MAC Modular Air Handling Unit

We Deliver Air For Your Ideal Enviroment

ISO 9001
ISO 14001
BUREAU VERITAS
Certification

UKAS
ENVIRONMENTAL
MANAGEMENT
0008

AHRI CERTIFIED®
www.ahridirectory.org
Central Station Air-Handling Unit Casings
AHRI Standard 1350

MAC MICRONAIRE

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ABOUT US

MAC is an Industrial Air Handling Unit (AHU) specialist company that manufactures custom-built air handling unit with superior quality and hygiene level.

With more than 20 years of industrial experience in cleanroom, we specialize in providing industrial HVAC solution.Our vast experience in the cleanroom industry ensures that we are able to deliver the critical air conditioning solution that is required by every Cleanroom System which are now a necessity in many upcoming industries such as Food and Beverage industry, Automotive Plant, Gloves Manufacturing and Bio-related establishment such as labs, hospitals and R&D center.

In order to keep abreast with the latest technology in the ever changing environment of the Cleanroom System Industry, we strive to innovate and improve our technology and services. The quality of our product is guaranteed with countless testing and round the clock engineering to ensure superior air handling unit performance and sophisticated selection software in compliance to EN1886 Eurovent Standard and AHRI 1350 standard.

We Tailor
Our Engineering Solutions
based on your requirement specifications which includes:

- Temperature & Humidity Control
- Heat Recovery & Energy Efficiency
- High Air Flow & High Static Pressure Applications
- Integrated Control System
- Hygienic and High IAQ Design
- Corrosion and Harsh Environment Usage

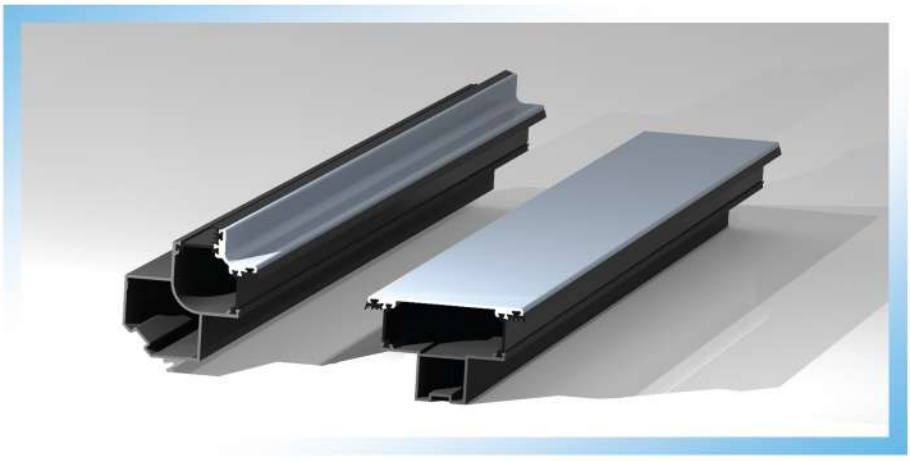
CASING

MAC Air Handling Unit casing is made of extruded aluminum profile which is interconnected with three-way connector. It comes in a special composite design frame which provides high mechanical strength with superb thermal isolation properties. Enclosed double skin thermal insulation panel is designed in accordance to EN ISO 14509. Our standard 60mm panel comes in a selection of Polyurethane Injection Foam or Fiberglass Insulation which provides thermal insulation properties for the construction. Both internal & external pre-painted GI skin provided to achieve "roughness free" surface for the internal.

FRAME

The internal frame is specifically designed with a curvy finish to form an edgeless interior. The gasket too was designed so that it eliminates the gaps and the edges of casing joint inside the unit. This was done so that MAC AHU is easier to clean while conforming to a hygienic design.

MAC's hygienically designed AHU is highly suitable for F&B, cleanroom and hospital application where they demand stringent compliance to air cleanliness.



THERMAL BREAK DESIGN

MAC AHU comes with aluminium alloy frame design with complete thermal break construction.

It provides surface temperature insulation between the internal and external of the air handling unit. The thermal break properties are established by combining both internal and external aluminium frame with a nylon stripe. A special clamping method is used to combine all three components into a single piece to form a sturdy structure.

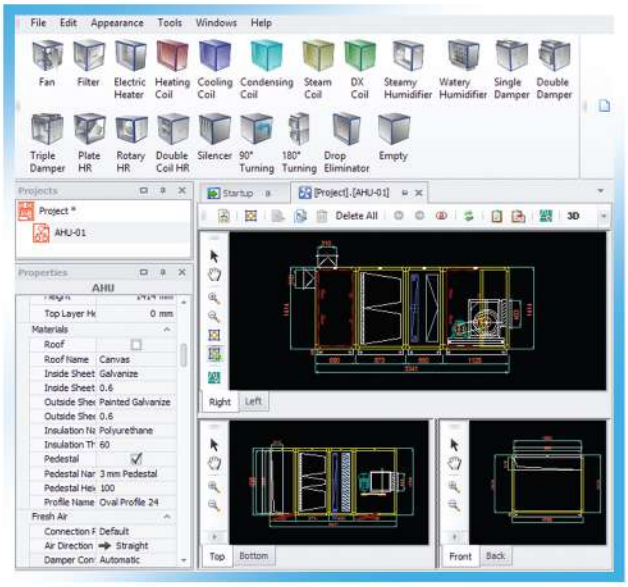
MAC's hygienically designed AHU is highly suitable

Hospital

Cleanroom

F & B

SELECTION SOFTWARE



MAC AHU has his own Eurovent standard compliance selection software. This is the key to provide the optimum component selection to meet the various requirement in system design.

MAC Software is capable of generating a complete and comprehensive technical information in just a click

FILTER

A variety of filter media can be fitted into the Air Handling Unit based on different type of application. MAC's AHU provide various filter media with performance in accordance to EN ISO 779. Filter media can be customisable with front/side withdrawal with powder coated GI filter frame.

The media type includes:

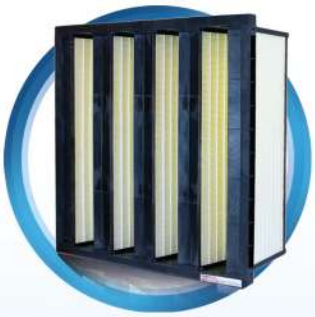
01 Primary and secondary filter for most of the HVAC application

02 High Efficiency Filter, Semi HEPA, HEPA, ULPA filters for F&B, hospital and cleanroom application

03 Chemical, Carbon filter for specified chemical compound arrestance in urban area and industrial process plant special air treatment solution

04 Heat Resistant Filter for continuous high temperature condition with fire resistance properties

05 Auto replacement filter for zero down time and labour free application



COIL SECTION

MAC MICRONAIRE

Coil selection is integrated into MAC's AHU software. The software will select the most optimized way to achieve the best performance with the most cost effective design. We provide various customization and construction material to achieve different application, whether in standard or extreme condition.

MAC cooling coil comes with 16 and 14 gauge galvanised steel/Al frame. It can be customised to 16 gauge SUS or brass frame material. Standard cooling and heating coils are manufactured from 0.013" (0.34mm), 0.016" (0.41mm) or 0.020" (0.51mm) wall thickness for 1□2" seamless copper tubes with a minimum of 0.0047" (0.12mm) thickness corrugated type aluminium fins.

The cooling coil can be customised to 3/8" seamless copper tubes with the wall thickness of 0.0118" (0.3mm) or 0.020" (0.508mm) wall thickness or 5/8" seamless copper tune with 0.020" (0.508mm) or 0.035" (0.89mm) wall thickness Steel headers come with threaded male pipe connections (BSPT) with drain plug and air vent included.

Standard coils are pressure tested to 450 PSIG (3105 KPa), with a maximum design operating temperature of 300□F (149□C). All of MAC AHU coils certified under AHRI 410 standard.

AHRI CERTIFIED®
www.ahridirectory.org
Air-Cooling and Air-Heating Coils
AHRI Standard 410

The selection of coils includes:

- Chilled Water Coil
- Direct Expansion Coil
- Hot Water Coil
- Steam Coil
- Glycol Water Coi

ANTI CORROSION

In order to supply a premium quality product for performance, safety and durability, we take the issue of corrosion into serious consideration as oxidation and rust would greatly impact the supply air quality after long period of operation.

As a standard issued MAC AHU, it comes with anodised aluminium framework and epoxy coated casing which provides anti-corrosion protection for open air or urban area without major corrosion loads.

Our hydrophilic fins coil is tested with 2000 hours of salt spray in accordance to DIN 50 021. Additional tint coating and heresite coating can be applied on aluminium or copper fins to prolong heat exchanger coil lifespan in corrosive operating condition. Special materials, painting or coating for casing and components in accordance to ISO12944-5 is available upon request. We provide suitable material pairing and surface treatment on components and fittings according to your application. MAC's additional coating and anticorrosion of coil is in compliance to ISO12944-5.


Durability


Safety

UNDERBEATH
DRAIN PAN DESIGN

DRAIN PAN

MAC's Air Handling Unit provides gradient double slope drain pan design in accordance to ASHRAE 62t to ensure that water drains freely from the pan whether the fan is on or off.

The drain pan was designed to be concealed underneath the AHU unit and also designed to be at the same level with the AHU floor to maximize air intake to the coil and eliminate coil bypass.

The standard material of the drain pan material is epoxy zinc powder coated GI. It can be customised with SUS material or special coating in order to achieve long lasting durability in corrosive environment.

FAN SECTION

MAC MICRONAIRE

Blower for the unit is selected using integrated selection software for the best efficiency and cost. The structure of the fan deck can be made of Al alloy or SUS material.

Various Fan Type can be selected in order to achieve the best efficiency based on the system application.

01 **Centrifugal SISW/ DIDW Fan**

02 **Centrifugal Plug Fan**

03 **EC plug fan**

AMCA CERTIFIED RATINGS
SOUND AND AIR PERFORMANCE
CERTIFIED BEST QUALITY
AIR MOVEMENT AND CONTROL ASSOCIATION, INC.

All the fan is dynamically and statically balanced in the factory and certified with AMCA. To reduce down time and to have a better consistency in fan efficiency, Plug fan can be used due to it being independent of pulley and belt driven system. The strong rigidity of the MAC AHU frame design is highly suitable for plug fan application due to high pressurisation. Without the belting that creates debris to the air stream, Plug fan is best to be applied in F&B, cleanroom and healthcare industries.

Its modular and compact design is suitable for fan array design that results in a more efficient and compact AHU system. The combination of the system with fan, commuter and external rotor motor made EC plug fan satisfied IE4 (IEC60034-31) efficiency class. It comes with IP20 or IP54 protection rating, suitable for most of the HVAC application inside AHU. MAC uses highest quality EC Plug fan that comply to EN 61000-6-3 on interference emission and EN 61000-6-2 for interference immunity.

EC plug fan
(Electronically Commutated)
comes with external rotor motor with integrated EC controller.

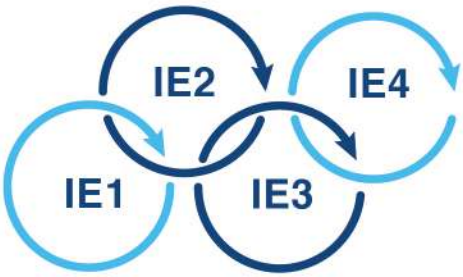
MOTOR

MAC chooses the best motor which is capable of adapting to most application types, allowing faster installation, ease of operation and low maintenance cost. The motor supplied is in compliance to IEC4 and IEC72 standard which covered most of the rotating electrical machine standard.

MAC provides full range of motor efficiency (IE1, IE2, IE3 and IE4) and all our motors are suitable for inverter driven application. The motor is mounted inside the unit casing on a sliding base to permit adjustment of drive belt tension. Standard motor is horizontal foot mounting, induction motor squirrel cage, totally enclosed fan-cooled with IP55 protection with class F insulation. The motor is suitable for operation at ambient temperature of 40°C, +-10% in voltage, +-5% in frequency and +-10% combined variation of both voltage and frequency.

Class H high temperature application motor is available upon request. It is capable of running at 300°C to 400°C for 2 hours at a time. The class H motor is certified EN12101-3 standard. Explosion proof motor, with Ex 'nA', Ex 'de' & Ex 'd' protection, is also available for application in environment exposed to flammable risk. IECEx or ATEX certification in accordance to IEC-60079-0 standard are available.

MAC provides full range of motor efficiency



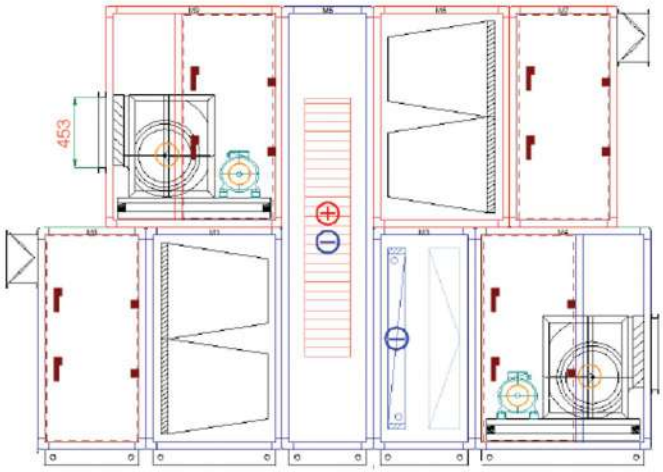
HEAT RECOVERY INTEGRATION

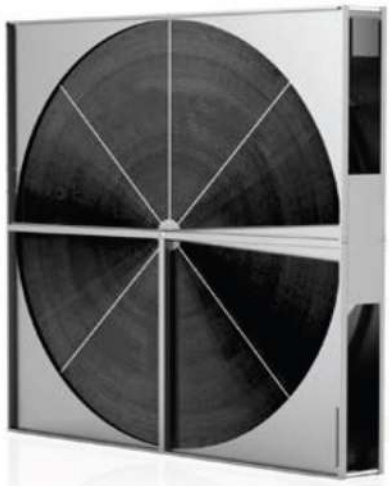
Energy recovery system is essential in any building for environmental friendliness with less power consumption and less CO2 emission. A good heat recovery design is essential to reduce the equipment size and operation cost. A treated indoor air can be recovered instead of exhausting out by using heat recovery system.

It is achieved by using rotary heat wheel, heat plate, run around coil and heat pipe which are built in with every MAC Air handling unit

HEAT WHEEL

Rotary heat wheel is able to achieve 90% energy recovery from fresh air and exhaust air system. Its 3A Molecular Sieve Desiccant Coated material on the surface of the wheel allows the system to recover both sensible heat and latent heat.

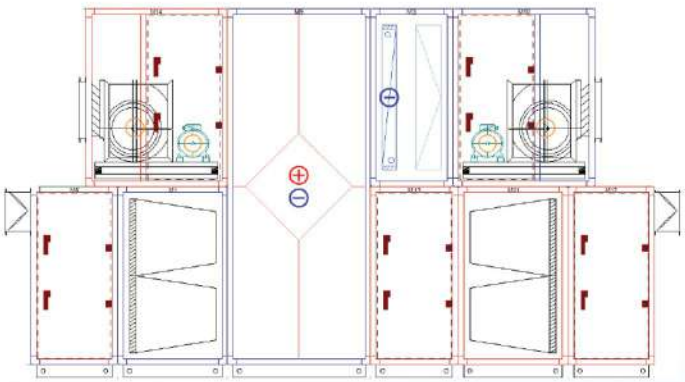




90% Energy recovery from fresh air & exhaust air system

HEAT PLATE

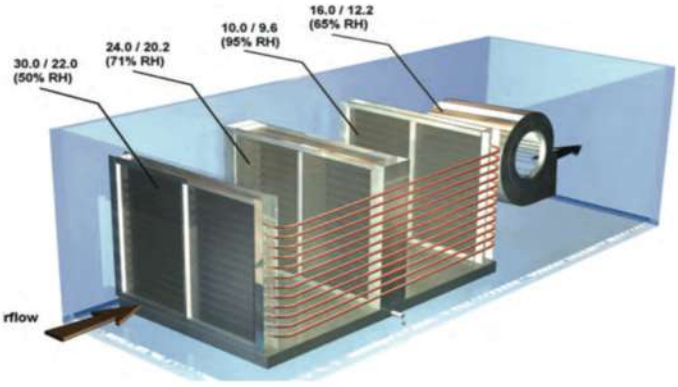
When cross contamination of exhaust air is of concern, heat plate can be used as heat recovery happen via the heat exchanger without mixing or infiltrate both air stream.



HEAT PIPE

Heat Pipe provides tremendous energy saving for dehumidification or recovery purpose with the efficiency of 50-60%.

By being a component with zero moving part, heat pipe is long lasting and self driven by thermal siphon effect.



RUN AROUND COIL

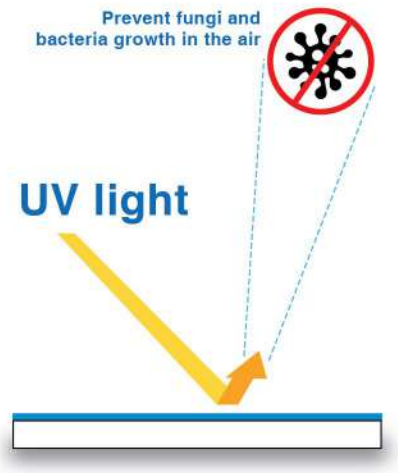
Run around coil is another option for heat recovery, that the sensible and latent heat carried by one airflow is transferred to the other airflow indirectly, via a liquid medium.

MAC can integrate run around coil into AHU that either run around inside the unit to achieve dehumidification or externally for recovery purpose.

UV LIGHT

Germicidal UV light can be installed near the coil component to sterilise any part of the unit especially the coil and drain pan to prevent fungi and bacteria growth in the air stream. The air quality and the safety of the occupant can be improved by integrating with UVC lamp.

UV light also slows down coil fouling during the operation which reduce air static losses and periodic coil cleaning schedule.



ACCESSORIES

Marine Lamp And Window

Pressure Gauge / Transducer

Dampers

Moisture Eliminator

INVERTER DRIVE

MAC can integrate inverter to the fan system especially direct driven application. Inverter can regulate motor speed to meet varies HVAC system performance depending to the climate and operation period. Inverter is essential to monitor system performance and power consumption on electrical motor.

This feature provides optimum performance on air handling unit and annual saving.

Optimum Performance

Annual Saving

MICRONAIRE GLOBAL SDN BHD

MAC MICRONAIRE

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