



CU AIR CONDITIONING INDUSTRIES L.L.C
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AIR HANDLING UNITS



FOUNDER'S MESSAGE



ABDULLAH M. AL SHIRAWI
Chairman

Oasis Investment Company, the holding company of the Al Shirawi Group of Companies, was founded on the basis of pure business passion. From the very start, we embedded a sense of pragmatism in the culture of the group. It is this pragmatism that has not only seen us through the most difficult of times but also allowed us to achieve greater success during times of economic growth.

Our journey from a trading house to an industrial complex and then on to a conglomerate comprising of trading, industrial, distribution, contracting and service industries has been with its fair share of trials and tribulations but we can honestly say that today, our 10,000 employees are richer in experience than their counterparts.

The foundations of our group are rock solid. These foundations, for all our companies, have been cast in the United Arab Emirates but today all our companies look at the world as their marketplace. In this age of globalization, we continue to grow at breathtaking speed.

Speed is a virtue that we stand by at all times. The successful induction of our next generation into the business has allowed us to retain the advantages of remaining a family concern but at the same time enabled us to act with speed in the hiring of top grade professionals.



MOHAN G. VALRANI
Sr. Vice Chairman

Our Group has been built on the premise of sheer hard work. We have progressed this far by believing in our values and never shying away from putting in the effort needed to grow any business. Our values: Excellence, Transparency, Compassion, Honesty, Empowerment and Discipline are inculcated in all our employees.

For us, the journey has been a long one but we see it as just the beginning of bigger things to come. Our next generation is now fully equipped to take the Group forward and to unimaginable heights.

"We want everyone who deals with us to see, understand and experience the high-quality solutions we provide and reap the full benefits of working with a company where innovation, unrivalled quality and the pursuit of excellence are day-to-day realities."

AL SHIRAWI GROUP

OUR BUSINESSES



COMPANY PROFILE

Clima Uno is a well-established brand for air-handling units and fan coil units, which originated in Italy and is owned today by the Al Shirawi Group of Companies. Clima Uno's Eurovent-certified product range is custom-built for maximum performance in the region's harsh climatic conditions.

Founded in Dubai in 1971, the Al Shirawi Group is one of the largest private business conglomerates in the UAE. The Group has an annual turnover of USD 1 Billion and has 40 companies in diverse business sectors such as Printing and Packaging, Oil and Gas, Logistics, Heavy Equipment, Manufacturing, Electronics, Engineering Services, Trading, Online Media and Publishing, and Education.

Clima Uno units are manufactured in a fully integrated facility in Dubai, equipped with the most modern machinery. Our core production team has 25 years of technical experience and each product has been expertly designed using Unilab software. The product range features premium components with AHRI certified coils, UL listed filters, AMCA certified fans and CE certified motors.

Clima Uno's ISO 9001:2008 certification from UKAS assures that the quality of all manufactured centralized air-conditioning and kitchen ventilation equipment meets the highest international standards. We are committed to continuous quality improvement and maintain focus on enhanced customer satisfaction levels.

Clima Uno units are ideal for installation in residential and commercial buildings, cinemas, sports complexes, hotels, hospitals, and shopping malls. Our units have been supplied to numerous projects in the Middle East including UAE projects such as The Arcadia Preparatory School, BMW Showroom, ARJ Tower, Thumbay Hospital and Aster Medical Centre as well as projects in Iraq such as Basrah Sports City and Shat Al Arab Hotel.

We offer our clients impeccable after-sales services and round-the-clock assistance. Clima Uno units are manufactured in a new, state-of-the-art, 100,000 square feet facility in the UAE, enabling us to serve our clients more efficiently.



CEO'S MESSAGE

Over forty years, Al Shirawi Group has continued to build on the in-depth knowledge of key industry sectors and the operational expertise of diversified businesses to propel unified growth. Our commitment to delivering quality products and services, our determination to fulfill the evolving needs of customers and the strong foundation of our core values, has driven our business value over the years.

The Al Shirawi Group of Companies has a strong foothold in the region's HVAC sector. Clima Uno, owned by the Group, is a strategic initiative to widen our valuable HVAC portfolio. We manufacture, sell, supply, install and service Clima Uno air-handling units. Our in-house logistics and manufacturing proficiency will optimize end-to-end operations of Clima Uno. Moreover, the expanded manufacturing base will increase production volumes, accelerate production times and improve project delivery

times. Our vision is to support every residential and commercial project with our products and affirm the Group's position as the region's leading HVAC manufacturer and supplier with a global vision.

I wish to thank our strategic partners for their continued support. I am confident that Clima Uno will develop new opportunities, create strong partnerships and deliver premium-quality services. I firmly believe that Clima Uno will be your air-handling unit of choice because of our experience, integrity and relentless commitment to quality.

NAVIN VALRANI
CEO



OUR MANUFACTURING FACILITY

SHEET METAL FABRICATION

Mechanical swing beam shear is a frequently used shearing machine in sheet metal cutting. Whole welded structure, hydraulic transmission, high mechanical strength and good rigidity contribute to excellent shearing performance and productivity.



BENDING

Bending machines are developed for high flexibility and low setup times. These machines are able to bend single pieces as well as small batches with the same precision and efficiency as series-produced parts in an economical way. A simple plug-in system supports quick and easy exchange of tools.



CNC PUNCHING

Our CNC machines ensure maximum precision with sophisticated technology and are used for production of air handling units casing work including panels, base frame, drain pan etc.



FOAM INJECTION

In the production of polyurethanes, accuracy in the mixing of the liquid components is the most important and decisive phase. Versatility and user friendliness are the main features that make the HPE series an ideal choice for every type of foam as they are rigid, flexible, integral, elastomeric etc. All panels are manufactured with 44 kg/m density as standard.



COIL SHOP

The highly-efficient and well-equipped coil shop ensures robust coil manufacturing capabilities with short lead times.



ASSEMBLY LINE

Our efficient manufacturing process ensures greater production volumes, consistency in quality and faster delivery times.



AIR HANDLING UNITS PRODUCT RANGE

RECIRCULATING AIR HANDLING UNITS



- Available in 32 sizes
- Airflow ranges from 765 CFM to 48000 CFM
- Chilled water, District cooling, DX-type coil are available
- Drain pan of stainless steel 304 as standard
- Framework is made of Thermal Break Extruded Anodized Aluminum Profile
- Casing is made of 50 mm thick, double insulated panels
- Centrifugal fans tested and certified by AMCA in accordance to AMCA 210
- IE1/IE2/NEMA efficiency motors
- TEFC, IP55 degree of protection, Class F insulated, VFD compatible electric motors
- Pre filter of synthetic media, G3/G4 class as per EN 779 standards
- Bag type fine filter of synthetic media, F6/F9 class as per EN 779 standards

ECOLOGY UNITS



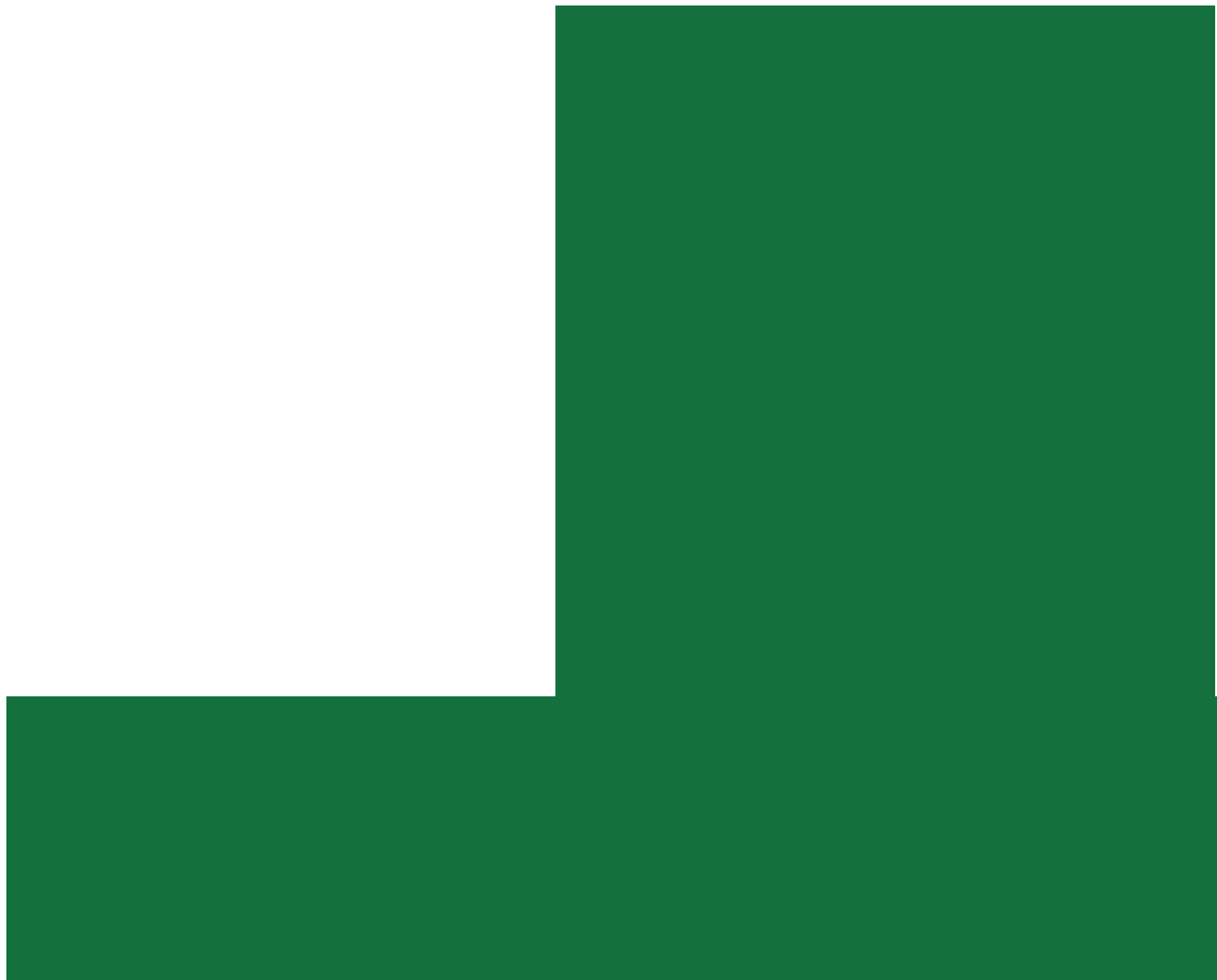
- Airflow ranges from 880 CFM to 30870 CFM
- Casing is made of 25 mm thick, double insulated panels with stainless steel inner skin
- UL certified filters in accordance to EN 779 standards
- Washable type, 2 inches thick metallic panel filters, G2 class, dust weight arrestance of 75% to 85%
- Electrostatic Precipitator with honeycomb structured filter cell having fumed and mist elimination efficiency $\geq 95\%$
- Available in programmable auto wash option
- Washable type 4 inches thick synthetic panel filters, G4 class, dust weight arrestance more than 90%
- Disposable type, 24 inches deep, synthetic pocket filters, F7 class, dust spot efficiency between 80% to 90%
- Refillable type, 24 inches deep, canister type activated carbon filters
- Centrifugal fans in accordance to AMCA 210
- IE1/IE2, TEFC, IP55 degree of protection, Class F insulated, VFD compatible electric motors
- HEPA Filters

FRESH AIR HANDLING UNITS

- Available in 32 sizes
- Airflow ranges from 765 CFM to 48000 CFM
- Heat Recovery Wheel, horse shoe heat pipe, plate type heat exchangers and run around coil options are available
- Chilled water, district cooling and DX-type coils are available
- Drain pan of stainless steel 304 as standard
- Framework is made of Thermal Break Extruded Anodized Aluminum Profile
- Casing is made of 50 mm thick, double insulated panels
- Centrifugal fans tested and certified by AMCA in accordance to AMCA 210
- IE1/IE2/NEMA efficiency motors
- TEFC, IP55 degree of protection, Class F insulated, VFD compatible electric motors



VENTILATION SOLUTIONS



HEAT RECOVERY WHEEL

FAN

MOTOR

COOLING COIL

HEAT PIPE

FILTER

*All heat wheel models of 200mm depth are Eurovent certified.

AIR FLOW CHART

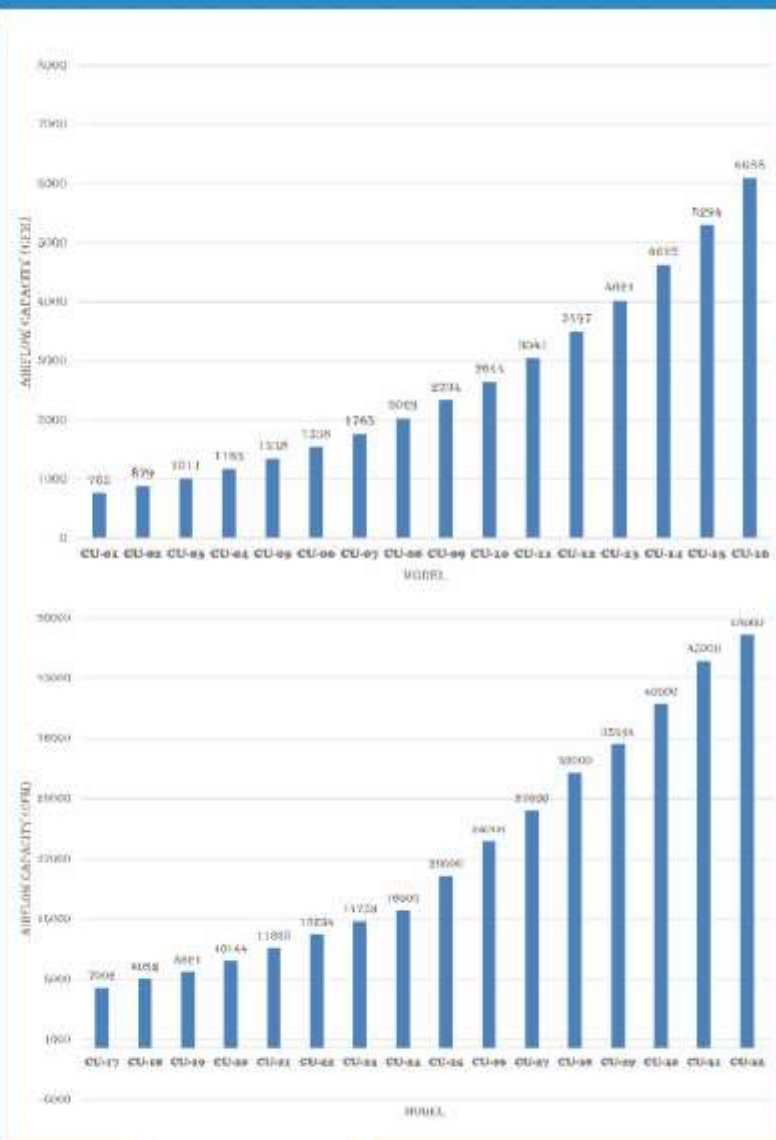
The CU-S series are developed for 32 standard sizes to fulfill the indoor air quality requirement, the air flow range is from 765 CFM to 48000 CFM and Static pressure at low, medium and high. The airflow speed across the cooling coil is from 2.0 to 2.5 m/s (till 3 m/s only for heating operation).

All model configuration are available for indoor or outdoor application and the arrangement will be in vertical, horizontal, double deck and 'U' shape installation.

AHU selection software programme is available, to optimise the best arrangement and performance for either chilled water system or DX system. Standard components can be selected and be placed according to customer requirement. Once the unit is defined, the output will be generated automatically.

Thanks to CU-S flexibility and modularity, the designer can easily transform the concept into real plant.

AHU Model	AHU Airflow Capacity
No.	CFM
CU-01	765
CU-02	879
CU-03	1011
CU-04	1163
CU-05	1338
CU-06	1538
CU-07	1765
CU-08	2029
CU-09	2334
CU-10	2644
CU-11	3041
CU-12	3497
CU-13	4021
CU-14	4625
CU-15	5294
CU-16	6088
CU-17	7002
CU-18	8052
CU-19	8821
CU-20	10144
CU-21	11665
CU-22	13234
CU-23	14753
CU-24	16000
CU-25	20000
CU-26	24000
CU-27	27600
CU-28	32000
CU-29	35294
CU-30	40000
CU-31	45000
CU-32	48000



FRAMEWORK



- Structure with aluminium profile of 50 mm
- Solid connecting corners made of glass-reinforced nylon, complete with thermal break
- Concealed intermediate aluminium profile to obtain a better thermal break and to reduce the unit length
- Modular frame for an easier transport and lifting in plant
- The base frame, independent for each section, is made of galvanized steel sheet



PANEL CONSTRUCTION

SHEET THICKNESS

Sheet Thickness (mm)	0.6	0.8	1.0	1.2
Galvanized steel	✓	✓	✓	✓
Aluminium	x	x	✓	✓
Stainless steel	✓	✓	✓	✓
Galvanized pre-coated	✓	✓	✓	✓

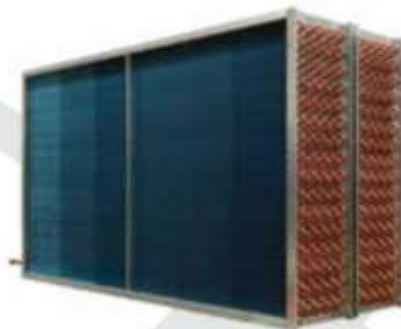
INSULATION

- Polyurethane 44 kg/m³ density
- Mineral wool 90 kg/m³ density

COIL SECTION



- AHRI certified coil
- Chilled water coil
- Direct expansion coil
- Copper tubes with aluminum fins
- Mounted on sliding guides for easy maintenance
- Stainless steel drain pan
- Moisture eliminator (optional)
- Anti-corrosive coating (optional)



COIL GEOMETRY

TUBE DIA	FIN SURFACE	TUBE GEOMETRY	FPI
1/2" OD	Corrugated Fin with Rippled Edge	Triangular 1.250" X 1.082"	8 to 16
1/2" OD	Louvre Fin with Rippled Edge	Triangular 1.250" X 1.082"	8 to 16
5/8" OD	Corrugated Fin with Rippled Edge	Triangular 1.50" X 1.299"	8 to 16
5/8" OD	Corrugated Fin with Rippled Edge	Triangular 2.360" X 1.181"	8 to 16

FILTER

METALLIC PRE-FILTER (MEDIUM EFFICIENCY)



Metallic Washable Filters are made of galvanized steel frame and multi-layer aluminium mesh filter media. These filters have applications in greasy exhausts, aggressive atmospheres as well as civil and industrial air conditioning systems with high relative humidity and dust load.

- Class: G1, G2 according to EN 779:2002
- Efficiency: 50% <G1< 65% / 65% <G2< 80%
- Clean pressure drop: 15 Pa
- Final pressure drop: 150 Pa
- Face Velocity: 2.5 m/s

SYNTHETIC PRE-FILTER (MEDIUM EFFICIENCY)



Synthetic Filters are made of galvanized steel frames and synthetic fiber filter media and are most effective for filtration of large dust particles in civil and industrial air conditioning systems.

- Class: G3, G4 according to EN 779:2002
- Efficiency: 80% <G3< 90% / 90% <G4< 95%
- Clean pressure drop: 70 Pa
- Final pressure drop: 250 Pa
- Face Velocity: 2.5 m/s

SOFT BAG FILTER (HIGH EFFICIENCY)



Soft Bag Filters are made of galvanized steel frames and multi-layer high-density synthetic fiber, equipped with external high-resistance film for increased filtration of solid particles and acts as a pre-filtration stage of HEPA filters.

- Class: F5, F6, F7 according to EN 779:2002
- Efficiency: F5< 65%, 65% <F6< 80%, 80% <F7< 90%
- Clean pressure drop: 70 Pa
- Final pressure drop: 250 Pa
- Face Velocity: 2.5 m/s

RIGID BAG FILTER (HIGH EFFICIENCY)



Rigid Bag Filters are made of plastic frame and water-repellent fiberglass paper, with a calibrated step pleated filter media with continuous thermoplastic thread separator. Rigid Bag Filters have been uniquely designed for efficient filtration of airborne particles and acts as a pre-filtration stage for HEPA filters.

- Class: F7, F8, F9 according to EN 779:2002
- Efficiency: 80% <F7< 90%, 90% <F8< 95%, F9= 95%
- Clean pressure drop: 80 Pa
- Final pressure drop: 150 Pa
- Face Velocity: 2.5 m/s

ABSOLUTE FILTER (HEPA FILTER)



Absolute Filters are made of galvanized steel frame with side handles, and water-repellent fiber paper with constantly calibrated spacing, separated through continuous thermoplastic threads. Absolute Filters are most effective for filtration of airborne solid particles and removal of a majority of air contaminants in controlled environments.

- Class: H12, H13, H14 according to EN 779:2002
- Efficiency: H12 >= 99.5%, H13 >= 99.95%, H14 >= 99.995%
- Clean pressure drop: 200 Pa
- Final pressure drop: 450 Pa
- Face Velocity: 2.5 m/s

ACTIVATED CARBON FILTER (DEODORIZATION FILTER)



Activated Carbon Filters are commonly used for the chemical/physical absorption and the deodorization of gaseous pollutants. The frame is made of galvanized steel and cylindrical cartridges of active carbon minerals, designed to eliminate organic odors.

- Class: CA-1
- Clean pressure drop: 200 Pa
- Maximum operating temp: 50 °C
- Maximum relative humidity: 70%
- Face Velocity: 2.5 m/s

ENERGY RECOVERY SECTION

Energy Recovery is the process of exchange and transfer of energy contained in the exhaust air stream that is used to treat the incoming outdoor fresh air in residential and commercial HVAC systems.

Energy Recovery offers the benefit of meeting ASHRAE ventilation and energy standards, while improving indoor air quality and reducing total HVAC equipment capacity.

Clima Uno Air Handling Units can be supplied with different energy recovery systems:

- Heat Recovery Wheels
- Cross Flow Plate Heat Exchangers
- Run-Around Coils
- Heat Pipe Systems

HEAT RECOVERY WHEEL

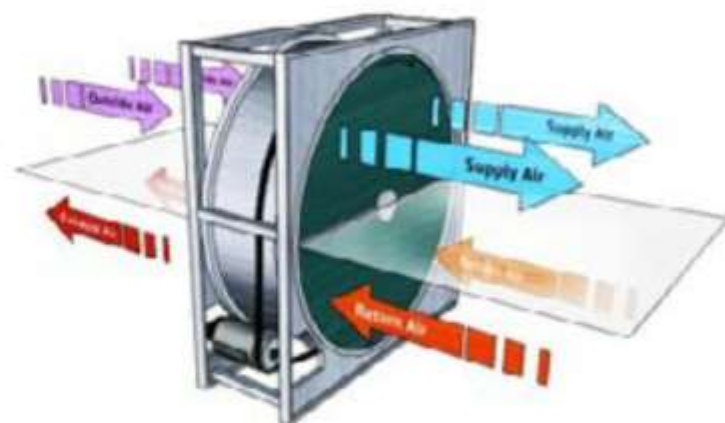
A thermal wheel consists of a circular honeycomb matrix of heat-absorbing material, which is slowly rotated within the supply and exhaust air streams of an air-handling system.

As the thermal wheel rotates, heat is picked up from the exhaust air stream in one half of the rotation and given up to the fresh air stream in the other half of the rotation. Thus, waste heat energy from the exhaust air stream is transferred to the matrix material and then from the matrix material to the fresh air stream, increasing the temperature of the supply air stream by an amount proportional to the temperature differential between air streams, or 'thermal gradient,' depending upon the efficiency of the device.

Heat exchange is most efficient when the streams flow in opposite directions as this causes a favorable temperature gradient across the thickness of the wheel. The principle of course works in reverse, and 'cooling' energy can be recovered to the supply air stream if so desired and if the temperature differential so allows.

ADVANTAGES

- Sensible and latent recovery
- 70% + effectiveness
- Compact



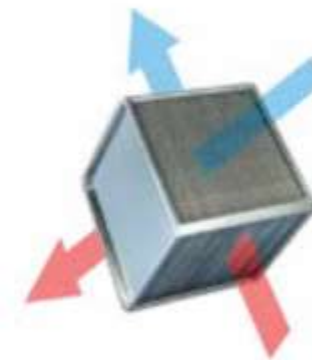
CROSS-FLOW PLATE HEAT EXCHANGER

Heat exchangers operate within the guidelines for heat recovery as re-cuperators with joint faces. The heat releasing and heat absorbing air streams pass along the joint face, through which the heat is directly transmitted. Supply and exhaust air must therefore be brought together and flow through the heat exchanger.

Heat transmission in plate heat exchangers operates on the cross-flow principle. Heat is transmitted via the plates from the warm to the cold air stream.

ADVANTAGES

- No cross-contamination of air streams
- 60-70% sensible effectiveness
- No moving parts

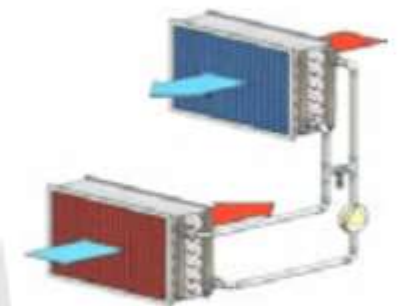


RUN-AROUND COIL

A run-around coil system is the optimal heat recovery system, comprising two or more multi-row finned tube coils connected to each other by a pumped pipework circuit. The pipework is charged with a heat exchange fluid, normally water, which picks up heat from the exhaust air coil and gives up heat to the supply air coil before returning again. Thus, heat from the exhaust air stream is transferred through the pipework coil to the circulating fluid, and then from the fluid through the pipework coil to the supply air stream.

ADVANTAGES

- High-efficiency
- Supply and exhaust stream need not be together
- No possibility of air stream for cross-contamination
- Flexibility in design



HEAT PIPE SYSTEM

Heat pipes are thermal transfer devices capable of moving large amounts of heat from the return air stream to the supply air stream of any AC system.

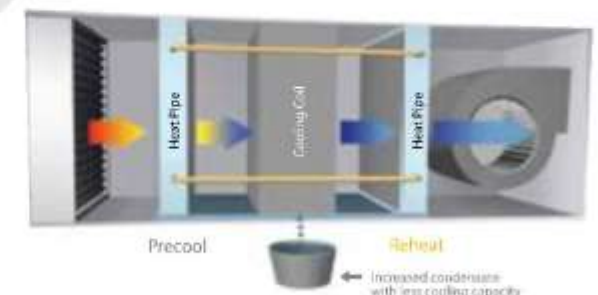
Heat pipes consist of two sections. The first section is placed in the incoming air stream before the AC cooling coil. When warm air passes over the first section, the liquid refrigerant vaporizes, moving heat to the section, placed downstream from the cooling coil.

Before entering the evaporator coils, heat is removed from the air. As the air passes through the cooling coil, it drops to a lower temperature, resulting in efficient moisture removal.

The overcooled air is then reheated to the desired temperature and a lower relative humidity by the second section, utilizing the same heat that was absorbed by the first section early in the process.

ADVANTAGES

- Reduces humidity
- Saves energy: replace or reduce reheat
- No moving parts - little maintenance
- Reduction of equipment load and tonnage
- Durable
- Low static pressure



FAN AND MOTOR

Standard Clima Uno units are equipped with plug-in or double inlet centrifugal fans. All fans used are AMCA certified and completed with frames according to the operating pressure.

Fans are statically and dynamically balanced and are available in the following varieties:

- Forward curved impeller blades
- Backward curved impeller blades
- Backward airfoil curved impeller blades
- Plug fans with backward curved impeller blades



Fans are driven by a three-phase electrical motor through belt and pulleys transmission, installed on a base frame with anti-vibration mounts and equipped with flexible connection on the outlet.

Standard motors are available with the following specifications:

- TEFC Squirrel Cage Induction Type
- Class of Insulation: F
- Protection: IP 55
- 3-Phase/1-Phase
- Motor Efficiency-IE/NEMA



SELECTION SOFTWARE

The main goal of utilizing software for the selection of an air handling unit is the automation of the quotation process that normally follows a client request. This is accompanied by the generation of a printout with complete information about the selected machine.

This goal can be achieved by outlining a simple five-step process, which also defines the functional specification for the software:

- Specification of the unit components
- Technical selection of each component, based on information given by the customer
- Price calculation, based on data computed in the previous step
- Assembly drawings of the unit
- Detailed drawings, DWG files with exact dimensions of the unit

