



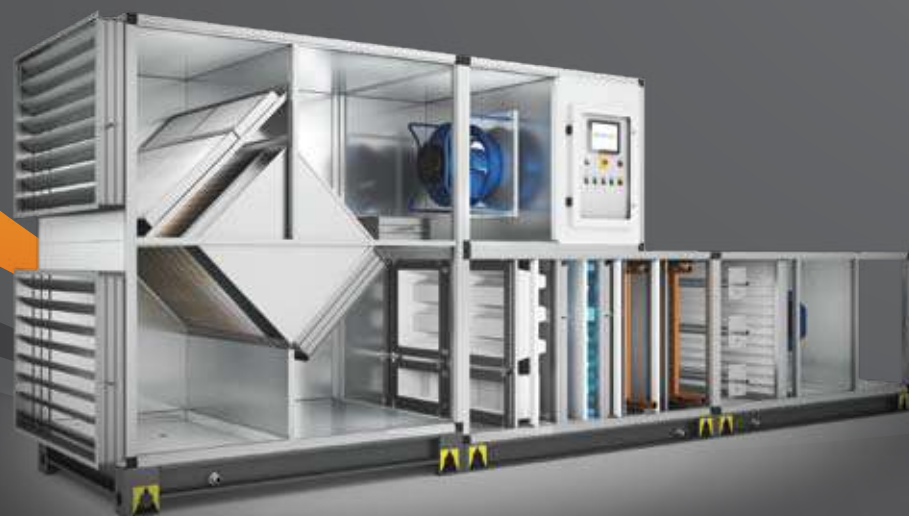
VENTUM MEP AIR CONDITIONING L.L.C
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AIR HANDLING UNIT

● FRESH AIR HANDLING ● MAKE UP AIR ● ECOLOGY UNIT

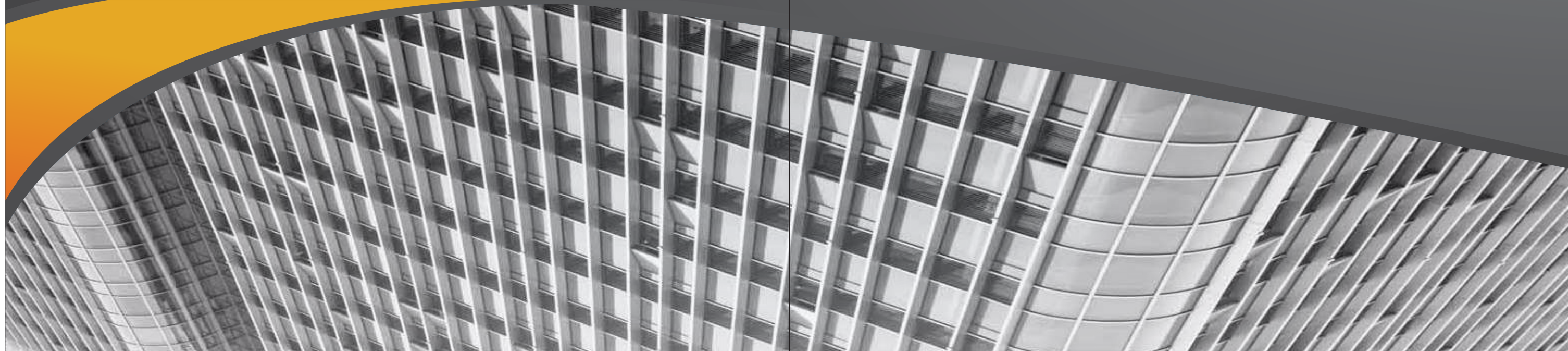




AIR HANDLING UNIT

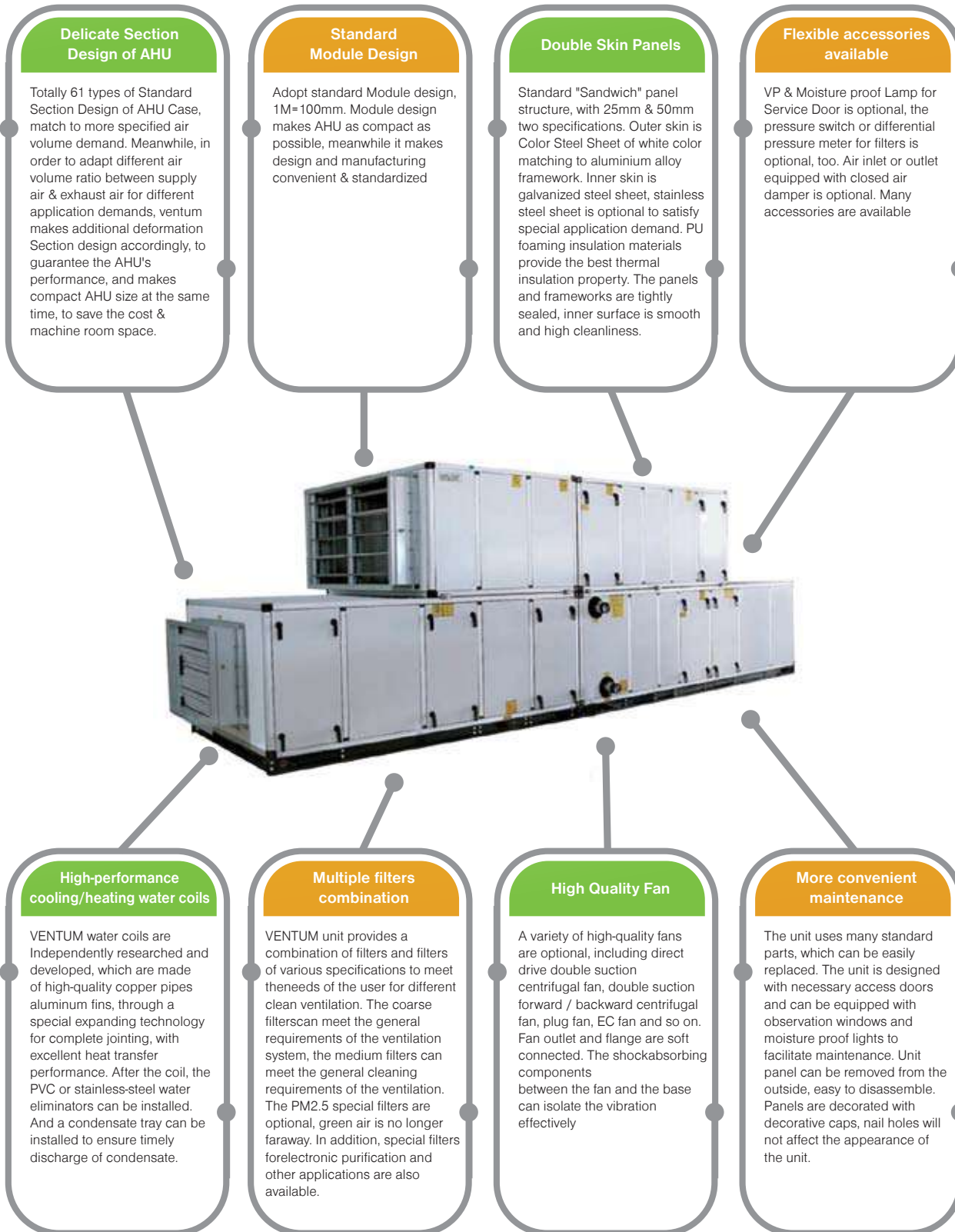
The VENTUM air handling units consist of modular sections which can be assembled to satisfy all forms of air treatment such as simple ventilation, filtration, heating, cooling, and control of humidity.

The series has been developed and dimensioned in length, width and height, using a module of 160 mm and has 28 basic sizes and 16 alternative (low profile) sizes. The latter units have a distinctly rectangular cross-section in order to reduce the height while increasing the width, where site conditions require low profile units. In addition, the units 3 and 4 modules high (720 and 880 mm for airflows up to 10000 m³/h) can be supplied without the base frame which reduces the height by a further 150 mm (to 570 and 730 mm respectively) thus facilitating ceiling mounted installation. The maximum dimensions of the sections which compose the unit are designed to permit transport by container.



Main Features

The design of VENTUM Combined Air Handling Unit updates for times, established leading advantage on Heat Recovery Technology. New Series Air Handling Unit, has been far beyond normal standards in many performance characteristics.



AHU/Air Handling Unit

1. Operating Efficiency

VENTUM Unique design

Thermal break profile with thermal break panels

Minimize heat loss and condensation on profile in high humid region hence reduced power consumption.

Patented gasketed frame channels

Minimize direct exposure of metal in cabinet framework to reduce cold bridging and condensate collection; lowers operating costs.

Highly efficient heat transfer coils - AHRI Certified coils as per test standard ARI-410 for performance and UL certified for safety

Results in reducing the power consumption of chiller.

Energy efficient Motor

Results in low power consumption

Energy recovery (Plate heat exchanger, heat pipe or energy recovery wheel)

Reduces cost of heating or cooling outside air; recovers up to 80% of the energy normally exhausted from a building.

Fan selection options (forward curve, backward curved or airfoil, belt drive or direct drive plenum, inline and twin fans)

Results in lowest possible BHP requirements

Low air-leakage cabinet design, all inside and outside pane:

Increasing operating efficiency; reduces energy loss and operating costs.

Glass wool, rock wool panels with perforated inner skin:

Reduce noise level in the room

Patented ultra seal low-leak dampers

Maximizes operating efficiency; reduces operating cost.

Hydrophilic anticorrosive blue aluminum fins

Exposes Max fin area to air results increase in efficiency of coil.

Double wall panels with injected PU foam insulation

Reduces condensation and improves operating efficiency.

2. Flexibility

Custom Modular platform

Allows customizing of the system with a wide selection of components and sizes

GI, Aluminum, SS Casing construction

Allows optimum selection for cost and indoor air quality

Variable Dimensioning design

Allows cabinets to be sized in any dimension (height, width and length) to meet installation or aesthetic requirements.

Multiple coils, fans and filters section

Allows optimum selection of cost, energy efficiency, performance, indoor air quality and low noise.

Wild selection of unit base heights

Allows for condensate trapping, eliminates need for costly housekeeping pad, and provides space required between condensate connection and traps on steam applications

Pre coated, powder coated, pre painted cabinet

Enhances exterior appearance for units in visible locations.

Technical Detail

Aluminum profile frame work - This Kind of frame work, carried out without welding and consequent inconvenience, allows an easy assembling and disassembling even in narrow yards, passageways, etc. During assembly Junctions will be sealed, for a perfect air tightness as shown in diagram.



Three-way corner - The three-way corner joints, allow an easy assembling and disassembling of the structure and its perfect alignment. Furthermore, it allows to ship sections disassembled without adding transport costs because of the advantage of compactness. Three-way corner made of nylon, Junctions will be sealed, for a perfect air tightness as shown in diagram.

Thermal break profile - The main cause of air handling unit external condensation is the heat transfer between inside and outside. To solve this problem thermal break profile and panels are provided with "insulating spacer". Indeed, to solve this problem It is necessary to interrupt the thermal continuity of the structure and consequently to slow down as far as possible this heat transfer between inside and outside of the profile and between the internal and external panel sheets by using thermal break barrier.



Condensate drain pan- Double sloped microbial-resistant Aluminum; stainless steel coated GI dram pan is used to Inhibits bacterial growth; eliminates standing water that can support bacteria. To avoid condensation, drain pan is externally Insulated with PUF or closed cell nitrile insulation.

Panel insulation-Double skin AHU provides high density PUF panels 1n 25/43/50/60mm thickness for better insulation and sound attenuation properties. Glass wool or rock wool Insulated panels can be manufactured for special application.



Hinges and locks - The hinges and locks are made of selfextinguishing thermoplastic nylon filled with glass wool and minerals. Heavy duty Hinges and locks are specially designed to operate at higher static pressure.

Functional Section - Filter Section

Coarse Filter



Filtration Class	G2-G4
Application	Applied in general requirement of primary air filtration or as prefilter for higher filtration requirement, primary filter can not only meet indoor cleanliness requirement but also keep the high efficiency of heat recovery section and cooling/heating coils section.
Materials	Washable" W" layout non-woven fabrics in PVC or aluminum frame.
Optional Configurations	Differential pressure gauge or differential pressure switch. Filter resistance can be monitored by the differential pressure gauge or differential pressure switch to remind user to maintenance or replacement filter.

Medium Filter



Filtration Class	F5-F9
Application	Applied in general requirement of final air filtration as coarse filter or as the prefilter to protect HEPA filter, medium filter has a higher filtration level it meets a higher indoor cleanliness requirement and ensure the higher efficiency of heat recovery section and cooling/heating coils section.
Materials	Not washable chemical fiber or glass fiber bag filter, aluminum frame.
Optional Configurations	1. Differential pressure gauge or differential pressure switch. Filter resistance can be monitored by the differential pressure gauge or differential pressure switch to remind user to maintenance or replacement filter. 2. Before the medium filter should install the primary filter, the recommended combination is as the following table.

PM2.5 Filter



Filtration Efficiency	Up to 95%
Application	Specially applied in ventilation system which requires filtering the PM2.5, before PM2.5 filter should install coarse filter and medium filter.
Materials	Microfiber filtration paper, galvanized steel frame.
Optional Configurations	Differential pressure gauge or differential pressure switch. Filter resistance can be monitored by the differential pressure gauge or differential pressure switch to remind user to maintenance or replacement filter. Functional Section – Filter Section

Heat Recovery System

Plate Heat Recovery Units

The plate heat exchanger is housed in appropriate sections of four types:

- Double stack, with exhaust above supply flow.
- Exhaust and supply in line.
- Exhaust and supply in line with the possibility of providing other components upstream of the HRS on one or both flows. This type, unlike the other, does not provide the filter at fresh air incorporated in the hrs section.
- Exhaust and supply side by side

In the lower section is a drain pan in peraluman or AISI304 stainless steel with 1" drain.

The recovery units are provided in three widths (rec1, rec2, rec3), depending on the percentage of outside air to be treated, and are available with by-pass single or double (recommended when the flow of outside air is less than 30% of the total).

An additional enlarged size of exchanger is available, full width, when extremely levels of efficiency with low pressure drop are required.

All sections can be equipped with recirculation damper. The sections are provided with external dampers and flat filter at fresh air or with internal shutters with flat filters or pockets on the fresh air renewal.

The plate exchanger can be of aluminum, pre-painted aluminum or stainless steel. For high differential pressures, like in hospital applications, the plate exchangers can be supplied in a reinforced version.



Wheel Recovery Units

It is the system currently available with greater efficiency in the presence of heat exchange between two air flows, can reach efficiencies of up to 75% under optimal conditions of exchange, both in summer and winter cycle. This type of recuperator consists of a real wheel composed of a pack of fins circular aluminum suitably spaced, connected to an electromechanical system for circular motion with constant or variable drive, depending on the needs. Available in only sensible or sensible and latent version.

The increased efficiency is achieved with the surface treatment "molecular sieve 3 L". Thickness of the standard rotor 200 mm, and a larger version, 250 mm (up to the diameter of 2000 mm). With this system, the installation of regenerable filters at fresh and exhaust air is highly recommendable to ensure maximum efficiency of heat exchange.

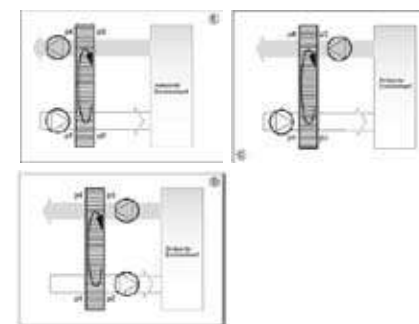
Maximum recovery of energy in cooling mode

If the fans are installed as shown in figure (B), all the heat losses of the motor and fan air expulsion and almost all those of the motor and fan air input, are controlled by the exhaust air. These types of installation allow a constant pressure in the building throughout the year. It has the maximum recovery of energy if cooling fans are installed so that the heat in the exhaust and the one generated by the fans themselves, is transferred together with the exhaust air; installation desirable where very clean air is required. The installation of the fans as shown in Figure (C) can give problems, since it is difficult a correct pressure balance.

Maximum recovery of energy in heating mode

If the fans are installed as shown (D), all the power supplied by the motor of the fan exhaust air and almost all of that provided by the fan motor air flow will be used.

This installation allows conditions of constant pressure in the building throughout the year. The maximum heat recovery is achieved if the fans are installed so that it uses the heat from the exhaust fan air, but only in the case of systems that allow air recirculation.



Functional Section Introduction - Fan Section

Working principle

For VENTUM AHU, there are different type of fans for options, such as direct driven centrifugal fan, belt driven DIDW forward / backward centrifugal fan, plug fan and EC fan. They are of high quality, superior performance and outstanding durability. The fan sections include the following components:

- Fan
- Electric motor
- Motor slide rail
- Belt drive transmission
- Base frame with antivibration mounts
- Flexible connection on the fan outlet
- Earthing cable on the fan and motor base frame



Direct Driven centrifugal fan



- Integration of fan and motor
- Direct driven
- Small air volume, moderate total pressure, high direct driven efficiency, small fan size and less space occupation

Belt driven DIDW forward / backward centrifugal fan



- Fan and motor share the same framework, good quality steel plate shell and bearing
- Belt driven
- Very wide range of air volume and air pressure

Plug Fan



- Without spiral casing, fan and motor share the same framework
- Direct driven/ belt driven
- Relative wide range of air volume and air pressure. Air from all directions distributes evenly and air outlet direction is not limited.

Plug Fan



- Brushless DC motor
- Direct driven
- High efficiency, variable speed driven, small vibration and long service life.

Condensing Unit

VENTUM Condensing Unit adopts industry-leading R410A scroll compressor with stable operation performance, the package unit can be applied into various fields, such as railway transportation, industrial plants, etc. Holtop rooftop packaged air conditioner is your best choice for any places where require minimum indoor noise and low installation cost.



Eco-friendly

Eco-friendly type R410A refrigerant, less refrigerant injection volume.



Stable and Reliable

Compressor is made by heat-resisting materials, spare parts import from world class brands, strong structure and reliable performance.



Packaged and Compact Design

Integrated with indoor unit and outdoor unit to lower the project investment, shorten installation period, save installation space and easy maintenance in the daily operation.

Condensing Unit is the middle size AC equipment that combines functions of HVAC (cooling, heating and air ventilation etc.) And it contains all components of compressor, evaporator, condenser and valves etc in one unit. Holtop rooftop packaged air conditioner are usually installed on the roof deck in commercial applications.



Air Cooled Condensing Units

COOLING CAPACITIES

Unit Model	Saturated Suction Temp °F	Air temperature entering condenser °F							
		85		95		105		115	
		MBH	Power (kW)	MBH	Power (kW)	MBH	Power (kW)	MBH	Power (kW)
VC 06	35	63.0	5.5	60.0	6.0	56.0	6.6	51.5	7.4
	40	69.5	5.6	66.0	6.1	62.5	6.7	58.0	7.4
	45	76.5	5.6	72.5	6.2	68.5	6.8	65.0	7.4
	50	84.0	5.7	79.0	6.3	75.0	6.9	71.5	7.5
VC 08	35	75.1	5.9	70.7	6.6	65.4	7.5	59.3	8.4
	40	83.3	5.9	78.7	6.6	73.3	7.5	67.1	8.4
	45	92.2	5.9	87.3	6.6	81.7	7.4	75.3	8.3
	50	102.0	5.9	96.5	6.6	90.6	7.4	84.0	8.3
VC 10	35	98.3	9.1	92.4	10.1	85.8	11.0	78.7	12.3
	40	109.5	9.2	103.0	10.1	96.0	11.0	88.4	12.3
	45	121.0	9.2	114.5	10.2	107.0	11.1	98.9	12.3
	50	134.0	9.3	127.0	10.2	119.0	11.1	110.0	12.3
VC 12	35	112.5	10.0	106.0	11.0	98.2	12.1	89.5	12.5
	40	125.5	10.0	118.0	11.0	110.0	12.1	101.0	12.5
	45	139.0	10.1	131.5	11.0	122.5	12.2	113.0	12.5
	50	153.5	10.1	145.5	11.0	136.0	12.2	126.0	12.5
VC 15	35	123.0	11.0	114.0	12.1	104.5	13.4	94.6	14.9
	40	138.0	11.0	128.5	12.1	118.5	13.4	108.0	14.9
	45	154.5	11.1	144.5	12.2	133.5	13.4	122.0	14.9
	50	172.5	11.1	161.5	12.2	150.0	13.4	138.0	14.9
VC 18	35	143.5	12.6	134.5	13.9	124.5	15.4	113.5	17.2
	40	160.0	12.7	150.5	14.0	140.0	15.5	128.0	17.2
	45	177.5	12.8	167.5	14.0	156.0	15.5	143.5	17.2
	50	196.5	12.9	185.5	14.1	173.5	15.5	160.5	17.2
VC 20	35	196.6	18.2	184.8	20.2	171.6	22.0	157.4	24.5
	40	219.0	18.4	206.0	20.2	192.0	22.0	176.8	24.5
	45	242.0	18.4	229.0	20.4	214.0	22.2	197.8	24.5
	50	268.0	18.6	254.0	20.4	238.0	22.2	220.0	24.6
VC 25	35	225.0	20.0	212.0	22.0	196.4	24.2	179.0	25.0
	40	251.0	20.0	236.0	22.0	220.0	24.2	202.0	25.0
	45	278.0	20.2	263.0	22.0	245.0	24.4	226.0	25.0
	50	307.0	20.2	291.0	22.0	272.0	24.4	252.0	25.0
VC 30	35	246.0	22.7	228.0	24.9	209.0	27.4	189.2	30.4
	40	276.0	22.8	257.0	24.9	237.0	27.4	216.0	30.4
	45	309.0	22.8	289.0	25.0	267.0	27.5	244.0	30.4
	50	345.0	22.9	323.0	25.0	300.0	27.5	276.0	30.4
VC 35	35	287.0	25.9	269.0	28.5	249.0	31.5	227.0	35.0
	40	320.0	26.0	301.0	28.6	280.0	31.6	256.0	35.0
	45	355.0	26.2	335.0	28.7	312.0	31.6	287.0	35.1
	50	393.0	26.4	371.0	28.8	347.0	31.7	321.0	35.1
VC 40	35	382.0	32.0	358.0	35.4	332.0	40.0	306.0	42.0
	40	426.0	32.2	400.0	35.6	372.0	40.2	344.0	44.4
	45	472.0	32.4	444.0	35.8	414.0	40.2	384.0	44.5
	50	522.0	32.4	492.0	36.0	460.0	40.4	428.0	44.6
VC 50	35	480.0	41.4	446.0	45.6	412.0	50.6	378.0	56.6
	40	536.0	41.8	500.0	45.8	462.0	50.8	424.0	56.6
	45	596.0	42.2	556.0	46.0	516.0	50.8	476.0	56.6
	50	660.0	42.4	618.0	46.4	576.0	51.2	532.0	56.8
VC 60	35	584.0	48.4	548.0	53.6	506.0	59.4	462.0	66.4
	40	652.0	48.8	612.0	53.8	570.0	59.6	522.0	66.6
	45	728.0	49.2	684.0	54.0	636.0	59.8	588.0	66.6
	50	808.0	49.6	760.0	54.4	710.0	60.0	658.0	66.8

NOTES:

1) All cooling capacities are at voltage of 380-420V and 50 Hz capacities.

Air Cooled Condensing Units

TECHNICAL DATA

Unit Model		VC 06	VC 08	VC 10	VC 12	VC 15	VC 18	VC 20	VC 25	VC 30	VC 35	VC 40	VC 50	VC 60
PERFORMANCE														
Nominal Cooling Capacity	MBH	83,000	94,000	124,000	140,000	154,000	175,000	248,000	280,000	298,000	364,000	476,000	596,000	728,000
@ 95°F and 45°F SST	kW	24.3	27.5	36.3	41.0	45.1	51.3	72.7	82.1	87.3	106.7	139.5	174.7	213.4
Power Source	V/Ph/Hz	380V / 3φ / 50Hz & 460V / 3φ / 60 Hz												
Refrigerant		R22 / R407c/R410a												
Suction ODF	Inch	3/4	1-1/8	1-1/8	1-3/8	1-5/8	1-5/8	1-3/8 x 2	1-3/8 x 2	1-5/8 x 2	1-5/8 x 2	1-5/8 x 2	1-5/8 x 2	1-5/8 x 2
Liquid ODF	Inch	1/2	5/8	5/8	5/8	3/4	3/4	5/8 x 2	5/8 x 2	3/4 x 2	3/4 x 2	7/8 x 2	7/8 x 2	7/8 x 2
Unit Depth	mm	1,055	1,055	1,800	1,800	1,800	2,300	2,300	2,300	2,300	2,300	2,300	3,100	3,100
Unit Width	mm	1,115	1,115	1,100	1,100	1,100	1,100	2,100	2,100	2,100	2,100	2,100	2,100	2,100
Unit Height	mm	900	900	1,100	1,100	1,100	1,100	1,100	1,100	1,700	1,700	1,700	1,700	1,700
Unit Weight (without charge)	kg	206	271	288	331	389	429	556	587	643	735	1,193	1,499	1,626
COMPRESSORS														
Type		Scroll												
Qty		1	1	1	1	1	1	2	2	2	2	2	2	2
Rated Load Current (Each)	Amps	14.3	15.6	19.2	22.1	26.5	30.0	19.2	22.1	26.5	30.0	33.6	41.4	54.3
Locked Rotor Current (Each)	Amps	100	95	118	118	140	174	118	118	140	174	225	272	310
CONDENSER COIL														
Type		Plate Fin bonded with inner grooved Copper Tubes												
Number of Circuits		1	1	1	1	1	1	2	2	2	2	2	2	2
Face Area	ft ²	20.1	20.1	31.2	31.2	31.2	31.2	35.3	35.3	35.3	35.3	73.8	73.8	98.4
Number of Rows		3	4	2	3	3	4	3	3	2	3	3	4	4
Fins Per Inch		14	14	14	14	14	14	14	14	14	14	14	14	14
CONDENSER FAN														
Type		Propellor												
Quantity		1	1	2	2	2	3	4	6	6	6	4	6	6
Number of Fan Blades		5	5	5	5	5	5	5	5	5	5	5	5	5
Diameter	mm	630	630	630	630	630	630	630	630	630	630	800	800	800
CONDENSER FAN MOTOR														
Type		Integrated motor with thermal protection, insulation grade B										IP55 3 phase, weather proof insulation grade F		
Power Source	V/Ph/Hz	220V/1φ/50Hz/60Hz										380-420V/3φ/50Hz/60Hz		
Quantity		1	1	2	3	2	3	4	6	6	6	6	6	6
Motor Power	Watts	870	870	870	870	870	870	870	870	870	870	1,500	1,500	1,500
RPM		1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,300	950	950	950
Full Load Amps (Each)	Amps	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	3.3	3.3	3.3

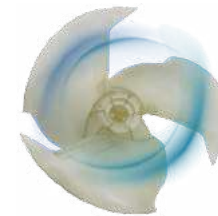
NOTES:

2) Power includes compressor and condenser fan motor power consumption.

Product Description

Axial fan

Strong torque and low noise, large airflow and excellent heat exchange efficiency.



High efficiency and energy saving motor

Efficiently bringing down the losses from electromagnetic energy, heat and mechanical energy, increasing operational efficiency with less heat generation and longer service life.



World class compressor for reliable performance

Adopting Copeland scroll compressor for excellent performance in terms of gas suction and cooling, Copeland compressor has higher working efficiency and longer service life.



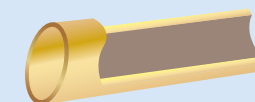
Safe electrical control system

Approved by different safety tests and equipped with various protection measurements, which is able to operate under temperature from -10°C to 50°C.

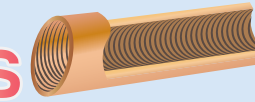
High efficiency heat exchanger

Evaporator is made of blue color hydrophilic aluminum foil, low pressure loss louvered fin and internal groove tube combines together perfectly, this design is able to significantly increase the heat exchange efficiency.

Smooth internal side, small disturbance at heat transfer boundary layer, low heat exchange efficiency.



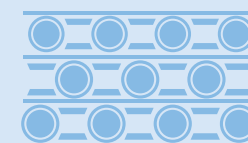
Common copper tube



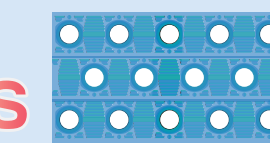
High gear and high internal groove copper tube

Expand internal surface area, raise the disturbance at heat transfer boundary layer, increase heat exchange efficiency.

ø9.52mm diameter aluminum fin with small louver area, heat exchange efficiency is smaller under same heat exchange area.



Regular louvered fin



Low pressure loss louvered fin

ø7.94mm diameter louvered fin coated with hydrophilic film, under same heat exchange area, the efficiency is 25% more than regular louvered fin.

Installation, Operation and Maintenance



Installation

- 1 - For maintenance purpose, enough space should be left for the AHU, especially the side of service door and water inlet/outlet.
- 2 - The base should be designed according to the length and width of AHU and must kept flat and level.
- 3 - Base should be higher than the ground to make it easy to set up trap for condensation water.
- 4 - Connect the water inlet/outlet to the external water pipe after cleaning. The weight of external connection of valve, pipe and others shall not burden on the machine unit.
- 5 - Use soft fittings to connect the air inlet/outlet of unit and air ducts.
- 6 - The machine casing should connect to ground. For motor bigger than 15Kw, it's suggested to use stepdown start.

Operation and Maintenance

- 1- Air handling unit is supplied by power system, AC3-380 v + N + PE.
- 2- Before running the AHU, the fan vibration locking devices shall be removed.
- 3- Before starting, please check if the fan impellers rotate flexible or not. And do the commissioning to check the fan rotating direction. Run the machine after all mechanical and electric equipment's were checked by professional personnel without fault.
- 4- Before running the unit, please do the debugging and control the motor running under the rated current to prevent the motor from overload and burn out. All air valves of the air inlet should not be closed, in case of damage and deformation of the unit.
- 5- The heat and cold media of heat exchanger are clean demineralized water. The working pressure shall not be larger than 1.6 MPa. Steam supply pressure ranges from 0.2 to 0.4 MPa.
- 6- In winter, please drain out all the inside water and blow away all water in the cooling coil. If the water can't blowout completely, antifreeze liquid should be charged into the coils.
- 7- Examine the filter regularly. When reaches the value of end resistance, the filter should be cleaned or replaced.
- 8- Check the belt looseness and wear condition regularly. If too loose, please adjust the screw under the base to tight the belt. And check the bearing lubricated condition and add lubricating grease regularly

Installation, Operation and Maintenance

