

MULTI V 2022

MULTI V™

For TROPICAL REGION

2 0 2 2

LG HVAC SOLUTION



LG Electronics

<http://www.lg.com>
<http://partner.lge.com>

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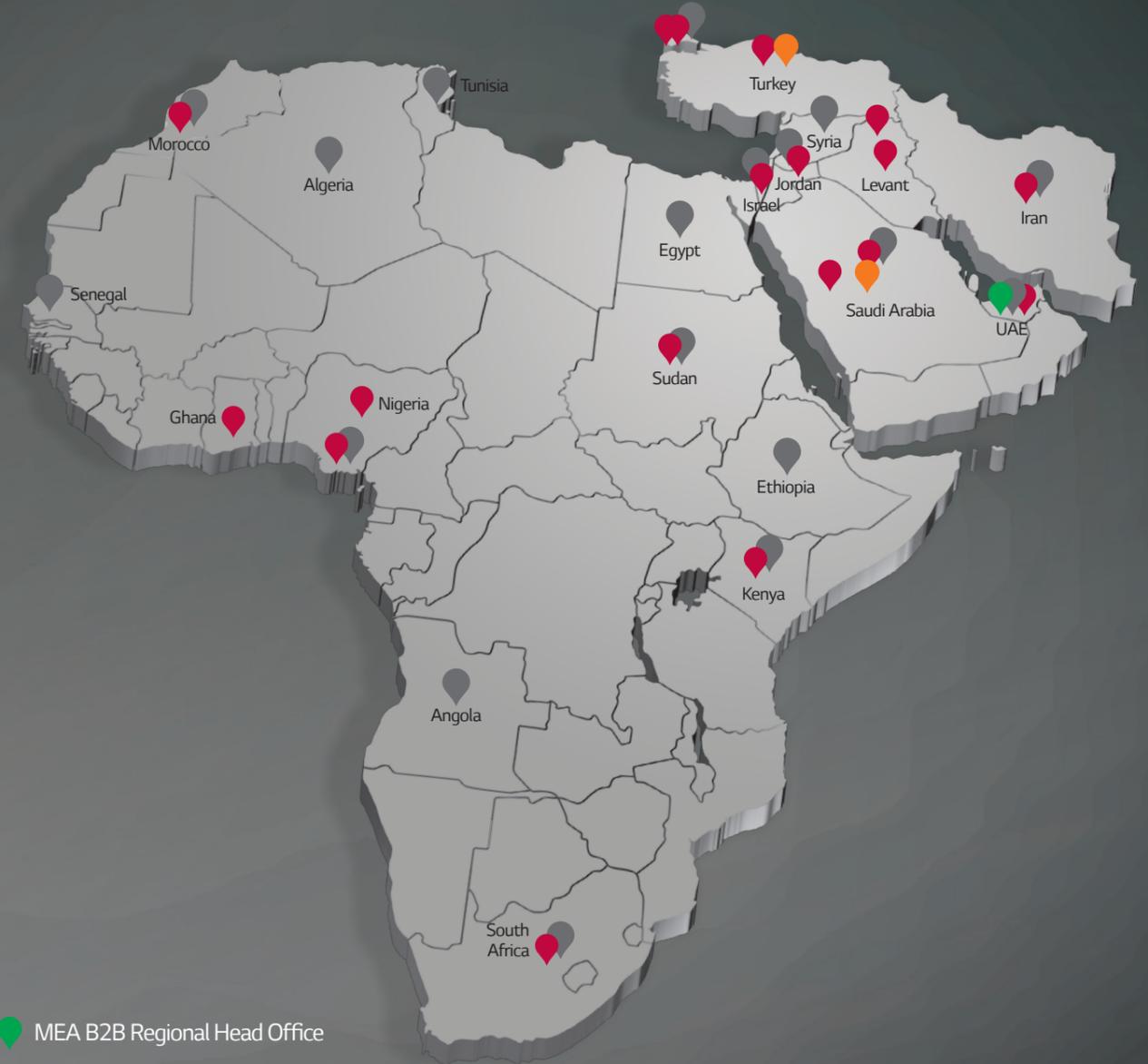
LG AIR SOLUTION

AS A TOTAL HVAC & ENERGY SOLUTION PROVIDER

INFRASTRUCTURE IN MIDDLE EAST & AFRICA



* LG Air Solution production sites



- MEA B2B Regional Head Office
- Production Site : 2
- Sales Office : 18
- Academy : 18



The LG Electronics Air Solution Business Unit is a provider of total HVAC and energy solution. The company offers a broad portfolio of air conditioner products that are compatible with any building anywhere, including residences, skyscrapers, factories, conference and concert halls. As a true total HVAC and energy solution provider, LG also supplies even the largest buildings and industrial facilities with central air conditioning systems such as chillers and efficient control solutions. The history of the business unit goes back to 1968, when LG (then called GoldStar) rolled out Korea's first residential air conditioner. As the company first began making chillers for large commercial buildings in 1970, the commercial air conditioning business has grown exponentially, especially within the last

20 years. In 2008, LG sold its 100 millionth air conditioning unit, becoming the first company in the industry to reach that significant milestone. The success of LG air conditioners has allowed the company to become one of the major players in the highly competitive HVAC industry. By enhancing the industry's B2B infrastructure and finding further solutions for the HVAC sector, LG has risen to become a total HVAC solutions specialist. The company has steadily increased its sales and market share by introducing energy efficient and reliable HVAC solutions and actively pursuing new opportunities wherever they arise. This sustained, excellent performance is built on a solid foundation of global R&D and advanced manufacturing capabilities.

MULTI V™

BRAND HISTORY

From the moment when LG introduced Korea's first residential air conditioner in 1968, the company has continuously enhanced its technological innovation and credibility. As a result of sustained improvement, LG launched its first VRF system; Multi V in 2006 and achieved significant results. With world's top class compressor and innovative technology competency applied on every part, cycle and controlling solutions, it has evolved to be one of the world's most efficient and reliable VRFs.

Following the first and second generations with Inverter technology and non-ozone depleting refrigerant, MULTI V III has advanced its efficiency with diverse cutting-edge technologies such as HiPOR™ that directly returns oil to compressor and Vapor Injection that allows double compression by adding mid-pressure refrigerant. The innovative technologies of 4th generation secured MULTI V brand the product leadership based on efficient system like Smart Load Control that controls operational load according to external temperature and other technologies that are optimized to manage refrigerant and heat exchange for all cooling, heating and part load operations. Moreover, wide range of MULTI V line up has been developed to satisfy extremely hot climate of desert areas in the Middle East and Africa region. MULTI V can perform stable operation even at high temperature and its overall reliability and performance have been improved specialized for dusty environments like Auto Dust Removal.

In 2017, finally, the time has arrived for the ultimate VRF system, MULTI V 5. This generation has fully improved its technological potential with ever powerful and reliable yet economical LG's Ultimate Inverter Compressor, Ocean Black Fin with the most effective corrosion resistance performance and biomimetics technology-applied, enlarged fans. At the same time, the Dual Sensing Control offers users the most pleasant environment while minimizing the unnecessary energy loss with system that senses both the temperature and humidity to efficiently manage cooling, heating and part load operations.

With MULTI V 5 that has been solely designed for the ultimate efficiency, performance, flexibility, comfort and control, we are highly confident to bring the ultimate pleasant air experience.



MULTI V™ 5

- Dual Sensing Control
- Ultimate Inverter Compressor
- Large Capacity Outdoor Unit with Biomimetics Technology Fan
- Ocean Black Fin
- Auto Dust Removal

2006 MULTI V™

- Ø7.0 Corrugate
- Fuzzy Algorithm
- AC Inverter
- R410A

2008 MULTI V™ III

- Ø7.0 Wide louver
- Fuzzy Algorithm
- LGDC Inverter

2011 MULTI V™ III

- High Pressure Oil Return
- Vapor Injection

2014 MULTI V™ IV

- Active Refrigerant Control
- Smart Load Control
- Auto Dust Removal

DUAL SENSING CONTROL

The cooling load is mainly based on the amount of both sensible heat load and latent heat load. Most importantly, the cooling load is keen to, and thus, greatly affected by external humidity, rather than the outdoor temperature. For such reason, Dual Sensing Control of MULTI V 5 senses both temperature and humidity and applies sensed data for load control in order to obtain in-depth understanding of sensible heat load and latent heat load. This helps preventing excessive cooling load supply and eventually offers the most pleasant and comfortable cooling environment the users want with reduction in energy consumption.

Previous VRF : Single Sensing



DID YOU KNOW THAT VRF UNTIL NOW HAS ONLY SENSED SINGLE INFORMATION?



MULTI V 5 : Dual Sensing



Smart Load Control (SLC)

This comprehensive understanding of environmental conditions allows optimized energy efficiency and maximized indoor comfort level.

* LG internal test result

Seasonal Efficiency

Up to 34%
(vs. standard mode at MULTI V IV 10HP)

Comfort Cooling

This maintains operation at mild cooling mode around set temperature without stopping in between operations for maximized user comfort.

Improved Indoor Comfort

ULTIMATE INVERTER COMPRESSOR



As the core technology of the air conditioning system, the Ultimate Inverter Compressor of MULTI V 5 boasts its ultimate efficiency and durability, designed based on the unique technology and innovation of LG HVAC.

10% IMPROVED ENERGY EFFICIENCY ENHANCED COMPRESSOR RELIABILITY

All Inverter

Provide high efficiency with low vibration and low noise

Six By-pass Valves

Prevent compressor damage due to excessively compressed refrigerant more efficiently than 4 by-pass valves

01. Vapor Injection

Maximize heating capacity via two-stage compression

02. Enhanced Bearing with PEEK Material

Newly invented system motivated by PEEK (Polyetheretherketone) bearing used for aero engine to increase operation range and durability

03. Wide Operation Range from 10 to 165Hz

Improved part load efficiency at all operation ranges

04. HiPOR™ (High Pressure Oil Return)

Resolve compressor efficiency loss caused by oil return

05. Smart Oil Management

Oil level detection in real time

01

02

03

04

05



10% IMPROVED AIR FLOW RATE
20% REDUCED POWER CONSUMPTION
*Based on 290 m³/min



LARGE CAPACITY OUTDOOR UNIT WITH BIOMIMETICS TECHNOLOGY FAN

As a result of the biomimetics technology invented through years of joint study with Department of Mechanical and Aerospace Engineering of Seoul National University, the fan of MULTI V 5 increased wind capacity while it reduced its power consumption when operating.



Humpback Whale Design

Inspired by the bumps on the humpback whale's flipper, the tubercles on the back side increased wind power by reducing flacking.



Clam Shell Pattern

Like the clam shell textures, the range difference created by moire pattern reduced noise level.



Increased Air Flow Rate

With extended shroud, discharged air current is stabilized and power consumption is reduced.

Large Capacity Outdoor Unit

Enhanced core parts like biomimetics technology-based fans, 4-sided heat exchanger as opposed to 3-sided heat exchanger of previous model and compressor with increased efficiency and capacity allow large capacity for outdoor units. A single unit of MULTI V 5 can provide up to 20HP.

OCEAN BLACK FIN HEAT EXCHANGER

LG's exclusive "Ocean Black Fin" heat exchanger is specially designed for durable and long-lasting performance even in corrosive environments. The black coating is applied for protection from various corrosive external conditions and the hydrophilic film keeps water from accumulating on the heat exchanger's fin, minimizing moisture buildup. This improvement in durability prolongs the product's lifespan and lowers both the operational and maintenance costs.

Ocean Black Fin

CERTIFICATE OF VALIDATION

Certificate Number: 4786735320-1 / 4786735320-15-1
 Report Reference: 2015-03-25
 Issue Date: 2015-03-25
 Expiration Date: 2018-03-24
 Issued to: LG Electronics Inc.
 76 Seongsandong, ChangwonSI, Gyeongsang, 641-713, Korea

UL

Claim Validated: Aluminum Fin & Copper Tube Heat Exchanger employed on the Outdoor Unit of Air-Conditioners. Simulating the corrosive load for 27 years of exposure in a more severe traffic environment with salt contaminated (Test Method B).

Tests: Test method B of ISO21207: Salt contaminated condition + severe industrial or traffic environment

Standards / Regulations: ISO 21207 6.2 & Annex A
 LG(89)4-148

This certificate and the claim validation results on the expiration date listed above, is validated the claim based upon criteria defined by the client. Client's use of the validated claim on or in connection with the product is not a warranty. Client's representation that the claim is true and accurate. UL neither selected the samples nor determined whether the samples were representative of production units. The test results apply only to the actual samples tested. UL is not responsible for the scope of the test performed or for the accuracy of test data generated by third parties. Please see test report for full details including test standards.

This certificate is not a warranty or makes Listing, Classification or Recognition or other certification by UL, and does not authorize the use of UL Listing, Classification or Recognition Mark on or in connection with the product. The validated claim relates solely to product performance and is not a warranty or other evaluation of the safety of the product described above.

Chunsoo Kim
 Engineering Director
 UL Korea Ltd.
 20th Fl. Gangnam Finance Center, 771
 Yongsan-ro, Gangnam-gu, Seoul, Korea

UL

* Test Method B of ISO21207, 6.2 & Annex A
 (Test condition : Salt contaminated condition + severe industrial/traffic environment (NO_x/SO_x))

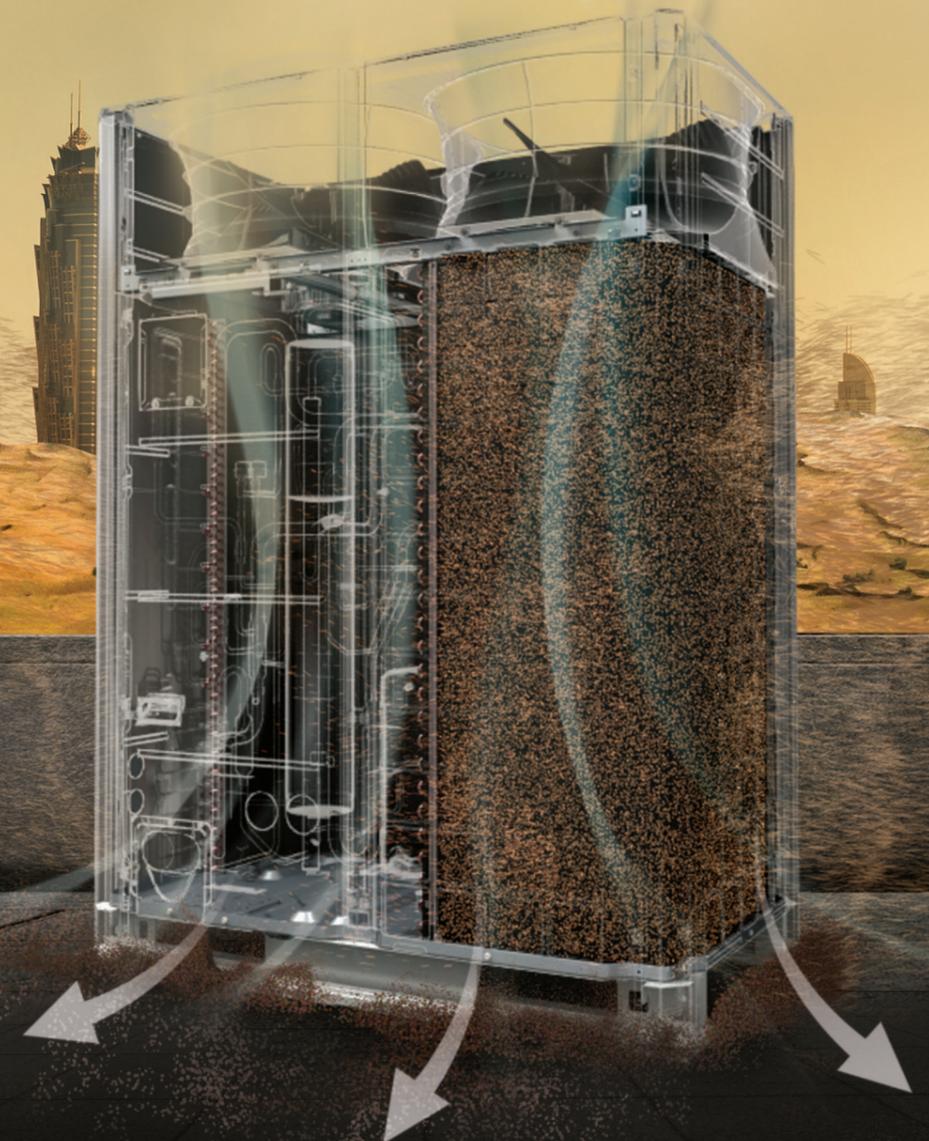
* Based on 1,500 hours



AUTO DUST REMOVAL

Auto Dust Removal

This feature in Multi V.5 removes dust on outdoor unit heat exchanger. The outdoor unit fan(s) rotate reversely to blow off the dust. Once the accumulated dust on the heat exchanger is removed, the fan(s) rotates normally and unit goes back to normal operation.



BUILDING OWNERS

With increased reliability of core parts such as compressor and heat exchanger, as well as high operational efficiency, building owners can significantly reduce operational costs in comparison to other systems. At the same time, large capacity outdoor units minimize installation space which eventually allow better use of the floor space. Moreover, MULTI V 5 prevents overuse of the operational costs by planning and consuming the projected monthly energy usage.

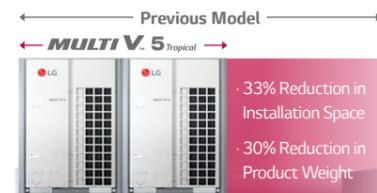
01 Corrosion resistance via Ocean Black Fin

LG's exclusive Ocean Black Fin is applied on the heat exchanger of MULTI V 5 in order to perform even in corrosive environments. Ocean Black Fin protects the coil itself from external corrosion, ensuring that the unit continues to function for long-lasting performance



02 Minimized installation footprint via large capacity outdoor units for flexible usage of the saved floor space

MULTI V 5 provides up to 20HP for single unit line up. Considering that a total of 200HP is being installed, the total installation space is saved up to 33% while the overall product weight decreases up to 30% in comparison to previous model. This eventually resulted in the maximized use of the saved floor space. Moreover, reduced product weight of MULTI V 5 makes installation easier with less limitation on product weight installed on the building's rooftop.



03 Operational costs management by presetting energy consumption

Energy management function allows MULTI V 5 to preset monthly energy usage and consume what has been previously planned. By analyzing and comparing previous consumption and planned energy usage for the month, overuse of the HVAC system operational costs can be prevented.

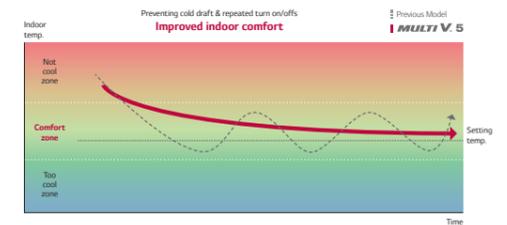


END USERS

LG's inverter technology and capability to actively respond to the building's both internal and external environment allow users to quickly arrive at the desired ambient and systematically maintain such condition. Moreover, users can control the indoor environment remotely via smartphone from wherever and whenever. Lastly, new Standard III Remote Controller with simple user interface and premium design provides users the optimal controlling experience.

01 More comfortable cooling via Dual Sensing Control

With the performance of LG's Ultimate Inverter Compressor MULTI V 5 can quickly approach at user's desired temperature. At the same time, Dual Sensing Control manages and maintains indoor temperature pleasantly based on its recognition of both the temperature and humidity in order to offer the optimal user comfort.



02 Auto Dust Removal

With Auto Dust Removal, MULTI V 5 can remove dust on heat exchanger of outdoor unit by reversely rotating fans to remove accumulated sand dust. This technology helps users to operate air conditioners comfortably without malfunctions due to dust accumulation.



03 Optimal controlling environment with new Standard III Remote Controller

MULTI V 5's new wired remote controller offers simple and easy controlling experience via simplified user interface and 4.3-inch large colored LCD screen. Moreover, it provides diverse information such as indoor temperature, humidity, cleanliness and real-time check on energy consumption.

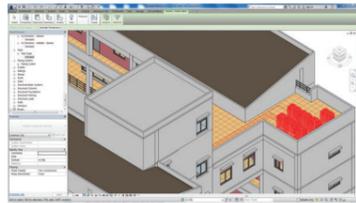


CONSULTANTS & HVAC DESIGNERS

From accurate 3D-based building modeling to strong system capability regardless of the building size and climate conditions, MULTI V 5 offers the most efficient and flexible installation environment for consultants and HVAC designers. Indeed, MULTI V 5 is the most reasonable HVAC system that has achieved the best efficiency through LG's enhanced inner parts, operational cycle and controlling technology.

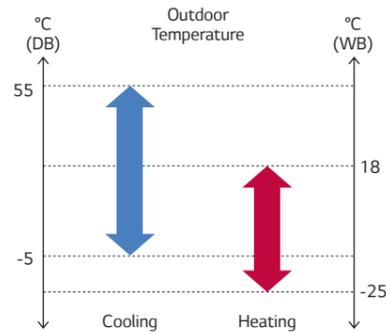
01 Improved designing effectiveness and accuracy via LATS Revit, the BIM application

LG provides 3D-based BIM simulation tool, LATS Revit, in order to offer product selection, positioning and piping from installation, interference check to correction phases based on systematic consideration of the load. This enables the easiest, yet the most accurate system modeling support



02 Adequate for tropical climate conditions based on wide operational range for cooling operations

Even in extremely hot condition, MULTI V 5 can perform stable cooling operations. With wide operational range, MULTI V 5 operates well at hot temperature as high as 55°C, making the product perfect for the tropical environment.



03 Flexible construction design available due to long piping technology

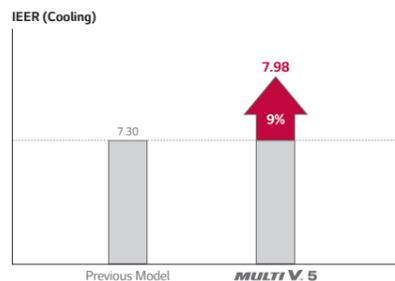
Through the world's best class piping technology MULTI V 5 provides the perfect solution for various types of building with diverse size and purposes. The equivalent longest piping length offered by MULTI V 5 is 225m and height difference between outdoor unit and indoor unit stretches up to 110m.

Total Piping Length	1,000m
Actual longest piping length (Equivalent)	150 / 200m* (175 / 225m*)
Longest piping length after 1 st branch	40m / 90m*
Height between ODU ~ IDU	110m
Height between IDU ~ IDU	40m
Height between ODU ~ ODU	5m

*Conditional application

04 The most economical solution with the world's top class energy efficiency

Improved reliability based on LG's Ultimate Inverter Compressor and other core parts, as well as the most developed controlling technology due to optimal cycle operation achieved the world's best class seasonal efficiency (IEER) of 7.98. As a result, this enables the most economical system capability for MULTI V 5 in comparison to any other existing HVAC systems.



* Comparison based on 10HP in cooling mode
**IEER (Integrated Energy Efficiency Ratio) / Test temperature condition (AHRI 123D)

INSTALLERS

Due to increased capacity provided by single outdoor units, installation became simpler with reduced number of outdoor unit combination. Moreover, solutions connected to and operated by smart devices significantly shortened physical hours required for test run, diagnose and monitoring of multiple services while making these controlling more accurate.

01 Increased installation convenience due to large capacity units reducing number of outdoor units required for combination

By providing up to 20HP for single unit line up, MULTI V 5 decreases the total number of required outdoor units in order to ultimately simplify installation process when compared to previous models. For example, previous system required a combination of a 16HP outdoor unit and two 12HP outdoor units to run a total of 40HP. For MULTI V 5, however, only 2 outdoor units with each providing 20HP can cover the same amount. This significantly reduces installation hours, especially those that used to take long time such as using crane to properly place outdoor units on the rooftop.



02 Simple and easy installation and service with Mobile LGMV

With LGMV, the smarter SVC application, hours and resources spent for installation are significantly reduced and more accurate installation and service can be offered.

Auto test run

Mobile application allows automatic address setting and test run report releasing.

Refrigerant diagnose solution

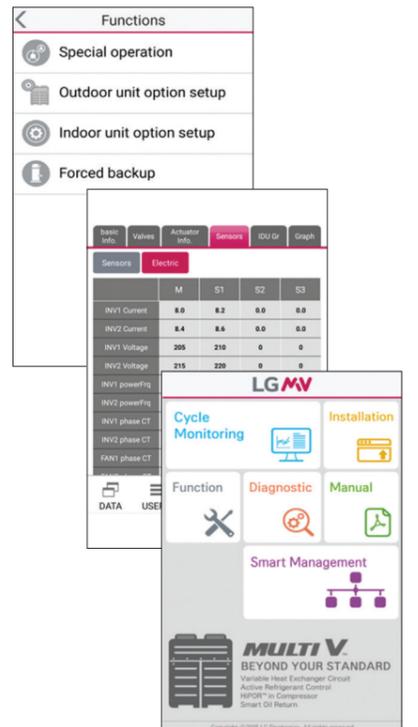
By regularly checking the amount of refrigerant, it automatically reloads if current amount is not enough.

Easier setting for installers

Unlike before when set up had to be done via DIP Switch of Outdoor unit, installers can simply manage setting via mobile app for MULTI V 5. Indeed, settings for SLC steps, Dual Sensing Control and outdoor unit fan's maximum RPM control can be easily managed via LGMV.

Smart management

By checking test run history, black box review and other previous records, site information can be managed efficiently.



ENGINEERING CAPABILITY: HVAC TOOL & SUPPORT

From planning to service & maintenance and then to reconstruction, an architectural project goes along many stages from the beginning to the end of its lifecycle. Along those stages, various engineering tools are applied to solve the diverse issues happening in each stage, with the most optimal solution possible. Due to the usage of such tools, buildings are effectively designed, built, supervised, and maintained throughout the lifecycle.

Dedicated to provide the best HVAC engineering support, LG Electronics Air-Solution Business Unit offers several engineering tools and solutions focused on HVAC, during the overall lifecycle of a building, related to the three categories: I. Draft Energy Estimation & Energy Modeling, II. Model Selection & Design, and III. Installation Environment Simulation.

Among them, the LATS* Program series has been developed to offer the best and the most optimized tool for LG HVAC systems, providing our customers a faster, easier, and a more accurate way in everyday duties of Model-selection, Draft Energy Estimation & Designing, and many more.

* LATS : LG Air-conditioner Technical Solution



I

**Energy Estimation
& Energy Modeling**



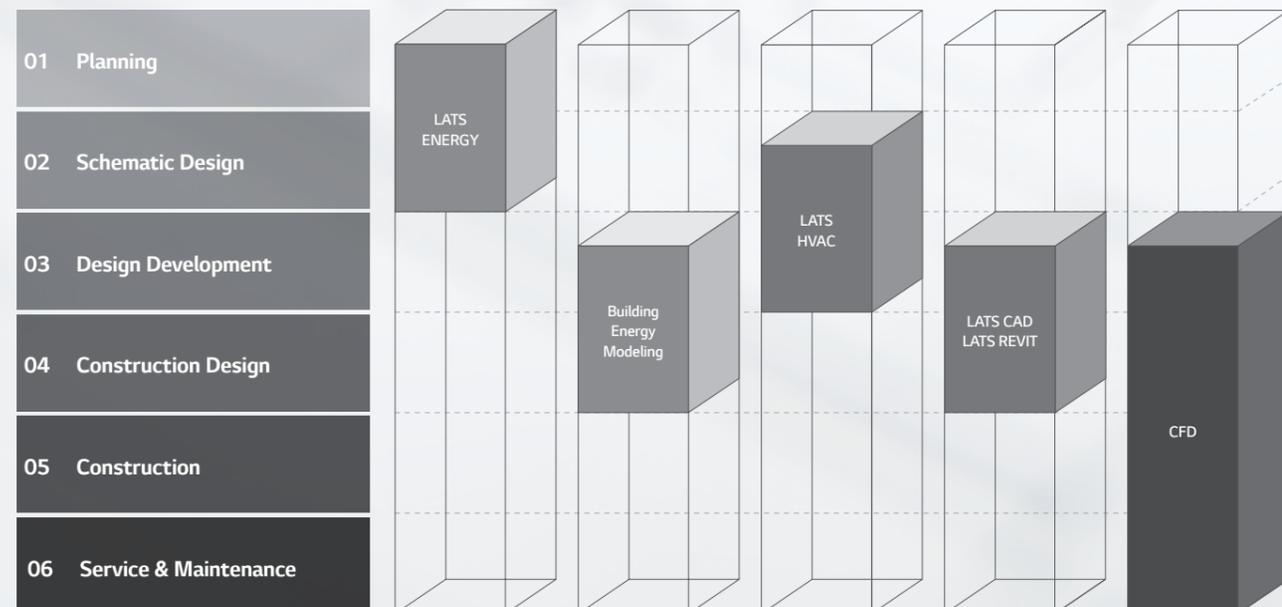
II

**Model Selection
& Design**



III

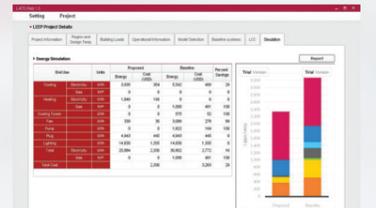
**Installation
Environment
Simulation**



01 Draft Energy Estimation

LATS Energy

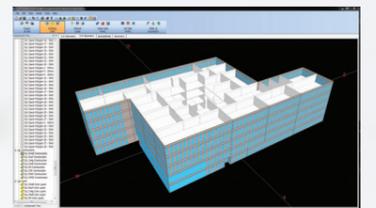
LATS Energy program is a draft energy estimation program, self-developed by LG. This program helps estimate the draft energy usage and analyzes the life cycle cost of LG VRF models during the early stage of a project.



02 Building Energy Modeling

eQuest, EnergyPro, Trace700 and More

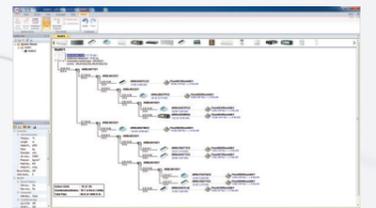
These are certified commercial programs which assess the HVAC system efficiency and building's annual energy saving for building standard or certification like LEED. LG HQ supports these programs for the project stages of Design Development and Construction Design wherein the overall designing is finished.



03 Model Selection

LATS HVAC

LATS HVAC is an integrated model selection program of LG HVAC products, enabling an accurate and quick selection on the best model suitable to each sites. In addition to model selection, faster estimation on refrigerant piping diameter and additional refrigerant is possible, along with auto printing of reports.



04 Design

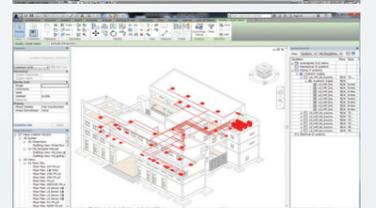
LATS CAD

LATS CAD enables faster and a more accurate design of LG HVAC products. Moreover, it offers not only designing, but also quotation and installation review in order to minimize problems during installation processes.



LATS Revit

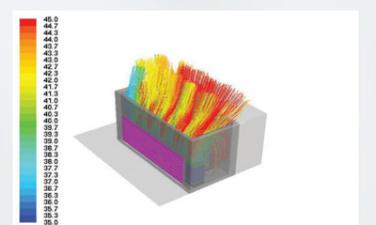
LATS REVIT is developed to make 3D designing of LG HVAC products easier than the previous program. It enables engineers to check 3D images from designing stage and prevents possible issues of the installation stage.



05 Installation Environment Simulation

CFD Analysis

CFD Analysis is applied in areas of estimating: indoor airflow and temperature distribution while operating VRF products, outdoor airflow distribution, and noise level. By running a simulation before construction, engineers estimate possible issues and find optimal solutions of malfunction that could occur after construction.



LG CONTROL SOLUTION

MULTI V 5 offers diverse range of effective control solutions that satisfy specific needs of each building and its user scene. These controlling systems are equipped with user friendly interface, flexible interlocking environment, energy management and smart individual controller for optimized controlling conditions and smart building management.

HOTEL

Hotel Room Solution



OFFICE

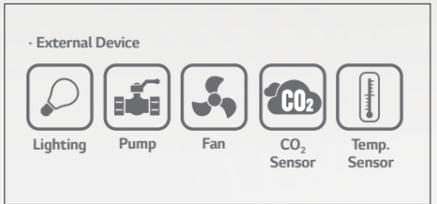
Central Control Solution



3rd Party BMS



Service/Maintenance



92kW
20kW
50kW

APARTMENT

Power Distribution Solution



RESIDENTIAL

Smart Individual Control Solution



SMALL BUILDING

Small Central Control Solution



Integration Solution



reddot award
communication design

REFERENCE SITE

Emirates Aviation Academy



Dubai - UAE

Institution
Multi V 98 Units (1,675TR)
CCD 154 Units, AHU 72 Units
Wired R/C

Rixos Hotel



Ras Al Khaimah - UAE

Hotel
Multi V 104 Units (1,098TR)
CCD / CST 155 Units, AHU 28 Units
Wired R/C, ACP, AC Ez

Hyatt Place Hotel



Dubai - UAE

Hospitality
MULTI V III 19 Units (660TR)
CCD 154 Units, AHU 72 Units
Wired R/C, ACP

Emirates Crew Accommodation



Dubai - UAE

Residential
Multi V III 318 Units (6,000TR)
CCD 3,095 Units, AHU 10 Units
Wired R/C

Sustainable City



Dubai - UAE

Residential
Multi V IV 600 Units (7,200TR)
CCD (3,600 Unit)
Wired R/C

Twin Tower



Doha - Qatar

Office
Multi V 60 Units (480TR)
CCD 310 Units
Wired R/C, ACP, AC Manager

WASL Vita



Dubai - UAE

Commercial
Multi V IV 150 Units (1,100TR)
CCD 520 Units, AHU 4 Units
Wired R/C

The Polo Residence & Townhouse



Dubai - UAE

Residential
Multi V S 105 Units (1,100TR)
Multi V IV 185 Units (4,000TR)
CCD 2,850 Units, AHU 29 Units
Wired R/C

Dar Al Wasl



Dubai - UAE

Residential
Multi V 278 Units (2,540TR)
CCD (1,714Units)
Wired R/C

Khaitan Police Station



Kuwait - Kuwait

Office
Multi V 10 Units (200TR)
CCD 45 Units
Wired R/C, AC Smart

Etihad Water Front



Abu Dhabi - UAE

Commercial
Multi V IV 46 Units (900TR)
CCD 550 Units, AHU 8 Units
Wired R/C, PDI

504 Villas Al Wajbah



Al Wajbah - Qatar

Residential
Multi V S 1,013 Units (6,800TR)
Multi V IV 23 Units (700TR)
CCD 4,585 Units, AHU 4 Units
Wired R/C

Bright rider school



Abu Dhabi - UAE

School
Multi V 65 Units (547TR)
CCD / SRAC 175 Units
Wired R/C

Al Turki - Mixed Use Building



Muscat - Oman

Residential / Commercial
Multi V 53 Units (532TR)
CCD 152 Units
Wired R/C

Book Oasis



Sharjah - UAE

Office
Multi V IV 650 Units (2,700TR)
CCD 2,100 Units, AHU 4 Units
Wired R/C, AC Smart IV

Khawarizmi International College



Al Ain - UAE

Education
Multi V IV 29 Units (1,230TR)
CCD 770 Units, AHU 2 Units
Wired R/C