GENERAL FEATURES

The air handling units is manufactured in a company certified in accordance with the ISO 9001 v2000 standard.

Supplied AHU is of the “Wesper” brand and of “Premi@ir” type. The unit construction is complying with the requirements of the European standard EN 1886:

- Casing strength: Class 2A
- Casing air leakage: Class B/B
- Filter air leakage: Class F9
- Thermal Conductivity: Class T2
- Thermal Bridge: Class TB2

The AHU’s are selected with the aid of an EUROVENT certified software programme that delivers AutoCAD compatible execution plans, scaled to the AHU’s size, fan performance curves with operating points and a printout of the air humidity diagram with the requested change points.

The noise levels are expressed in accordance with EUROVENT standard. Casing attenuation is 41dB.

MODULE CONSTRUCTION / ASSEMBLY

- The AHU’s is of the self-supporting type without framework, and of perfectly smooth metallic interior construction (Public Buildings compatible), without any visible screws.
- The liaisons between modules ensure perfect continuity of the air passage tunnel with thermal bridge breakage and a smooth interior finish without any rough points at the joining surfaces to prevent any dust build-ups encouraging microbial growth.

- Hexagonal inserts are factory-fitted and pre-positioned to ensure perfect compression of the tightness seals between the modules during assembly on site.

- The modules are fastened from the outside by means of a thermal bridge breakage system (angle pieces and bolts).

- All internal electrical components and entire AHU are earthed.

- The AHU’s are delivered with continuous base frame. This base frame comprises the required openings of sling hooks / handling as well as openings for attaching rubber pads.
For outside installation, a roof is mechanically fixed on top part of AHU.

Fresh air / exhaust air weather hood equipped with bird screen is available as optional.

The panels are of the double skin type with a uniform thickness of 50 mm. Insulation can be:
- Glass wool 32 kg/m³, M0 fire class, CE certified; 
  \( k = 0.64 \text{ W/m}^2\text{K} \), or
- Rock wool 70 kg/m³, M0 fire class, CE certified, 
  \( k = 0.7 \text{ W/m}^2\text{K} \), or
- Polyurethane foam 40 kg/m³, M1 fire class, 
  \( k = 0.58 \text{ W/m}^2\text{K} \)

The inner skin is made of 0.8 mm thick galvanized sheet steel.
- As optional: Pre-painted, aluminium or stainless sheet steel (1 mm thick).

The outer skin is made of 1 mm thick sheet steel, pre-painted in RAL 9010 colour with an epoxy primer undercoat and a 25 micron thick polyester topcoat (resistance to salt spray test = 750 hours).

The panels are fastened to each other by means of screws countersunk in the panels (absence of localized thermal bridges). The screws are equipped with panel-coloured plastic caps.

The insulator is completely enclosed inside the panels (6 faces covered) in order to prevent any humidity penetration, and any loss of insulation efficiency.
The construction of the access doors is identical to the AHU’s panel construction.

The hinges are of the polyamide (anticorrosion) offset type.

The door locking system comprises progressive tightening, “rotor” locking handles for door alignment and perfect seal continuity (on both the positive pressure and negative pressure sides) between the doors and the panels. These handles are operated with the aid of a triangular key (in compliance with the EC directive on machinery safety). To avoid creating any localized thermal bridges, the door handles’ closing system (cam) does not traverse the panel.

INTERNAL EQUIPMENT

FAN MOTOR ASSEMBLY (FMA)

For «standard» application

- Fans are of forward curved or backward curved blade centrifugal double width double inlet type. They are statically and dynamically balanced as per VDI 2060 standard.

- A flexible connector inside the unit and mounted on a removable frame, provide the link between the fan-motor assembly and the end panel.

- The drive is of belted pulley type.

- Belt tension adjustment is done by way of a single piece sliding platform adjustable by a single screw without having to release the motor fixation. Thus, motor alignment remains fixed.
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- Or notched rails for motor powers > 22 kW.

- **For « hygienic » application**
  - Fans are of backward curved blade centrifugal single inlet “free wheel” type (plug fans). They are used with an electronic frequency inverter, supplied as optional.
  - High density foam is provided to ensure air tightness between suction panel and fan wheel inlet cone.

- As standard equipment, the fan-motor assembly is mounted on rubber vibration isolators.
  - Spring anti-vibration mounts can be supplied as optional.

- This assembly is mounted on a metallic base capable of spreading the load generated by fan-motor assembly in an even manner.
Protection and safety devices:

- As standard equipment the motors have an internal thermal overload protection (PTO) sensor.

- The minimum motor insulation class is IP 55 in compliance with EN 60529, IK08 in compliance with EN 50102, and they have a minimum class of efficiency EFF2 in accordance with CEMEP (European Committee of Manufacturer of Electrical Machine and Power Electronics) criteria for single speed motors with powers between 1.1 kW and 75 kW.

- A non-removable, hinge-mounted door guard (supplied as optional), requiring a special tool for opening, in compliance with EN 292.2, guarantees personal safety.

FILTERS

- The filtration systems meet the requirements of the EN 779 standard in terms of “medium” and "high" efficiency categories and the requirements of the EN 1822 standard for very high efficiency categories.

- The air tightness of the filtering surface complies with Class F9 of the EN 1886 standard.

- The filtration surface comprises rail-mounted filter cells, with the addition of a foam seal between the frame’s outer surround and the filter cells, and the addition of mastic sealing between the filtration surface frame and the air handling unit tunnel.

- The filtration surface air tightness of “high” efficiency categories is ensured by way of a sliding rail actuated by compression handles. The replacement of the filters is carried out without tools.

- The filters are selected in averagely clogged mode.
COILS

Water coils

- The coils comprise a finned block copper tubes. The copper tubes shall be deoxidised by the phosphorus electrolysis method. The aluminium fins shall be with a pitch of 2.1 mm, 2.5 mm or 3.2 mm.

- The coils are tested to a pressure of 16 bar for a service pressure of 10 bar.

- Hydraulic connections are of the male threaded type (for diameters smaller or equal to 60.3 mm) or smooth type (for larger diameters).

- The heating coils are mounted on slide rails.

- For « standard » application
  
  - The cooling coils are placed in a sloped condensate drain pan which eliminates any water retention. Pan is slide rail mounted for easy removal.

  - A droplet eliminator is used for air velocity > 2.7 m/s. It shall be fixed on the coil.

- For « Hygienic » application
  
  - The cooling coils are mounted on independent slide rails.

  - The drain pan has a slope and shall be extractable without dismounting the coil.

  - An extractable droplet eliminator is used for face velocity > 2.7 m/s. Eliminator is supplied with polyamide handle in order to facilitate its withdrawal.
**Electric heating coils**

- The electric heating coils comprise a series of stainless steel sheathed heating resistances. They are pre-wired and connected to a terminal block located behind an access door. The coils are mounted on sliding rails. The equipment is protected by a manual reset safety thermostat. The power supply to the electric heating coil must be dependent on fan operation.

**DAMPERS**

They are capable of being motorized and be selected from the following versions:

- **« Standard » dampers :**
  They consist of galvanized steel blades driven by polyamide gears or ties rods. Bearings are of polyamide type with 1300 Pa admissible pressure for a 1 metre length.

- **« Airtight » dampers :**
  They are of class 3 according to EN 1751 standard. Galvanized steel blades are driven by ties rods. Admissible pressure for a length of 1m is 1300 Pa. Dampers are equipped with stainless steel gasket on the frame and rubber gasket on the blades in order to guarantee the declared tightness.

- **« Heightened airtight » dampers :**
  They are used as isolation dampers on « Hygienic » type AHUs for clean room, operation theatre, laboratory.... Dampers are of class 4 (total leakage) and class C (frame leakage) in accordance with EN 1751 standard, and are suitable for use in the event of disinfection procedure by formolisation. They are composed of galvanized steel blades (stainless steel as optional), driven by galvanized steel (stainless steel as optional) tie rods. Bearings are of Teflon (bronze as optional; nylon strictly forbidden).
SILENCERS

- The construction of the silencer section is identical to that of the other AHU sections. The acoustic baffles are of single piece design, with an even density and a thickness of 200 mm. Standard length is 900 mm
  - 600 mm & 1200 mm as optional
- They are covered by a protective non-defibrating fibreglass veil, compacted at high temperature and guaranteed for air velocity up to 15 m/s between the baffles.

HEAT RECOVERY

- **Plate heat exchangers**
  Made of aluminium, and adapted for a differential pressure of 1000 Pa.
  The leakage rate between the two air streams is less than 1%.
  A condensate tray with a threaded condensate drainage pipe is mounted on the extract air side.
  A by-pass is available as an option for free cooling, for reducing or eliminating the antifreeze coil upstream of the recuperator or for preventing plate clogging during periods when heat recovery is not required.

- **Heat pipes**
  Comprising a heat exchanger equipped with a galvanized steel frame, the heat pipe is composed of hermetically sealed tubes, inside which a heat carrying fluid is in liquid / vapour phase balance.
  Aluminium fins are crimped onto the outside of the tubes to increase the heat exchange coefficient.
  A central partition separates the extracted airflow from the fresh airflow. The heat pipes are integrated in stacked air handling units, and are equipped, as required, with a bypass damper (as an option).

- **Thermal wheels**
  They comprise a constant speed aluminium hygroscopic rotor driven by belt.
  The assembly is installed in a rail-mounted galvanised steel frame inside the unit.
  A high performance seal provides tightness around the wheel surround and between the air inlet and the air outlet.
  The thermal wheel is equipped with a purge section to enable continuous wheel cleaning.
  A speed controller can be provided as an option.
Features & Benefits
AG PR – W.4 GB

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Date
April, 2005

Run around coils
Run around coils consist of finned coils placed in the supply and exhaust air units. The supply coil complies with the specification for hot water heating coils and the exhaust coil complies with the specification for chilled water cooling coils.

HUMIDIFIERS

Wet deck type humidifiers
The wet deck type humidifier is equipped with its own water-recycling pump, entirely integrated inside the section. The recovery tray located in the lower part of the humidifier is equipped with a float tap for the water inlet, an opening for the overflow and a drainage system. The “Glasdek” type humidification medium is 100 mm thick for an efficiency rating of up to 60 % and 200 mm thick for an efficiency rating of 85 %. It is classified M1.

Spray type humidifiers (air washers)
The air washer is equipped with its own water-recycling pump, installed outside the section. The recovery tray located in the lower part of the washer is equipped with a float tap for the water inlet, an opening for the overflow and a drainage system. The water is sprayed through PVC nozzles attached by a clip system onto the distribution rails.

Steam humidifier
To enable the steam generator blow pipe to be integrated in the section, it is equipped with an empty section of the same construction as the other air handling unit’s sections, and equipped with a galvanized or optional stainless steel condensate drain pan.