

***MYHC Air Handling Units***  
***Comfort application***

**Mechanical specification**



**SEM MYHC** air handling units must be rigged, lifted, and installed in strict accordance with the Installation and Operation manual for **MYHC** air handling units. The units are also to be installed in strict accordance with this document's specifications.

Units may be shipped fully assembled or disassembled to the minimum functional section size in accordance with shipping and jobsite requirements. Units shall be shipped on an integral base frame (100 mm) for the purpose of mounting units to a housekeeping pad that should be sized to provide additional height to properly trap condensate from the unit. Units shall be provided with adjustable feet connected to the unit base frame. The integral base frame may be used for ceiling suspension, external isolation, or as a housekeeping pad.

The characteristics for each air handling unit shall consist of the following components:

## **Certifications**

The air handling units shall be designed and manufactured in accordance to ISO 9001 quality assurance standards and all units shall be compliant with applicable European regulations. Air handling performance data shall be Eurovent certified, based on EN 1886 performance which assures the mechanical performance of the machine, and EN 13053 certification, which assures that performance of the machine are in line with declared values. Unit sound performance data shall be provided using Eurovent Standard test methods and reported as sound power.

Unit shall conform to classification standards:

- **Casing strength\***  
*For each 1 meter of casing, unit will not have more than 0.8 mm/m deflection (-1000 Pa) and/or 1.0 mm/m deflection (+1000 Pa)*
- **Air leakage\***  
*Not to exceed 0.03 liters per second per square meter of panel under -400 Pa Pressure*  
*Not to exceed 0.05 liters per second per square meter of panel under +700 Pa Pressure*
- **Filter Bypass\***  
*Not to exceed 0.08% leakage for 400 Pa differential pressure*
- **Thermal Transmittance\***  
*Maximum 0.72 watt per square meter per °K)*
- **Thermal Bridge\***  
The ratio between the lowest temperature difference between any point on the external

surface and the mean internal air temperature, and the mean air-to-air temperature difference shall not exceed 0.67.

- *Acoustical Performance for standard units--polyurethane panel solution shall exceed 25dB attenuation*
- *Acoustical Performance for sound-sensitive units rock wool panel solution shall exceed 40dB attenuation*

*\*According to EN 1886 and Eurovent Test Methodology*

Machine performance calculations shall be conducted using a Eurovent certified software program. Depending on conditions, a machine selection is capable of achieving the highest energy class standard: Class A, according to Eurovent energy efficiency calculations.

The air handling units shall be guaranteed for 10 years\*\* by the machine's manufacturer under the condition that: the unit contains factory mounted controls as well as a service and maintenance contract held from the machine's manufacturer.  
\*\*Conditions may apply: Warranty shall begin at commissioning of the machine and controls. Exclusions may apply: warranty guarantee shall not include machine corrosion, general machine-wear, and normal internal and external climate condition. See maintenance contract for terms and conditions.

The air handling unit panels shall be compliant to the EN10169 standard, which guarantees against panel corrosion for 10 years.

## **Casing construction**

Between the ambient air surrounding the machine and the supply air, the machine's delta dew point shall not exceed 6 grams per kilogram of dry air, in order to avoid condensation under the unit.

### **• Dimensions**

The interior dimensions of the machine shall be based on worldwide industry standard filter sizes (595 mm x 595 mm). All interior components (coils, filters, fans, etc.) shall be sized using these international standards. The machine shall have no block off to ensure a sanitary machine interior.

### **• Panels**

All unit panels shall be dismountable; 50 mm thick with double-wall construction to facilitate the cleaning

of the unit interior. All six outer panels (floor, roof, sides, drain pans, etc.) of the interior and exterior walls of the machine shall be made standard from galvanized steel with a quality level of sendzimir 300 gr/m<sup>2</sup> of zinc. The outer-skin shall be pre-painted with Polyester as standard RAL9002. The minimum paint thickness shall be 25 µm. The inner-skin shall be made of galvanized steel.

The casing shall consist of self-supporting panels. The isolation shall be tightly secured and entirely surrounded by the panels on all six sides. There shall be no thermal conduction between the inner and outer skin of the panels. The panels shall be capable of 2500 Pa of mechanical resistance.

No screws, nuts, and bolts shall be exposed to the airstream. All integrated support materials shall be composed of galvanized steel.

When rock wool is selected (sound-sensitive unit), the outer and inner skin shall have a total thickness of 2.0 mm; which assures higher sound attenuation around the unit.

When injected polyurethane foam is selected, the interior and exterior skin shall have a total thickness of 1.2mm; which assures lower unit energy loss.

All drilling shall be done in the factory and cable glands, pressure nipples, sensors, actuators, etc. shall be fully pre-integrated into the machine. There shall be no drilling to be done on-site in order to guarantee tightness and performance of the machine (with factory-mounted controls).

- **Gaskets**

Between fixed panel: Gaskets or sealant, as alternative, shall be present between all fixed paneling.

**Access door:** The EPDM gaskets shall be integrated (through permanent insertion) into the door frame, to avoid gasket damage during maintenance and repair. The hollow gasket body ensures maximized air-tightness when the door is closed.

Between junctions:

The EPDM gaskets shall be integrated (through

permanent insertion) into the door frame, to avoid

gasket damage during maintenance and repair. The

hollow gasket body ensures maximized air-tightness

when the door is closed.

- **Junction assembly**

If the machine is delivered in several sections, the junction assembly device shall connect the two unit sections with ease, and shall not require any extra tooling, while still providing a mechanical tractive force of 300 daNewton.

- **Unit flooring**

The unit floor shall be of sufficient strength to support a 120-kilogram load during maintenance activities and shall deflect no more than 2mm per meter.

- **Insulation**

50mm insulation shall be offered in two forms:

Rock wool: which tailors to acoustical needs,

- B - s2, d0 (EN 13501-1)
- 80 kg/m<sup>3</sup> fiber material density
- Thermal conductivity: 0.040 Watts/m<sup>2</sup>K
- 1.0 mm metal sheet thickness

OR

Injected polyurethane: which assures optimal thermal performance throughout the full life of the machine.

- B - s2, d0 (EN 13501-1)
- 40 kg/m<sup>3</sup> injected polyurethane foam (non-fiber, inert to all environments and humid conditions)
- Thermal conductivity: 0.022 Watts/m<sup>2</sup>K
- 0.6 mm metal sheet thickness

- **4-way inclined floor, integrated drainage**

All machine sections that generate condensate shall be provided with an insulated, double-wall galvanized or stainless steel drain pan. The drain pan shall not be added as a separate component to the base floor of the machine. The drain pan shall be fully-integrated into the machine's panels using an inclined floor design. The inclined floor shall be designed to collect all condensation produced by the machine's components. The inclined floor shall be standard, fully insulated (50mm thick) and made of galvanized steel or stainless steel as option, for polluted environments. The floor shall be angled on 4 points and shall be attached to a centralized vertical water evacuation tube through a threaded connection that shall be easily accessed and visible externally from the unit, promoting positive drainage to eliminate any stagnant water conditions. If application requires, the option of an inclined floor shall be applied throughout the entire air handling unit.

- **Base frame**

The entire unit casing shall be fixed on the base frame shall expand the entire perimeter of the machine. The base frame also consists of interior galvanized supports with a thickness between 2 mm

and 2.5 mm. The base frame shall stand at 100mm high. The base frame profile shall be fully closed externally, and shall not permit any stagnant water or dust traps, avoiding bacterial or corrosion risk.

Eye-bolts shall be integrated into the base frame for the loading, unloading, and manipulation of the machine on-site. There shall be no need to drill holes on-site for handling purposes.

- **Access doors**

Access to maintenance areas shall be marked with a door with hinges and a ¼ turn progressive handle (15 centimeters long), to ensure gasket tightness. Depending on the section of the unit (potential for danger or not), a key-lock is provided for safety precautions in conformity with EN292.2. Depending on the size of the machine, hinges and handles may be added to the doors. There shall be a maximum space of 1m between each door fixture. Progressive handle closure ensures the security of the door. Doors located in pressurized sections shall be equipped with a removable safety chain for security purposes.

- **Outdoor applications**

For outdoor applications, a flat roof shall be factory-installed, and pre-painted with Polyester paint as standard RAL9001 (white-grey). The minimum paint thickness shall be 25 µm. The color will match that of the other outer panels. There shall also be the option of a protective rain grill or rain hood which will come pre-installed using the same material as the roof and panels. An anti-bird screen will come standard with all rain grill or rain hoods.

## **Machine components**

- **Flexible connection**

Flexible connections shall be factory-mounted on a rigid casing. No on-site attachment shall be required. The flexible connection shall not be directly connected to the machine casing; instead it shall be connected to a metal flange which acts as a support to provide maximized air tightness. The flexible connection material shall conform to the European standard A2 Euroclass EN 13501-1 for fire prevention. The minimum thickness shall be 100mm.

- **Damper**

Dampers shall be factory-installed. They shall modulate the volume of outdoor, return, or exhaust air.

Dampers shall have airfoil blades with extruded edge seals.

Class 1 dampers, used primarily for mixing boxes, smoke dampers, etc. shall have a maximum leakage

rate of 200 liters per second per square meter under 100 Pa pressure (standard EN 1751). As standard (class 1), the dampers will be motorized on wheels by a shaft and motor. All components controlling the dampers shall be outside the airstream to ensure the integrity of the machine.

Class 3 dampers shall be provided as an option and are used primarily for isolating the machine when not running. The damper shall have a maximum leakage rate of 8 liters per second per square meter under 100 Pa pressure (standard EN 1751). Class 3 dampers shall be controlled through linked, opposing aluminum blades.

Maximum damper torque requirement shall be 20Nm per square meter.

- **Filtration**

### **Pre-filtration, efficiency G4 according to EN 779**

The filter cells shall be 50mm thick, consisting of pleated synthetic material. The filter frames shall be composed of galvanized steel. If the application requires only a flat filter (G4), the filter shall be accessed through side access filter rails/guides. If the flat filter and bag filter are combined as one filter section, the two filters shall be fixed at all 4 corners to a frontal holding frame. An access section shall be created, allowing for ample space (500 mm minimum) to change the filters on the contaminated side. The fire prevention certificate shall conform to the A3 Euroclass EN 13501-1.

Pressure nipples shall be supplied before and after the filter and come pre-integrated into the machine, no drilling shall be performed on site.

The machines quotation shall be made under the assumption that filters are half clogged. The value of a completely clogged filter is 2 times the value of the clean filter.

### **Bag filter F6 to F9 according to EN 779**

The bag filters shall consist of a polypropylene frame, and shall be composed of fiberglass materials. Filters F6, F7 shall be accessed through adjustable side access filter guides. Filters F8 and F9 shall be fixed on all 4 sides to a frontal holding frame. An access section shall be created, allowing for ample space (500mm minimum) to change the filters on the contaminated side only. Access from the clean side of the filter shall be forbidden.

The fire prevention certificate shall conform to the A3 Euroclass EN 13501-1.

Pressure nipples shall be supplied before and after the filter and come pre-integrated into the machine, and no drilling shall be performed on site.

The machines quotation shall be made under the assumption that filters are half clogged. The value of a completely clogged filter shall be 2 times the value of the clean filter.

- **Energy recovery system**

- Coil loop**

- A coil loop shall consist of copper tubes (0.4mm thick), aluminum fins (0.12mm thick), galvanized steel frame, painted steel headers, and threaded connections. Depending on the location or application, the aluminum fins of the coil can be coated with Epoxy, anti-corrosion paint.

- The fin spacing shall be provided between 2.0 and 3.0mm depending on the rate of dehumidification.

- The coils shall be factory-tested at 30 bars and capable of a service pressure up to 12 bars.

- The coil shall be removable on connection side of the machine, through side-access rails. When removing the coil, the hydraulic kit piping shall remain in place.

- The header shall be equipped with a threaded connection for draining purposes.

For all air speeds exceeding 2.50 m/s over the fin area or dehumidification exceeding 2gr/kg, the machine shall be equipped with a drop eliminator and PVC blades 100 mm thick including three changes of flow direction, and a combined lip.

Calculations shall be conducted using winter-mode only. This system shall not be chosen for function during summer months.

- Plate heat exchanger**

- The plate heat exchanger shall be certified by Eurovent. It shall be composed of aluminum undulated fins. Depending on the location or application, the aluminum can be coated with Epoxy, anti-corrosion paint. The airflow leakage rate between the two airflows shall be less than 0,1% at 500 Pa, when airflow rates are under 15000 m<sup>3</sup>/hr. The maximum air pressure difference between each airflow shall be 1000 Pa.

A floor shall serve as the integrated drain pan on the exhaust side of the exchanger.

In case of freezing risk, a bypass damper shall be installed to the fresh airflow.

The plate heat exchanger shall have the capacity to obtain gross energy efficiencies of up to 65%. Calculations shall be based only on the performance of the plate heat exchanger, based on temperature of

outdoor and return air (without adding other variables such as fan reheat).

The maximum air pressure drop caused by the plate heat exchanger shall be 250 Pa.

Depending on the application, various damper configurations shall be made available: Free cooling dampers, bypass damper, or face damper.

Depending on the application, the exchanger may be calculated using partial airflows.

- Recovery wheel**

- The recovery wheel is a standard condensation heat exchanger for transfer of sensible energy. The wheel shall be Eurovent certified. It shall be composed of aluminum undulated fins. Depending on the location or application of the machine, the aluminum pieces may be coated with Epoxy, anti-corrosion paint. The rotor hub shall require no maintenance and is equipped with life-time lubricated ball bearings or roller bearings, installed in a protected position within the hub.

The wheels thickness shall be 200mm. Fin oil thickness shall be 60μ.

The speed of the heat exchanger (and its efficiency) shall be controlled by the frequency inverter. A magnet shall be installed as a detection device to monitor the movement of the wheel. An alarm is activated if the wheel stops turning.

The recovery wheel shall obtain gross energy efficiencies of up to 80%. Calculations shall be based only on the performance of the recovery wheel, based on temperature of outdoor and return air (without adding other variables such as fan reheat).

The maximum air pressure drop on the recovery wheel shall be 250 Pa.

Depending on the size and positioning of the machine, the wheel shall have the option of being delivered in several pieces to the job site. In order to guarantee the unit, a dedicated factory-expert must be present for the re-assembly of the wheel.

Depending on the application, the exchanger may be calculated using partial airflows.

- **Coils**

- Water cooling coil**

- The manufacturer shall be certified by the Air Conditioning, Heating, and Refrigeration Institute (A.H.R.I.), and all coil calculations shall conform to

ARI 410 standard. The cooling coil shall consist of copper tubes (0.4mm thick), aluminum fins (0.12 mm thick), galvanized steel frame, painted steel or copper headers, and threaded connections. Depending on the location or application, the aluminum fins of the coil can be coated with Epoxy, anti-corrosion paint.

The fin spacing provided shall be between 2.0 and 3.0mm depending on the rate of dehumidification. The coils shall be factory-tested at 30 bars. The service pressure shall not exceed 12 bars. The coil shall be removable on connection side of the machine, through side-access rails. When removing the coil, the hydraulic kit piping shall remain in place. The header shall be equipped with a threaded connection for draining purposes.

For all air speeds exceeding 2.50 m/s over the fin area or dehumidification exceeding 2gr/kg, there shall be a drop eliminator and PVC blades 100 mm thick including three changes of flow direction, and a combined lip. Depending on the location or application, the drop eliminator can be provided in full stainless steel.

An inclined floor shall serve as the integrated drain pan. For more information (see above: 4-way inclined floor, integrated drainage).

Very important requirements regarding high-humidity climates/applications (dehumidifying up to 6gr/kg):

- Air speed shall not exceed 2.5 m/s over the fin area.
- Fin spacing shall be fixed at 3mm
- Drop eliminator shall consist of PVC blades 200 mm thick including five changes of flow direction, and two combined lips. Depending on the location or application, the drop eliminator can be provided in full stainless steel.

#### **Direct expansion cooling coil**

The manufacturer shall be certified by the Air Conditioning, Heating, and Refrigeration Institute (A.H.R.I.), and all coil calculations shall conform to ARI 410 standard. The direct expansion cooling coil shall consist of copper tubes (0.4mm thick), aluminum fins (0.12mm thick), galvanized steel frame, and copper headers. Depending on the location or application, the aluminum fins of the coil can be coated with Epoxy, anti-corrosion paint. The refrigerant distributor shall be integrated to fit the inside of the coil casing and outside of the airstream.

The fin spacing shall be provided between 2.0 and 3.0mm depending on the rate of dehumidification. The coils shall be factory-tested at 30 bars. The service pressure shall not exceed 12 bars.

The coil shall be removable on connection side of the machine, through side-access rails.

For all air speeds exceeding 2.50 m/s over the fin area or dehumidification exceeding 2gr/kg, there shall be a drop eliminator with PVC blades 100 mm thick including four changes of flow direction, and two combined lips. Depending on the location or application, the drop eliminator can be provided in full stainless steel.

An inclined floor shall serve as the integrated drain pan. For more information (see above: 4-way inclined floor, integrated drainage).

Very important requirements regarding high-humidity climates/applications (dehumidifying up to 6gr/kg):

- Air speed shall not exceed 2.5 m/s over the fin area.
- Fin spacing shall be fixed at 3mm
- Drop eliminator shall consist of PVC blades 200 mm thick with five curved drop deflectors, and two beaks. Depending on the location or application, the drop eliminator can be provided in full stainless steel.

#### **Hot water coil**

The manufacturer shall be certified by the Air Conditioning, Heating, and Refrigeration Institute (A.H.R.I.), and all coil calculations shall conform to ARI 410 standard. The hot water coil shall consist of copper tubes (0.4mm thick), aluminum fins (0.12 mm thick), galvanized steel frame, painted steel or copper headers, and threaded connections. Depending on the location or application, the aluminum fins of the coil can be coated with Epoxy, anti-corrosion paint. The coils shall be factory-tested at 30 bars. The service pressure shall not exceed 12 bars. The coil shall be removable on connection side of the machine, through side-access rails. When removing the coil, the hydraulic kit piping shall remain in place. The header shall be equipped with a threaded connection for draining purposes.

#### **Steam coil**

The manufacturer shall be certified by the Air Conditioning, Heating, and Refrigeration Institute (A.H.R.I.), and all coil calculations shall conform to ARI 410 standard. The steam water coil shall consist of steel tubes (1.5 mm thick), aluminum fins (0.15mm thick), galvanized steel frame, painted steel headers, and threaded connections.

All tubes shall be inclined (2°) of vertical for perfect medium drainage, and to avoid internal corrosion tube risk.

The coils shall be factory-tested with air at 30 bars. The coil shall be capable of handling service pressure of steam up to 5 bars.

The coil shall be removable on connection side of the machine, through side-access rails. When removing the coil, the steam kit piping shall remain in place. The header shall be equipped with a threaded connection for draining purposes.

#### **Direct expansion heating coil**

The manufacturer shall be certified by the Air Conditioning, Heating, and Refrigeration Institute (A.H.R.I.), and all coil calculations shall conform to ARI 410 standard. The direct expansion heating coil shall consist of copper tubes (0.4mm thick), aluminum fins (0.12mm thick), galvanized steel frame, and copper headers. Depending on the location or application, the aluminum fins of the coil can be coated with Epoxy, anti-corrosion paint. The refrigerant distributor shall be integrated to fit the inside of the coil casing and outside of the airstream.

The fin spacing shall be provided between 2.0 and 3.0mm.

The coils shall be factory-tested at 30 bars. The service pressure shall not exceed 12 bars.

The coil shall be removable on connection side of the machine, through side-access rails.

#### **Electric coils**

Electric coils shall consist of single carbon steel or stainless steel 304 elements and shielded spiraled fins.

Electrical element load shall be minimum 4 watt/cm<sup>2</sup>.

The internal electrical elements shall cover the entirety of the internal casing (not bypassed), especially important when the electrical coil is used for pre-heating/antifrost purposes.

Manual-reset thermostats shall be provided.

If a hazard exists before or after the electric coil, protective sheet can be installed, or an empty space will be added.

The security responsibility for the machine shall be assumed by the supplier of the controls of the machine (in cases of after-ventilation).

The connection box is fully-integrated into the machine, and shall be outside of the air stream.

- **Antifrost thermostat frame**

The antifrost thermostat frame shall be provided on all machines taking in outdoor air. It shall be placed after the first water coil without glycol added. The antifrost thermostat frame shall be mounted on side rails and accessed by a dedicated removable panel. It shall fit securely inside the entire surface space of the internal casing. Sensor and module shall be integrated inside the casing (to avoid external disturb measurement).

- **Humidifiers**

#### **Stand-alone electric immersed electrode steam humidifier**

This humidifier shall be available for indoor applications only. It shall be a modulating system and shall be equipped with an anti-foaming system to ensure that the humidifier can operate with a large range of water qualities and reduces the energy consumption by optimizing the water filling and drain cycles in order to obtain the ideal conductivity. The controller (with LCD screen display) shall be mounted on the humidifier and shall have the capability for communication.

An inclined floor shall serve as the integrated drain pan. For more information (see above: 4-way Inclined Floor, Integrated Drainage).

#### **Evaporative adiabatic humidifier**

A honeycomb media type shall be used to humidify the air and shall be mounted on a galvanized or stainless steel frame.

A stainless steel water holding-tank shall house the immersed pump system. The system shall also include the spray arrangement, recycling aluminum pump and float valve which determines the appropriate water levels.

Depending on humidifying needs, honeycomb media thicknesses will determine the varying levels of humidifying efficiency. This system allows for evaporation of between 6 and 10 grams of water per kilogram of dry air.

Depending on the phase velocity, a drop eliminator shall be mounted to the humidifier.

Internal skin panels of the humidifier section shall be galvanized or stainless steel (304).

- **Fans motor group**

#### **Backward blade fans for high pressure applications/high efficiency**

The centrifugal fan shall have inclined backward blades. The wheel shall be epoxy painted.

The fan type shall be provided as required for stable operation and optimal energy efficiency. The fan shall be statically and dynamically balanced at the factory and shall conform to a G4 class further ISO 1940-1 standard. The fan shall not exceed 75 percent of its first critical speed at any cataloged speed. Fan wheels shall be keyed to the fan shaft to prevent slipping. The fan shafts shall be made of solid steel. The fan section shall be provided with an access door on the drive side of the fan.

Fans shall be mounted on a galvanized steel motor base frame, fully insulated from vibrations, using

rubber insulation (high frequency) or springs (low frequency) under the base frame. To further reduce vibrations, there shall be a flexible connection between the fan discharge and the outlet panel. Vibrations shall be treated under the fan using spring or rubber insulators. The unit shall have a built-in rubber pad to the base frame of the entire unit (not supplied by unit manufacturer).

The fitting type shall be selected so that the transmission provides a minimum theoretical life of 40 000 hours for the unit's bearings.

The minimum fan efficiency shall be compliant with EU regulation 327/2011/EU.

In order to reduce the sound level, the dynamic pressure shall not exceed 120 Pa.

#### **Forward curve blade fans for low pressure applications/sensitive acoustical needs**

The centrifugal fan shall have inclined forward curve blades.

The fan type shall be provided as required for stable operation and optimal energy efficiency. The fan shall be statically and dynamically balanced at the factory and shall conform to a G4 class further ISO 1940-1 standard. The fan shall not exceed 75 percent of its first critical speed at any cataloged speed. Fan wheels shall be keyed to the fan shaft to prevent slipping. The fan shafts shall be made of solid steel. The fan section shall be provided with an access door on the drive side of the fan.

Fans shall be mounted on a galvanized steel motor base frame, fully insulated from vibrations, using rubber insulation (high frequency) or springs (low frequency) under the base frame. To further reduce vibrations, there shall be a flexible connection between the fan discharge and the outlet panel. Vibrations will be treated under the fan using spring or rubber insulators. The unit shall have a built-in rubber pad to the base frame of the entire unit (not supplied by unit manufacturer).

The fitting type shall be selected so that the transmission provides a minimum theoretical life of 40 000 hours for the fan's bearings.

The minimum fan efficiency shall be compliant with EU regulation 327/2011/EU.

In order to reduce the sound level, the dynamic pressure shall not exceed 120 Pa.

#### **Direct drive plug fan for high efficiency and more control over fan programming**

The direct drive plug fan shall have backward curve blades. The wheel shall be epoxy painted.

The fan type shall be provided as required for stable operation and optimal energy efficiency. The fan shall be statically and dynamically balanced at the factory and shall conform to a G2.5 class further ISO 1940 standard. The fan shall not exceed 75 percent of its first critical speed at any cataloged speed. Fan wheels shall be keyed to the fan shaft to prevent slipping. The fan shafts shall be made of solid steel. The fan section shall be provided with an access door on the drive side of the fan.

Fans shall be mounted on a galvanized steel motor base frame, fully insulated from vibrations, using rubber insulation. To further reduce vibrations, there shall be a flexible connection between the fan discharge and the outlet panel. Vibrations will be treated under the fan using spring or rubber insulators. The unit shall have a built-in rubber pad to the base frame of the entire unit (not supplied by unit manufacturer).

Unit manufacturer shall provide pressure nipples which will perfectly measure the fan's internal pressure. This measurement shall be used by the controller to calculate the unit's airflow.

The minimum fan efficiency shall be compliant with EU regulation 327/2011/EU.

#### **• Motors**

Motors shall be integrally mounted to an isolated fan assembly furnished by the unit manufacturer. The motor shall be mounted inside the unit casing on an adjustable base to permit adjustment of drive-belt tension.

The asynchron motor shall be housed in aluminum or cast iron depending on sizes, and shall have a temperature class F (maximum 40°C and an altitude lower than 1000m) and motor tightness of IP55. The minimum efficiency shall be compliant with the EU regulation 640/2009/EC. The electric motor shall be equipped with PTC thermal protection, and the motor shall contain a self-cooling capability which allows for a of frequency inverter drive.

The nominal motor power is defined with a proper reserve as fan manufacturer prescription, compared with the absorbed shaft fan power. The number of motor poles shall be selected with a direct relationship to the fan revolution speed.

#### **• Transmission**

The transmission shall be created with pulley-technology and a taper lock hub system on a trapezoidal belt.



- **Sound absorbers**

A rectangular silencer shall be provided to reduce airborne sound transmitted through the air handling unit. Face velocity between sound absorber baffles shall not exceed 12 m/s.

Sound absorber baffles shall be 200mm thick. They shall be constructed of mineral wool and protected by a non-fiber material coating to prevent duct clogging. Length of the sound absorber shall be determined depending on unit inlet / outlet sound power level required.

For high noise attenuation requirements, sound absorbers baffles shall be 350mm thick.

Sound attenuator module shall be integrated as close as possible of the source sound of the unit.

- **Accessories**

**View windows**

An optional shatterproof window for viewing shall be available, capable of withstanding unit operating pressures. Windows shall have a diameter of 18 centimeters, and shall have double glass windows, one attached to the exterior wall of the panel and the other attached to the interior wall of the panel.

**Lighting**

Each section equipped with lighting shall have a factory-mounted light, pre-cabled/wired to a single switch within a factory-provided service module. The lighting shall be weather-resistant IP54 standard (enclosed and gasketed to prevent water and dust intrusion), 230 or 24 Volts. Electrical contractor shall be required to provide a 230 V or 24 V wired to the switch terminal strip.

**Fan motor main switch**

The fan motor shall be connected to a pad lockable main switch located outside of the fan section and as close as possible to the fan access door. The motor wiring shall be compliant with European regulation for electromagnetic compatibility.

**Clogged filter indicators**

Differential pressure gage with pin indicator is a factory-installed dial type/or inclined differential pressure gage which shall be piped to both sides of the filter to indicate filter-clogging status. Gage shall maintain a +/- 5 percent accuracy within operating temperature limits.

**Air flexible connections**

Open sections shall have the option of factory-mounted flexible connections, mounted on a solid pre-assembled frame. The flexible connection material shall comply with the European standard A2 Euroclass EN 13501-1 for fire prevention. The minimum thickness shall be 100 mm.

- **Factory-mounted controls**

Factory-mounted direct-digital control systems shall be engineered, mounted, wired, and tested by the air handling unit manufacturers to reduce installed costs, improve reliability, and save time at unit startup.

Each control system shall be fully functional in a stand-alone mode or may be connected with a building automation system with a single pair of twisted wires. All factory-mounted controls shall be covered by the air handling unit manufacturer's standard warranty.

All wiring shall be fully integrated inside the double skin panel of the machine. Wiring shall not be visible within the machine; however, shall be accessible for servicing through cabling glands built into the machine's casing. The electrical panel shall be fully incorporated into the machine's casing at the factory. The electrical panel shall incorporate both power and controls wiring. The air handling unit shall be compliant with EN 60204-1 standard.

All factory-mounted control devices shall be provided to accommodate integration into existing building systems. Devices provided shall be wired to standard point locations of a unit-mounted direct digital controller or terminal block for a remote controller.

Control valves shall be provided by the air-handling unit manufacturer and field-piped by the piping contractor. Power and signal wiring shall be extended to a factory-installed external junction box to facilitate field-wiring and to maintain air leakage integrity of the casing.

The communication controls protocol shall be LonTalk or BACnet protocol.

One control screen shall be included. The door shall have surveillance capabilities:

Green: ON

Red: Default

Emergency switch

- **Air handling commissioning**

Commissioning shall be provided when control is

factory-integrated by the air handling manufacturer.

Manufacturer commissioning shall include:

- Settings parameters
- Frequency inverter settings
- Verification of all electrical connections on each actuator and sensor

- Airflow measurement of the machine.
- Official technical report of commissioning results

- **Warranty**

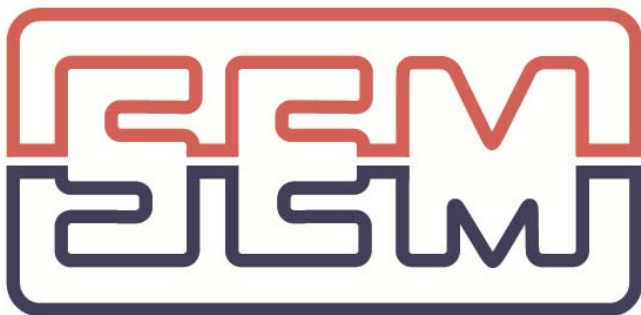
The unit material shall be guaranteed for 12 months after commissioning, and a maximum of 18 months after the delivery. The machine and controls manufacturer shall provide extended warranty opportunities through service and maintenance contract availability. When the machine is delivered in a disassembled state, it is imperative that the unit's manufacturer is present for the reassembly (in order to ensure the guaranteed machine's performance).

- **Delivery/packaging**

Units shall be shipped with a shipping skid designed for forklift transport and the integral base shall be designed with the necessary number of lifting lugs for safe installation. The lifting lugs shall be designed to accept standard rigging devices and shall be removable after installation. Units shipped in sections shall have a minimum of four points of lift.

Following industry regulations, units shall be shipped stretch-wrapped to protect the unit from in-transit rain and debris. Installing contractors shall be responsible for long-term storage in accordance with the Installation, Operation, and Maintenance manual.

*\*Terms and conditions may apply.*



✓ VDI 6022, Blatt 1 (07/2011)  
 ✓ SWKI VA104-01 (04/2006)  
 ✓ DIN 1946, Teil 4 (12/2008)  
 ✓ ONORM H 6021 (09/2003)  
 ✓ ONORM H 6020 (02/2007)



Political of SEM, top player as HVAC solution provider in residential, commercial and industrial applications, is focused on development of the quality and comfort in building, increase efficiency and productivity and warranty a safe and healthy environment.

Due to policy of continuous improvement, SEM reserves the right to change design and specification without prior notice.

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