

**THE BEST
SOLUTION**

HVAC & ENERGY



MULTI V™ 



Green energy & Smart HVAC Solution

- I Innovation that outperforms**
- II Higher Efficiency**
- III Bigger capacity**
- IV Longer piping**
- V More reliable**
- VI More convenient**



What is VRF system?

The **V**ariable **R**efrigerant **F**low System has the ability to control the amount of refrigerant flowing through the system

Simply, each FCU/AHU unit receives only the required amount of refrigerant in order to meet the cooling load of the conditioned space

This is accomplished by an inverter compressor which increases or decreases the amount of compressed refrigerant according to the required conditions.

What makes Multi V III outperform?

▼ Inverter control technology, high efficiency parts, optimum cycle

V - Scroll

01

05 BLDC Inverter Fan Motor

High Pressure Oil Return [HiPOR™]

02

06 New refrigerant distributor

Cyclone sub-cool circuit

03

07 Wide Louver fin in Heat Exchanger

High static propeller fan

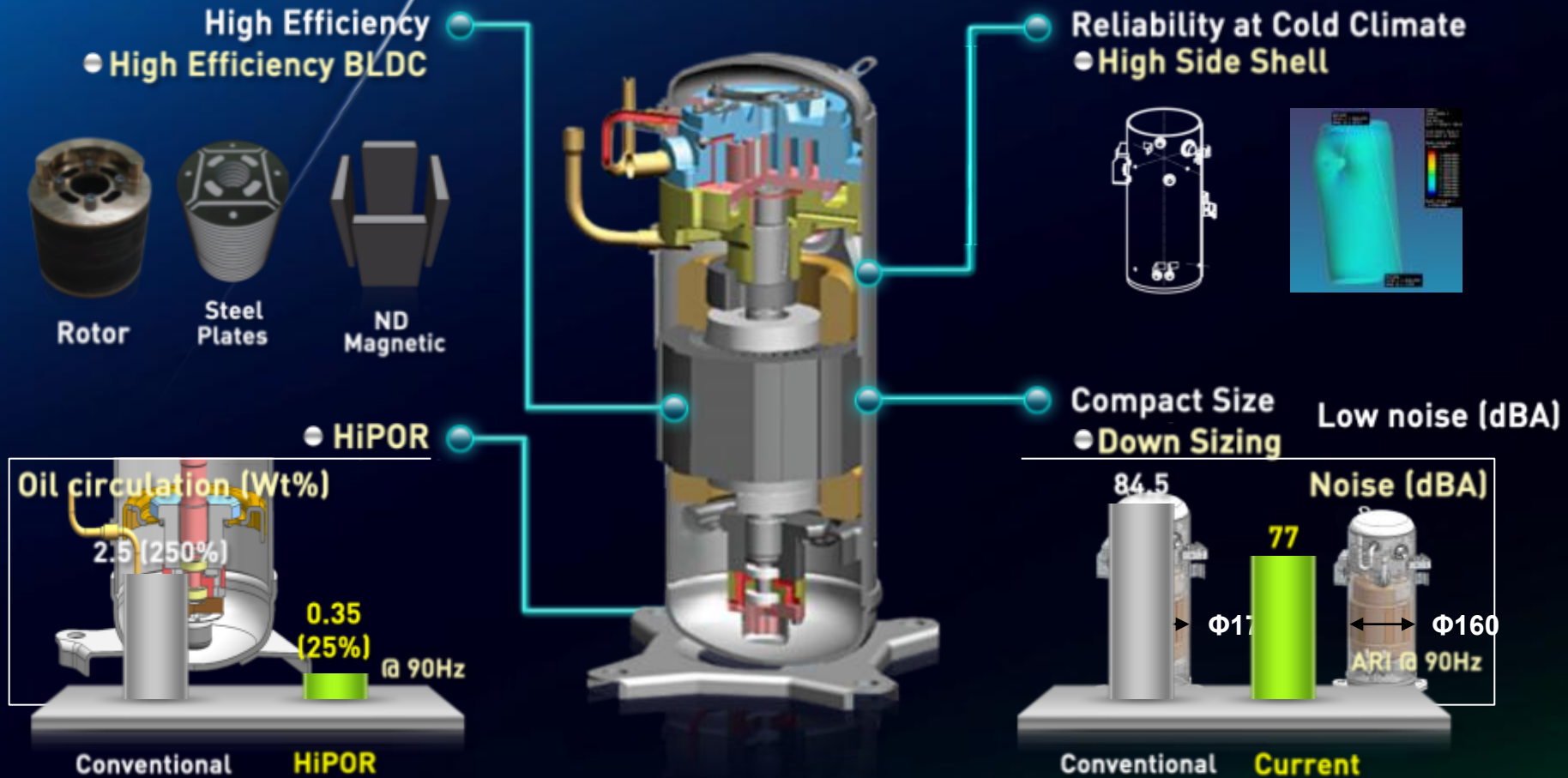
04

08 Sine wave inverter control



Higher Efficiency V-Scroll

▼ High Efficiency system, low noise [dBA] & oil circulation [Wt%]

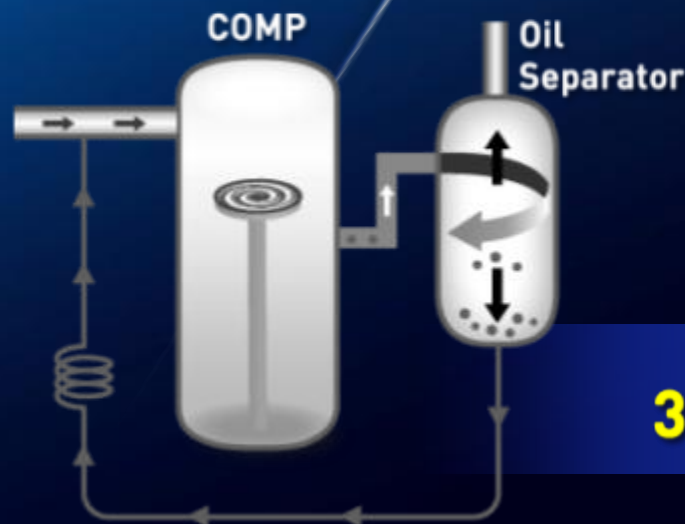


Higher Efficiency

World unique oil return system

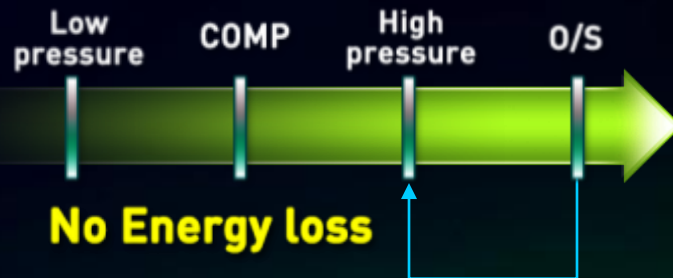
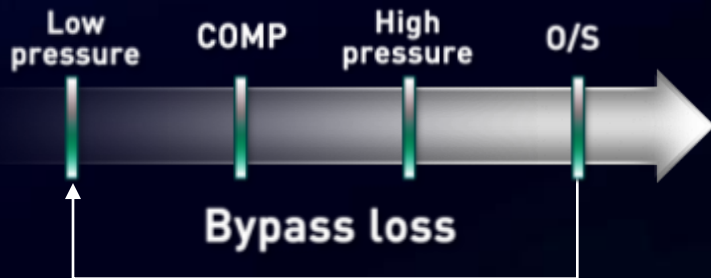
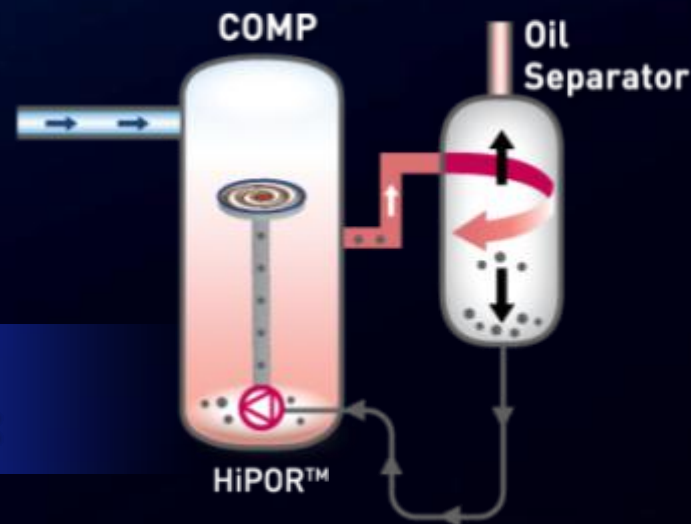
World unique oil return method [HiPOR™] - Capacity up, COP Increase

Conventional



COP
3% improvement

MULTI V. III



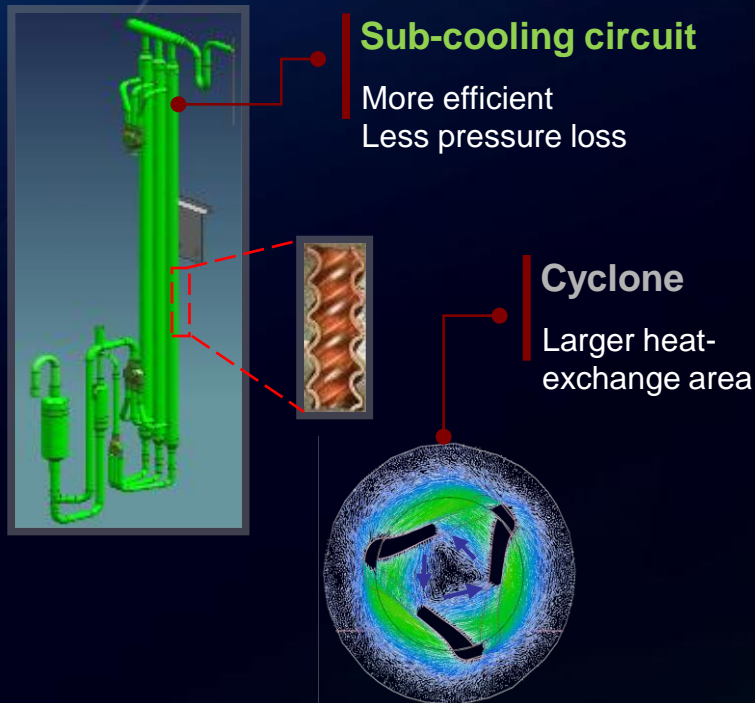
HiPOR™ : High Pressure Oil Return

Higher Efficiency Sub-Cooling

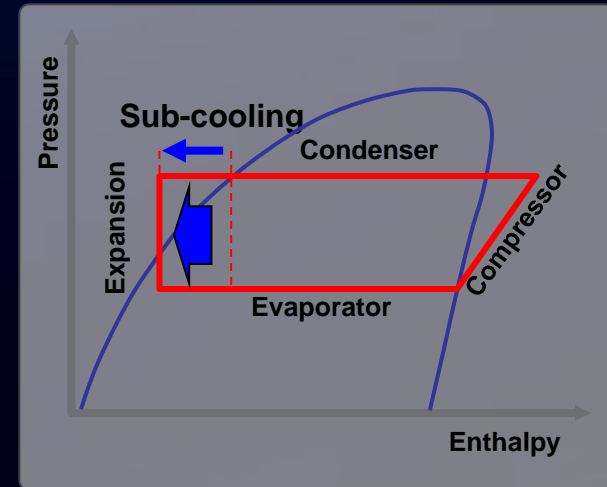
Innovation 2 – Cyclone SCC

Sub-cooling is one of the most important technologies in VRF system. LG Multi V use more efficient cyclone type. By cyclone sub-cooling circuit, Best effect can be achieved.

●● Cyclone sub-cooling circuit



Theory and Effects



1st effect : Refrigerant pressure loss reduce
Long and high rising piping

2nd effect : Cooling capacity gets improved
In a thermodynamic point of view

Higher Efficiency

Higher cooling and heating COP

▼ Higher COP [Heating 4.54]

COP Comparison (based on 14HP)

| Cooling |



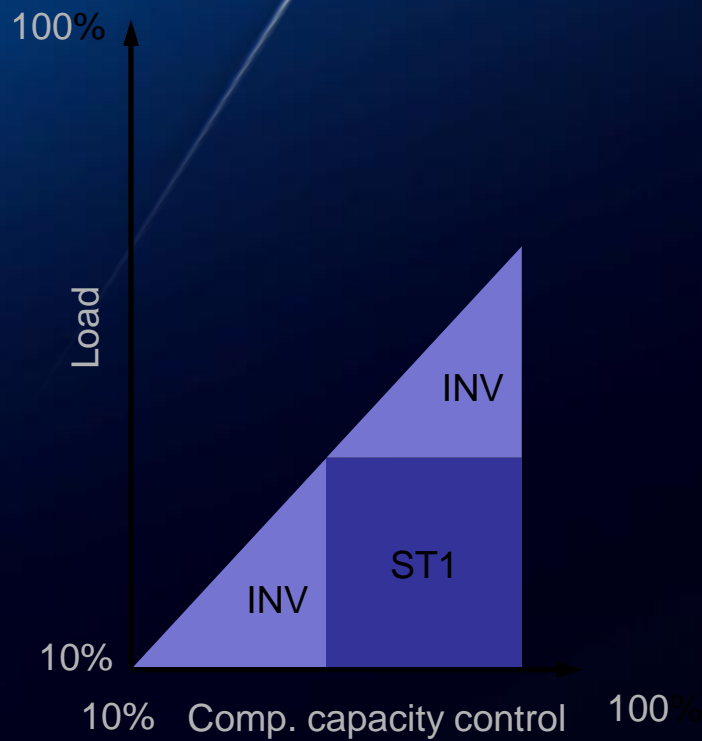
| Heating |



● Heat pump model [14HP]

How Does it Work?

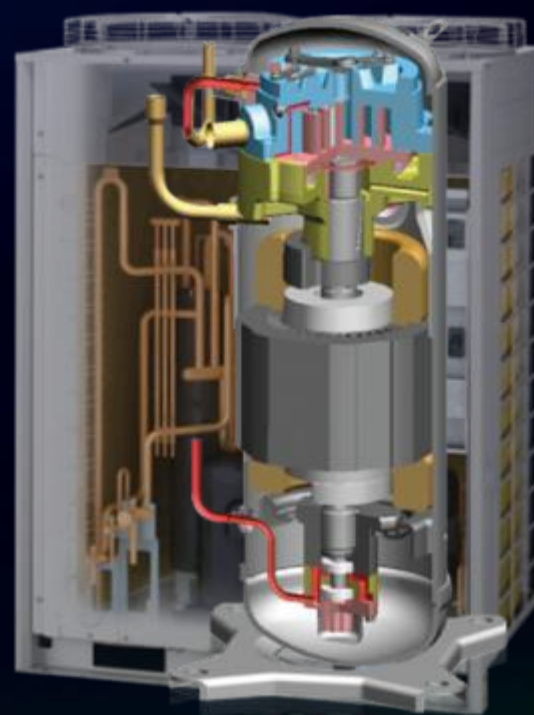
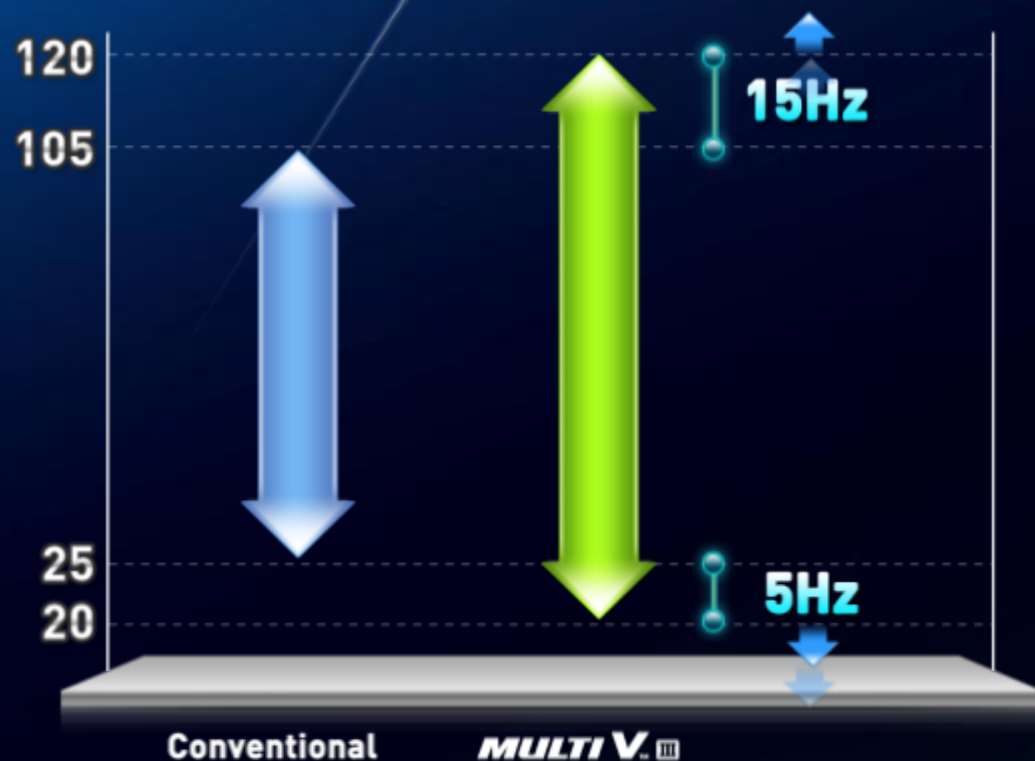
- Control of the refrigerant flow by inverter compressor



Wide range inverter control

- Wide range Inverter control & Improve energy efficiency Max 30%

Wide range Inverter



Variable Refrigerant Flow System

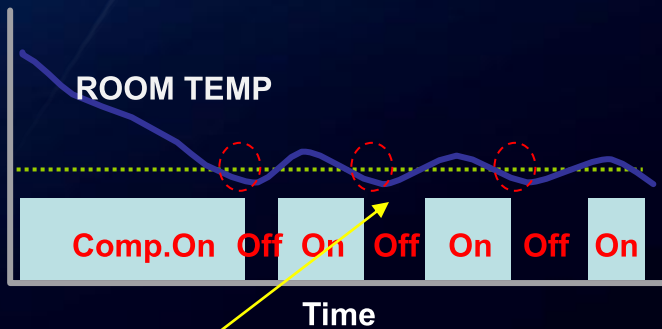


Owing to VRF Technology, **Multi V** is the Brand Name of LG.

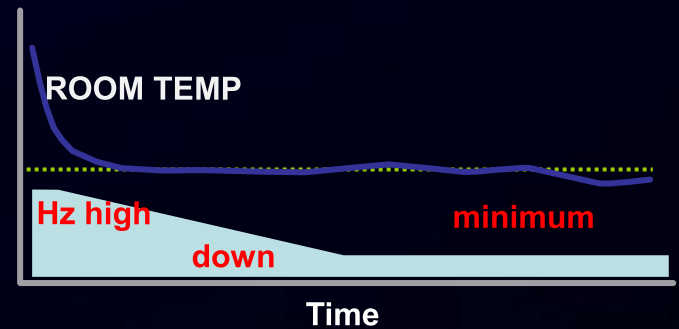
Multi V is the LG VRF system: -

Compared to the Common On-Off Controlled Compressor, the Inverter Controlled Compressor is able to run the proper revolution (Hz) in order to provide the best efficiency (power Consumption), Exceptional dehumidification & Temp Control.

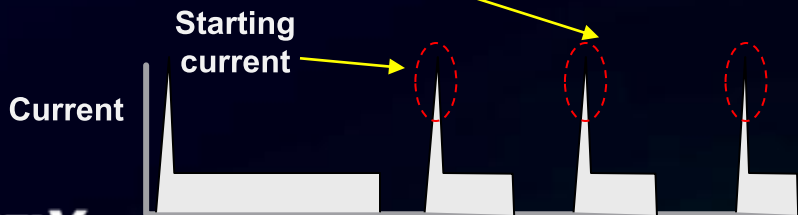
On-Off system



Inverter system



Energy loss



Power input



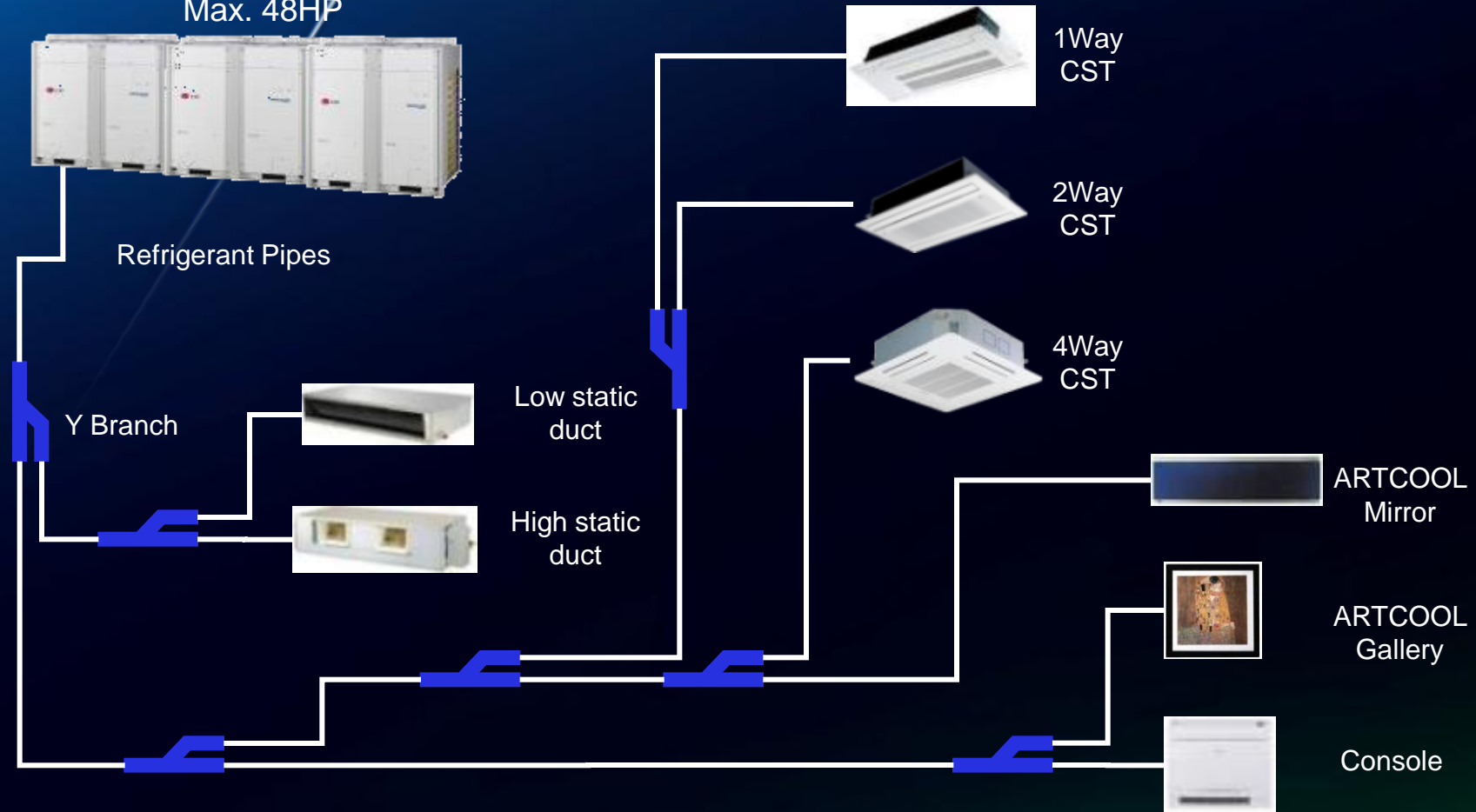
More convenience

Combination of Maximum 64 Indoor Units

■ Multi V III – Tropical Model

Max. 48HP

IDU combination Rate
Multi V III : 130 %



More convenience

Multi V Systems (VRF)



Multi V III
tropical



Multi V
Sync II



Multi V
Space III



Multi V Mini



Multi V DX AHU



Multi V Water II



Indoor Units Systems (VRF)



4-Way
Cassette



2-Way
Cassette



1-Way
Cassette



Art 1-Way
Cassette



Low Static
CCD



Built-In
CCD



High Static
CCD



Floor
Standing



Wall
Mounted



Artcool
Gallery



Artcool
Mirror



Ceiling
& Floor



Ceiling
Suspended

More convenience

Ventilation Systems (VRF)



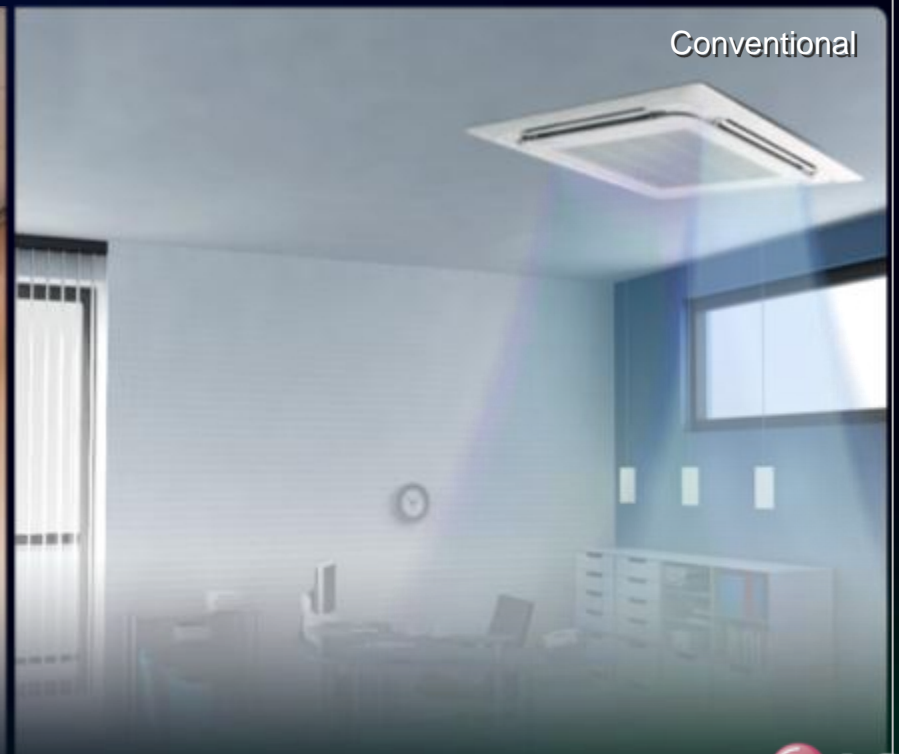
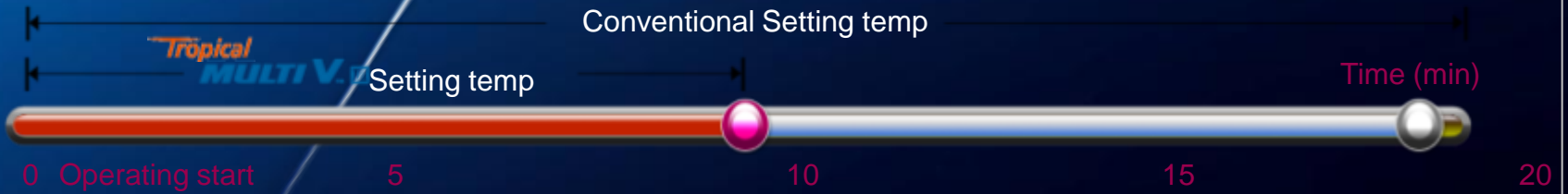
Control Systems (VRF)



More convenience

Fast Cooling / Heating

Make a customer comfortable by fast heating operation (also fast cooling is possible)



More convenience

MULTI V. III

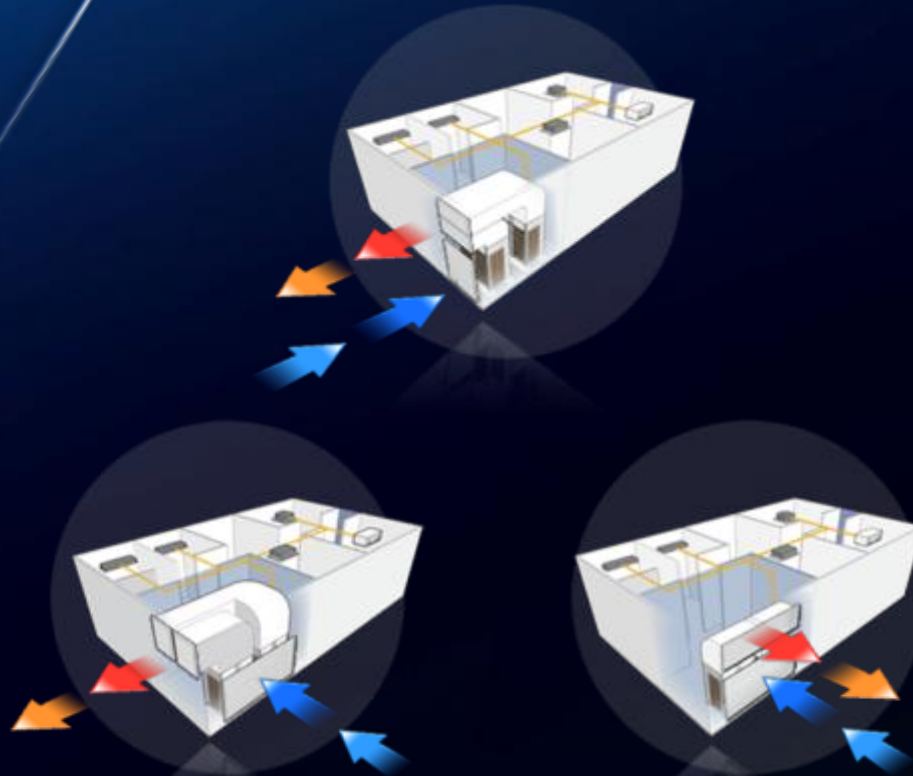
Night silent operation



More convenience

External static pressure

- ▼ Design & installation degree of freedom increase [Max 8mmAq]

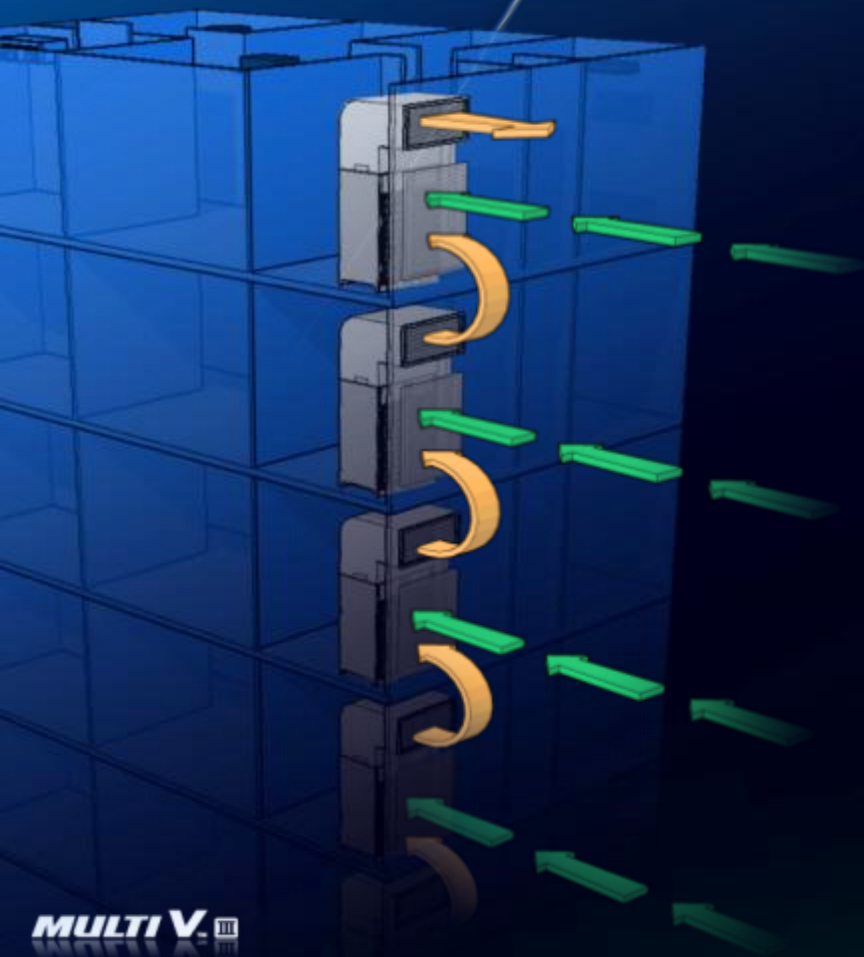


More convenience

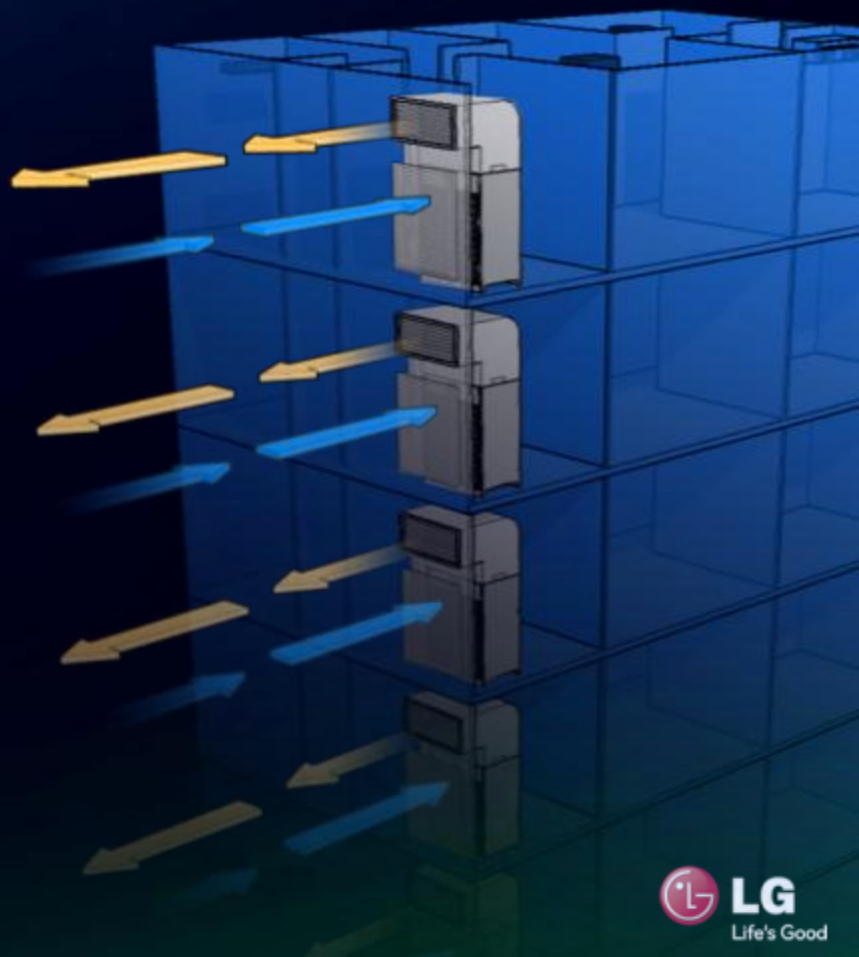
External static pressure

▼ Design & installation degree of freedom increase [Max 8mmAq]

Conventional



MULTI V. III

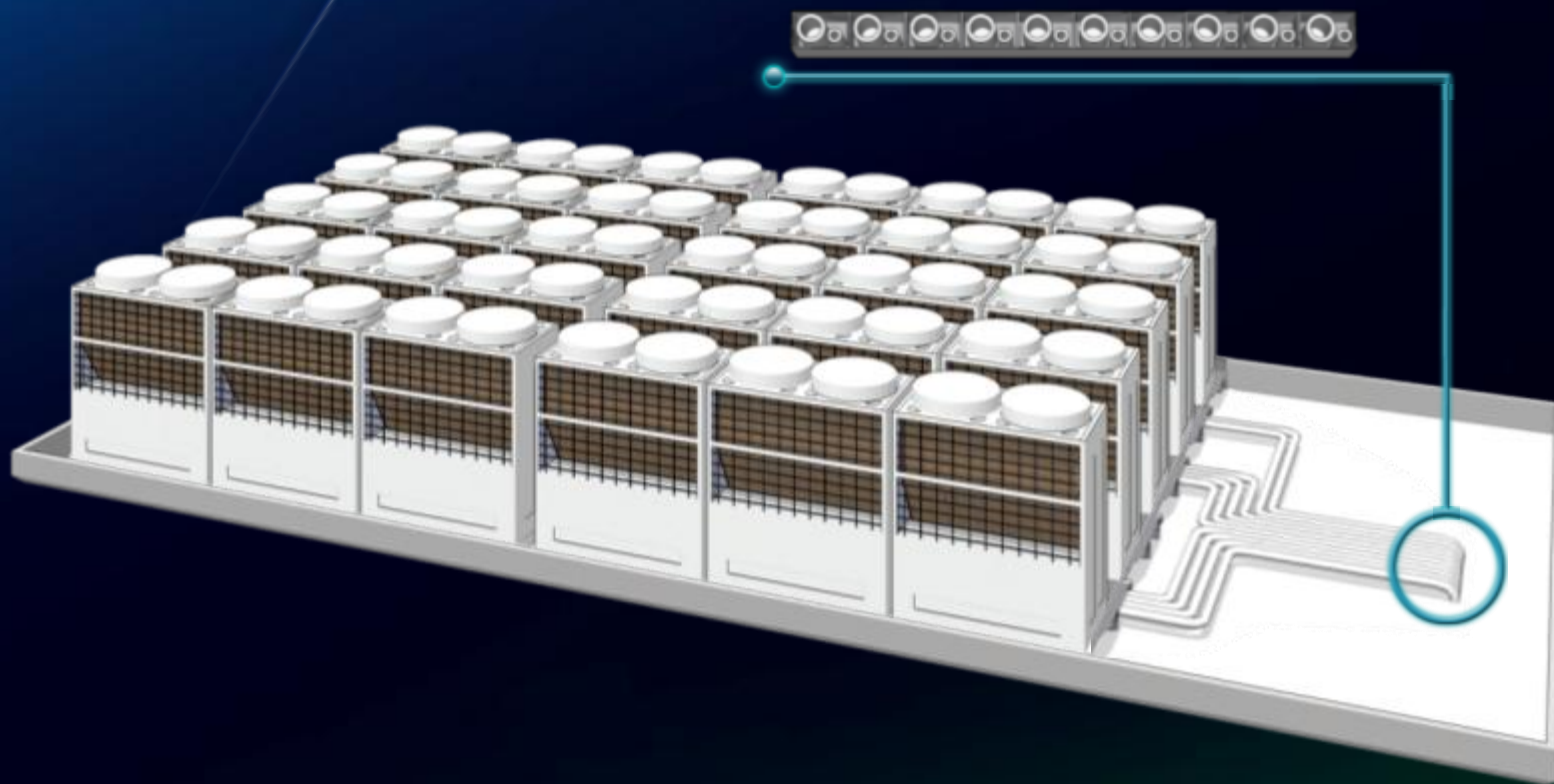


More convenience

Optimization of installation space

- Minimum installation space – max combination capacity : 80HP

Conventional



More convenience

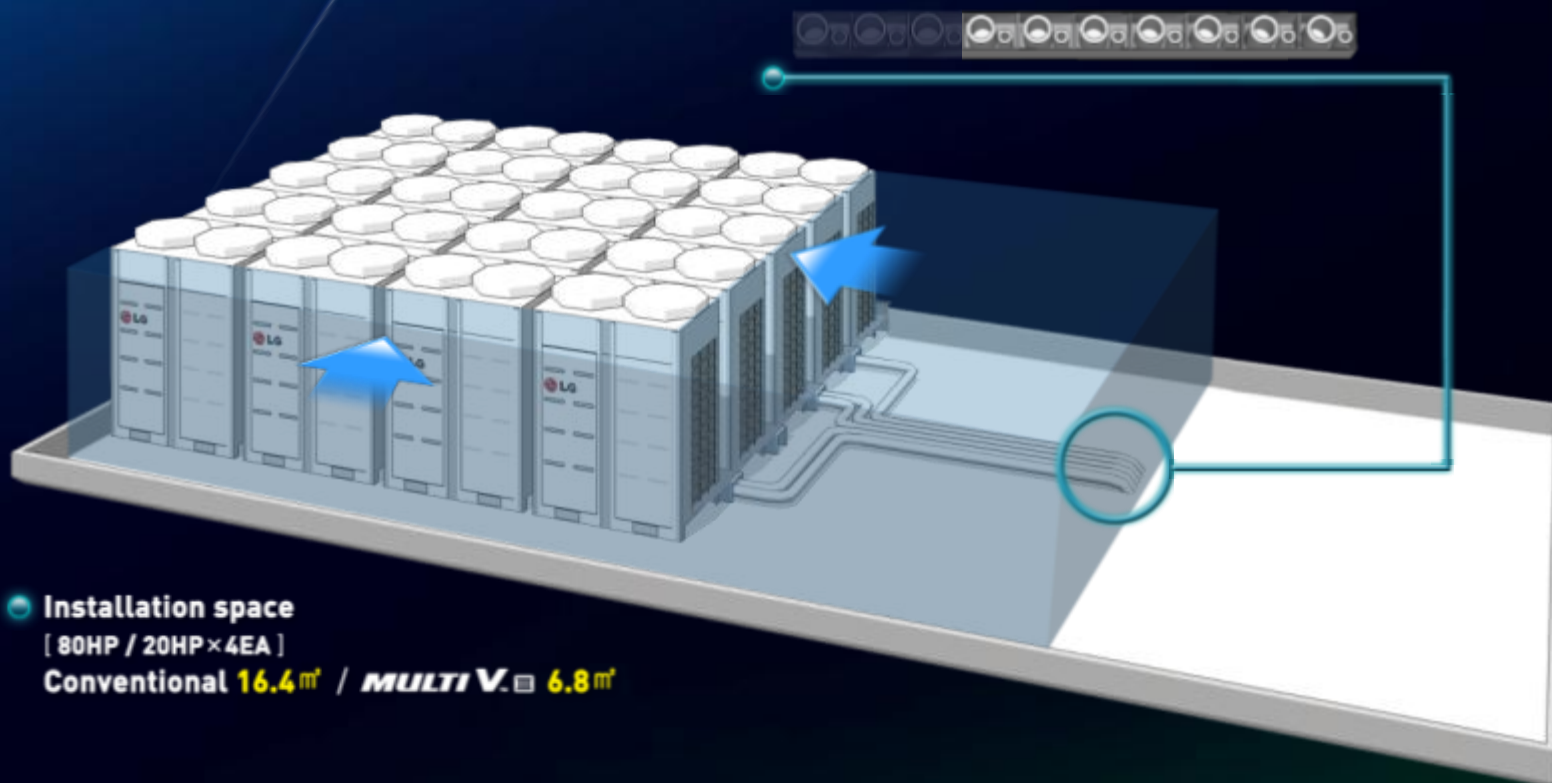
Optimization of installation space

Minimum installation space – max combination capacity : 80HP

MULTI V. III

58% Reduction

30% Reduction



Installation space

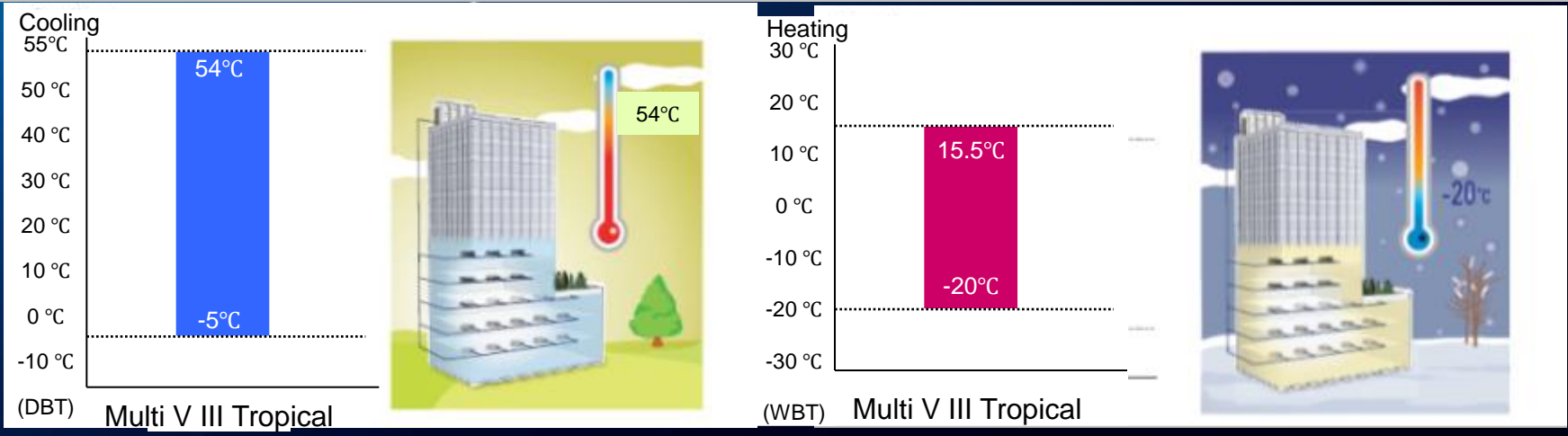
[80HP / 20HP×4EA]

Conventional **16.4m²** / **MULTI V. III 6.8m²**

More convenience

Wide Operation Range & Anti-corrosion Gold Fin

Wide Operation Range



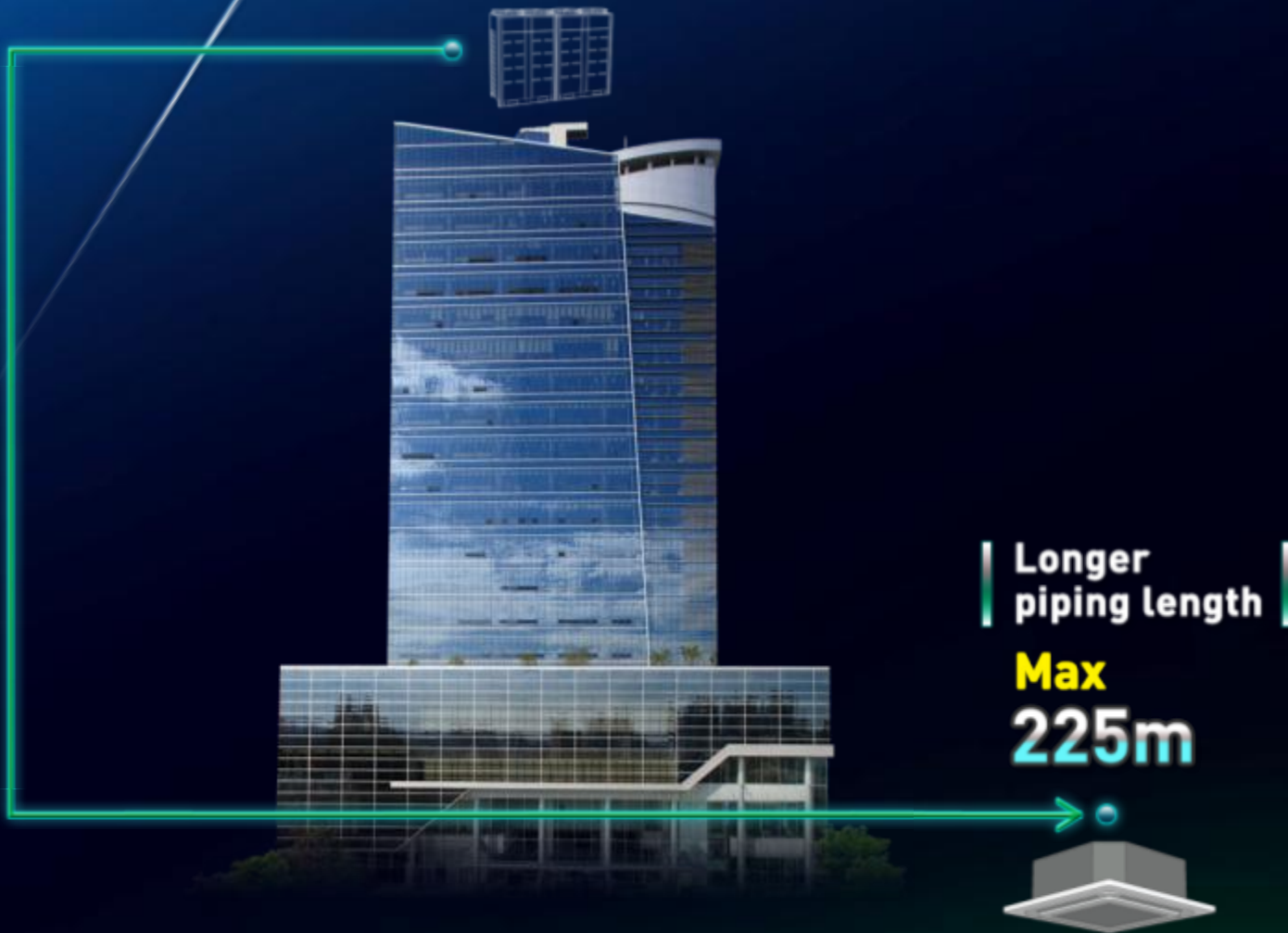
Anti-corrosion Gold Fin



Longer piping

Extending pipe length and elevation

▼ Difference of elevation technology



Longer piping

Extending pipe length and elevation

▼ Difference of elevation technology



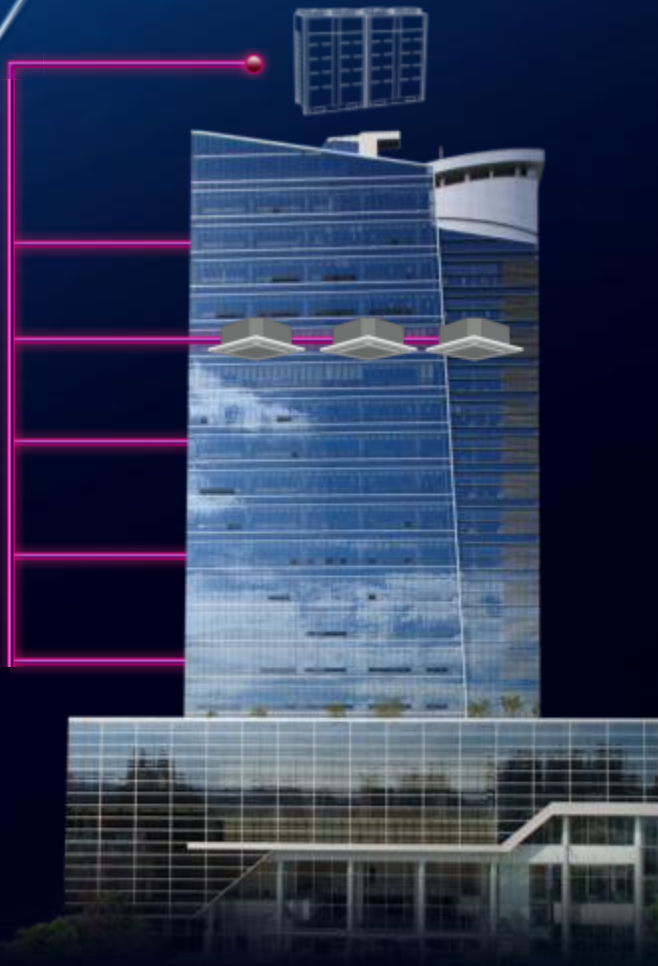
Level difference
between ODU and IDU

Max 110m

Longer piping

Extending pipe length and elevation

▼ Difference of elevation technology



| Total piping length |
Max 1000m

- Longer piping length : **Max 225m**
- Level difference between ODU and IDU : **Max 110m**
- Total piping length : **Max 1000m**

More Reliability

Fault Detection & Diagnosis

- ▼ Automatic test run, refrigerant amount check, and real-time inspection and pack-up operation for parts and sensors, maximizing reliability of the product.



FDD MICOM

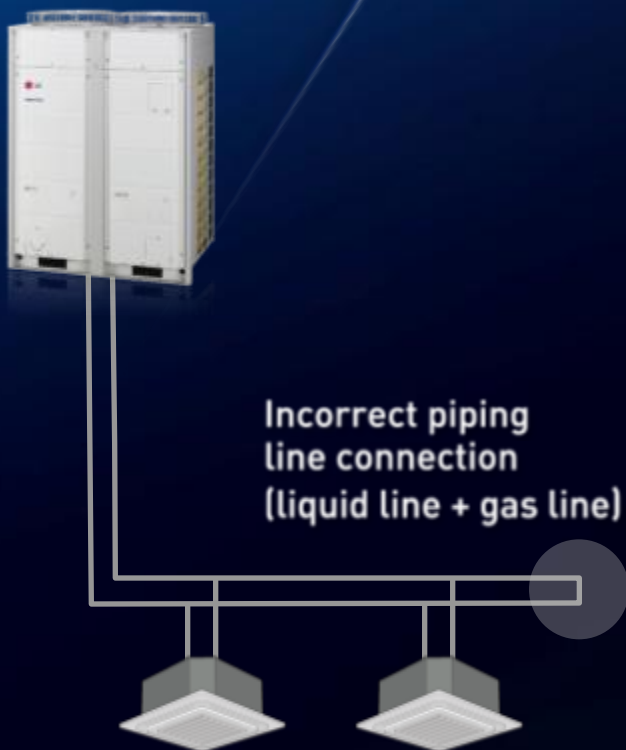
- 01 Automatic test run
- 02 Refrigerant amount check
- 03 Real-time diagnosis (refrigerant and parts)
- 04 Real-time back-up (compressor and sensors)

More Reliability

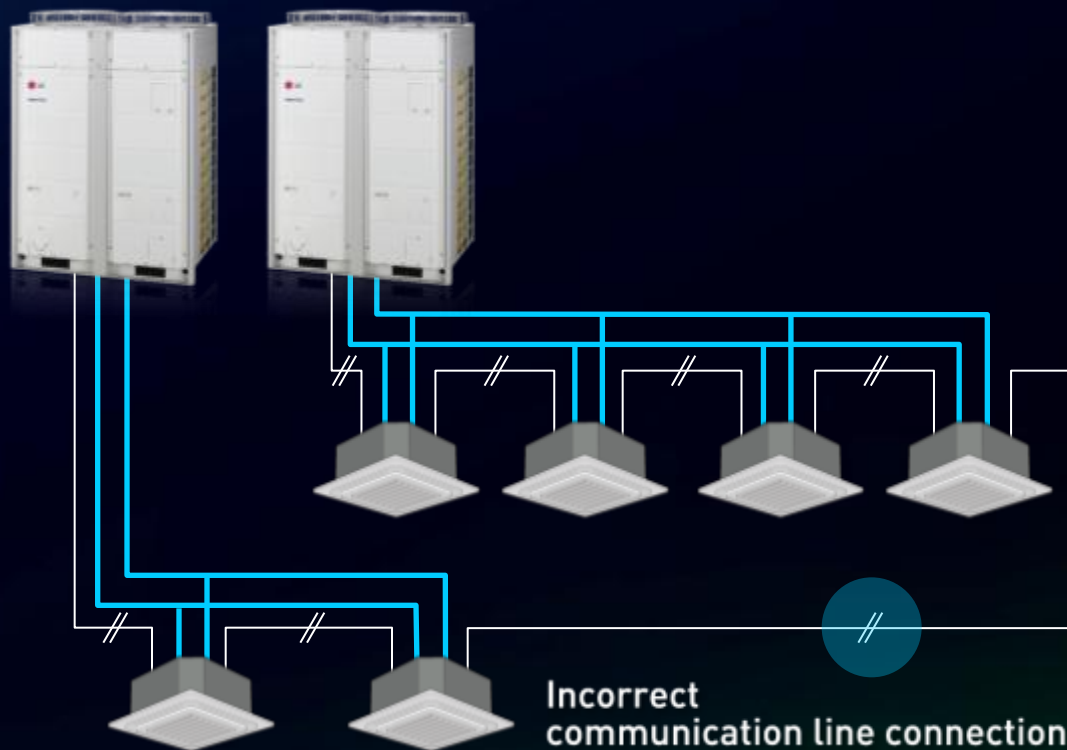
Fault Detection & Diagnosis

- Multi V III automatically checks the connections of piping and communication Lines and notifies the user if there is any problem

Incorrect piping notice



Incorrect communication notice

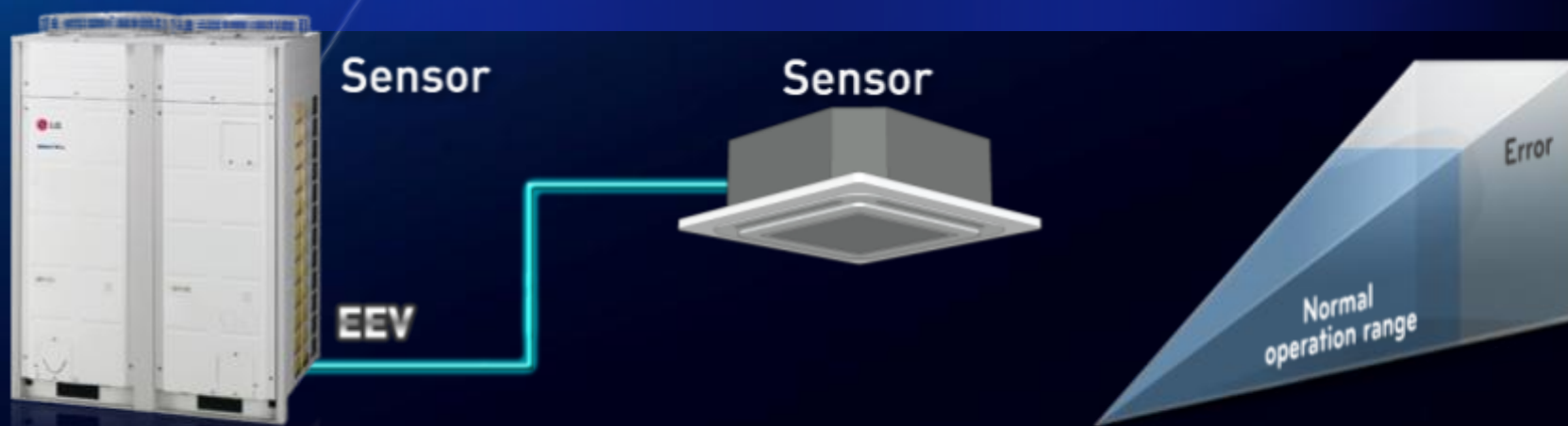


More Reliability

Fault Detection & Diagnosis

▼ Real-time automatic fault prediction function

Multi V III allows you to check the current status for the sensors and the EEV, which are the major components for system control, through a test run



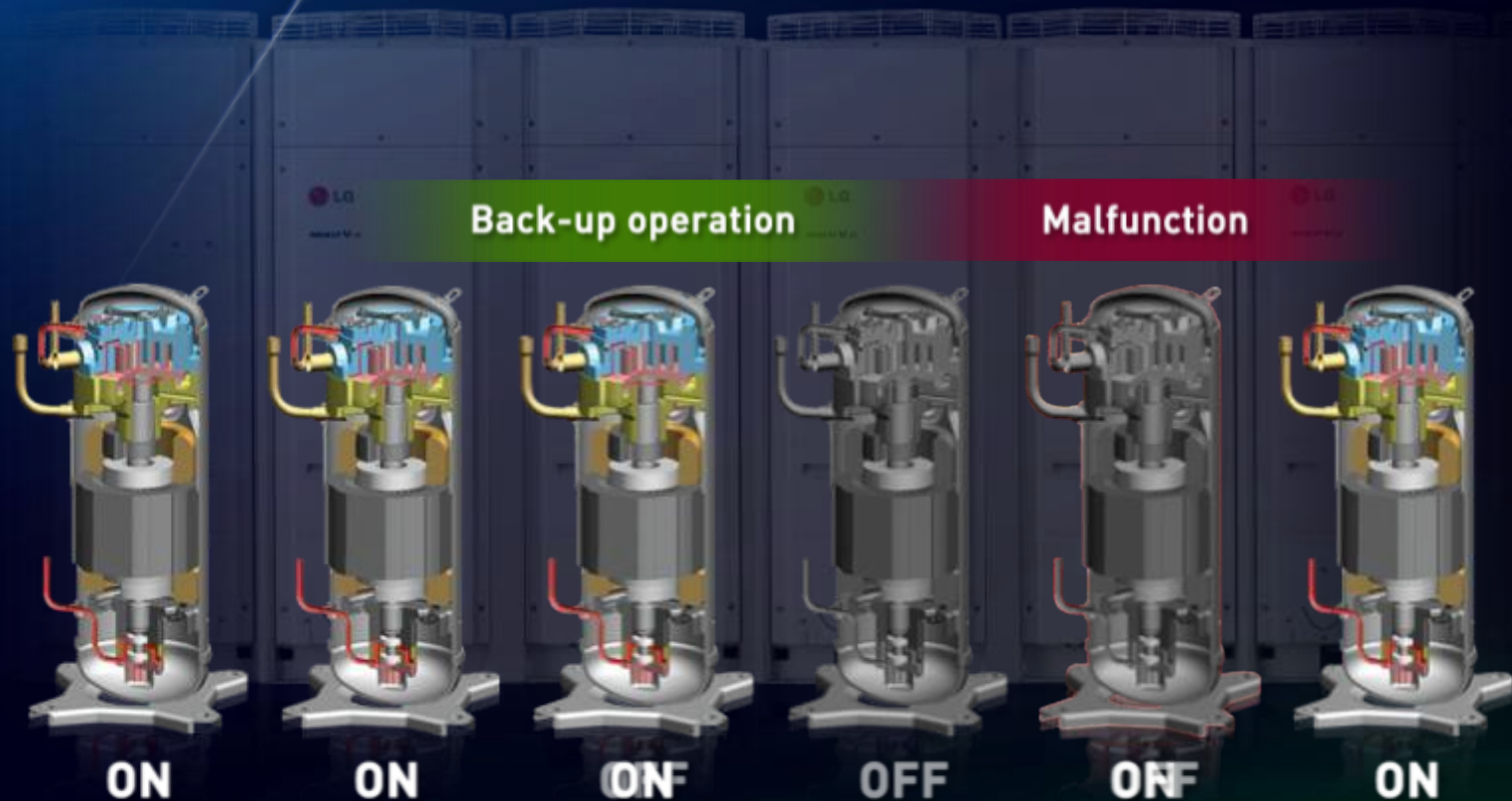
	Outdoor unit	Indoor unit
Temperature sensor	8	3
Pressure sensor	2	0

More Reliability

Fault Detection & Diagnosis

- ▼ Minimizing any inconvenience that may occur in an emergency situation

[Automatic] Emergency back-up

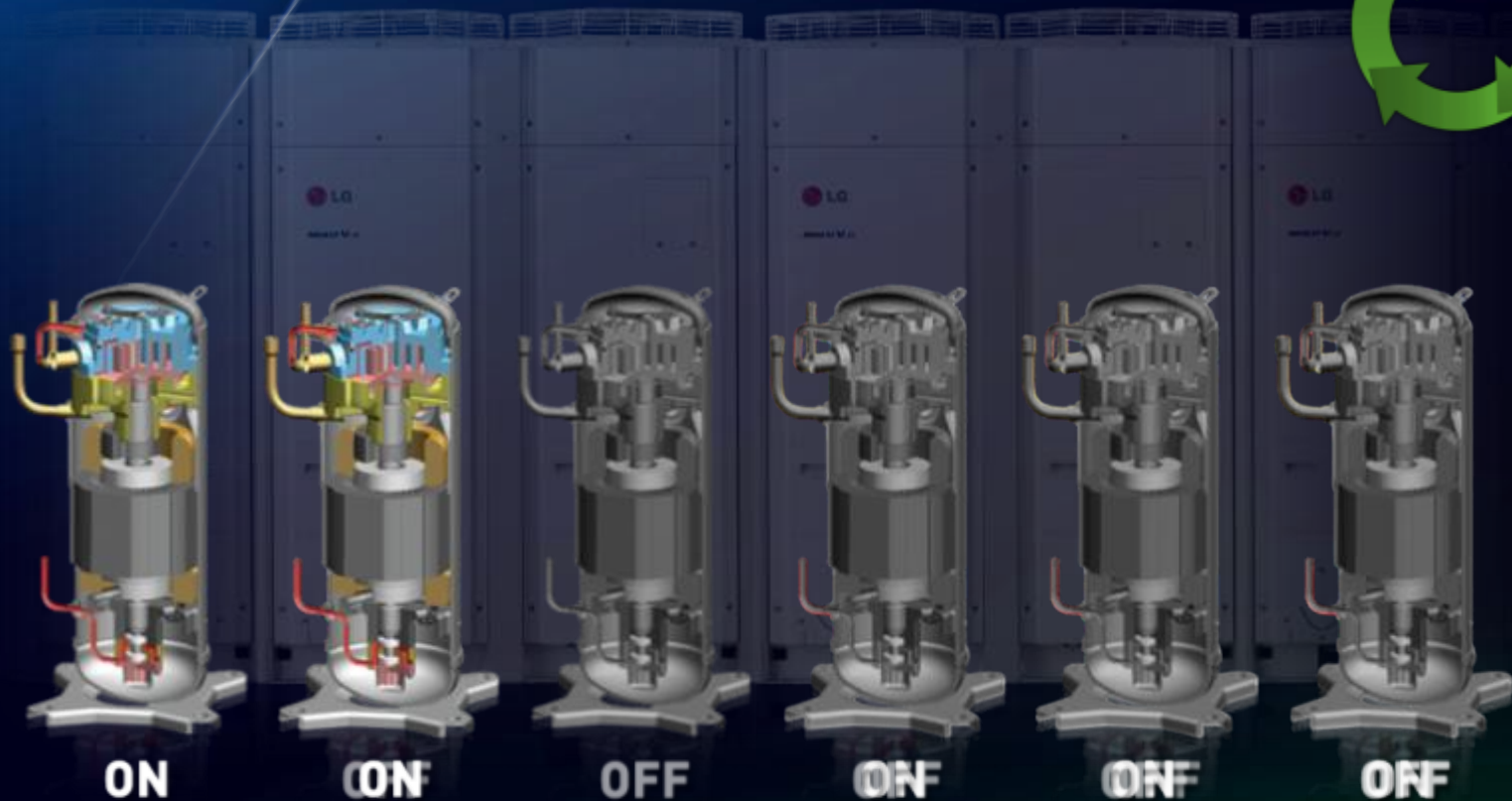


More Reliability

Fault Detection & Diagnosis

- ▼ Minimizing any inconvenience that may occur in an emergency situation

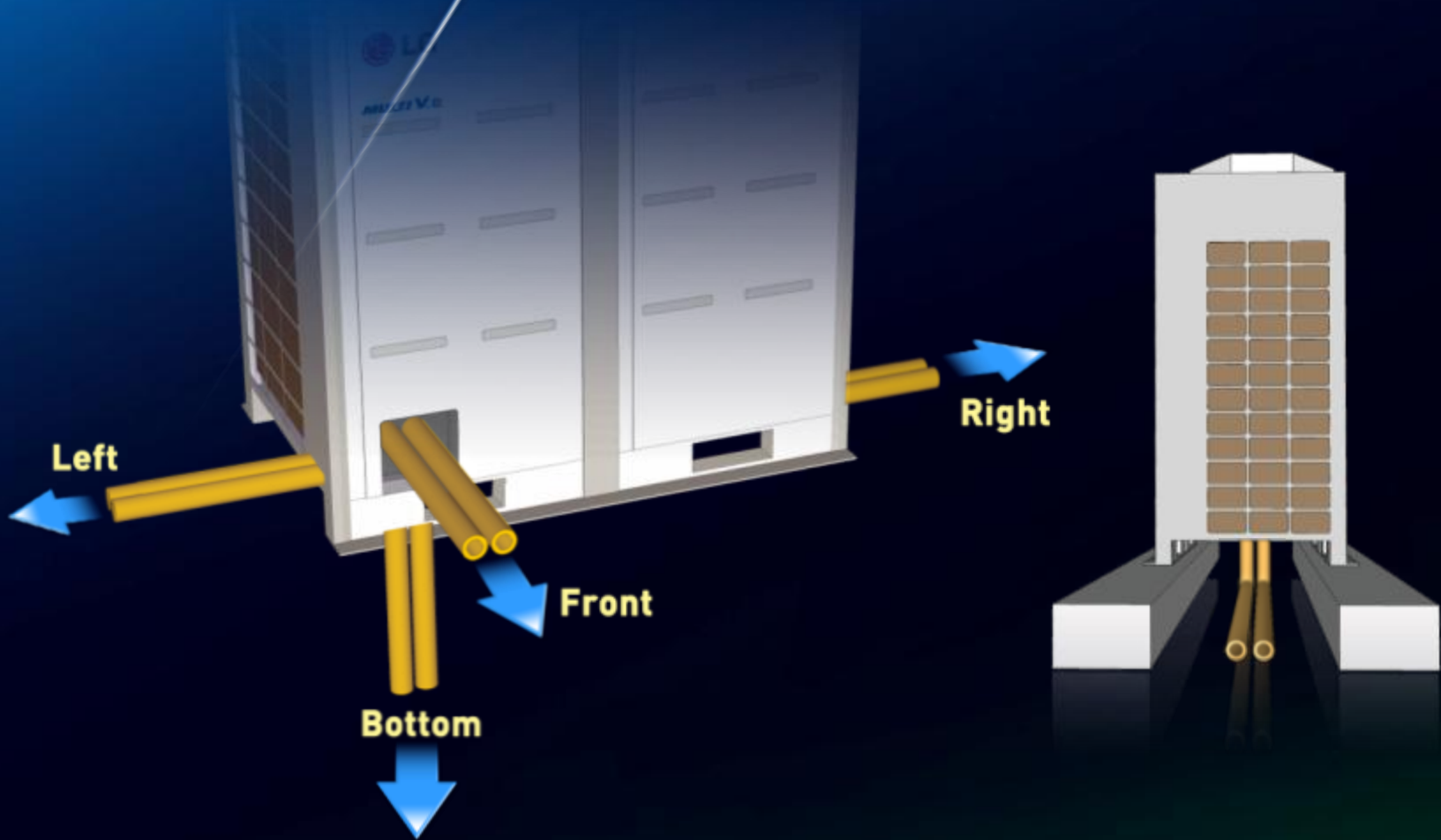
[Automatic] Alternative operation



More convenience

4way piping connection

- ▼ Easy to install refrigerant pipe & Easy SVC [front SVC are decrease]

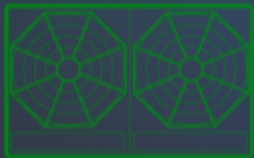


More convenience

4way piping connection

▼ Easy to install refrigerant pipe & Easy SVC [front SVC are decrease]

Conventional



900

C/Box Open area



MULTI V^{III}



500 SVC Area



Front SVC Area

Standing service available

45%

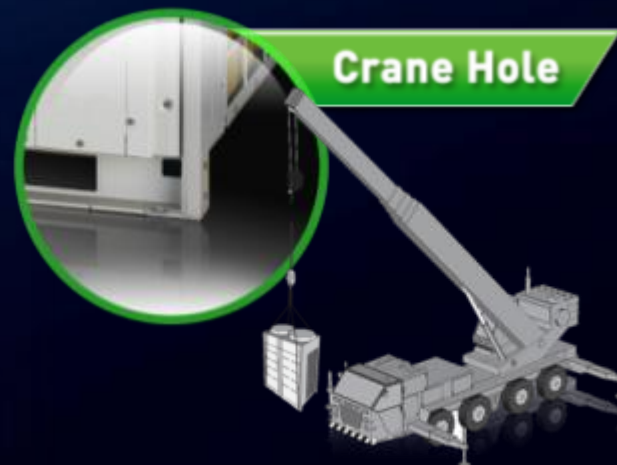
More convenience

Easy and safe transportation

- ▼ Size of outdoor unit is optimized. (Using elevator is possible)



20HP [350kg]
760×1,240mm

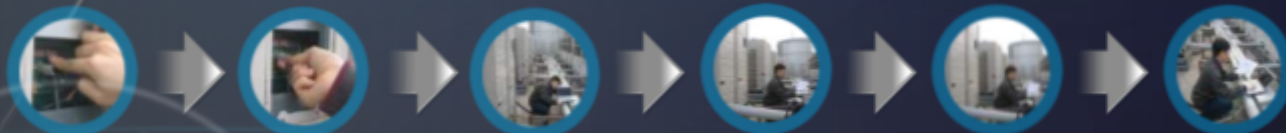


More convenience

Easy and fast test run

▼ Auto test run function

Conventional
Test Run



Setting

LGMV

PC

100%
operation

1 Unit
operation

Report

Auto Test Run



Start

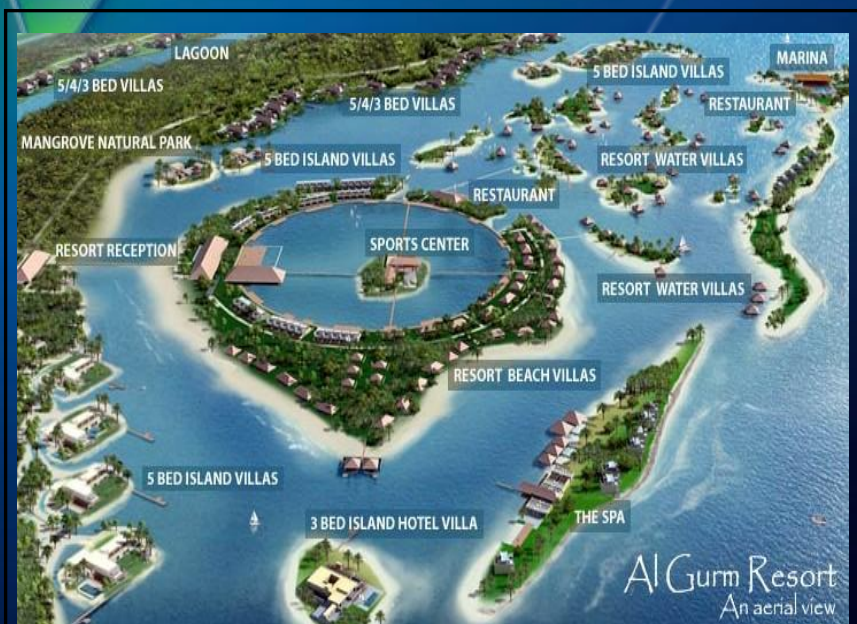
Report

Time save **60%**





5. Installation references-Residential



Al Gurm Resort

- **Project Name** : Al Gurm Resort
G+1 Villa - 65 Nos (Phase 1)
Total - 245 Villas
- **Location** : Abudhabi
- **Client** : Al Dar
- **Building Type** : Super Premium G+1 Villas
Villa Cost - 5 ~ 25M\$
- **Project Schedule** : Completion - END 2008
- **System Details**
 - Multi-V OD Units : 130 Nos. (TR)
 - Indoor Units : 520 Nos.
 - Controller : Wired Remote controller
 - Total AC Value : US\$ 1.8M CIF
- **Remark**
 - Client wanted the most innovative compatible to HomNet.
 - AC unit to match with the project image

5. Installation references-Commercial

MERAAS Sales centre – More concerned about the Operating expense since the client was paying the electricity bill. System operating since two years and passed two summers.

Total capacity – 120 TR

Consultant – SPW consultant



5. Installation references-Commercial

Project converted from Air-cooled Chiller system to Multi-V to reduce the capital cost and the connected Electrical power input.



- **Project Name** : BELHOUL Office Bldg
- **Location** : Dubai
- **Client** : BELHOUL
- **Consultant** : Nutek
- **Contractor** : ARJ
- **System Details**
 - Multi-V OD Units : 250 TR.
 - Indoor Units : 80 Nos.
 - Controller : Central Controller
- **Remarks**
 - Project converted from Air-cooled chillers to Multi-V.



5. Installation references-Commercial



Arial View of the Aviculture Project



Hubara

Hubara Bird culture

- **Project Name** : Hubara Bird culture
(Breeding facility of Endangered Middle-east bird)
- **Location** : Dubai – Alain Road
- **Client** : ADACH
- **Building Type** : 3 Bldgs which include Lab and Offices
- **Consultant** : Lab Design
- **Contractor** : Adearest
- **Project completion** : August 2008
- **System Details**
 - Multi-V OD Units : 1800 KW.
 - Indoor Units : 118 Nos.
 - Controller : Central Controller
- **Project requirement**
 - Less number of Outdoor units was required
 - Indoor conditions were closely monitored.
 - Multi-V auto back up was one of the key factor
 - Sustainable project.

5. Installation references-Commercial



ZUMA

Zuma Restaurant in DIFC

- **Project Name** : Zuma Restaurant
- **Location** : Dubai - DIFC
- **Client** : Zuma / DIFC
- **Building Type** : Restaurant
- **Consultant** : Design & Build – Penguin
- **Contractor** : Penguin Engineering.
- **Project Schedule** : June 7th 2008
- **System Details**
 - Multi-V OD Units : 5 sets.
 - Indoor Units : 20 Nos.
 - Controller : Wired Remote controller
 - Total AC Value : **US\$ 100K CIF**
- **Remark**
 - District cooling was not enough.
 - Client concerned about the operating cost.
 - Limited Condensing unit space in the parking.

5. Installation references-Commercial

KOREAN EMBASSY IN KUWAIT

-Total capacity of ODU – 250 TR

Important requirement of the client

- Centrally control the AC units from one location.
- Group control multiple units serving the same zone.
- Reliable operation even at Hi ambient temperature of 54 deg C.



5. Installation references-Commercial

Project – Monte Carlo branded Beach Club



1.1 DX-SPLIT DUCTED UNITS

1. General

Unit shall be air-cooled, multi split type air-conditioner consisting of one outdoor and multiple indoor units, each having capability of working independently with remote controller.

The out door shall have different capacities ranging from 8 to 36 HP, and 0.7HP to 10HP capacity range for indoor units.

The capacity of the out door unit ranging from 8HP to 12HP shall be of 1 module, the capacity of the out door unit ranging from 16HP to 24HP shall be of 2 modules and the capacity of the out door unit ranging from 26HP to 36HP shall be of 3 modules.

Compressor shall be a mix of one or more inverter & rest other constant speed scroll to work up to an ambient of 54 deg C. The hot gas bypass system shall be incorporated as a safeguard to the compressor in case of condenser blockage, adverse condition and capacity control. The system shall be able to change between cooling and heating from the selection at the thermostat.

Saadiyat Beach Club
Abu Dhabi, UAE

APPENDIX - A

I - AIR CONDITIONING AND VENTILLATION

SR NO.	ITEM	APPROVED MANUFACTURERS / MECHANICAL WORKS					
		MANUFACTURER (1)		MANUFACTURER (2)		MANUFACTURER (3)	
		NAME	ORIGIN	NAME	ORIGIN	NAME	ORIGIN
1	DX-System	LG	Korea	Daikan	Japan	Mistubishi	Japan

✓ AHU / FAHU is connected to Multi-V to achieve high EER to meet ESTIDAMA guidelines.

5. Installation references-Commercial



Arabian Horse Stud

- **Project Name** : Arabian Horse Stud
10 Horse Stable
(belonging to royal family)
- **Location** : Al Quadra Rd, Dubai
- **Client** : Engineers Office
- **Building Type** : Animal husbandry
- **Project Schedule** : Completion - Dec 2009
- **System Details**
 - Multi-V OD Units : 800 TR
- **Remark**
 - Client wanted Green Refrigerant, 24 Hours operation, auto back up & and fast track completion.

5. Installation references-School

American Academy school – Premium plus school in Khalifa city. This school has adopted the sustainable practices by implementing LG Multi-V VRF AC system. They have adopted AHU for Fresh air and recirculating air, which is integrated with Multi-V system. Multi-V system is integrated with the BMS system with the help of interface device.

Total capacity – 3800 KW

Consultant – National Engineering Bureau



5. Installation references-School

Project – Al Mootasem school for

Boys



✓ Retrofit project to replace DX Split units with VRF to benefit from Lower life cycle cost of VRF System and to meet Sustainability guidelines of Estidama.

5. Installation references-School

Project – Ministry school for Girls



✓Retrofit project to replace DX Split units with VRF to benefit from Lower life cycle cost of VRF System and to meet Sustainability guidelines of Estidama.

5. Installation references-School

Project – Ministry schools in Abudhabi



✓ Retrofit project to replace DX Split units with VRF to benefit from Lower life cycle cost of VRF System and to meet Sustainability guidelines of Estidama.

5. Installation references-School



Brighton College, Abudhabi

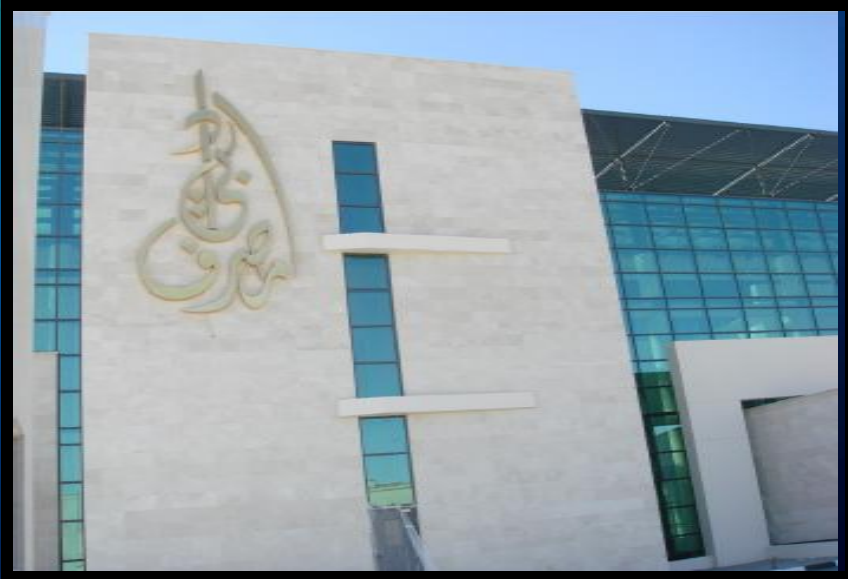
School Building

- Client – Bloom Properties
- Consultant - APG Consultant
- Contractor – Schneider contracting
- Total capacity of ODU – 1200 TR

Important requirement of the client

- BMS compatible AC system.
- Operating cost a major concern. Therefore they adopted Multi-V system with 12.5 EER.
- Higher emphasis on Indoor air quality since it is a college. LG provided FAHU connected to Multi-V system
- Reliable operation even at Hi ambient temperature of 54 deg C.

5. Installation references-Bank



Project summary

- **Project Name** : **Dubai Bank**
- **Location** : **Mirdiff, Dubai**
- **Client** : **S S Lootah Building & Construction**
- **Building Type** : **Commercial**
- **Project Schedule** : **July, 2009**
- **System Details**
 - **Multi V Outdoor Units** : **19 Nos. (159.2TR)**
 - **Indoor Units** : **38 Nos.**
 - **Controller** : **Simple Wired Remote controller**
- **Remark**
 - **Project converted from Daikin VRF to LG Multi V**
 -

5. Installation references-Bank



Project summary

- **Project Name** : **Ajman Bank**
G+2+Building
- **Location** : Ajman
- **Client** : Edara
- **Consultant** : Mac-Nally consultant
- **Building Type** : Bank
- **Project Schedule** : Completion - END 2008
- **System Details**
 - Multi-V OD Units : 8 Nos. (220 TR)
 - Indoor Units : 43 Nos.
 - Controller : Simple Wired Remote controller
- **Remark**
 - Client wanted alternate to Air-cooled Chiller system.
 - Client wanted individual billing to each office.

5. Installation references-Bank

Project – Al Khaliji Bank HQ



Project summary

- **Project Name** :AL JAZI TOWER
2B+G++18 Bank Building
- **Location** :DOHA, QATAR
- **Client** :AL KHALIJI HQ BANK.

- **Building Type** : OFFICE BUILDING
(ONLY 2ND 3RD & 4TH FLOOR)
- **Project Schedule** : END 2008
- **System Details**
 - Multi-V OD Units : 6 Nos. 162(TR)
 - Indoor Units : 42 Nos.
 - Controller : Simple Wired Remote controller
 - Total AC Value :
- **Remark**
 - Client wanted the most premium AC system
 - High Elevation

5. Installation references-Hotel / Resort



DHALAK RESORT PROJECT

- **Project Name** : Dhalak Resort Project
- **Location** : Dhalak, Eritrea
- **Client** : Qatari Diar
- **Building Type** : Resort
- **Consultant** : WS Atkins
- **Contractor** : QDVC
- **MEP Contractor** : Voltas International
- **Project Schedule** : September 2010
- **System Details**
 - Multi-V OD Units : 30 sets.
 - Indoor Units : 165 Nos.
 - Controller : Function Controller.

Remark

- Less number of Outdoor units was required
- LG has given full support through training and installation support

**Contact:- Eng. Shekar Bhole
Project Manager, 33249825**

5. Installation references-Hotel / Resort

SAVANNAH, FLAMINGO RESORT

Sir Baniyas Island

- Client – TDIC
- Consultant - Atkins consultant
- Contractor – Al Shafar Contracting
- Total capacity of ODU – 800 TR

Important requirement of the client

- **Comply with Estidama 2 pearl rating.**
- **High COP requirement of 3.8.**
- **Lower Power input required as the power is generated through Diesel generator.**





MULTI V™ 

