



## LG FRESH AIR SOLUTION AIR HANDLING UNITS





# AIRHANDLINGUNITS INDEX

Integration of AHU with Multi V (VRF) condensing unit provides perfect Indoor Air Quality (IAQ) with highest efficiency.

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# Company Profile

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Ever since manufacturing Korea's first homegrown air conditioner in 1968, LG has remained at the forefront of air conditioning innovation. For eight of the last 10 years, LG has been the world's top selling manufacturer of residential air conditioning solutions. And in 2008, LG became the first company to sell a cumulative total of more than 100 million air conditioners.

Building on its success and technological leadership in the residential air conditioning sector, LG has moved into system air conditioning as well. The company's range of high-performance system air conditioning products provides effective temperature control to large scale building and facilities. Over time, LG has evolved into the total HVAC and energy solution provider, investing in new technologies and adding chillers, VRF systems, and improve indoor air quality through AHU-VRF solution building management systems (BMS) into its comprehensive product portfolio.

Along with a wide range of innovative solutions LG delivers unrivaled customer service. The company produces top notch air conditioning professionals at its SAC academies of which there are more than 100 worldwide. These centers of excellence provide

detailed product workshops and training programs that offer invaluable hands-on experience. LG also provides useful tools for HVAC system engineers and installers, including its timesaving LG Air Conditioner Technical Solutions (LATS) software.

Additionally, LG operates several state-of-the-art R&D facilities all across the planet. One such facility is the Energy Lab, a purpose-built R&D and testing center in northern France. Helping to keep the company ahead of the competition, the scientists and engineers at the Energy Lab study the effects of different environmental conditions on LG's products. This in-depth research and analysis enables LG to tailor its solutions to the specific environmental demands of each individual market.

With 10 manufacturing plants throughout the world, LG produces in excess of 17 million reliable compressors and 16 million first-class HVAC solutions per year. Combining the best technologies with the best ideas, LG's highly quality products are now enjoyed by consumers in over 100 countries.

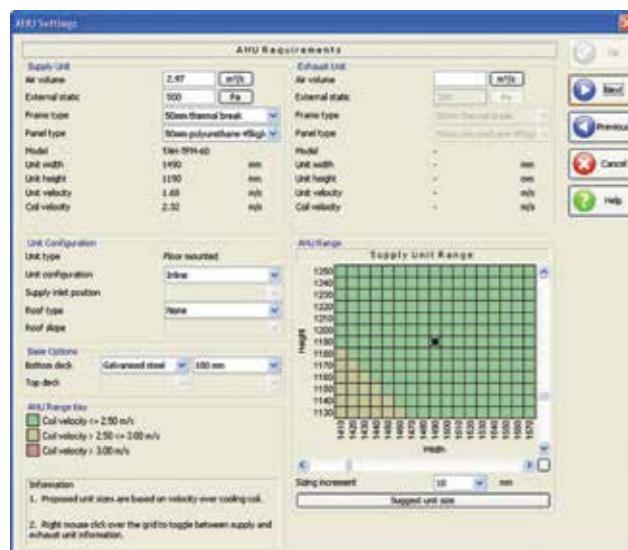
# INTRODUCTION

Selection Program  
Design Flexibility  
Casing Construction  
Acoustics  
Safety

# Selection Program

LG WinTADS software has been custom built to accommodate most of the possible requirements from the customer with a very user friendly input panel on linear windows. The selection program, built with standard models of TAH series, includes 30 different sizes for floor mounted Air Handling Units, 15 sizes for Ceiling Hung units and 9 sizes for Kitchen Ventilation (Ecology) units.

In addition to the standard models, the selection program has a built-in feature which allows us to select unit dimensions on a grid of height vs width, the scale of the grid being 10mm, practically this means that we can meet any combination of sizes for our units as per the Customer's site requirements.



• Air Handling Units



• Cold Water Coil

# Design Flexibility

Cooler batteries can be selected with one of these options: water, glycol or refrigerants such as R22, R407C, R410a and R134a. The system has been designed to operate using the SI units of measurement. But the user is free to toggle between the Imperial system and Metric system for each input data at their convenience.

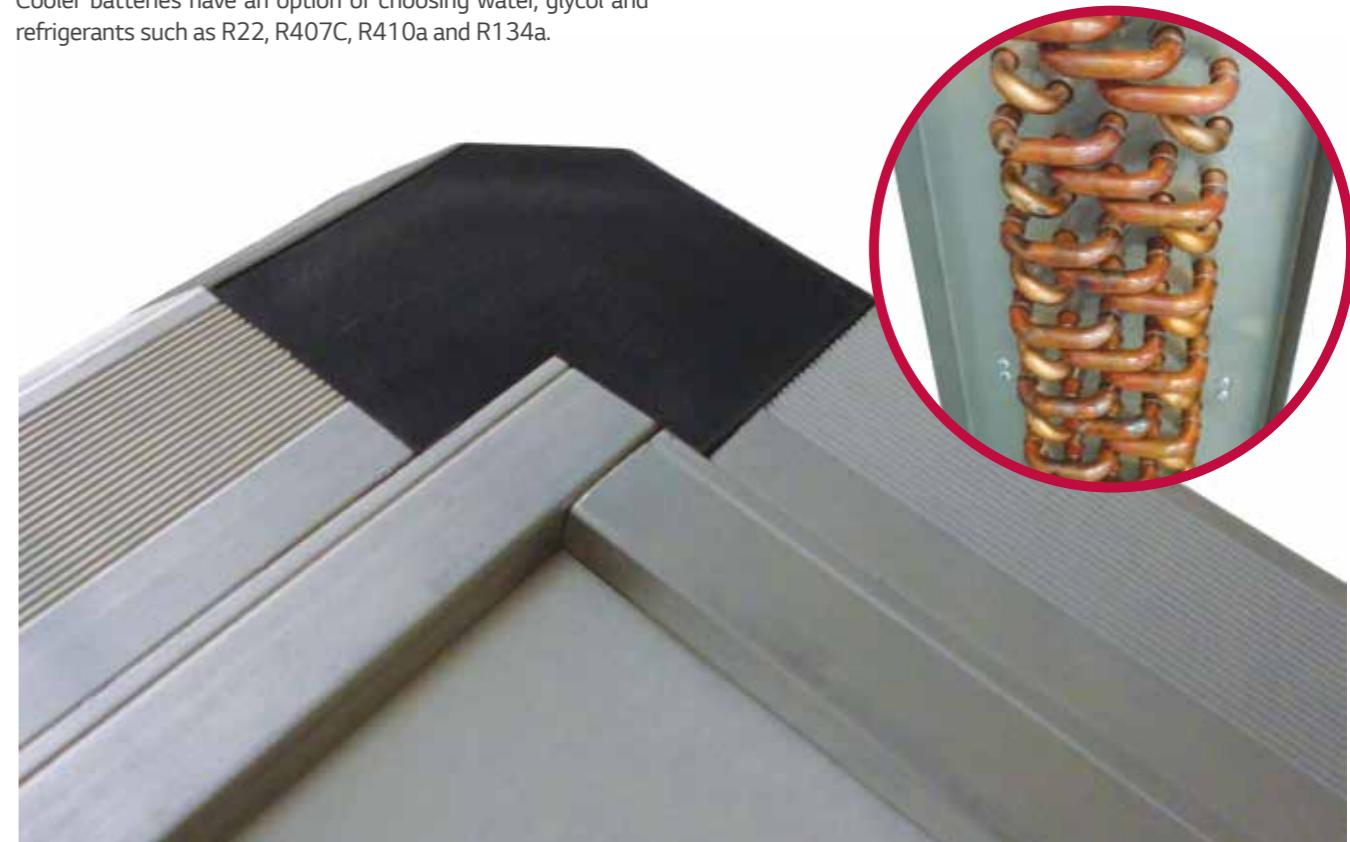
The output of the selection program provides a very detailed specification and performance of each component chosen and produces a complete technical submittal comprising of all the technical information required for the customer.

LG WinTADS offers an incredible flexibility to the user by customizing the unit dimensions in multiples of 10mm on the width and height meeting all aspects of customer's requirement. The selection program provides us with tremendous options in choosing the components and its arrangement, thereby satisfying the system designer and architectural layout.

Screw less snap fix panels are offered for contemporary looks at very low air leakage rates. For retrofit and revamp requirements, we offer complete solutions of building up compact units so that the units can move comfortably through the passage constraints.

The cooler batteries are offered with a flexibility of choosing either  $\frac{1}{2}$ "OD (12.5mm) or  $\frac{5}{8}$ "OD (15.8mm) copper tubes depending on the capacities and water side pressure drops. Cooler batteries have an option of choosing water, glycol and refrigerants such as R22, R407C, R410a and R134a.

Complete range of construction materials are available including plain galvanized steel, pre-painted galvanized steel, aluminium and stainless steel. Trosten WinTADS covers a multitude of environments including the most corrosive atmosphere and offers complete range of components ensures to provide the environment with quality indoor air. Units can also be designed to suit indoor and out conditions with variable sized inlet and discharge openings.



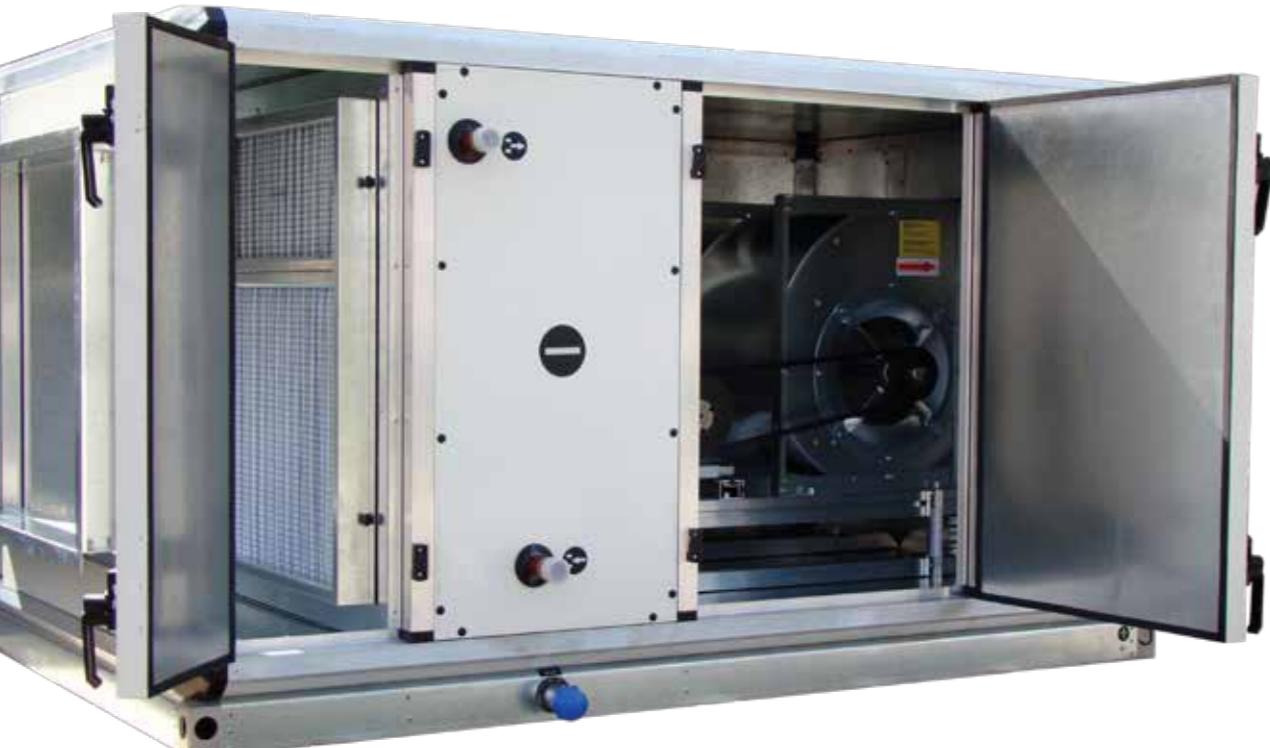
# Casing Construction

TAH series Air Handling Units are of modular construction using pentapost, extruded aluminium profiles with excellent rigidity. Thermal efficiencies, i.e., thermal transmittance and thermal bridging are addressed by our unique thermal break casing design meeting the European standard EN 1886. Aluminium profiles are offered with options of anodized finish for anti corrosion and screw less snap fixing type for low air leakage rates.

Panels are secured to the unit frame work with fasteners, exerting pressure evenly onto the panel and the gasket attached to the frame to ensure better air tight casing construction.

Panels are of double wall construction either injected with polyurethane foam insulation of 48 kg/cu.m density or with high density Rockwool insulation providing a rigid, sturdy and easily cleanable enclosure. The double wall construction keeps the insulation out of air stream and contributes towards improved IAQ.

Polyol used for PUF insulation are blended with environment friendly CFC & HFC free agents, self extinguishable as per ASTM D 3014 standard and the foam insulation conforms to Class "O" of ISO 1182.2 standards. Thermal conductivity "K" factor is 0.02 W/m°K.



Panels are offered in 25mm and 50mm thickness chosen as per the given specification and application. The outer skin and inner skin of the casing comes with a variety of options in choosing sheet thickness and material (Galvanized Steel / Aluminium / SS) as per the requirement.

The outer surface of the panel is generally offered with pre-coated polyester, having excellent corrosion resistance, applied over galvanized steel sheet and further protected with vinyl guard film towards scratch protection. All plain galvanized steel sheets used shall have a minimum zinc coating of 270 GSM (G90) for anti corrosion.

Base frames are made out of sendzimir galvanized steel sheets with either die cast aluminium joints or heavy duty steel joints with lifting holes. Hot dip galvanized channel frames are also provided, especially for larger dimension units.

For hygiene applications, food grade gaskets are provided as a standard feature conforming to BS EN-71 Part 3: 1995 standard.

# Acoustics

LG WinTADS selection software calculates the sound levels transmitted from the unit into the outlet ducting, inlet ducting and the radiated sound levels for each octave band based on the specific working condition and as per the tests carried out conforming to EN ISO 3744:2009 standards.

Fan sound is a major component of the unit noise levels and to minimize the sound generation, fans need to correctly sized and selected to operate at or near peak efficiency. Oversized fans can generate much higher sound power levels than necessary. Undersized fans can also result in higher sound power levels because of increased fan speed and the higher tip velocity of the air leaving the fan blades.

Sound performance data is derived from testing performed in accordance with AMCA standard 300. The effects of various components, casework and unit configurations are taken into account while deriving the sound levels in octave band.



## Rockwool

| Octave Band     | 125  | 250  | 500  | 1000 | 2000 | 4000 | 8000 | Hz |
|-----------------|------|------|------|------|------|------|------|----|
| Sound Reduction | 10.4 | 22.3 | 27.9 | 31.3 | 34.1 | 37.0 | 43.5 | dB |

50mm panel, 1.0mm inner & 0.9mm outer steel sheet.

## Polyurethane Foam

| Octave Band     | 125 | 250  | 500  | 1000 | 2000 | 4000 | 8000 | Hz |
|-----------------|-----|------|------|------|------|------|------|----|
| Sound Reduction | 7.7 | 14.3 | 12.3 | 13.8 | 21.9 | 35.0 | 40.5 | dB |

50mm Panel, 0.7mm inner & 0.7mm outer steel sheet.

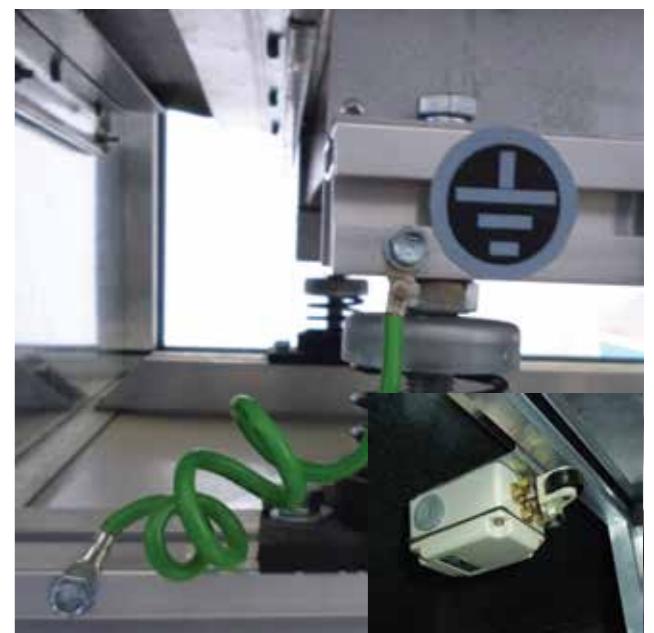
# Safety

Air Handling Units must not be put into operation before all electrical and mechanical safety devices have been installed. All unprotected openings should be equipped with protective screen. For any service work or inspection need to be carried out, all safety isolating switches of the unit should be tripped before the access doors are opened and before restarting, all safety devices must be reset.

Fan guard is fixed at the access opening of fan section to restrict the access to the fan / motor assembly for additional safety. It is strongly recommended to prevent the access to the fan section while the unit is in operation. View port on the access doors enable visual inspection of the fan motor drive and UV lamp status.

Fan motor assembly isolated by anti-vibrators and flexible connectors shall be earthed to the casing. Further, the casing is earthed as a part of field wiring to ensure complete safety. Fan section access doors shall be incorporated with safety "cut-off" switches electrically interlocked with the fan motor. No sharp edges, all projected screws shall be covered with nylon caps.

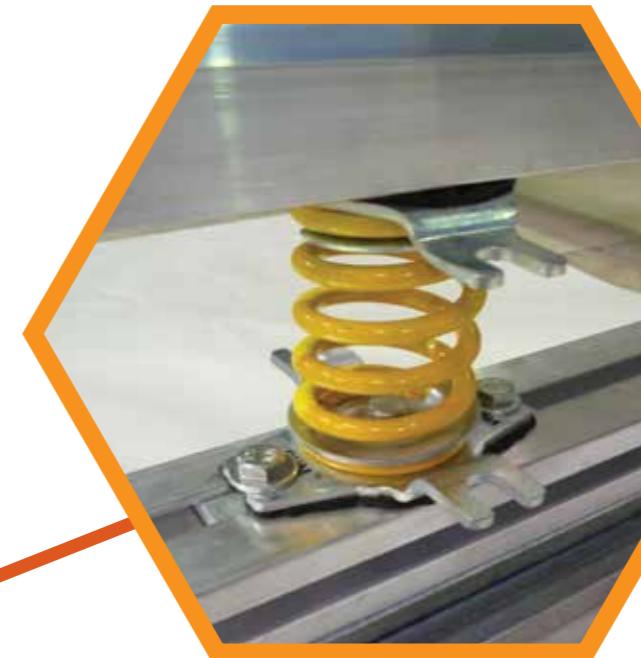
Electrical heaters should be provided with separate power supply, safety thermostat and need to be interlocked with an air flow switch. Hot water coils need to be handled with utmost care while using the purge connections for the risk of water hammer or steam discharge. Adequate space need to be provided in the front of the electric heater and electric control panels in accordance to the local electrical safety regulations.



## Components

Fans  
Motors  
Coils  
Filters  
Electric Heaters  
Mixing Boxes and Economizers  
Sound Attenuators  
Energy Recovery Components  
Humidifiers  
Accessories

# Fans



LG units are housed with centrifugal, double inlet, double width (DIDW) fans with blades of forward curved, backward inclined, airfoil, plenum or twin fans. The performance of the fans have been tested and measured in accordance to AMCA standard 210. Similarly, the noise levels of the fans have been tested and measured in accordance with AMCA standard 300.

Fans are designed in accordance to the specified operating class of AMCA standard 99-2408-69 performance class limits for centrifugal fans. Further, all backward inclined, airfoil and most of the forward curve fans are sized accordance to AMCA standard 99-0098-76 R20.

Wheels of forward curved fans are manufactured in galvanized steel construction, backward inclined and airfoil wheels in cold rolled steel sheet with polyester coated finish. Shafts are manufactured from C45 grade carbon steel and then coated for anti corrosion after assembly.

The drives are selected for 150% of the maximum motor horse power of the units. Sheaves are fixed pitch type and dynamically balanced. Adjustable pitch pulleys are provided upon request. V-belts are of anti-static and oil resistant type.

Bearings used are of either deep groove ball bearing type with an adaptor sleeve or spherical roller bearing type sealed at both sides for different applications. All the bearings are lubricated for life and maintenance free under normal operating conditions. All the fan bearings have a minimum life time of 200,000 hours at L50 life and upon request, we can provide heavy duty bearings suitable for continuous operation of 200,000 hours at L10 life.

Fan and motor assemblies are mounted on a common extruded aluminium base located inside the air handling casing which in turn is mounted on anti vibration mounts designed for 93% isolation.

All the wheels are statically and dynamically balanced according to ISO 1940 and AMCA 204-G2.5 standards. Clean room application fans with balancing grade of G1.0 can be provided upon request.

Fire retardant fabrics are used as flexible connectors between the fan outlet and the unit casing for vibration free operation.

# Motors

All fan motors are mounted inside the unit casing. The appropriate motor size will be selected by LG WinTADS selection software.

Electric motors are of IEC standard in squirrel cage, total enclosed fan cooled (TEFC), B3 foot mounted, IP 55 degree of protection and class F insulation. Motors conform to IED34, IEC72, BS5000, BS3979, BS4999 standard carry CE mark.

Motor efficiencies available include EFF2 (IE1) standard efficiency, EFF1 (IE2) high efficiency and premium efficiency (IE3), offered based on the requirement. On request, the motors can be offered upto 660Volts, 50/60Hz AC supply. Motors of explosion proof construction can also be offered.

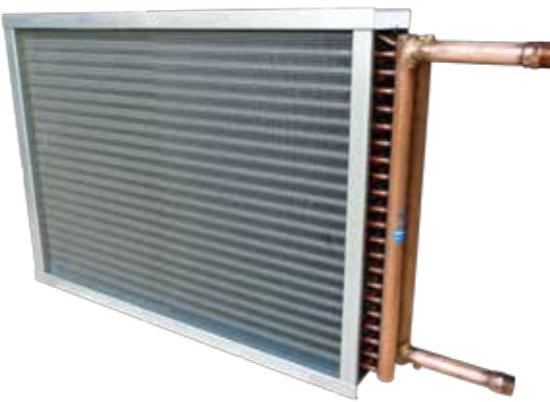


Motors are suitable for VFD operation, 5:1 ratio for constant torque applications, as higher grade and type of copper materials, lamination etc., are used and the motors undergo vacuum impregnated insulation treatment, thereby increasing the insulation strength on the overhangs of the motors so that harmonic distortions are minimized. Speed variations of 40 to 100% are recommended.

please refer to page nos. 71 to 76 for motor ratings and cable sizing.



# Coils



LG WinTADS offers wide range of application flexibility in selecting the coils using different pitches of 12.5mm OD (1/2") or 15.8mm OD (5/8") copper tubes with cooling medium as water (chilled water / hot water), glycol, steam or refrigerants of R22, R134a, R410a & R407c. Various configurations of coil arrangements like draw-through, blow through and multi-zone are also offered.

Coils are designed to maximize the utilization of the available unit cross section area with the connections clearly labeled on the outside of the units. Cartridge type coil mounted on steel channels shall ease the access for removability.

Coils are constructed out of corrugated aluminium fins and seamless copper tubes as standard. Anti corrosion coated coils or copper fins are provided upon request. The fins are of sine wave design and shall have collars drawn, belled and firmly bonded to the copper tubes by mechanical expansion of the tubes.

Casing shall be 1.5mm thick galvanized steel or stainless (optional) with formed end supports on the top and bottom. The bottom channel is provided with drain holes to ensure proper condensate drainage.

Headers shall be of extra heavy seamless copper tubing with tube holes intruded to provide the maximum brazing surface

for added strength. Header end caps are heavy gauge, die formed copper. Connections for water coils shall be of threaded hexagonal brass/copper fittings as standard for the ease of plumbing while erection.

Drain pans are made out of stainless steel - SS304 construction with dual slope to facilitate immediate discharge of condensate. Specially designed drain pan with all round edges allow complete cleaning and avoid microbial growth as per ASHRAE 62-1999. Drain pans can be offered in SS316 construction upon request. Intermediate drain pans are provided for stacked coils to drain the condensate to the main drain pan without flooding the lower coils or passing the condensate through the airstream of the lower coil.

Moisture eliminators are provided in PVC construction for coil face velocities exceeding 2.5 m/s as standard. Aluminium and stainless steel construction are provided upon request.

Cupro-nickel tubes and headers can be provided for special applications upon request where high acid or sand content to be corrosive or erosive. Each coil is factory pressure tested at 375psig air pressure under water/steam coils and 450psig for refrigerant coils for trouble free operations. Vent and drain plugs are provided for all water coils.

Please refer to page No.63 for coil sizing.

# Filters

## Metallic Filters

Metallic washable filters are made out of fine galvanized steel wire mesh for use in heavy duty industrial and kitchen air ventilation applications. Filters having excellent dust holding capacities and ability to perform in high moisture conditions are specially made to handle the grease content exhausted out of kitchen hoods. The metallic filters shall be with multiple layered and pleated galvanized steel wire mesh formed into compact maze of dirt catching surfaces.



- Technical specifications: Metallic Filters
- Filter class: G2 as per EN779 Standard
- Initial resistance: 22 Pa
- Final resistance: 130 Pa
- Mean resistance: 75 Pa
- Rated velocity: 2.5 m/s
- Average arrestance: 75-80%
- Maximum operating temp: 420°C

## Synthetic Panel Filters

The 2" / 4" deep pleat shall have consistent pleat spacing durable execution. Pleated Filters feature a self supporting media pack in a two piece frame - pleat stabilizers on the air leaving side in combination with pleat support straps on the air entering side ensure pleat consistency providing excellent dust holding capacity and low pressure resistance. The pleated media shall be made from a controlled and repeatable special blend of size-specific virgin fibers. Also available, G3 class filters upon request.



- Technical specifications: Synthetic Panel Filters
- Filter class: G4 as per EN779 Standard
- Initial resistance: 90 Pa
- Final resistance: 250 Pa
- Mean resistance: 170 Pa
- Rated velocity: 2.5 m/s
- Average arrestance: ≤ 90%
- Maximum operating temp: 70°C

## Absolute Filters

HEPA Filters shall have metal cell sides, heavy duty filter designed for both constant air volume and variable air volume systems. These filters shall consist of pleated media pack enclosed in an electro galvanized steel housing; the media shall be made of ultra fine fiber glass formed into a series of pleats. Corrugated Aluminum separators maintain uniform spacing between each pleat to allow unrestricted air flow. Bar braces shall be installed on both the sides of the filter for extra reinforcement of the media pack. H10, H11, H13 and H14 class filters are available upon request.



- Technical specifications: Absolute Filters
- Filter class: H12 as per EN1822
- Efficiency: 99.5% at 0.3 Micron
- Initial resistance: 250 Pa
- Final resistance: 750 Pa
- Mean resistance: 500 Pa
- Cell sides: Galvanized steel
- Filter media: Ultra-fine glass fiber media
- Separators: Aluminium
- Maximum operating temp: 120°C

## Carbon Filters

Canister delivery system shall consist of multiple individual canisters in metal execution. Canister shall be assembled in a galvanized sheet metal holding frame to fit standard dimension filter sections. The individual canister seals and holds in the frame due to its unique seal and bayonet style clamping mechanism. Canisters shall be factory pre-filled with user specific media. Each canister shall be vibration filled in order to ensure that the media is uniformly packed.



- Technical specifications: Carbon Filters
- Frame material: Galvanized steel frame
- Carbon filter size: 145 dia x 600mm long
- Volume per canister: 5.9l
- Capacity per 24x24: 3200m3/hr having 16 canisters
- Carbon content: 3kgs per canister = 48kgs per cell
- Average resistance: 150 Pa
- Dwell time (Contact time): 0.1 sec
- Refillable type: Yes

# Filters

# Electric Heaters

## MERV Rating

Minimum Efficiency Reporting Value (MERV) - ASHRAE 52.2.1999 standard on "Method of Testing General Ventilation Air-Cleaning Devices for Removal by Particle Size" provides a methodology for determining filter efficiency at removing various sizes of particles as the filters become loaded. There are three ranges of particle sizes that define the MERV value.

ASHRAE standard 52.2 replaces ASHRAE 52.1 method and please refer to the table of ASHRAE 52.2 showing the MERV ratings and particle size range.

| MERV Rating | ASHRAE 52.2 Standards    |                          |                           | ASHRAE 52.1 Standards |                       | EN779 / EN1822 Standards |
|-------------|--------------------------|--------------------------|---------------------------|-----------------------|-----------------------|--------------------------|
|             | Range 1<br>0.3 to 1.0 µm | Range 2<br>1.0 to 3.0 µm | Range 3<br>3.0 to 10.0 µm | Arrestance %          | Dustspot Efficiency % |                          |
| MERV 1      |                          |                          | <20%                      | <65%                  | <20%                  | G1                       |
| MERV 2      |                          |                          | <20%                      | 65 - 70%              | <20%                  | G2                       |
| MERV 3      |                          |                          | <20%                      | 70 - 75%              | <20%                  | G2                       |
| MERV 4      |                          |                          | <20%                      | 75 - 80%              | <20%                  | G2                       |
| MERV 5      |                          | 20 - 35%                 | 80 - 85%                  | <20%                  |                       | G3                       |
| MERV 6      |                          | 35 - 50%                 | 85 - 90%                  | <20%                  |                       | G3                       |
| MERV 7      |                          | 50 - 70%                 | >90%                      | 25 - 30%              |                       | G4                       |
| MERV 8      |                          | 70 - 85%                 | >90%                      | 30 - 35%              |                       | G4                       |
| MERV 9      | <50%                     | ≥85%                     |                           | 40 - 45%              |                       | F5                       |
| MERV 10     | 50 - 65%                 | ≥85%                     |                           | 50 - 55%              |                       | F5                       |
| MERV 11     | 65 - 80%                 | ≥85%                     |                           | 60 - 65%              |                       | F6                       |
| MERV 12     | 80 - 90%                 | ≥90%                     |                           | 70 - 75%              |                       | F6                       |
| MERV 13     | <75%                     | ≥90%                     | ≥90%                      | 80 - 90%              |                       | F7                       |
| MERV 14     | 75 - 85%                 | ≥90%                     | ≥90%                      | 90 - 95%              |                       | F8                       |
| MERV 15     | 85 - 95%                 | ≥90%                     | ≥90%                      | >95%                  |                       | F9                       |
| MERV 16     | ≥95%                     | ≥95%                     | ≥90%                      | 85% DOP<br>95% DOP    | H10<br>H11            |                          |

The standard only lists arrestance efficiencies for MERV values up to 16. Higher ratings of MERV 17 to MERV 20 correspond to HEPA (High Efficiency Particulate) and ULPA (Ultra-low Particulate) filters. These filters are suited for Clean room & Pharmaceutical manufacturing applications.

LG WinTADS offers wide range of application flexibility in selecting the coils using different pitches of 12.5mm OD (1/2") or 15.8mm OD (5/8") copper tubes with cooling medium as water (chilled water / hot water), glycol, steam or refrigerants of R22, R134a, R410a & R407c. Various configurations of coil arrangements like draw-through, blow through and multi-zone are also offered.

Coils are designed to maximize the utilization of the available unit cross section area with the connections clearly labeled on the outside of the units. Cartridge type coil mounted on steel channels shall ease the access for removability.

Coils are constructed out of corrugated aluminium fins and seamless copper tubes as standard. Anti corrosion coated coils or copper fins are provided upon request. The fins are of sine wave design and shall have collars drawn, belled and firmly bonded to the copper tubes by mechanical expansion of the tubes.



Casing shall be 1.5mm thick galvanized steel or stainless (optional) with formed end supports on the top and bottom. The bottom channel is provided with drain holes to ensure proper condensate drainage.

Headers shall be of extra heavy seamless copper tubing with tube holes intruded to provide the maximum brazing surface for added strength. Header end caps are heavy gauge, die formed copper. Connections for water coils shall be of threaded hexagonal brass/copper fittings as standard for the ease of plumbing while erection.

Drain pans are made out of stainless steel - SS304 construction with dual slope to facilitate immediate discharge of condensate. Specially designed drain pan with all round edges allow complete cleaning and avoid microbial growth as per ASHRAE 62-1999. Drain pans can be offered in SS316 construction upon request. Intermediate drain pans are provided for stacked coils to drain the condensate to the main drain pan without flooding the lower coils or passing the condensate through the airstream of the lower coil.

Moisture eliminators are provided in PVC construction for coil face velocities exceeding 2.5 m/s as standard. Aluminium and stainless steel construction are provided upon request.

Cupro-nickel tubes and headers can be provided for special applications upon request where high acid or sand content to be corrosive or erosive. Each coil is factory pressure tested at 375psig air pressure under water/steam coils and 450psig for refrigerant coils for trouble free operations. Vent and drain plugs are provided for all water coils.

Please refer to page No.63 for coil sizing.

## Calculation of Electric Heater capacity in kW

IP system: Capacity (kW) = 1.08 x Air Flow Rate (cfm) x Air Temperature Rise (deg.F) / 3410

SI system: Capacity (kW) = 1.21 x Air Flow Rate (L/s) x Air Temperature Rise (deg.C) / 1000

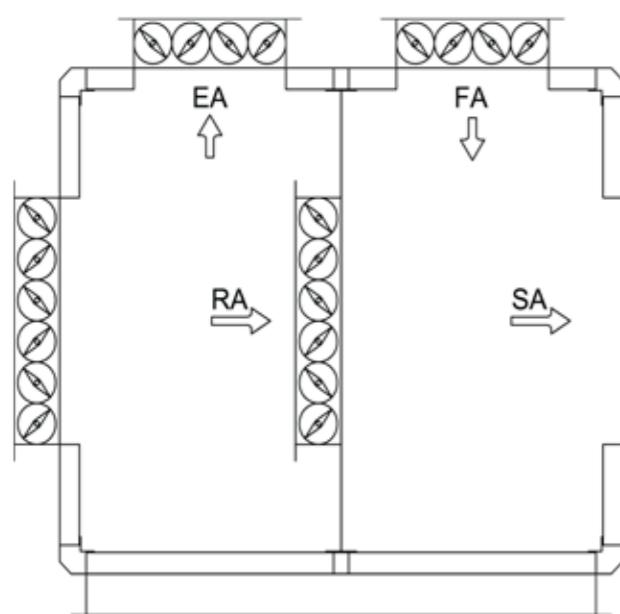
# Mixing Boxes & Economizers

# Sound Attenuators

Mixing boxes and Economizer sections are offered with fresh air and return air inlets to mix the ambient fresh air and return air from the conditioned space. Fresh air and return air dampers are provided upon request.

The mixing box segment typically must be the first segment in the direction of airflow. Variable size openings and locations are offered to meet the plant requirements.

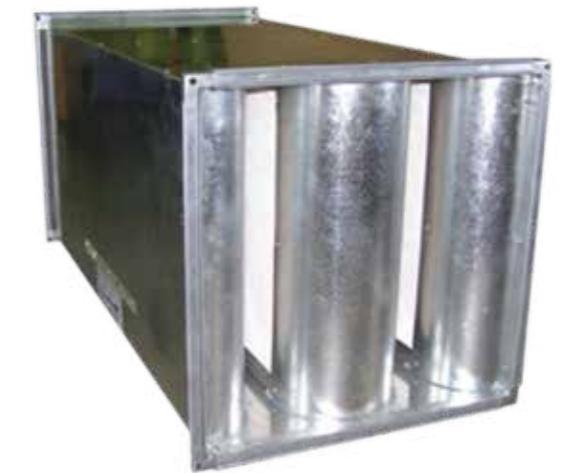
Based on the need of ventilation, Economizers are offered which may be the first segment in the air stream or may be used in conjunction with other segments. Correctly setup economizers will constantly tract building pressurization as well as indoor and outdoor temperatures. Inlet plenum sections are also offered to provide a proper means of air entry into the Air Handling Unit. Openings may be applied at top, bottom, front, left side or right side. The variable size opening option allows the opening to be properly aligned and sized for airflow convergence or divergence.



Sound Attenuators can be offered as an integral part of the Air Handling Unit in both supply and return air streams for low noise application by absorbing the noise generated by fans. The length of the sound attenuator combined with the volume and velocity of the air moving through it determines the insertion loss or sound attenuation characteristics of the unit.

Sound attenuators are manufactured in square and rectangular sizes with round transitions to match the equipment internal dimensions. Attenuators are constructed out of 270 GSM zinc coated galvanized steel sheet to the standards of JIS 3302 / BS 2989 exterior sealed shell with sound absorbing baffles.

The acoustic material is inorganic, incombustible, has a class 1 fire rating to BS 476 and non-hygroscopic mineral fiber which is retained by means of galvanized perforated steel sheet. Splitters are of vermin proof and non-combustible material. The interior partitions shall be fabricated from perforated sheets and shall have coved entrance shapes so as to provide the maximum aerodynamic efficiency and minimum self-



noise characteristics. Upon request, materials of aluminum / stainless steel casing and heavy gauge exterior casings for low "break-out" noise can also be offered. The following table shows the acoustical characteristics of our standard sound attenuator lengths.

| Length  | Frequency (Hz) |     |     |     |      |      |      |      |
|---------|----------------|-----|-----|-----|------|------|------|------|
|         | 63             | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
| 900 mm  | 8              | 11  | 16  | 21  | 32   | 26   | 18   | 14   |
| 1200 mm | 9              | 13  | 19  | 27  | 39   | 33   | 21   | 16   |
| 1500 mm | 10             | 16  | 22  | 32  | 47   | 39   | 24   | 18   |

# Energy Recovery Components

## Heat Recovery Wheels

Heat recovery wheels are of air to air rotary heat exchangers with energy recovery over 80%, provide improved IAQ, control humidity and save energy. By pre-conditioning the incoming fresh air, the heat recovery wheels with minimal cross contamination, deliver fresh air at conditions close to the room conditions and allow reduction in system capacity by 30 to 65%.

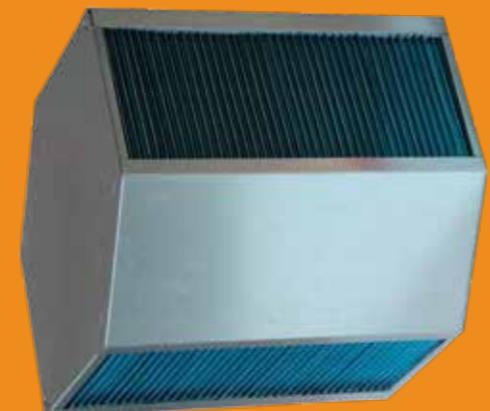
Sensible heat is transferred as the metallic substrate picks up and stores heat from the warmer air stream and gives it up to the cooler one. Latent heat is transferred as the desiccant coating on the metallic substrate absorbs moisture from the air stream that has the higher humidity ratio and releases the moisture in to the air stream that has the lower humidity ratio.



## Plate Type Heat Exchangers

Plate type heat exchangers are ideal for sensible energy recovery. Being static, have no moving parts and provide highest reliability and safe operation. The exchange takes place across the plates forming the walls of the passages and efficiency values between 40% and 75%.

Plate type heat exchangers do not allow the passage of humidity from one flow to the other, but may use part of the latent heat contained in the humid exhaust air. The direction of the air flow is not of particular importance. However, it is recommended for the exhaust to pass through the heat exchanger from top to bottom in cases in which the formation of condensation is expected.



## Heat Pipes

Heat pipes are energy efficient thermal superconductors with no moving parts and transfer large amounts of heat energy across a small temperature gradient. Heat pipes with zero cross contamination are used for energy recovery and dehumidification applications.

Heat Recovery heat pipe is used for reclaiming heat from exhaust air and returning it to the fresh-supply stream which in turn saves energy and cost. The running cost of the heat pipe heat recovery system is virtually nil and maintenance is minimal. Dehumidification: Wrap around (horse shoe) heat pipe enhances the performances of a dehumidifier and improves the quality of the re-circulated air.



## Run Around Coils

Run around coils have same construction of standard water coils, positioned within the supply and exhaust air streams, connected to each other by a pumped pipe work circuit for energy recovery. The pipe work is charged with a heat exchange fluid, normally water, which picks up heat from the exhaust air coil and give up heat to the supply air coil before returning again.

Thus heat from the exhaust air stream is transferred through the pipe work coil to the circulation fluid and then from the fluid through the pipe work coil to the supply air stream.

The use of this system is generally limited to demands where the air streams are separated and no other type of device can be utilized since the heat recovery efficiency is lower than other forms of air-to-air heat recovery. Gross efficiencies are usually in the range of 40% to 50%.



# Humidifiers

Steam type and water type humidifiers are provided based on the specification and application.

Steam humidifiers could either be located externally or internally to add steam in the air handling system.

Internal steam humidifiers are provided with steam generators integrated with immersion type electric heaters, containing tank and controls.

In external type steam steam humidifiers, the steam distribution tubes and hoses are brought inside the air handling system.



Water type humidifiers can also be offered in honeycomb and air washer configurations. Multifold droplet eliminators are provided as standard for water type humidifiers.

Calculation of humidifying efficiency for Water Humidifier :

| <b>Humidifier Efficiency =</b> |   | <b>Actual Moisture Content Change</b> | <b>=</b> | <b><math>\frac{ET_{DB} - LT_{DB}}{ET_{DB} - LT_{WB}}</math></b> |
|--------------------------------|---|---------------------------------------|----------|---|
| $ET_{DB}$                      | - | Entering Dry Bulb Temperature         |          |   |
| $LT_{DB}$                      | - | Leaving Dry Bulb Temperature          |          |   |
| $LT_{WB}$                      | - | Leaving Wet Bulb Temperature          |          |   |

Calculation of humidifier capacity (Kg/h) :

| <b>Humidifier Capacity H (kg/h) =</b> |   | <b><math>\frac{Y \times V_f \times (X_i - X_o)}{1000}</math></b> |
|---------------------------------------|---|--|
| H                                     | - | Humidification load in kg/h                                      |
| Y                                     | - | Specific weight of the air in kg/m <sup>3</sup>                  |
| $V_f$                                 | - | Fresh air flow in m <sup>3</sup> /h                              |
| $X_i$                                 | - | Absolute humidity inside in g/kg                                 |
| $X_o$                                 | - | Absolute humidity outside in g/kg                                |

# Accessories

## UV lamps

Ultraviolet lamps are factory fitted in the air handling units, pre-engineered for placement to provide maximum effectiveness by neutralizing biological and chemical contents such as mold, bacteria, viruses, spores, allergens, VOCs and many other airborne contaminants. The UV lamps direct the UV energy onto the evaporator coil and drain pan, destroying and preventing mold and other microbial growth.

Ultra Violet lamps use Quartz (lamps) and are filled with mercury vapour. UV lamps improve energy savings and reduce maintenance by keeping the coil clean. UV lamps can be installed either upstream or downstream of the cooling coil. UV lamps are also available with reflectors for better efficiency.



## Volume Control Dampers

Volume control dampers are square or rectangular type with opposed blade operation designed for low leakage to control the air flow rate by offering resistance to flow of air.

Dampers are constructed out of extruded aluminium profile frame with blades of extruded aluminium airfoil design, operated with nylon gears and handles for smooth and quiet operation. Links are provided for either manual or motorized operation.

## Sand Trap Louvers

Sand trap louvers are provided for fresh air intake and are designed to separate large size sand particles at low air velocities thus avoiding excessive dust loading on conventional secondary stage filters. At low velocities, sand trap louvers give excellent performance for air filtration and moderate pressure drops.

Sand trap louvers are constructed out of aluminium in general and powder coated for corrosion resistance. Stainless steel construction can be offered upon request.



## Supply Air Grilles

Exposed type air handling units having direct discharge into the conditioned space are provided with linear grilles, of double deflection type, designed to provide full flexibility in volume and air pattern control. The grilles are constructed from extruded aluminium profiles and finished with powder coating.



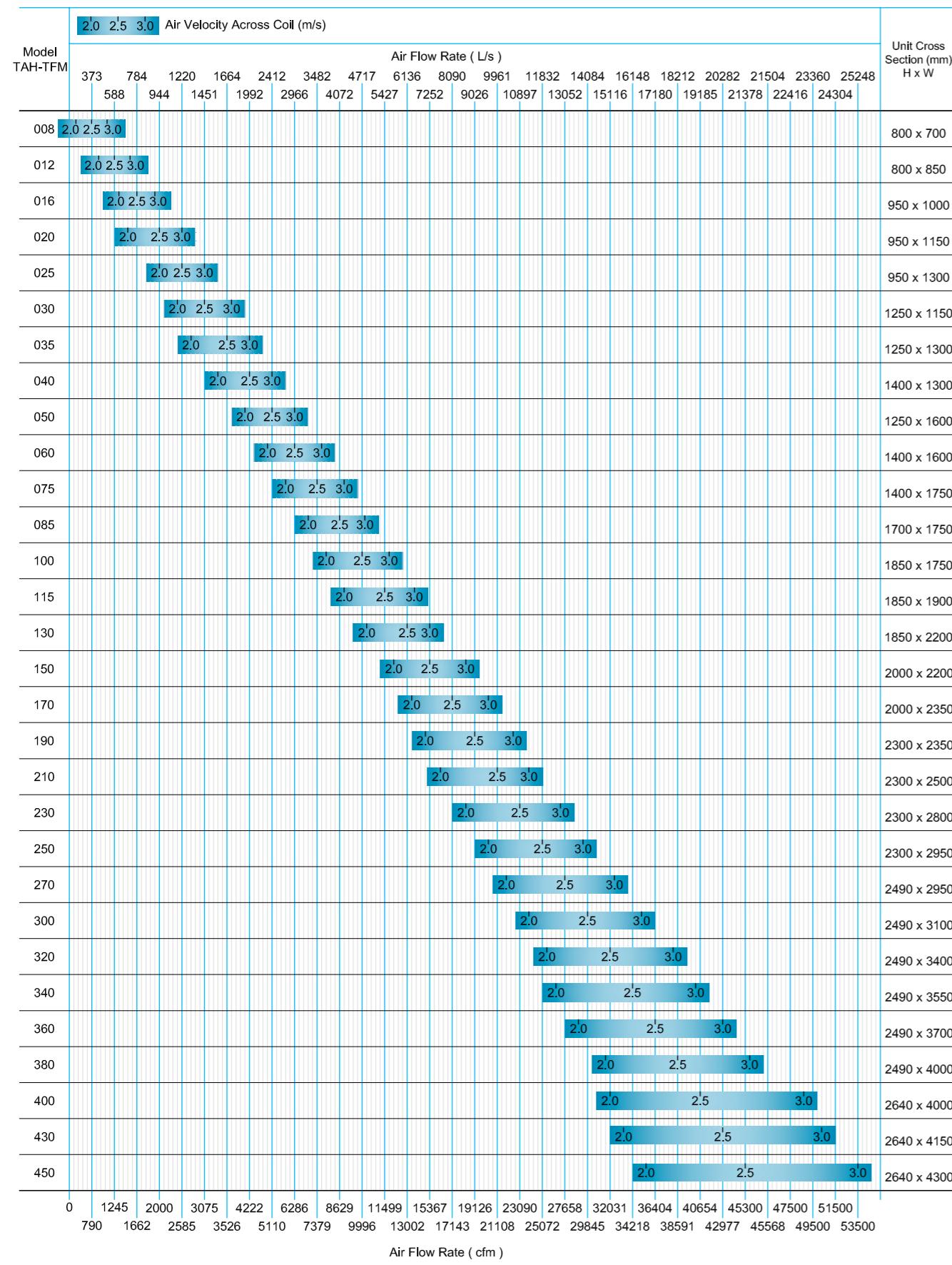
## Return Air Louvers

Return air louvers are provided for exposed type installation with non ducted return air. The grilles are constructed from extruded aluminium profiles, fixed at 35 degree deflection and finished with powder coating.

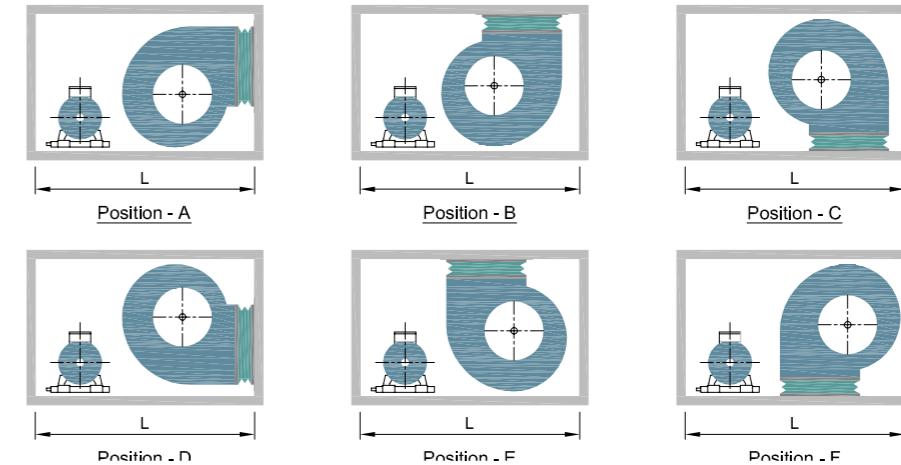
## Engineering Data

Quick Selection Chart  
Fan Orientation  
Coil Sizing  
Filter Grid  
Ceiling Suspended Units  
Vertical Units  
Ventilation Units

# Quick Selection Chart

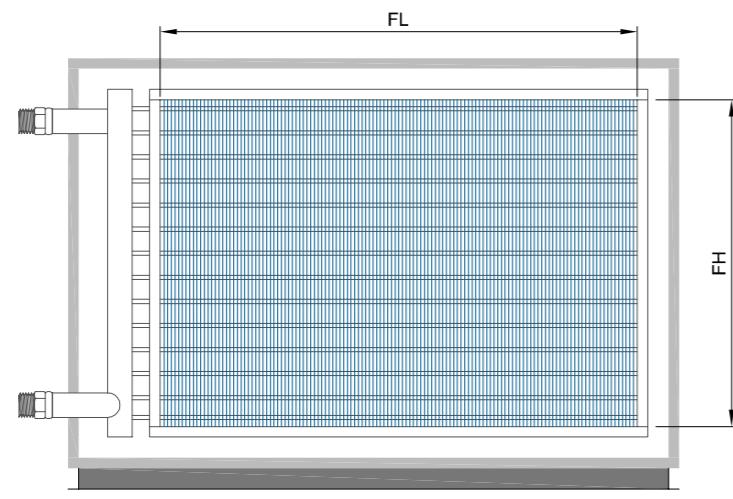


# Fan Orientation



| Fan Dia | Position           | Motor Frame Sizes |              |         |      |      | Fan Outlet |          |
|---------|--------------------|-------------------|--------------|---------|------|------|------------|----------|
|         |                    | ≤112              | 132          | 160-180 | 200  | 225  | Height mm  | Width mm |
| 7-7     | A - F              | 857               |              |         |      |      | 228        | 259      |
| 9-9     | A - F              | 1007              |              |         |      |      | 262        | 298      |
| 10-10   | A - F              | 1007              |              |         |      |      | 289        | 331      |
| 12-12   | A - F              | 1007              |              |         |      |      | 341        | 395      |
| 15-15   | A - F              | 1157              |              |         |      |      | 404        | 471      |
| 18-18   | A - F              | 1307              | 1307         |         |      |      | 478        | 557      |
| 160     | A - F              | 857               |              |         |      |      | 205        | 205      |
| 180     | A - F              | 857               |              |         |      |      | 229        | 229      |
| 200     | A - F              | 857               | 1007         |         |      |      | 256        | 256      |
| 225     | A - F              | 1007              | 1007         |         |      |      | 288        | 288      |
| 250     | A - F              | 1007              | 1007         |         |      |      | 322        | 322      |
| 280     | A - F              | 1007              | 1007         |         |      |      | 360        | 360      |
| 315     | A - F              | 1007              | 1157         |         |      |      | 404        | 404      |
| 355     | A - F              | 1157              | 1157         |         |      |      | 452        | 452      |
| 400     | A, D<br>B, C, E, F | 1157<br>1307      | 1157<br>1307 |         |      |      | 506        | 506      |
| 450     | A, D<br>B, C, E, F | 1307              | 1307         | 1457    | 1607 |      | 568        | 568      |
| 500     | A, D<br>B, C, E, F | 1307              | 1457         | 1457    | 1757 |      | 638        | 638      |
| 560     | A, D<br>B, C, E, F | 1457<br>1607      | 1457<br>1607 | 1607    | 1757 |      | 714        | 714      |
| 630     | A, D<br>B, C, E, F | 1607              | 1607         | 1757    | 1907 |      | 800        | 800      |
| 710     | A, D<br>B, C, E, F | 1757<br>1907      | 1907         | 2057    | 2207 | 2207 | 898        | 898      |
| 800     | A, D<br>B, C, E, F | 1907<br>2057      | 2057         | 2207    | 2357 | 2357 | 1006       | 1006     |
| 900     | A, D<br>B, C, E, F | 2057<br>2207      | 2207         | 2357    | 2507 | 2507 | 1130       | 1130     |
| 1000    | A, D<br>B, C, E, F | 2057<br>2357      | 2207         | 2357    | 2357 | 2357 | 1266       | 1266     |
| 1120    | A, D<br>B, C, E, F | 2357<br>2807      | 2507         | 2657    | 2657 | 2657 | 1422       | 1422     |

# Coil Sizing

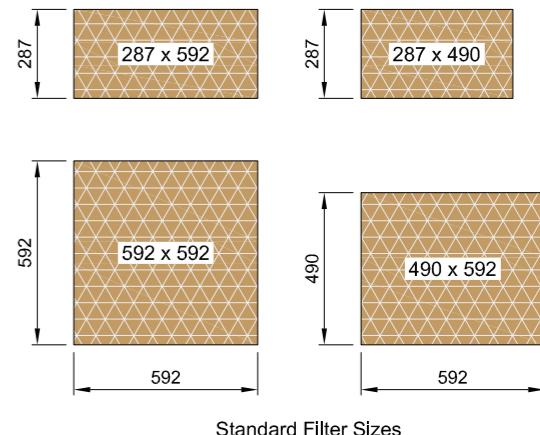


| Model   | Air Flow Rate |       | Coil Size 1/2 |      |             | Coil Size 3/8 |      |             | Coil Face Area  |                |      |
|---------|---------------|-------|---------------|------|-------------|---------------|------|-------------|-----------------|----------------|------|
|         | cfm           | L/s   | FH            | FL   | Tubes / Row | FH            | FL   | Tubes / Row | ft <sup>2</sup> | m <sup>2</sup> |      |
| TAH-TFM | 008           | 790   | 373           | 445  | 330         | 14            | 457  | 330         | 12              | 1.58           | 0.15 |
|         | 012           | 1245  | 588           | 445  | 520         | 14            | 457  | 520         | 12              | 2.49           | 0.23 |
|         | 016           | 1662  | 784           | 572  | 540         | 18            | 610  | 540         | 16              | 3.32           | 0.31 |
|         | 020           | 2000  | 944           | 572  | 650         | 18            | 610  | 650         | 16              | 4.00           | 0.37 |
|         | 025           | 2585  | 1220          | 572  | 840         | 18            | 610  | 840         | 16              | 5.17           | 0.48 |
|         | 030           | 3075  | 1451          | 762  | 750         | 24            | 838  | 750         | 22              | 6.15           | 0.57 |
|         | 035           | 3526  | 1664          | 762  | 860         | 24            | 838  | 860         | 22              | 7.05           | 0.66 |
|         | 040           | 4222  | 1992          | 826  | 950         | 26            | 991  | 950         | 26              | 8.44           | 0.78 |
|         | 050           | 5110  | 2412          | 826  | 1150        | 26            | 838  | 1150        | 22              | 10.22          | 0.95 |
|         | 060           | 6286  | 2966          | 1016 | 1150        | 32            | 1067 | 1150        | 28              | 12.57          | 1.17 |
|         | 075           | 7379  | 3482          | 1016 | 1350        | 32            | 1067 | 1350        | 28              | 14.76          | 1.37 |
|         | 085           | 8629  | 4072          | 1206 | 1330        | 40            | 1372 | 1330        | 36              | 17.26          | 1.60 |
|         | 100           | 9996  | 4717          | 1397 | 1330        | 44            | 1448 | 1330        | 38              | 19.99          | 1.86 |
|         | 115           | 11499 | 5427          | 1397 | 1530        | 44            | 1448 | 1530        | 38              | 23.00          | 2.14 |
|         | 130           | 13002 | 6136          | 1397 | 1730        | 44            | 1448 | 1730        | 38              | 26.00          | 2.42 |
|         | 150           | 15367 | 7252          | 1651 | 1730        | 52            | 1600 | 1730        | 42              | 30.73          | 2.86 |
|         | 170           | 17143 | 8090          | 1651 | 1930        | 52            | 1600 | 1930        | 42              | 34.29          | 3.19 |
|         | 190           | 19126 | 9026          | 1842 | 1930        | 58            | 1905 | 1930        | 50              | 38.25          | 3.56 |
|         | 210           | 21108 | 9961          | 1842 | 2130        | 58            | 1905 | 2130        | 50              | 42.22          | 3.92 |
|         | 230           | 23090 | 10897         | 1842 | 2330        | 58            | 1905 | 2330        | 50              | 46.18          | 4.29 |
|         | 250           | 25072 | 11832         | 1842 | 2530        | 58            | 1905 | 2530        | 50              | 50.14          | 4.66 |
|         | 270           | 27658 | 13052         | 2032 | 2530        | 64            | 2057 | 2530        | 54              | 55.32          | 5.14 |
|         | 300           | 29845 | 14084         | 2032 | 2730        | 64            | 2057 | 2730        | 54              | 59.69          | 5.55 |
|         | 320           | 32031 | 15116         | 2032 | 2930        | 64            | 2057 | 2930        | 54              | 64.06          | 5.95 |
|         | 340           | 34218 | 16148         | 2032 | 3130        | 64            | 2057 | 3130        | 54              | 68.44          | 6.36 |
|         | 360           | 36404 | 17180         | 2032 | 3330        | 64            | 2057 | 3330        | 54              | 72.81          | 6.77 |
|         | 380           | 38591 | 18212         | 2032 | 3530        | 64            | 2057 | 3530        | 54              | 77.18          | 7.17 |
|         | 400           | 40654 | 19185         | 2159 | 3500        | 68            | 2210 | 3500        | 58              | 81.31          | 7.56 |
|         | 430           | 42977 | 20282         | 2159 | 3700        | 68            | 2210 | 3700        | 58              | 85.95          | 7.99 |
|         | 450           | 45300 | 21378         | 2159 | 3900        | 68            | 2210 | 3900        | 58              | 90.60          | 8.42 |

# Filter Grid



Illustrated Model : TAH-050 TFM

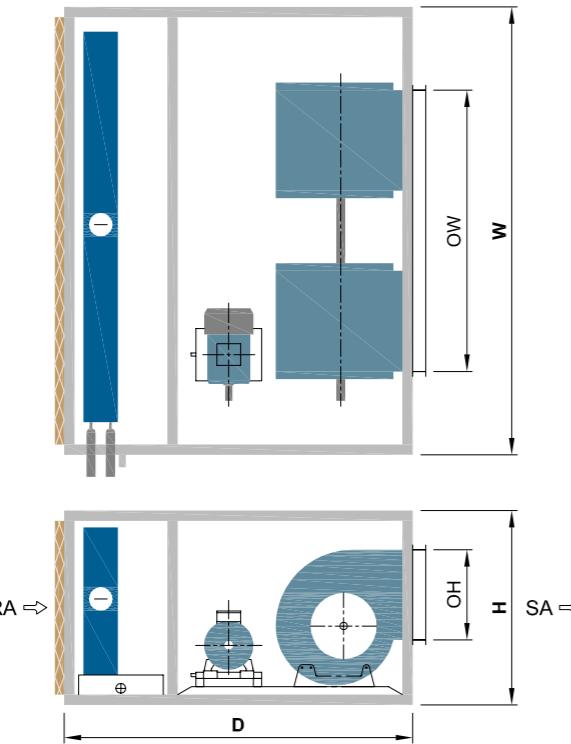


| Model | Air Flow Rate |       | Filter Grid |           |           |           | Filter Face Area |                 |                |
|-------|---------------|-------|-------------|-----------|-----------|-----------|------------------|-----------------|----------------|
|       | TAH-TFM       | cfm   | L/s         | 592 x 592 | 287 x 592 | 490 x 592 | 287 x 490        | ft <sup>2</sup> | m <sup>2</sup> |
| 008   | 008           | 790   | 373         |           |           |           | 1                | 1.52            | 0.14           |
| 012   | 012           | 1245  | 588         |           |           |           | 1                | 3.12            | 0.29           |
| 016   | 016           | 1662  | 784         | 1         |           |           |                  | 3.77            | 0.35           |
| 020   | 020           | 2000  | 944         | 1         |           |           |                  | 3.77            | 0.35           |
| 025   | 025           | 2585  | 1220        | 1         | 1         |           |                  | 5.60            | 0.52           |
| 030   | 030           | 3075  | 1451        | 1         | 1         |           |                  | 5.60            | 0.52           |
| 035   | 035           | 3526  | 1664        | 1         | 2         |           |                  | 7.42            | 0.69           |
| 040   | 040           | 4222  | 1992        | 1         | 2         |           |                  | 7.42            | 0.69           |
| 050   | 050           | 5110  | 2412        | 2         | 2         |           |                  | 11.19           | 1.04           |
| 060   | 060           | 6286  | 2966        | 2         | 2         |           |                  | 11.19           | 1.04           |
| 075   | 075           | 7379  | 3482        | 2         |           | 2         | 2                | 13.77           | 1.28           |
| 085   | 085           | 8629  | 4072        | 4         | 2         |           |                  | 18.72           | 1.74           |
| 100   | 100           | 9996  | 4717        | 4         | 2         |           |                  | 18.72           | 1.74           |
| 115   | 115           | 11499 | 5427        | 4         | 4         |           |                  | 22.38           | 2.08           |
| 130   | 130           | 13002 | 6136        | 6         | 3         |           |                  | 28.08           | 2.61           |
| 150   | 150           | 15367 | 7252        | 6         |           | 3         |                  | 31.96           | 2.97           |
| 170   | 170           | 17143 | 8090        | 6         |           | 3         |                  | 31.96           | 2.97           |
| 190   | 190           | 19126 | 9026        | 9         | 3         |           |                  | 39.38           | 3.66           |
| 210   | 210           | 21108 | 9961        | 9         | 3         |           |                  | 39.38           | 3.66           |
| 230   | 230           | 23090 | 10897       | 12        |           |           |                  | 45.19           | 4.20           |
| 250   | 250           | 25072 | 11832       | 9         | 3         | 3         |                  | 48.74           | 4.53           |
| 270   | 270           | 27658 | 13052       | 12        | 4         |           |                  | 52.51           | 4.88           |
| 300   | 300           | 29845 | 14084       | 12        | 7         |           |                  | 58.00           | 5.39           |
| 320   | 320           | 32031 | 15116       | 15        | 5         |           |                  | 65.64           | 6.10           |
| 340   | 340           | 34218 | 16148       | 15        | 5         |           |                  | 65.64           | 6.10           |
| 360   | 360           | 36404 | 17180       | 15        | 8         |           |                  | 71.12           | 6.61           |
| 380   | 380           | 38591 | 18212       | 15        | 5         | 3         |                  | 75.00           | 6.97           |
| 400   | 400           | 40654 | 19185       | 15        | 5         | 3         |                  | 75.00           | 6.97           |
| 430   | 430           | 42977 | 20282       | 18        | 6         |           |                  | 78.76           | 7.32           |
| 450   | 450           | 45300 | 21378       | 18        | 9         |           |                  | 84.25           | 7.83           |

# Ceiling Suspended Units

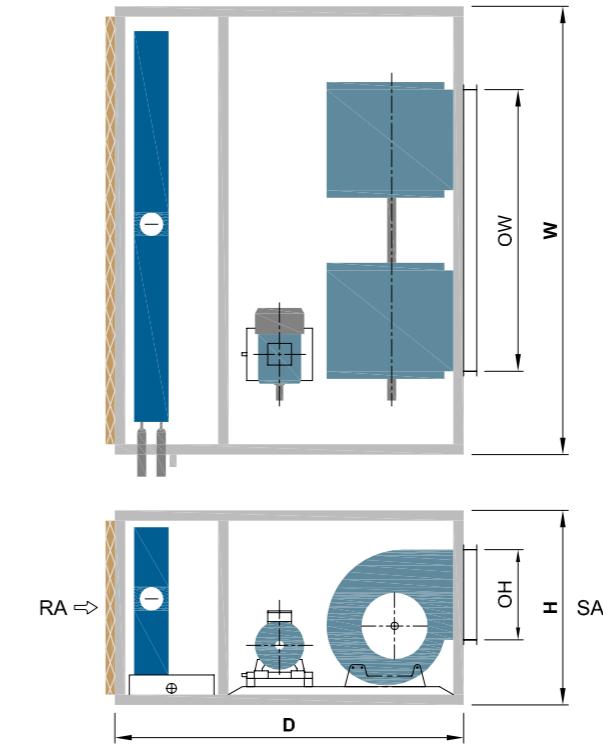
Model TCS

25mm Panel



Model TAH-TCS

50mm Panel



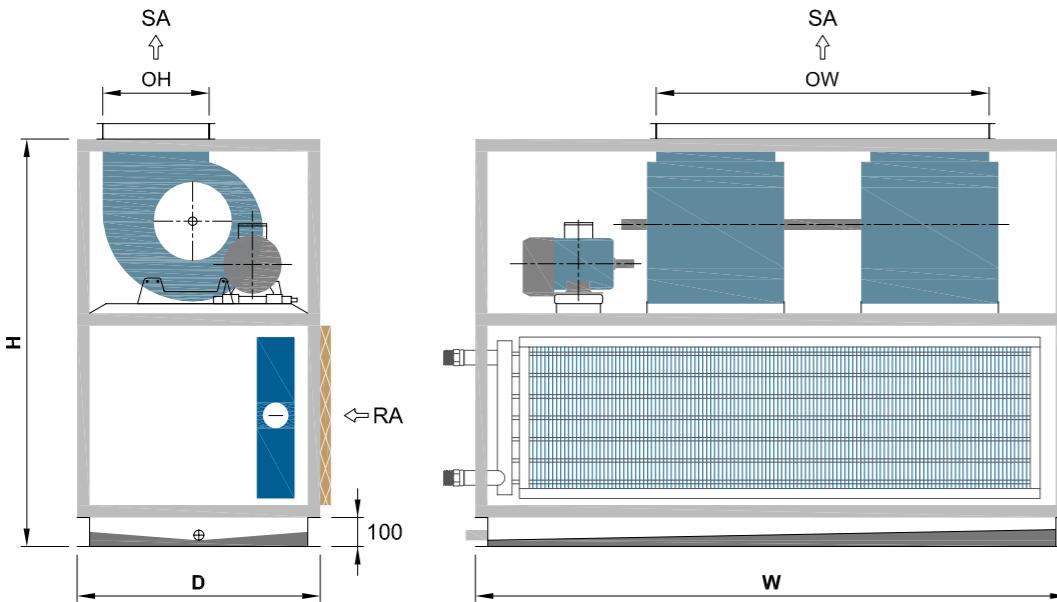
| Model | Air Flow Rate |      | Unit Dimensions |      |     | Coil Size |      | Fan Size   | Motor Power | Fan Outlet Dim |      | Filter Face Area | Unit Weight    |
|-------|---------------|------|-----------------|------|-----|-----------|------|------------|-------------|----------------|------|------------------|----------------|
|       | cfm           | L/s  | mm              | mm   | mm  | mm        | mm   |            |             | mm             | mm   | ft <sup>2</sup>  | m <sup>2</sup> |
| TCS   | cfm           | L/s  | mm              | mm   | mm  | mm        | mm   |            | kW          | mm             | mm   | ft <sup>2</sup>  | kgs            |
| 010   | 1000          | 472  | 800             | 1120 | 550 | 381       | 483  | 07/07      | 0.55        | 228            | 259  | 3.39             | 0.32           |
| 015   | 1500          | 708  | 1050            | 1200 | 550 | 381       | 737  | 09/09      | 1.1         | 262            | 298  | 4.59             | 0.43           |
| 020   | 2000          | 944  | 1140            | 1300 | 550 | 445       | 838  | 10/10      | 1.1         | 262            | 298  | 5.02             | 0.47           |
| 025   | 2500          | 1180 | 1530            | 1200 | 550 | 381       | 1219 | 07/07 Twin | 2.2         | 228            | 702  | 6.88             | 0.64           |
| 030   | 3000          | 1416 | 1760            | 1200 | 550 | 381       | 1448 | 09/09 Twin | 2.2         | 262            | 840  | 7.98             | 0.74           |
| 035   | 3500          | 1653 | 2020            | 1200 | 550 | 381       | 1702 | 09/09 Twin | 2.2         | 262            | 840  | 9.22             | 0.86           |
| 040   | 4000          | 1889 | 1780            | 1300 | 680 | 508       | 1473 | 10/10 Twin | 2.2         | 262            | 840  | 10.44            | 0.97           |
| 045   | 4500          | 2125 | 1970            | 1300 | 680 | 508       | 1651 | 10/10 Twin | 3.0         | 289            | 926  | 11.61            | 1.08           |
| 050   | 5000          | 2361 | 2140            | 1300 | 680 | 508       | 1829 | 12/09 Twin | 3.0         | 341            | 807  | 12.66            | 1.18           |
| 055   | 5500          | 2597 | 1910            | 1300 | 810 | 635       | 1600 | 12/12 Twin | 4.0         | 341            | 1114 | 13.79            | 1.28           |
| 060   | 6000          | 2833 | 2070            | 1300 | 810 | 635       | 1753 | 12/12 Twin | 4.0         | 341            | 1114 | 15.00            | 1.39           |
| 065   | 6500          | 3069 | 2220            | 1300 | 810 | 635       | 1905 | 12/12 Twin | 4.0         | 341            | 1114 | 16.13            | 1.50           |
| 070   | 7000          | 3305 | 2370            | 1460 | 810 | 635       | 2057 | 15/15 Twin | 4.0         | 404            | 1326 | 17.27            | 1.61           |
| 075   | 7500          | 3541 | 2520            | 1460 | 810 | 635       | 2210 | 15/15 Twin | 4.0         | 404            | 1326 | 18.41            | 1.71           |
| 080   | 8000          | 3777 | 2650            | 1460 | 810 | 635       | 2337 | 15/15 Twin | 5.5         | 404            | 1326 | 19.39            | 1.80           |

| Model   | Air Flow Rate |      | Unit Dimensions |      |     | Coil Size |      | Fan Size   | Motor Power | Fan Outlet Dim |      | Filter Face Area | Unit Weight    |
|---------|---------------|------|-----------------|------|-----|-----------|------|------------|-------------|----------------|------|------------------|----------------|
|         | cfm           | L/s  | mm              | mm   | mm  | mm        | mm   |            |             | mm             | mm   | ft <sup>2</sup>  | m <sup>2</sup> |
| TAH-TCS | cfm           | L/s  | mm              | mm   | mm  | mm        | mm   |            | kW          | mm             | mm   | ft <sup>2</sup>  | kgs            |
| 010     | 1000          | 472  | 850             | 1180 | 600 | 381       | 483  | 07/07      | 0.55        | 228            | 259  | 3.39             | 0.32           |
| 015     | 1500          | 708  | 1100            | 1260 | 600 | 381       | 737  | 09/09      | 1.1         | 262            | 298  | 4.59             | 0.43           |
| 020     | 2000          | 944  | 1190            | 1360 | 600 | 445       | 838  | 10/10      | 1.1         | 262            | 298  | 5.02             | 0.47           |
| 025     | 2500          | 1180 | 1580            | 1260 | 600 | 381       | 1219 | 07/07 Twin | 2.2         | 228            | 702  | 6.88             | 0.64           |
| 030     | 3000          | 1416 | 1810            | 1260 | 600 | 381       | 1448 | 09/09 Twin | 2.2         | 262            | 840  | 7.98             | 0.74           |
| 035     | 3500          | 1653 | 2070            | 1260 | 600 | 381       | 1702 | 09/09 Twin | 2.2         | 262            | 840  | 9.22             | 0.86           |
| 040     | 4000          | 1889 | 1830            | 1360 | 730 | 508       | 1473 | 10/10 Twin | 2.2         | 262            | 840  | 10.44            | 0.97           |
| 045     | 4500          | 2125 | 2020            | 1360 | 730 | 508       | 1651 | 10/10 Twin | 3.0         | 289            | 926  | 11.61            | 1.08           |
| 050     | 5000          | 2361 | 2190            | 1360 | 730 | 508       | 1829 | 12/09 Twin | 3.0         | 341            | 807  | 12.66            | 1.18           |
| 055     | 5500          | 2597 | 1960            | 1360 | 860 | 635       | 1600 | 12/12 Twin | 4.0         | 341            | 1114 | 13.79            | 1.28           |
| 060     | 6000          | 2833 | 2120            | 1360 | 860 | 635       | 1753 | 12/12 Twin | 4.0         | 341            | 1114 | 15.00            | 1.39           |
| 065     | 6500          | 3069 | 2270            | 1360 | 860 | 635       | 1905 | 12/12 Twin | 4.0         | 341            | 1114 | 16.13            | 1.50           |
| 070     | 7000          | 3305 | 2420            | 1520 | 860 | 635       | 2057 | 15/15 Twin | 4.0         | 404            | 1326 | 17.27            | 1.61           |
| 075     | 7500          | 3541 | 2570            | 1520 | 860 | 635       | 2210 | 15/15 Twin | 4.0         | 404            | 1326 | 18.41            | 1.71           |
| 080     | 8000          | 3777 | 2700            | 1520 | 860 | 635       | 2337 | 15/15 Twin | 5.5         | 404            | 1326 | 19.39            | 1.80           |

# Vertical Units

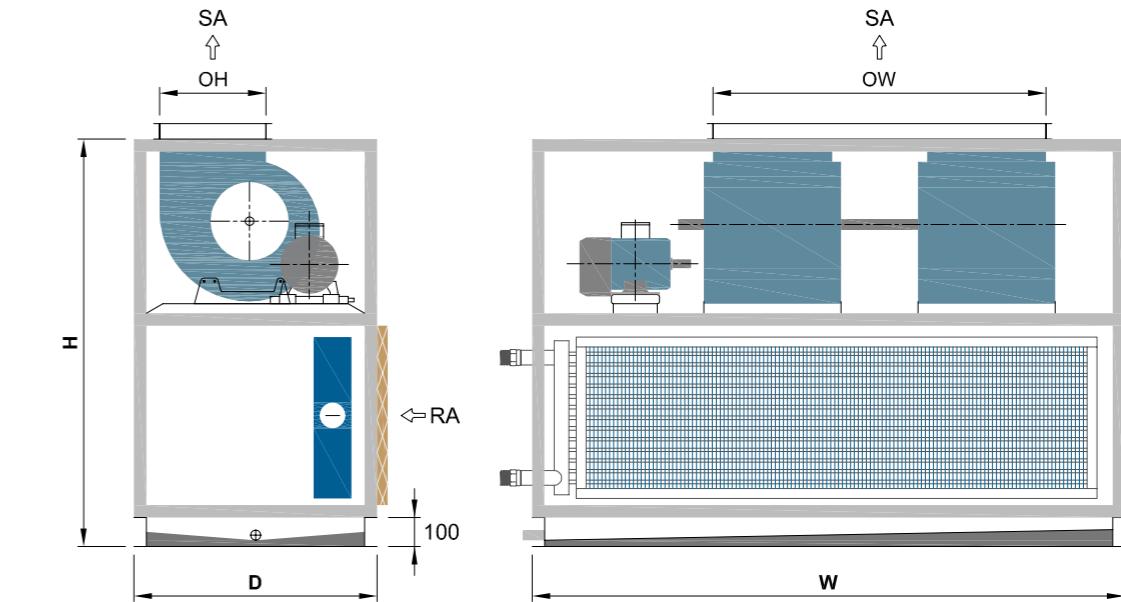
Model TFM

25mm Panel



Model TAH-TFM

50mm Panel



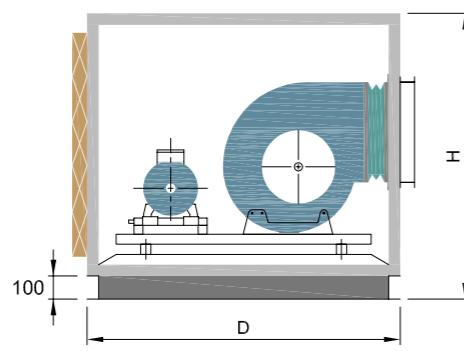
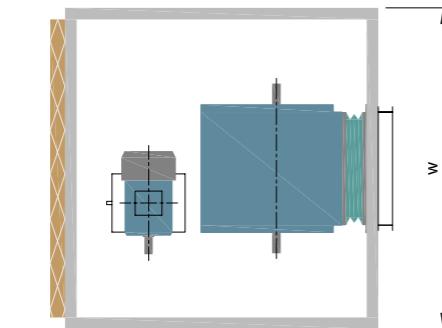
| Model | Air Flow Rate |      | Unit Dimensions |     |      | Coil Size |      | Fan Size   | Motor Power | Fan Outlet Dim |      | Filter Face Area | Unit Weight    |
|-------|---------------|------|-----------------|-----|------|-----------|------|------------|-------------|----------------|------|------------------|----------------|
|       | cfm           | L/s  | mm              | mm  | mm   | mm        | mm   |            |             | mm             | mm   | ft <sup>2</sup>  | m <sup>2</sup> |
| TFM   |               |      |                 |     |      |           |      |            |             |                |      |                  |                |
| 010   | 1000          | 472  | 900             | 600 | 1070 | 381       | 483  | 07/07      | 0.55        | 228            | 259  | 4.49             | 0.42           |
| 015   | 1500          | 708  | 1050            | 600 | 1140 | 381       | 737  | 09/09      | 1.1         | 262            | 298  | 5.34             | 0.50           |
| 020   | 2000          | 944  | 1140            | 700 | 1260 | 445       | 838  | 10/10      | 1.1         | 262            | 298  | 5.85             | 0.54           |
| 025   | 2500          | 1180 | 1530            | 600 | 1070 | 381       | 1219 | 07/07 Twin | 2.2         | 228            | 702  | 8.06             | 0.75           |
| 030   | 3000          | 1416 | 1760            | 700 | 1140 | 381       | 1448 | 09/09 Twin | 2.2         | 262            | 840  | 9.36             | 0.87           |
| 035   | 3500          | 1653 | 2020            | 700 | 1140 | 381       | 1702 | 09/09 Twin | 2.2         | 262            | 840  | 10.83            | 1.01           |
| 040   | 4000          | 1889 | 1780            | 700 | 1320 | 508       | 1473 | 10/10 Twin | 2.2         | 262            | 840  | 9.47             | 0.88           |
| 045   | 4500          | 2125 | 1970            | 700 | 1320 | 508       | 1651 | 10/10 Twin | 3.0         | 289            | 926  | 11.33            | 1.05           |
| 050   | 5000          | 2361 | 2140            | 800 | 1380 | 508       | 1829 | 12/09 Twin | 3.0         | 341            | 807  | 12.37            | 1.15           |
| 055   | 5500          | 2597 | 1910            | 800 | 1510 | 635       | 1600 | 12/12 Twin | 4.0         | 341            | 1114 | 12.64            | 1.17           |
| 060   | 6000          | 2833 | 2070            | 800 | 1510 | 635       | 1753 | 12/12 Twin | 4.0         | 341            | 1114 | 16.29            | 1.51           |
| 065   | 6500          | 3069 | 2220            | 800 | 1510 | 635       | 1905 | 12/12 Twin | 4.0         | 341            | 1114 | 14.81            | 1.38           |
| 070   | 7000          | 3305 | 2370            | 900 | 1580 | 635       | 2057 | 15/15 Twin | 4.0         | 404            | 1326 | 16.20            | 1.51           |
| 075   | 7500          | 3541 | 2520            | 900 | 1580 | 635       | 2210 | 15/15 Twin | 4.0         | 404            | 1326 | 17.27            | 1.61           |
| 080   | 8000          | 3777 | 2650            | 900 | 1580 | 635       | 2337 | 15/15 Twin | 5.5         | 404            | 1326 | 18.20            | 1.69           |

| Model   | Air Flow Rate |      | Unit Dimensions |     |      | Coil Size |      | Fan Size   | Motor Power | Fan Outlet Dim |      | Filter Face Area | Unit Weight    |
|---------|---------------|------|-----------------|-----|------|-----------|------|------------|-------------|----------------|------|------------------|----------------|
|         | cfm           | L/s  | W               | D   | H    | FH        | FL   |            |             | mm             | mm   | ft <sup>2</sup>  | m <sup>2</sup> |
| TAH-TFM |               |      |                 |     |      |           |      |            |             |                |      |                  |                |
| 010     | 1000          | 472  | 950             | 660 | 1120 | 381       | 483  | 07/07      | 0.55        | 228            | 259  | 4.49             | 0.42           |
| 015     | 1500          | 708  | 1100            | 660 | 1190 | 381       | 737  | 09/09      | 1.1         | 262            | 298  | 5.34             | 0.50           |
| 020     | 2000          | 944  | 1190            | 760 | 1310 | 445       | 838  | 10/10      | 1.1         | 262            | 298  | 5.85             | 0.54           |
| 025     | 2500          | 1180 | 1580            | 660 | 1120 | 381       | 1219 | 07/07 Twin | 2.2         | 228            | 702  | 8.06             | 0.75           |
| 030     | 3000          | 1416 | 1810            | 760 | 1190 | 381       | 1448 | 09/09 Twin | 2.2         | 262            | 840  | 9.36             | 0.87           |
| 035     | 3500          | 1653 | 2070            | 760 | 1190 | 381       | 1702 | 09/09 Twin | 2.2         | 262            | 840  | 10.83            | 1.01           |
| 040     | 4000          | 1889 | 1830            | 760 | 1370 | 508       | 1473 | 10/10 Twin | 2.2         | 262            | 840  | 9.47             | 0.88           |
| 045     | 4500          | 2125 | 2020            | 760 | 1370 | 508       | 1651 | 10/10 Twin | 3.0         | 289            | 926  | 11.33            | 1.05           |
| 050     | 5000          | 2361 | 2190            | 860 | 1430 | 508       | 1829 | 12/09 Twin | 3.0         | 341            | 807  | 12.37            | 1.15           |
| 055     | 5500          | 2597 | 1960            | 860 | 1560 | 635       | 1600 | 12/12 Twin | 4.0         | 341            | 1114 | 12.64            | 1.17           |
| 060     | 6000          | 2833 | 2120            | 860 | 1560 | 635       | 1753 | 12/12 Twin | 4.0         | 341            | 1114 | 16.29            | 1.51           |
| 065     | 6500          | 3069 | 2270            | 860 | 1560 | 635       | 1905 | 12/12 Twin | 4.0         | 341            | 1114 | 14.81            | 1.38           |
| 070     | 7000          | 3305 | 2420            | 960 | 1630 | 635       | 2057 | 15/15 Twin | 4.0         | 404            | 1326 | 16.20            | 1.51           |
| 075     | 7500          | 3541 | 2570            | 960 | 1630 | 635       | 2210 | 15/15 Twin | 4.0         | 404            | 1326 | 17.27            | 1.61           |
| 080     | 8000          | 3777 | 2700            | 960 | 1630 | 635       | 2337 | 15/15 Twin | 5.5         | 404            | 1326 | 18.20            | 1.69           |

# Ventilation Unit

Model TFM

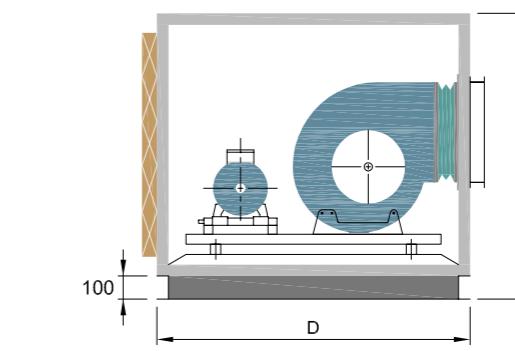
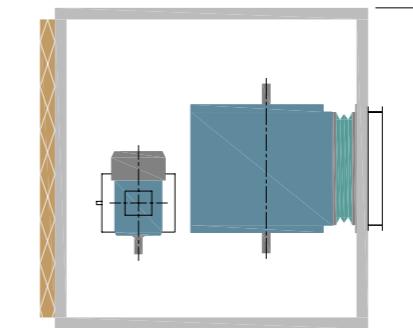
25mm Panel



| Model | Air Flow Rate |       | Unit Dimensions |      |      | Fan Size | Motor Power | Filter Grid |           |           |                 | Filter Face Area | Unit Weight |
|-------|---------------|-------|-----------------|------|------|----------|-------------|-------------|-----------|-----------|-----------------|------------------|-------------|
|       | cfm           | L/s   | W               | D    | H    |          |             | 592 x 592   | 287 x 592 | 287 x 490 | 490 x 592       |                  |             |
| TFM   | cfm           | L/s   | mm              | mm   | mm   | kW       | mm          | mm          | mm        | mm        | ft <sup>2</sup> | m <sup>2</sup>   | kgs         |
| 010   | 1000          | 472   | 650             | 960  | 690  | 180      | 0.55        |             | 1         |           | 1.52            | 0.14             | 90          |
| 015   | 1500          | 708   | 800             | 960  | 720  | 200      | 0.75        |             | 1         |           | 3.12            | 0.29             | 100         |
| 020   | 2000          | 944   | 800             | 1110 | 770  | 225      | 1.1         |             | 1         |           | 3.12            | 0.29             | 115         |
| 025   | 2500          | 1180  | 850             | 1110 | 900  | 250      | 1.1         | 1           |           |           | 3.77            | 0.35             | 125         |
| 030   | 3000          | 1416  | 1100            | 1110 | 950  | 280      | 1.5         | 1           | 1         |           | 5.60            | 0.52             | 155         |
| 035   | 3500          | 1652  | 1100            | 1260 | 950  | 315      | 1.5         | 1           | 1         |           | 5.60            | 0.52             | 175         |
| 040   | 4000          | 1888  | 1300            | 1260 | 1030 | 355      | 1.5         | 1           |           | 1         | 6.89            | 0.64             | 205         |
| 060   | 6000          | 2832  | 1400            | 1410 | 1200 | 400      | 2.2         | 2           | 2         |           | 11.19           | 1.04             | 240         |
| 080   | 8000          | 3775  | 1400            | 1410 | 1200 | 450      | 3.0         | 2           | 2         |           | 11.19           | 1.04             | 260         |
| 100   | 10000         | 4719  | 1700            | 1410 | 1500 | 500      | 4.0         | 4           | 2         |           | 18.72           | 1.74             | 330         |
| 120   | 12000         | 5663  | 1700            | 1710 | 1500 | 560      | 4.0         | 4           | 2         |           | 18.72           | 1.74             | 395         |
| 150   | 15000         | 7079  | 2000            | 1860 | 1550 | 630      | 5.5         | 6           |           |           | 22.60           | 2.10             | 525         |
| 180   | 18000         | 8495  | 2200            | 2010 | 1700 | 710      | 7.5         | 6           | 3         |           | 28.08           | 2.61             | 660         |
| 200   | 20000         | 9438  | 2300            | 2010 | 1700 | 710      | 7.5         | 6           | 5         |           | 31.74           | 2.95             | 670         |
| 220   | 22000         | 10382 | 2400            | 2160 | 2000 | 800      | 7.5         | 9           |           |           | 33.89           | 3.15             | 845         |
| 250   | 25000         | 11798 | 2400            | 2160 | 2000 | 800      | 11.0        | 9           | 3         |           | 39.38           | 3.66             | 905         |
| 270   | 27000         | 12742 | 2700            | 2310 | 2150 | 900      | 11.0        | 12          |           |           | 45.19           | 4.20             | 1050        |
| 300   | 30000         | 14158 | 2700            | 2310 | 2150 | 900      | 11.0        | 12          |           |           | 45.19           | 4.20             | 1050        |
| 320   | 32000         | 15101 | 2900            | 2310 | 2150 | 900      | 11.0        | 12          | 3         |           | 50.68           | 4.71             | 1075        |
| 350   | 35000         | 16517 | 3000            | 2460 | 2300 | 1000     | 15.0        | 12          | 3         |           | 50.68           | 4.71             | 1275        |

Model TAH-TFM

50mm Panel



| Model   | Air Flow Rate |       | Unit Dimensions |      |      | Fan Size | Motor Power | Filter Grid |           |           |                 | Filter Face Area | Unit Weight |      |
|---------|---------------|-------|-----------------|------|------|----------|-------------|-------------|-----------|-----------|-----------------|------------------|-------------|------|
|         | cfm           | L/s   | W               | D    | H    |          |             | 592 x 592   | 287 x 592 | 287 x 490 | 490 x 592       |                  |             |      |
| TAH-TFM | cfm           | L/s   | mm              | mm   | mm   | kW       | mm          | mm          | mm        | mm        | ft <sup>2</sup> | m <sup>2</sup>   | kgs         |      |
| 010     | 1000          | 472   | 700             | 1020 | 740  | 180      | 0.55        |             | 1         |           |                 | 1.52             | 0.14        | 110  |
| 015     | 1500          | 708   | 850             | 1020 | 770  | 200      | 0.75        |             | 1         |           |                 | 3.12             | 0.29        | 125  |
| 020     | 2000          | 944   | 850             | 1170 | 820  | 225      | 1.1         |             | 1         |           |                 | 3.12             | 0.29        | 135  |
| 025     | 2500          | 1180  | 900             | 1170 | 950  | 250      | 1.1         | 1           | 1         |           |                 | 3.77             | 0.35        | 150  |
| 030     | 3000          | 1416  | 1150            | 1170 | 1000 | 280      | 1.5         | 1           | 1         |           |                 | 5.60             | 0.52        | 185  |
| 035     | 3500          | 1652  | 1150            | 1320 | 1000 | 315      | 1.5         | 1           | 1         |           |                 | 5.60             | 0.52        | 205  |
| 040     | 4000          | 1888  | 1350            | 1320 | 1080 | 355      | 1.5         | 1           | 1         |           | 1               | 6.89             | 0.64        | 235  |
| 060     | 6000          | 2832  | 1450            | 1470 | 1250 | 400      | 2.2         | 2           | 2         |           |                 | 11.19            | 1.04        | 280  |
| 080     | 8000          | 3775  | 1450            | 1470 | 1250 | 450      | 3.0         | 2           | 2         |           |                 | 11.19            | 1.04        | 295  |
| 100     | 10000         | 4719  | 1750            | 1470 | 1550 | 500      | 4.0         | 4           | 2         |           |                 | 18.72            | 1.74        | 375  |
| 120     | 12000         | 5663  | 1750            | 1770 | 1550 | 560      | 4.0         | 4           | 2         |           |                 | 18.72            | 1.74        | 445  |
| 150     | 15000         | 7079  | 2050            | 1920 | 1600 | 630      | 5.5         | 6           |           |           |                 | 22.60            | 2.10        | 585  |
| 180     | 18000         | 8495  | 2250            | 2070 | 1750 | 710      | 7.5         | 6           | 3         |           |                 | 28.08            | 2.61        | 720  |
| 200     | 20000         | 9438  | 2350            | 2070 | 1750 | 710      | 7.5         | 6           | 5         |           |                 | 31.74            | 2.95        | 735  |
| 220     | 22000         | 10382 | 2450            | 2220 | 2050 | 800      | 7.5         | 9           |           |           |                 | 33.89            | 3.15        | 915  |
| 250     | 25000         | 11798 | 2450            | 2220 | 2050 | 800      | 11.0        | 9           | 3         |           |                 | 39.38            | 3.66        | 975  |
| 270     | 27000         | 12742 | 2750            | 2370 | 2200 | 900      | 11.0        | 12          |           |           |                 | 45.19            | 4.20        | 1135 |
| 300     | 30000         | 14158 | 2750            | 2370 | 2200 | 900      | 11.0        | 12          |           |           |                 | 45.19            | 4.20        | 1135 |
| 320     | 32000         | 15101 | 2950            | 2370 | 2200 | 900      | 11.0        | 12          | 3         |           |                 | 50.68            | 4.71        | 1160 |
| 350     | 35000         | 16517 | 3050            | 2520 | 2350 | 1000     | 15.0        | 12          | 3         |           |                 | 50.68            | 4.71        | 1370 |



# Mechanical Specification

## Air Handling Units

### General

Supply and install as indicated in the schedule of equipment, Air Handling Units (AHUs) / Fresh Air Handling Units (FAHUs), each capable of the duty as mentioned in the schedule of equipment. The space available for the unit to be physically verified at the site and dimensions of the units shall be selected to fit into the spaces available. Where necessary the units may be built on site, subject to acceptance of the finished units for warranty purposes by the original supplier and their local agent.

The units shall be double skin construction, draw-thru type comprising of various sections such as mixing box (wherever the RA, FA is ducted), filter section, heat recovery components, cooling coil, electric heater and fan section as per the details shown either in the drawings or specified in the schedule of equipment.

Fresh air handling units with heat recovery systems shall be provided with heat recovery wheels / heat pipes as indicated in the schedule of quantity.

### Quality Assurance

The equipment manufacturer shall strictly adhere to following standards & specification:

(1)ISO 9001:2008 certificate of the manufacturing facility required.

(2)Eurovent certification.

(3)The equipment manufacturer shall submit the mechanical performance report certified by Eurovent for the following characteristics.

| Mechanical Characteristics | Class |
|----------------------------|-------|
| Mechanical Strength        | D1    |
| Casing Air Leakage -400 Pa | L1    |
| Filter by-pass Leakage     | F9    |
| Thermal Transmittance      | T2    |
| Thermal Bridging           | TB2   |

The thermal transmittance factor and thermal bridge factor shall be relaxed to T3 and TB3 respectively for re-circulated Air Handling Units installed in conditioned plant rooms.

AHU panel insulation shall be injected polyurethane foam and be in accordance to fire retardant Class O of ISO 1182.2 standards.

### Unit Construction

The unit casings shall be of double skinned panels not less than 50mm thickness. Casing shall be assembled with self-supporting modular panel elements with an integrated base frame made of zintec steel sections along upper sides of the units.

The frame work shall be of extruded aluminum, thermal break construction using polyamide profiles, without using gaskets for thermal bridging ensuring durability for all Fresh Air Handling Units and also for all the Air Handling Units installed in non-conditioned plant rooms.

Sheet metal thickness shall be not less than 0.8 mm for the inner skin, 0.8 mm for the outer skin and shall be made from 270 GSM zintec steel sheets. The outer skin shall be pre-painted galvanized steel sheet having 7 to 9 microns of primer coat and 20 to 25 microns of polyester coat on the outer surface. For additional protection, outer surface of the outer skin shall be provided with vinyl guard film for scratch protection. Inside and outside of panel walls shall be completely smooth.

All casing panels shall be insulated with injected CFC free polyurethane foam insulation and shall be in accordance to Class O of ISO 1182.2 standards. The insulation density shall be 48 Kg /m<sup>3</sup> and having thermal conductivity (K value) of 0.02 W/m K.

The base frame of the units shall be made from sendzimir galvanized sheet metal for size with largest dimensions up to 2500 mm, and hot dip galvanized U-profile for larger units.

The manufacturer shall guarantee that no condensation shall take place on the exterior of panels. In the event that any condensation problems appear after installation, the contractor shall undertake all remedial measures to rectify and to the satisfaction of the consultants. Any stacked or double height coils shall have separate drain pans to reduce carry over. Units installed outdoors shall be fitted with weather proof aluminum canopy.

Acoustical insulation through the panel:

| Hz | 125 | 250  | 500  | 1000 | 2000 | 4000 | 8000 |
|----|-----|------|------|------|------|------|------|
| dB | 6.7 | 14.4 | 12.5 | 19.2 | 29   | 27.3 | 38.9 |

# Material Specification

## Vibration Isolation

The Air Handling Unit shall have internal vibration isolation system by mounting fan, motor and drive assembly on spring isolators designed for 93% isolation. The fan discharge shall be connected to the air handling unit casing through canvas connection to prevent vibration transfer. In addition to the above the entire unit shall be mounted on additional vibration isolators.

## Filter Section

Filter cells shall be of standard sizes and shall be obtained from reputed European manufacturers. The filters shall be sealed against the filter frame using a permanently elastic gasket to a standard compatible with the filter efficiency.

Pressure drop tapings shall be integrated into the frame to allow a manometer or filter monitor to be fitted. Filter materials shall be flame-retardant, incombustible, non-odorous and may offer no sustenance to vermin. Each filter section has to be provided with manometer.

The filter material shall be pleated to provide a large effective area. Filter section should be provided with an inspection door.

The contractor shall supply one set of all filters per AHU as spares for replacement after testing and commissioning and prior to handing over of the installation.

## Panel Filter

The Panel filter material shall be synthetic media pleated to provide a large effective area and shall be supported by a wire mesh and frame. The filter cells shall be suitable for side withdrawal on the inspection side. The filter class shall be EU-4 as per Eurovent 4/5 or G4 as per EN 779.

## Bag Filter

Bag filter material shall be synthetic media, of standard and readily available sizes. The filters shall be clamped against the frame using a cam locking bar. The filter class should be EU7 as per Eurovent 4/5 or G7 as per EN 779. Bag filters shall be provided for both Fresh Air Handling Units and Re-circulated Air Handling Units.

## Fan & Fan Motor

Fans shall be double inlet, double width, and backward curved centrifugal type with galvanized steel casings. Fans shall be tested in accordance with AMCA 300-85. Every individual fan shall be run before delivery to check bearing condition and vibration. Fan shafts shall be mounted in taper sleeve bearings designed for continuous operation and a mean useful life of 200,000 hours. Backward curved impeller should be coated with 60 micron epoxy painting of high quality.

Fans shall be designed in accordance with the specified operating class of AMCA standard 99-2408-69 - performance class limits for centrifugal fans. The impeller & fan shaft shall be statically and dynamically balanced to a balancing grade of G 2.5.

The fan shall be connected to the outlet opening by means of an airtight flexible connection. Fans shall not exceed a maximum outlet velocity of 12 m/sec.

The degree of protection shall be IP55 with mounting method B3 and Class F insulation for the electric motors. Fan drive shall be rated at 150% of the maximum motor power of the units and shall be fitted with adjustable belt tension arrangement.

Belt guards or screen protection door in fan section shall be provided in accordance with CEN Standard. The fan motor shall be suitable for operating at 415V, 3Ph, 50Hz electrical power supply. The fan motor shall be wired to the safety isolation switch or connection box. The contractor shall select power input and speed of the fan subsequent to ascertaining system static pressure in accordance with pressure drop calculations to the approval of the engineer.

The fan motor shall meet the safety requirements of the CE and compatible with variable frequency drives. The motor shall be mounted on a common, torsionally rigid, galvanized steel base frame. carryover of bacteria, dust and other pollutants, from the exhaust air to supply air. With proper adjustments the cross contamination shall be limited to less than 0.04% of the exhaust air concentration.

# Material Specification

## Heat Recovery Wheel (Enthalpy)

Fresh air handling units shall be provided with heat recovery wheel (enthalpy) wherever specified in the schedule of quantity.

Wheel matrix should be only from pure aluminum foil to allow for quick and efficient uptake of thermal energy, sufficient mass for optimum heat transfer, maximum sensible heat recovery during low rotational speed of 20 to 25 rpm.

The Desiccant for Enthalpy wheel should be water molecule selective and non-migratory.

The Desiccant should be molecular sieve and keep the cross contamination to absolute minimum and also ensure the exclusion of contaminants from the air streams, while transferring the water vapor molecule.

The desiccant should be of sufficient mass, and should be coated with non- masking porous binder adhesive on the aluminum substrate (matrix) so as to allow quick and easy uptake and release of water vapor. The weight of desiccant coating and the mass of aluminum foil shall be in a ratio so as to ensure equal recovery of both sensible and latent heat over the operating range.

The Rotor/Wheel matrix shall have equal sensible and latent recovery in the range of 75 to 80%.

The Rotor honeycomb matrix foil should be so wound and adhered as to make a structurally very strong and rigid media unaffected by temperature and humidity changes.

The rotor shall be non-clogging aluminum media, having a multitude of narrow aluminum channels, thus ensuring a laminar flow and will allow particles up to 800 microns to pass through it.

The rotor should rotate at a speed lower than 20 to 25 rpm, ensuring long life of belts and reduce wear and tear of seals. The media shall be cleanable with compressed air or low pressure steam or light detergent, without degrading the latent recovery.

The recovery wheel cassette / casing shall be manufactured from tubular construction to provide a self-supporting rigid structure, complete with access panels, purge sector, rotor, bearings, seals and drive mechanism complete with belts.

The rotor shall have a field adjustable purge mechanism to provide definite separation of air flow, minimizing the carryover of bacteria, dust and other pollutants, from the exhaust air to supply air. With proper adjustments the cross contamination shall be limited to less than 0.04% of the exhaust air concentration.

## Heat Pipes (Wrap around Type)

FAHUs / AHUs shall be provided with wrap around type heat pipes wherever specified in the schedule of quantity. Heat pipes shall be included within the FAHU / AHU and wrapped around the main cooling coil for enhanced dehumidification.

The external fins shall be of aluminum with a minimum thickness of 0.15mm. Fins shall be of the continuous plate type and louvered type. Tubes shall be of refrigeration standard seamless copper for heat exchanger use. Tube diameter shall be 12mm with a grooved inner surface and minimum root thickness of the tube shall be 0.35mm. Casings shall be from galvanized sheet steel with a minimum thickness of 1.6mm. The casing shall incorporate tube plates and top and bottom plates around both precool and reheat heat pipe blocks.

The working fluid shall be refrigerant type classified as ASHRAE safety group A1. The refrigerant shall be R134a.

The heat pipe circuits shall be factory charged and hermetically sealed with the calculated weight of refrigerant. There shall be a multitude of loops in the height of the heat pipe and each loop shall be individually charged. Heat pipes with header assemblies containing a single circuit are not suitable as a single leak will render the entire heat pipe inoperative.

Heat pipe performance shall be independently type tested and certified in line with the requirements of British Standards BS 5141 pt1 / European Standards EN 305 & 306 / American Standards ARI 410 for testing and rating of heat exchangers. All software used to state the performance of heat pipes shall be based upon the results of these independent tests.

The heat pipe should have a third party independent test report conducted by a certified laboratory from U.S.A / Europe.

### Fresh Air Intakes

Sand trap louvers of aluminum construction duly epoxy coated with bird screen and extruded aluminum, aero foil construction dampers shall be provided at the intake section of the unit.

Fresh air dampers shall be of opposed blade louver type. Blades shall be made of extruded aluminum, aerofoil construction and shall be rattle-free.

Fresh air fans and fresh air intakes shall be per the requirements mentioned in the equipment schedule.

### Safety Features

All the units must have safety features as under:

The fan access door shall be equipped with micro-switch inter locked with fan motor to enable switching off the fan motor automatically in the event of door opening. The fan access door shall be provided with a view port and further have wire mesh screen as an added safety feature bolted on to the unit frame.

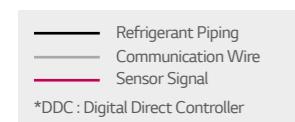
Fan and motor base shall be properly earthed from the factory. All screws used for panel fixing and projecting inside the unit shall be covered with PVC caps to avoid human injury.

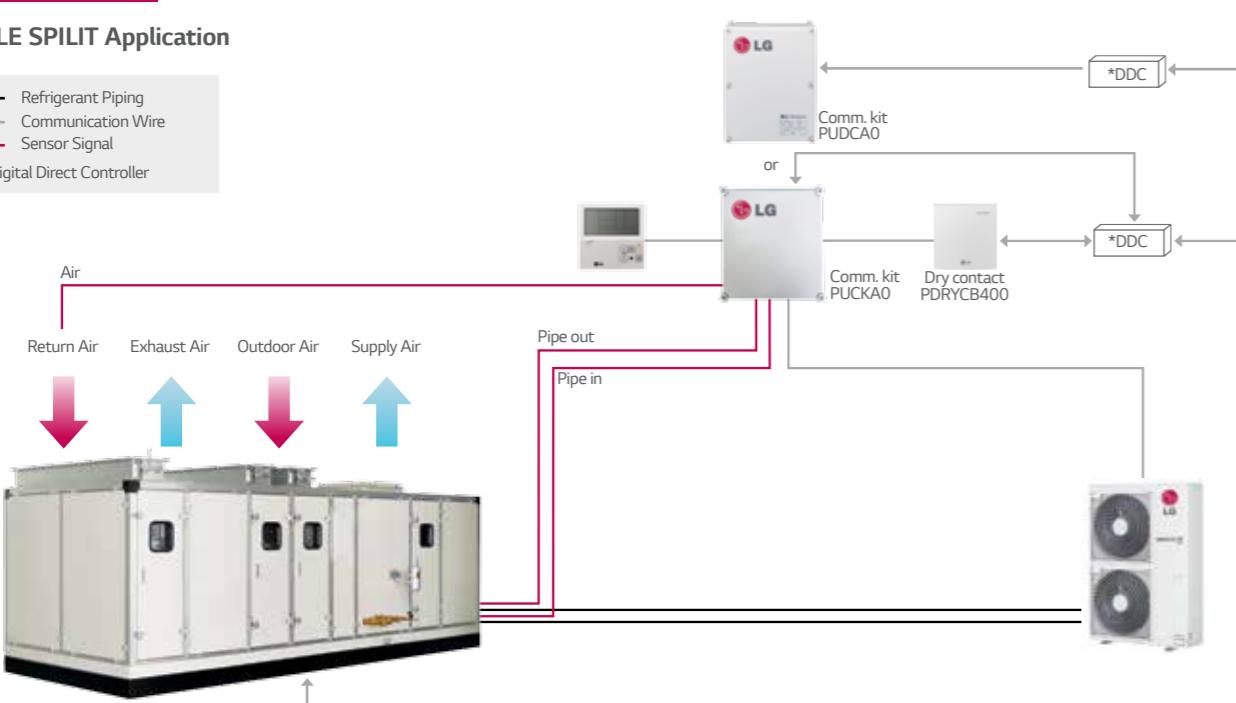
# AHU KITS (AIR HANDLING UNIT KITS)

Solution to connect LG outdoor unit on the DX coil of an air handling unit, with LG's high efficient products for maximum cost saving

## Combination

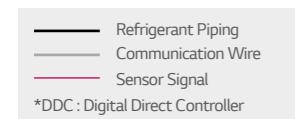
### • SINGLE SPILIT Application

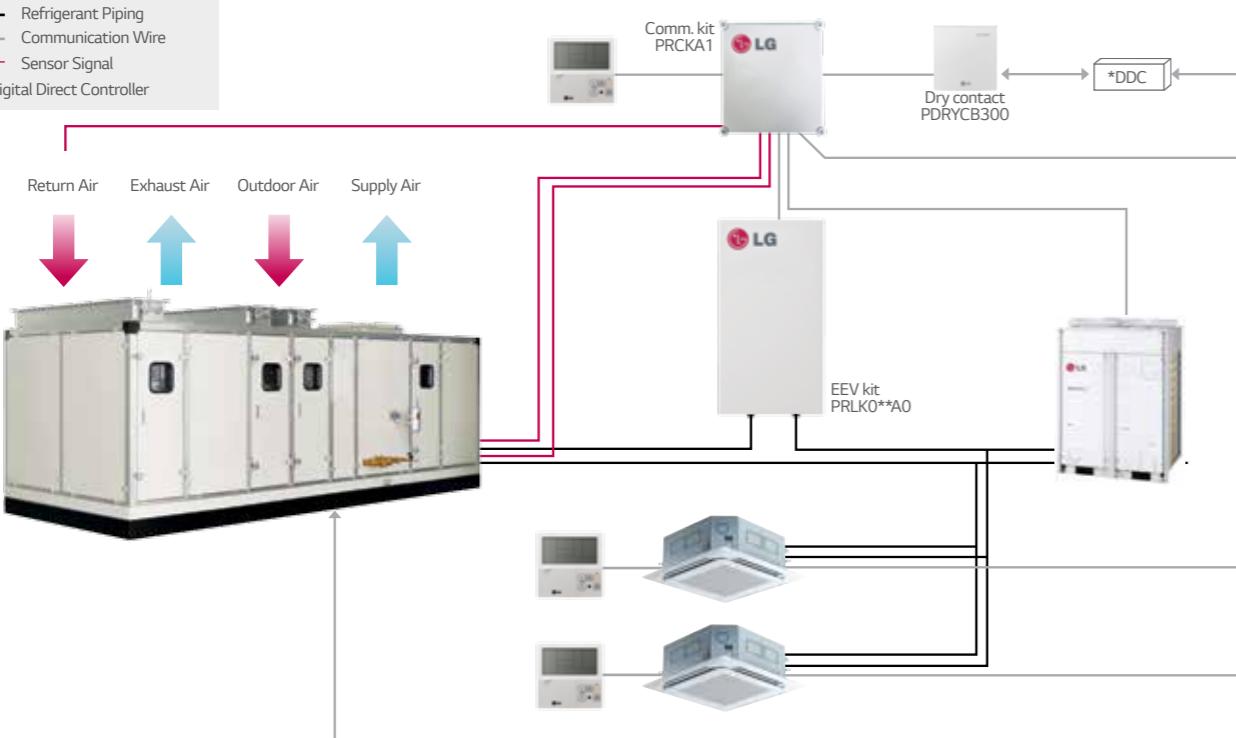

  
\* DDC : Digital Direct Controller



\* AHU : Air Handling Unit

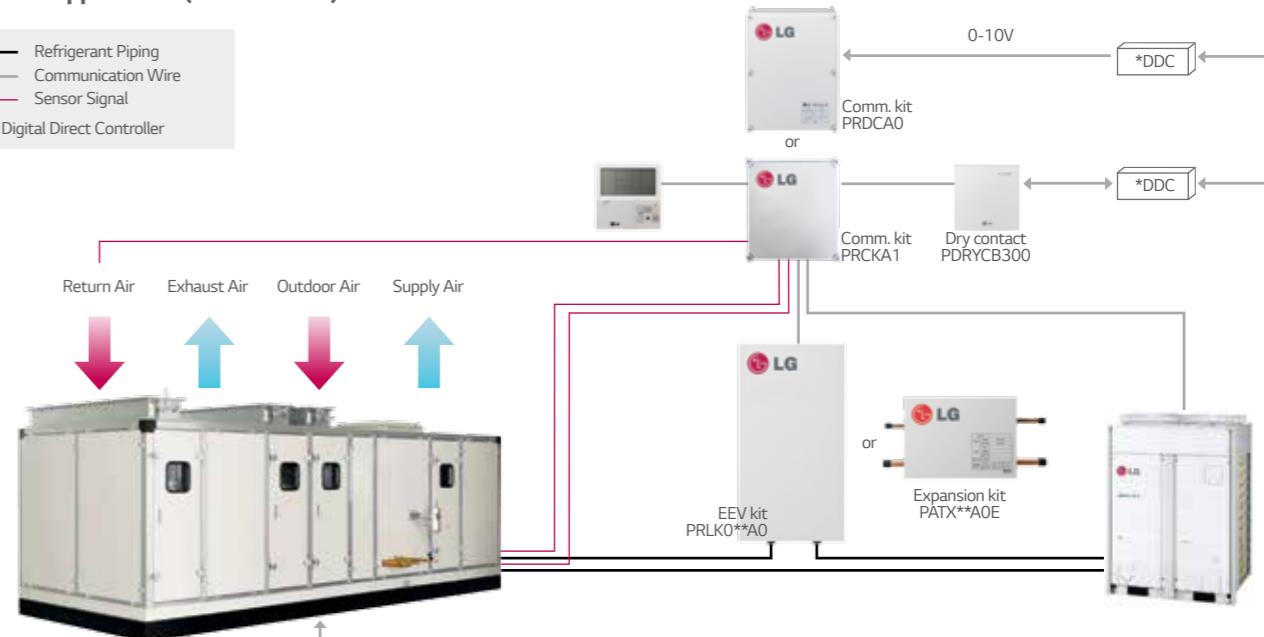
### • MULTI V Application (in Combination with AC System)


  
\* DDC : Digital Direct Controller



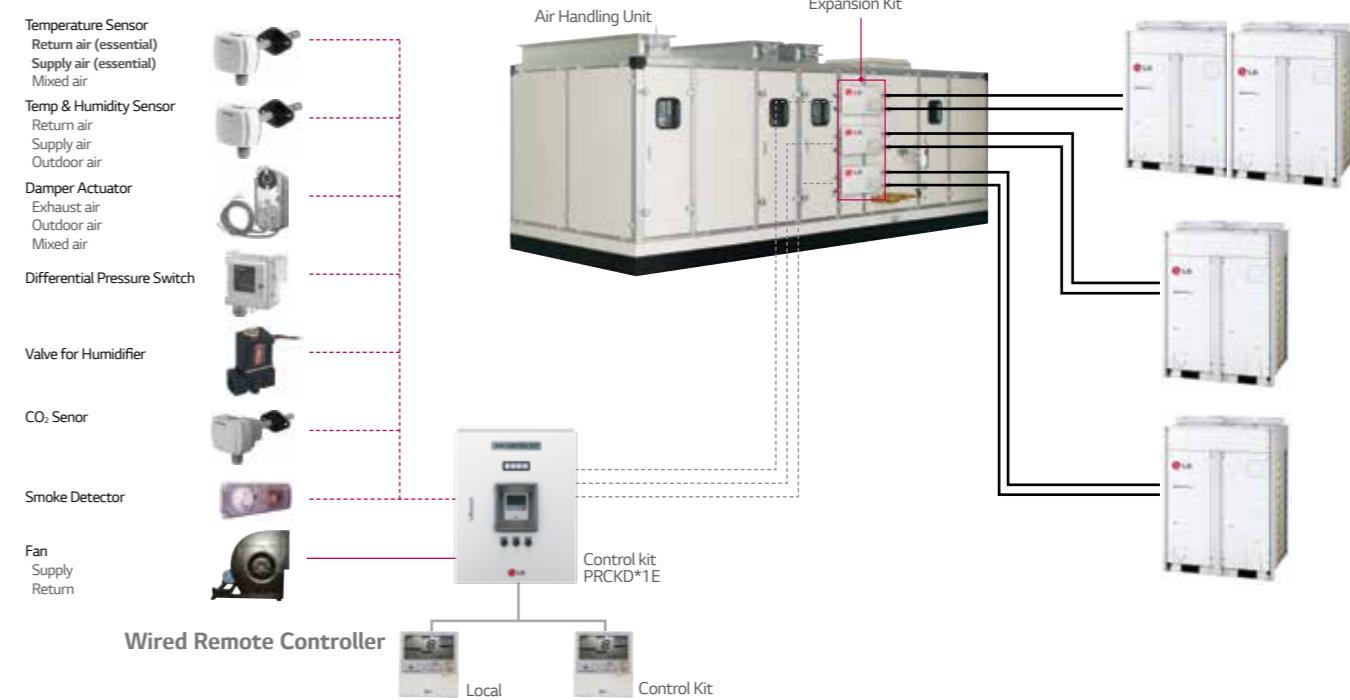
### • MULTI V Application (Stand Alone)


  
\* DDC : Digital Direct Controller



### • MULTI V Application (Total AHU Control for Medium to Large Capacity)







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