the product automatically adjusts the indoor units to ensure they operate at an optimal level by using the capability compensation operation.

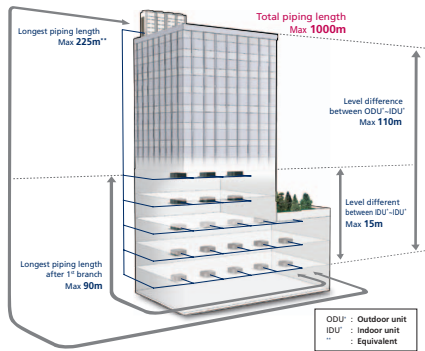
Capability compensation operation



Freedom with VRF design

Extended piping length and elevation

The use of inverter control technology and sub-cooling control circuit technology in the product means, it is possible to design a system with longer piping lengths and a higher elevation difference. With this product, a cooling and heating system can be designed more flexibly in a high-rise building or in more complex facilities. This means, the designer's working time is reduced.

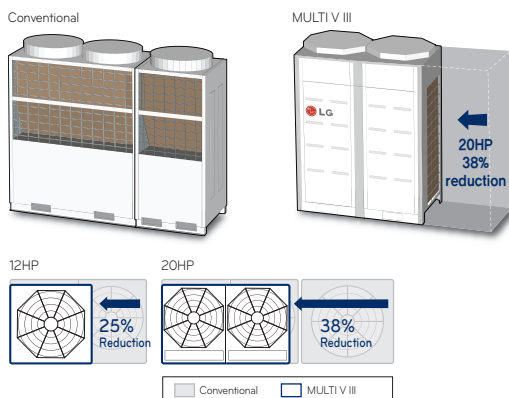


Total piping length up to	1000m
Actual longest piping length up to	200m
(Equivalent) up to	(225m)
Longest piping length after 1st branch up to	40m
*(Conditional application) up to	(90m)
Level difference between ODU-IDU up to	110m
Level difference between IDU-IDU up to	15m
Level difference between ODU-ODU up to	5m

*Contact your regional technical team for guidance environmental conditions.

Better space utilisation

The size of the product has been reduced by up to 38% compared to the existing products thereby, reducing the amount of installation space required. This gives you more free space and allows for easier outdoor unit positioning.



Maximum combination capacity of 80 HP with a single pipe

A combination of up to 80 HP can be made using 20 HP units. This makes it possible to design a VRF system that fits into a restrictive space. The usual problems in design, such as space for outdoor units, pipe shaft and piping line space is now less of an issue.

Outdoor unit combination of up to 80 HP



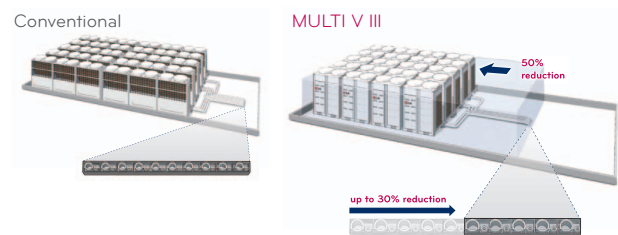
Space saving installation
- Optimal space utilisation

Single pipe
- Easy to design
- Cooling and heating for a large installation
- Installation cost savings

When designing a VRF system with a total capacity of 400 HP, the 80 HP MULTI V III combination offers the following benefits, compared to conventional 40 HP combination models:

- Reduces the installation space by up to 50%
- Reduces the amount of piping by up to 50%
- Reduces the pipe shaft space needed by up to 30%
- A large capacity design reduces the time spent on designing the VRF system, and also reduces the construction costs

Comparison of outdoor unit installation space



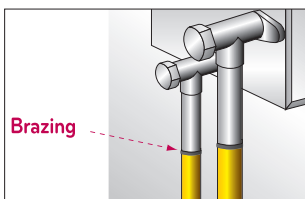
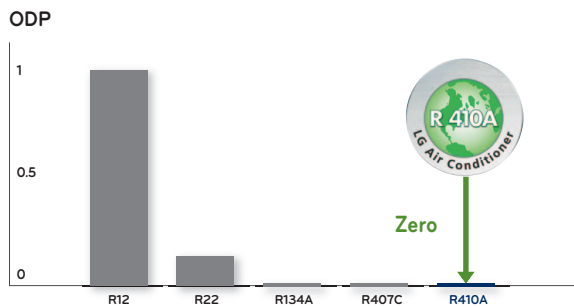
Freedom with VRF design

Innovative design

We not only produce highly efficient products that have excellent energy-saving capabilities, but we also develop products with greener technology that help to protect the environment. With these products we are taking a leading role in developing lower carbon and greener technologies.

R410A Refrigerant

R410A is a refrigerant, with zero Ozone Depletion Potential (ODP). All products in the range use R410A refrigerant, which means they are more efficient and use less energy compared to products that use the conventional R22. This helps to protect the environment.



No refrigerant leakage design and production

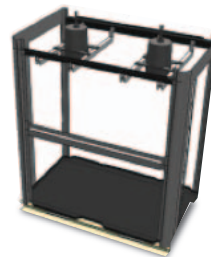
The product is designed and produced with brazing to connections at the service valves to help prevent leakage. No leakage will occur unless an external factor, such as an impact damages it. This is true even when the product is used for an extended period of time.

Auto leakage detection

The product monitors the operation status data in real time and decides the appropriate amount of refrigerant needed and displays it. It can automatically notify the user of any refrigerant leakage.

New designs for quiet operation

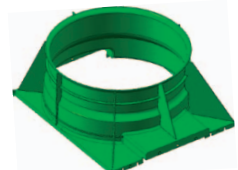
In order to provide a high cooling and heating performance within compact dimensions, MULTI V III uses various low noise technologies. It has minimised operation noise by using a compressor with BLDC motors, low noise fan motors, new soundproof technology, outdoor fans, and a newly developed shroud shape.



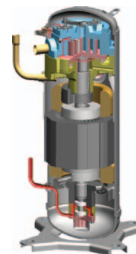
Robust structure design



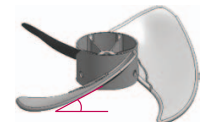
Octagonal grill reduces air flow resistance



Expanded bellmouth shaped shroud



Low torque motor with ripple design
Resonance frequency shift with optimal current angle control



Robust S-shaped blade
Increases pitch angle

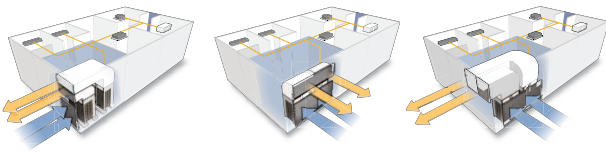
Design freedom with VRF

High static pressure fan

The powerful high static pressure fan in the product means that, the outdoor unit can not only be installed on the roof of a building, but also inside the building by using an air duct. High static pressure fans and BLDC fan motors, allow for sufficient air volume to be acquired for heat exchange and prevents the re-circulation of the discharged air currents occurring. Depending on the building structure, you can reduce the piping length by installing the outdoor unit in the machine room.

(Maximum External Static Pressure: 8mmAq)

Various design and installation methods are available that can fit into different building structures



No stacking of hot air occurs due to powerful discharge of air currents even in a high-rise building

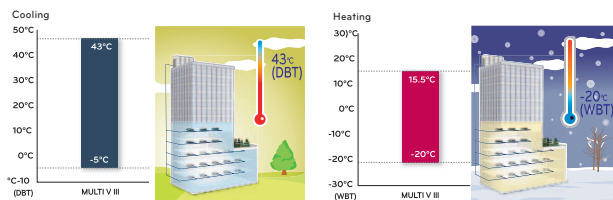


Conventional

MULTI V III

Wide operating range

The product has undergone rigorous testing in extreme conditions whereby cooling and heating functions have been tested to the limit of the product's operable range. It has extended the range of operation by using more enhanced inverter compressor and control technology.

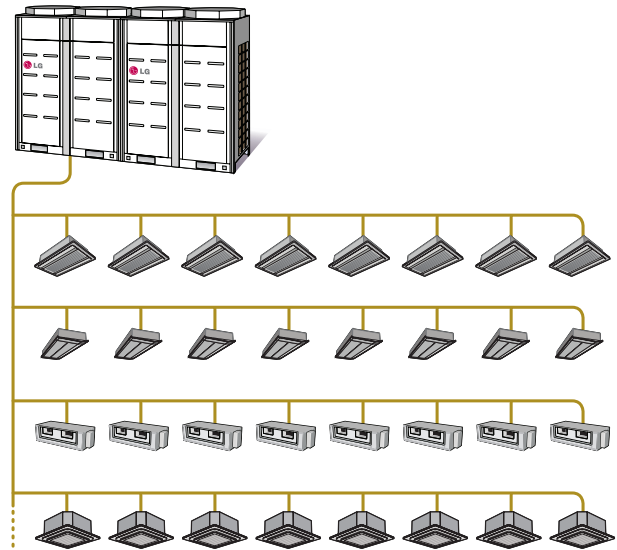


Flexible indoor unit combinations

Up to 64 indoor units can be connected together. There are 17 types with 86 individual indoor models that can be combined. A variety of designs can be tailored for individual usage. Up to 200% efficiency can be achieved by using different combinations.

Connectable indoor unit capacity Up to Max 200%	Number of connectable indoor units Up to 64	Range of indoor units 17 types, 86 models
---	---	---

※ A combination that has a maximum efficiency of 200% can only be achieved if changes in the heating and cooling load as well as the product operation rate by time are considered.



Combination ratio (50~200%)*

No. of outdoor unit	Connection Capacity
Single unit	200%
Double unit	160%
Triple and quad unit	130%

*Depending on model used

Easy transportation and installation

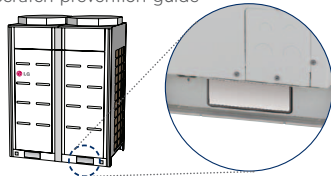
Easy and safe transportation

It's compact size and reduced weight mean, the product can be easily transported in a lift when installing it inside a building or in areas where it is difficult to use a crane. The product is designed so that installers can move it safely and easily. In addition, the larger 20 HP capacity of unit makes installation work easier by reducing the transportation and the installation time. The lifting holes can be used when it is being moved by crane. The design of the product means that installation time can be reduced, transportation is more convenient and, above all, the installation is safe.

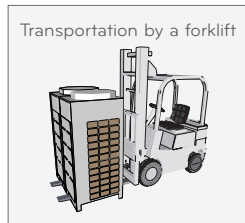
Fast and safe transportation by a forklift

There are forklift transportation holes at the bottom of the product, designed to make it easy for a forklift to load, transport and unload the product. The product also has scratch prevention guides that prevent a forklift from scratching the product during transportation.

Forklift transportation hole
Scratch prevention guide



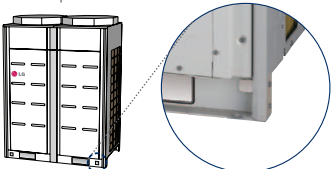
Transportation by a forklift



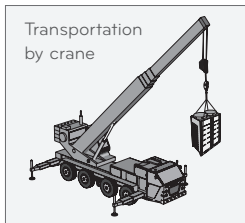
Safety design for transportation by crane

Enhanced safety during transportation by crane is provided by the crane rope holes that secure the product and protect it from external impacts.

Crane rope hole

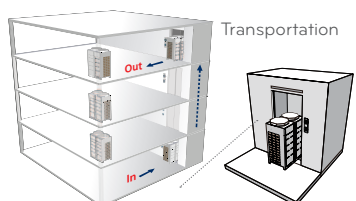


Transportation by crane



Compact product design allowing transportation

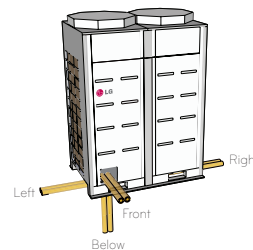
With smaller dimensions, the product can be easily moved in a lift.



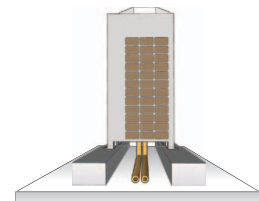
Free 4-way piping connection

The piping lines for the outdoor unit can be connected in 4 ways (front/left/right/below), allowing various installation possibilities depending on the individual site. If the piping lines are installed on the floor (piping from below), the product looks neat as they are hidden from view. Piping line tray work may not be necessary depending on the individual site. This can reduce additional working hours, and also makes access for maintenance easier.

4-way piping design

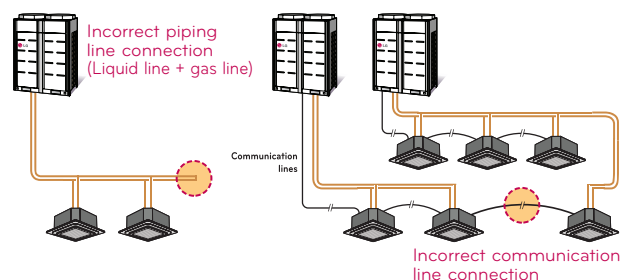


When installing piping lines on the floor (piping from below)



Automatic detection of incorrect connections

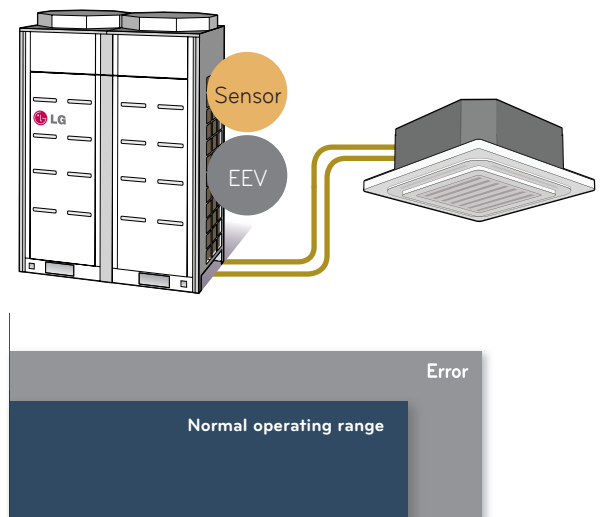
In conventional products, if an installation engineer has connected a liquid line to a gas line by mistake, you have to go to the trouble of checking the piping line connections for all of the indoor units installed over the ceiling. However, MULTI V III automatically checks the connections of piping and communication lines with its FDD (Fault Detection and Diagnosis) function and notifies the user if there is a problem. Usually, an installation becomes more and more complex as the number of connected indoor units increases. However, with the automatic detection function of the product, if an indoor unit has a connection problem, action can be taken quickly because the automatic detection function will highlight the issue.



System monitoring and maintenance

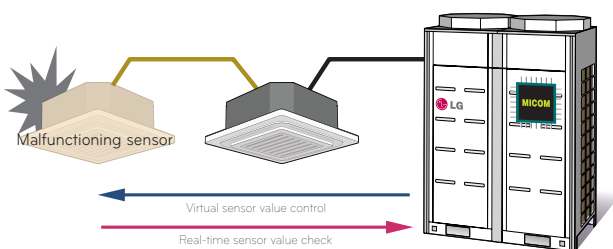
Real-time fault prediction function

With conventional products, the performance and reliability would be reduced if there is a slight fault with a sensor or the Electronic Expansion Valve (EEV). However, MULTI V III allows you to check the current status of the sensors and the EEV, through a auto test run. The auto test run inspects the current status of the sensors and the EEV. If a problem occurs, the part of the system that has the problem is shown. This means action can be taken quickly even if it occurs within the normal operating range.



New virtual sensor back-up function

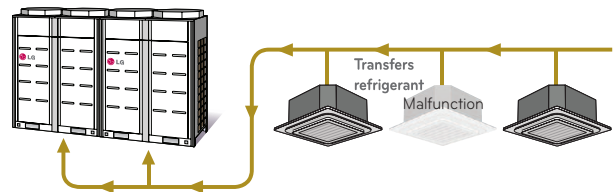
When an indoor unit sensor malfunctions by showing an abnormal value, it is detected as a faulty part. However the outdoor unit can estimate what the normal sensor value should be and control the unit accordingly. This improves the overall system performance and reliability.



Pump down and pump out function

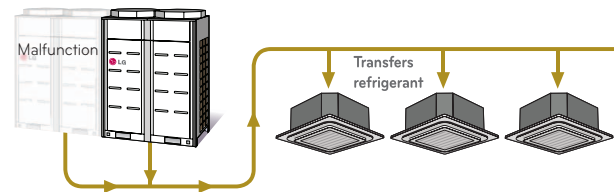
PUMP DOWN

If an indoor unit malfunctions, the pump can collect the refrigerant remaining in the piping line or pump it to an outdoor unit.



PUMP OUT

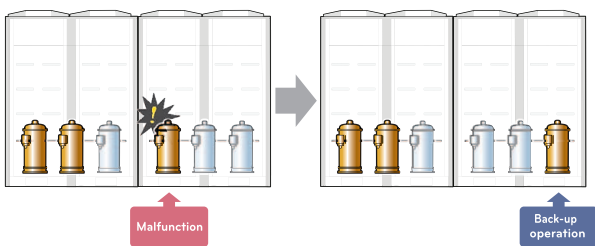
If an outdoor unit malfunctions, the pump can collect its refrigerant in another indoor unit or a piping line.



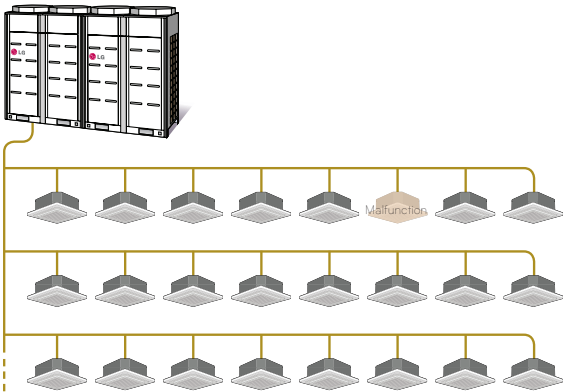
Emergency back-up and monitoring

Automatic emergency back-up function

If a compressor malfunctions, the other compressor that is operating normally in an outdoor unit can run automatically as a substitute. This minimises any inconvenience that may occur in an emergency situation.

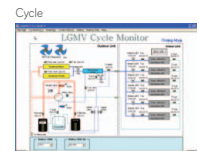
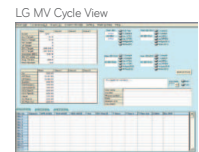
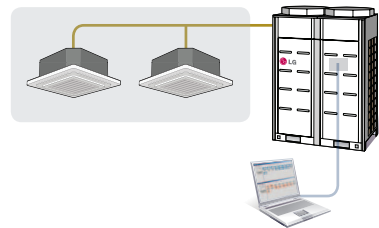


Even if an indoor unit malfunctions, the other indoor units operate normally because each indoor unit is operated individually by the Micom embedded in the unit.



LGMV Monitoring Software

This program allows you to monitor and control the operation of the product. The program can be connected to either an indoor or outdoor unit. The status of the product can be monitored easily and conveniently any time, anywhere.

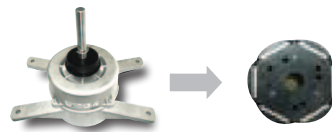


Cutting edge technology

New and core technologies

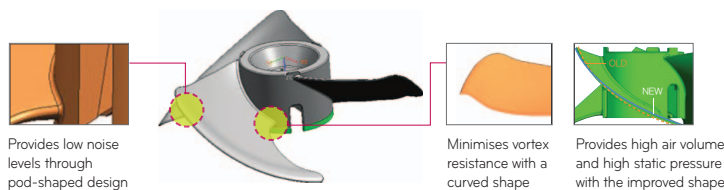
1 New BLDC Inverter fan motor

MULTI V III is equipped with a highly efficient BLDC motor. Compared to the standard induction motor, the power consumption of the BLDC motor has been reduced and the output has been improved. High torque and a powerful magnet inside the rotor means that, the BLDC motor provides large air volume and high static pressure.



2 New design of propeller fan (Super Aero fan)

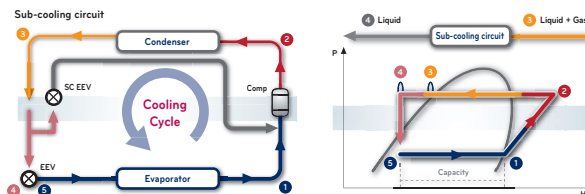
The Super Aero fan is a large air volume and high static pressure fan. It also produces low levels of noise.



3 Cyclone sub-cooling circuit

The sub-cooling circuit control acquires sub-cooled liquid refrigerant and this improves the symptoms of oil recovery and the performance degradation that can occur. This loss of system capability usually occurs throughout the piping lines. The sub-cooling circuit control is a core technology that enables MULTI V III to implement some of the longest piping lengths and elevation differences in the industry.

※ Sub-cooling circuit control: Extracts part of the refrigerant from the SC circuit in the liquid line exit of an outdoor unit. It then expands the extracted refrigerant using the SC EEV to make low temperature refrigerant, and performs the heat exchange in the system using the low temperature to increase the sub-cooling rate of the system.

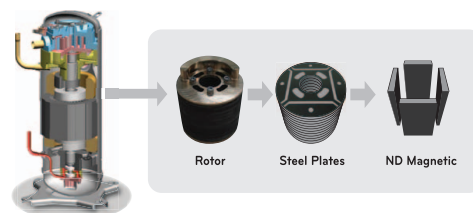


4 V-scroll (LG BLDC inverter compressor)

We have developed a new compressor with better performance, higher efficiency, and improved reliability compared to conventional compressors.

At the core of the compressor, is a highly efficient BLDC motor, whereby magnetism inside the rotor produces torque. The metal part of the rotor produces resistance torque to generate a strong rotational force. Efficiency is improved because there is no slip loss, which nearly always occurs in normal induction motors.

Noise is also reduced due to its low torque ripple design.



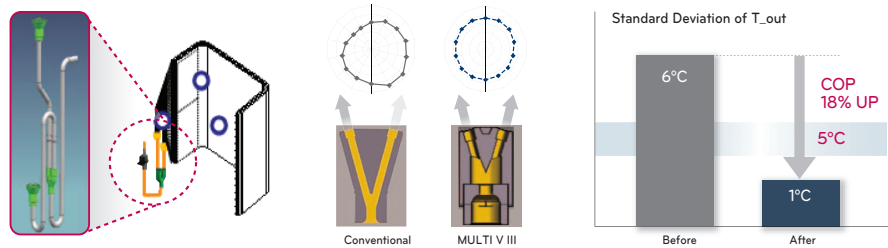
In addition, the LG BLDC inverter compressor has a 'back pressure structure' whereby the interior of the compressor is maintained at a high pressure. Consequently, the compression efficiency is improved. The high pressure compressor also makes oil lubrication smoother. Compared to conventional models, the LG BLDC inverter compressor has improved performance and reliability. It is the ideal scroll inverter compressor for VRF systems and is at the core of MULTI V III products.





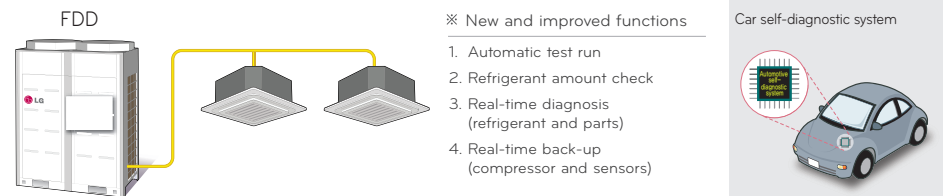
5 New optimised refrigerant distributor

The new optimal distributor design that has been applied to the heat exchanger, distributes refrigerant to the heat exchanger uniformly. This means that the entire area can be used efficiently and as result, both the heat exchange efficiency and system performance are improved.



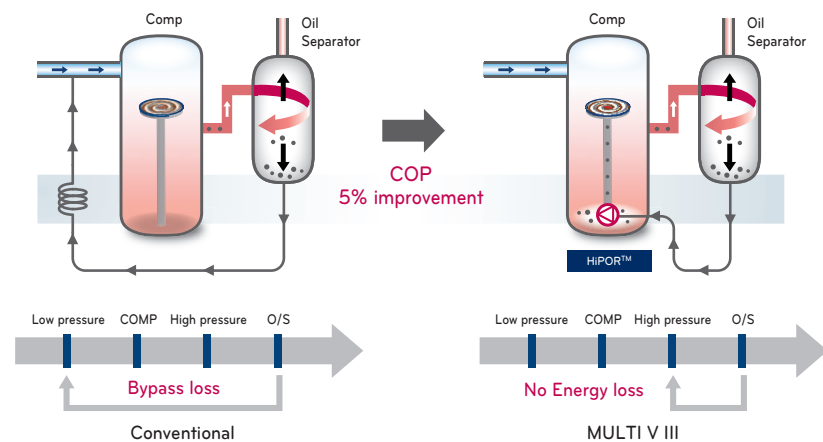
6 FDD (Fault Detection and Diagnosis)

Just like a car's on-board diagnostic system, the MULTI V III is also equipped with a comprehensive diagnostic system. This system carries out an automatic test run, refrigerant amount check, real-time inspection as well as back-up operation for parts.



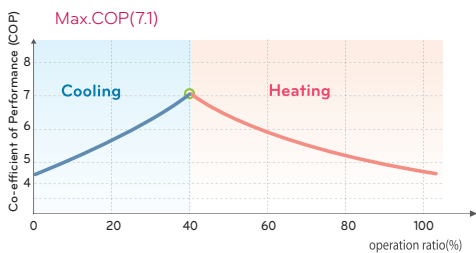
7 New oil management technology (HiPOR™)

HiPOR™ is a new technology that maximises the reliability and efficiency of the compressor by reducing pressure loss. This is done by forwarding refrigerant and oil to the higher pressure side using the pump installed inside the compressor.

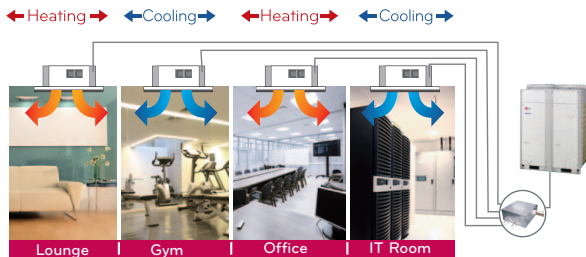


Synchronised heating and cooling

- High COP up to 7.1
- When, cooling (40%) + heating (60%)
- Energy consumption can be decreased by 30%



* Outdoor temperature: 7°C DB / 6°C WB
 * Indoor temperature: 20°C DB / 15°C WB



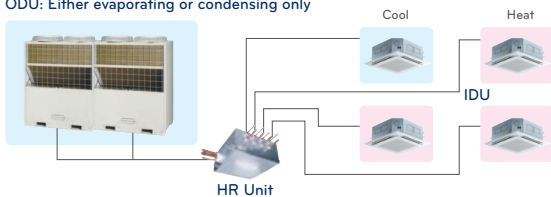
Simultaneous operation of outdoor units

Outdoor units' heat exchanger can be operated simultaneously for cooling and heating.

- Linear loading response
- Increased efficiency with simultaneous operation
- Minimised switch mode (continuous cooling and heating)

Conventional

ODU: Either evaporating or condensing only



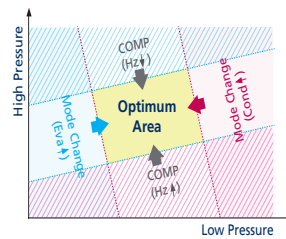
Multi V III

ODU: Condensing and evaporating together



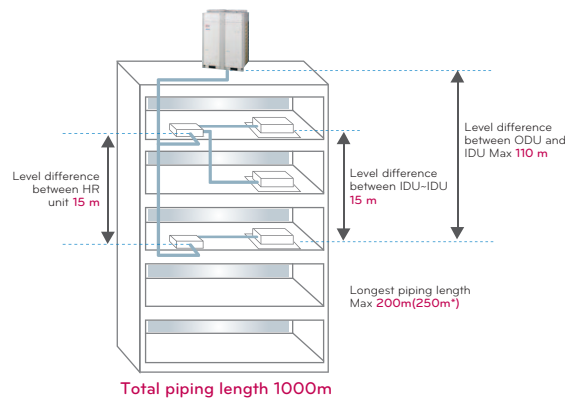
AMC (Advanced Mode Change)

AMC control provides an optimal cycle operation under any conditions. During this mode, system cycles can be more stable and maintain comfort for the end user.



- Real time pressure control
- Optimal cycle in optimum area
- Minimise settling time after switching mode: MAX 5 min.

Long piping length



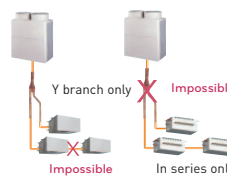
Total piping length up to	1000m
Actual longest pipe length up to	200m (250m*)
Longest piping length after 1st branch up to	40m [90m**]
Level difference between ODU-IDU up to	110m
Level difference between IDU-IDU up to	15m
Level difference between ODU-ODU up to	5m
Level difference between HR unit up to	15m

* Equivalent application
 ** Conditional application

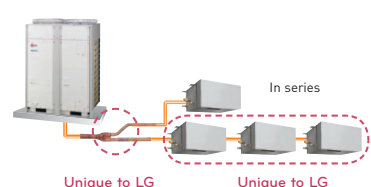
Flexible connection of HR unit

LG's heat recovery unit allows flexible connection both in parallel and in series.

Conventional



MULTI V Heat recovery



MULTI V III Heat recovery provides various applications and flexible control over zoning for the user's convenience.

Convenient zoning

MULTI V III Heat recovery provides flexible control over individual zones for the convenience of the user.

Individual control

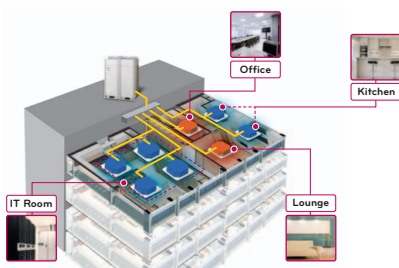
- Control over ventilation spaces

Zone control

- Max. of 8 indoor units can be connected on one branch
- Max. of 32 indoor units can be connected to one HR unit
- Same operational model can be operated by indoor units with zone control function installed

Combination of individual and zoning installations

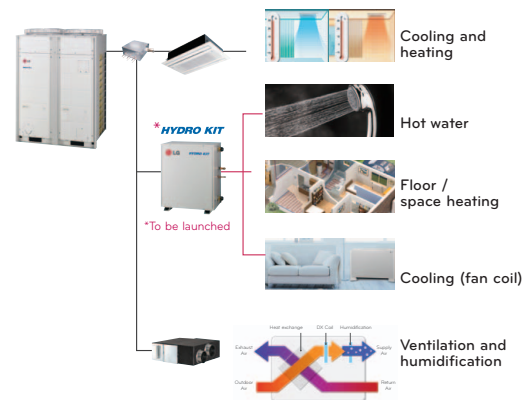
- Flexible piping design



Various applications

Experience different operations simultaneously to provide optimal comfort with LG Air Conditioning systems

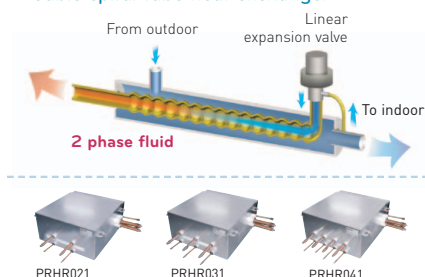
- Cooling and heating
- Fast water heating/ under floor heating
- Ventilation/ humidification



High efficiency heat recovery unit

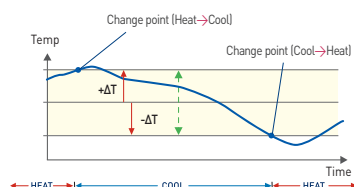
- Highly efficient double spiral tube type SCI circuit
- Maximum of 8 indoor units can be connected per branch
- Easy installation with auto piping detect function
- Access allowed to internal parts for SVC

• Double spiral tube heat exchanger



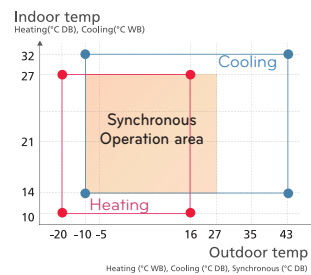
Auto changeover

The auto changeover can automatically change the operating mode (cooling and heating), to maintain the optimum room temperature. There is no need to change the mode when the seasons change.



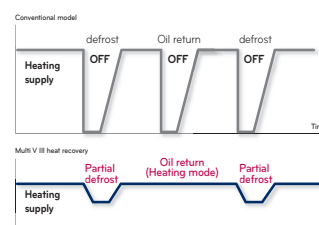
Wide range of operation

Extended range of operation at low temperatures by using the condenser with various controls.



Continuous heating operation

- Improved continuous heating function
(In the case of series units, alternative defrost per unit)
- Integrated heating capacity: up 17%
- Heating mode oil return
- Continuous heating and oil return during heating mode



*Existing mode can be operated automatically, depending on the condition of application.

MULTI VTM MINI

Enhanced comfort

- Night time silent operation
- High COP

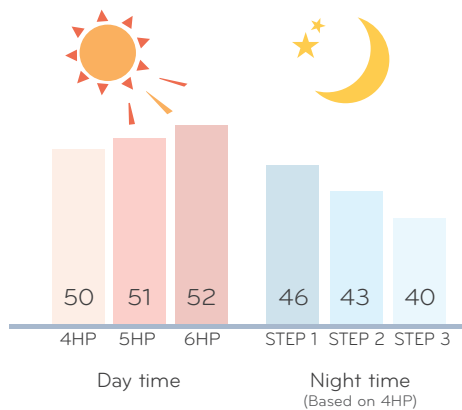
1Ø, 220V		
Mini		
4HP	3.7	3.9
5HP	4.0	4.1
6HP	3.7	3.9

Longest piping lengths

Total piping length up to	300m
Longest piping length up to (Equivalent)	150m (175m)
Longest piping length after 1st branch up to	40m
Level difference between ODU-IDU up to	50m (40m*)
Level difference between IDU-IDU up to	15m
Level difference between ODU-ODU up to	5m

*Outdoor unit is lower than indoor unit.

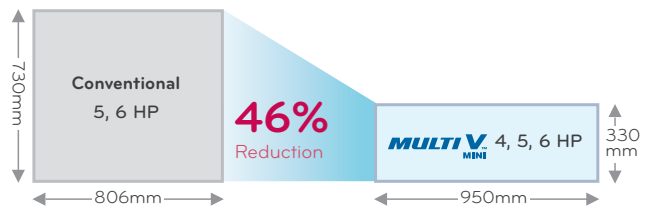
• Noise level (dBA)



Slim and compact size

Simple and efficient installation of MULTI V MINI provides the best solution for small offices and shops.

• Foot print area



• Volume

