

# FACTORY SPECIFICATIONS



## Technical Specifications for 39 HQ AIROVISION Air Handling Unit

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### **1.0 PURPOSE :**

This specification specifies the technical properties of 39 HQ AIROVISION air-handling units.

### **2.0 SCOPE :**

This specification covers 39 HQ AIROVISION air-handling units.

## **3 – TECHNICAL CHARACTERISTICS**

### **3.1. CASING and GENERAL CHARACTERISTICS**

<b><u>Class</u></b>	<b><u>According to EN 1886 (TS EN 1886 – Jan 2002)</u></b>	<b><u>Acc. To PrEN1886 (Sep. 2002):</u></b>
Casing Leakage	: B	L2
Thermal Transmittance	: T2	T2
Thermal Bridging	: TB2	TB2
Casing Strength	: 2A	D1
Filter bypass leakage	: F9 (front withdrawal filter)	F9
	: F9 (slide withdrawal filter)	F9
	: F7 (slide withdrawal filter -standard)	F7


### **Operating Ranges:**

Air volume	: 1.000 - 140.000 m <sup>3</sup> /h
Max pressure	: 2500Pa
Temperatures	: -40 ...+40 C

- Modular construction (1 module=160 mm)
- Casing panels (excluding bottom panel) shall be mounted on the framework of the air handling unit in such a manner that they can be dismantled from the outside of the unit to ensure access to the inside of the unit, thereby facilitating maintenance works.
- The framework of the unit shall be of powder-painted galvanized steel profiles and abs corner parts.
- All panels and doors shall be double-skin (internal sheet metal-insulation-external sheet metal).
- The doors and the panels shall be formed by bending the panel external sheet metal over the internal sheet metal so that closed panel structure resistant to water and steam will be obtained. Bended external sheet metal structure of the panel (preventing the formation of sharp edges) also reduces the risk of any possible injuries during mounting and maintenance.
- The bottom of the unit shall be completely flat which provides easy assembly/service of the functions and simple, fast and easy cleaning due to the flush floor without “thresholds” at the corner posts
- Panel internal sheet metals shall be galvanized. Panel external sheet metals shall be galvanized sheet metal, painted with polyester paint and then coated with a protective film.

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- h) Thickness of the panel and the door shall be 60 mm, and the thickness of the internal and external sheet metal of the panel shall be 0.8 mm.
- i) The doors, casing and coil panels shall be made of same thickness, thereby ensuring a uniform body performance in respect of technical characteristics.
- j) A base shall be provided under the unit to avoid contact of the bottom surface of the unit with the surface, and to ensure required body strength. The height of the base shall be 62 mm or 160 mm, depending on whether a siphon will be used or not, and required strength.
- k) Base frame profiles, where the unit will be carried, shall be of closed section, and thus risk of its deformation during transportation shall be minimized.
- l) Glass wool, with a thickness of 60 mm, shall be used for doors and panels as insulation material, except bottom panels. To increase panel strength, the panels shall be reinforced with PIR plates for certain sizes. The insulation of the bottom panel shall be PIR.
- m) The construction of the casing of the unit shall be smooth inside and outside without protruding parts, thus the places where dust or dirt may accumulate during operation and cleaning of the unit shall be minimized.
- n) The top surface of the units, to be operated in open-air conditions, shall be covered with a roof against weather conditions. Silicone shall be applied to the profile joints on the outer surface of the unit, increasing insulation against water. The screws to be used on outer surfaces shall be made of stainless steel and they shall be mounted with plastic washers.
- o) Viewing glasses (requested to be mounted on the doors and panels) shall have double skin (there shall be glass on both interior and exterior surfaces of the viewing glass).
- p) Pressure measurement equipments shall be mounted onto the plastic measurement consoles (depending on the model of the equipment), thus the visibility of measurement tubes shall be minimized and the casing performance will not be deteriorated.

## 3.2 AIR CONTROL DAMPER

- a) The frames of the control dampers shall be made of galvanized sheet metal.
- b) Damper blades shall be made of aluminum for 100 mm framed dampers, and galvanized sheet metal and aerodynamic design for 185 mm framed dampers.
- c) Damper blades shall be mounted on the frame using nylon bearings.
- d) Dampers shall be of low-leakage type. To ensure this, gaskets shall be used both on the tips of the blades and on frames of the dampers.
- e) The air leakage from the damper shall not exceed 25m<sup>3</sup>/h for the damper size of 1005x1000mm and a pressure difference of 100Pa.
- f) Damper blade shafts shall be connected to each other with a common drive system enabling blade position arrangement and preventing different movements of the blades.
- g) Catalogues and laboratory test results indicating the aperture percentages, control options, damper resistances, air leakage rates and torque requirements shall also be provided.
- h) Dampers shall be suitable for servomotor connection and manual operation as specified.
- i) Manually operated dampers shall have position indicators, adjustment and locking mechanism.

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### 3.3 FILTER SECTIONS

- Filter media of bag filters shall made of fiber material.
- Air by-pass around the filter shall be prevented by means of parts made from galvanized steel. The filters shall be mounted on the parts/profiles holding them, by means of appropriate gaskets and fixing mechanisms.
- Filter efficiencies are specified in accordance with the standard EN 779, and filters shall have certificates of conformity according to this Standard.

### 3.4 SOUND ATTENUATOR SECTIONS

- The attenuators shall be mounted inside unit. Sound absorption levels shall not be lower than the values given for each octave band.
- The attenuators shall have a shape of rectangular prism and shall be designed and manufactured in accordance with the standard ISO 7235.
- Their intervals and installation shall be made in such manner as to avoid deformation and to conform to the sound absorption principles.
- Sound absorption sections shall be made of inorganic, non-flammable mineral wool so as to satisfy DIN 4102 Class A-1 flame spread conditions, and their surfaces shall be covered with a material resistant to moisture and abrasion. Thus, even the airflow rate is 20m/s between attenuators, no abrasion shall occur.

### 3.5 EMPTY SECTION FOR STEAM HUMIDIFIER

- Shall meet the specified performance values.
- The section structure of the steam humidifier shall be similar to that of the main air-handling unit.
- The section of the steam humidifier shall be of appropriate length. Considering technical documentation of humidifier supplier, it shall be guaranteed (during selections and ordering the unit) that there shall be no condensation under the specified conditions and the process shall be dry.
- It shall be possible to mount steam humidifiers of desired type on humidifying section, and the connection points according to the type of the humidifier shall be ready.
- The casing shall be provided with a viewing glass with a diameter of min 160 mm. There shall also be a steam proof lamp with replaceable bulb for lighting within the section. The lamp shall have a power of 40 Watts and supplied with 220 Volts.

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### 3.6 HEATING COILS

- The capacities of heating coils shall not be less than the required capacities at given temperatures and pressure drops.
- Coil face velocity shall not exceed 3.8 m/s.
- In heating coils, copper tubes with an outside diameter of 16 mm and in conformity with the standards ASTM B 68 M and EN 12735 shall be used. The copper tubes shall be expanded mechanically to the aluminium fins (conforming to the characteristics given in TS EN 573-3 and EN AW 8006) for heat transfer contact.
- The coil frames shall be made of galvanized steel.
- Headers shall be made of steel.
- Heating coils shall be mounted into the unit so that no air by-pass shall occur around the coil.
- The heating coils' structure and assembly shall enable their pulling out completely from the service side of the unit after the piping connections has been dismantled.
- Coils shall be of counter-flow type and shall be manufactured so that the water inlets shall be at the bottom while the water returns shall be at the top.
- Pipe connection holes shall be hermetically sealed.
- The header connections on the coils shall be threaded (male) connections.
- All the coils shall be suitable to work under manometric pressure of 20 bars. Test pressure shall be 30 bars.

### 3.7 COOLER / DRIER COILS

- Cooling coils shall ensure the required cooling capacities for air and fluid side input/output conditions.
- Coil face velocity shall not exceed 3.2 m/s.
- In order to avoid water drift after the cooling coils, an eliminator shall be used. Eliminators shall be made of polypropylene material resistant to 120°C.
- In cooling coils, copper tubes with an outside diameter of 16 mm and in conformity with the standards ASTM B 68 M and EN 12735 shall be used. The copper tubes shall be expanded mechanically to the aluminium fins (conforming to the characteristics given in TS EN 573-3 and EN AW 8006) for heat transfer contact.
- The coil frames shall be made of galvanized steel.
- Headers shall be made of steel.
- Cooling coils shall be mounted into the unit so that no air by-pass shall occur around the coil.
- The cooling coils' structure and assembly shall enable their pulling out completely from the service side of the unit after the piping connections has been dismantled
- Coils shall be of counter-flow type and shall be manufactured so that the water inlets shall be at the bottom while the water returns shall be at the top
- Pipe connection holes shall be hermetically sealed.
- The tube connections on the coil shall be threaded (male) connections or they may be fitted with flanges depending on the size.
- All the coils shall be suitable to work under manometric pressure of 20 bars. Test pressure shall be 30 bars.
- There shall be a drainpan made of stainless sheet metal under the cooling coils, which shall also embrace the eliminator section, and this drain pan shall have a bottom condensation water drain connection with diameter of 32mm. A siphon to ensure the continuous discharge

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- a) of the condensed moisture and the formation of a hermetic water trap shall be supplied with the unit.

### 3.8 WET CELL HUMIDIFIER

- a) This humidifier is a fill-type humidifier, and the fill material shall be a high-absorbing material made from cellulose plate. The humidifier shall have sufficient number of pumps depending on the size of casing and the flow rate required. The water is pumped onto the fill material by means of distributing pipes.
- b) The humidification shall be homogenous.

### 3.9 PLATE HEAT EXCHANGER

- a) Heat recovery calculations shall be made in accordance with VDI 2071.
- b) Plate structures can be embossed or corrugated.
- c) Efficiency of the heat exchanger can vary between %60 and %70.
- d) Housing types can be selected as normal, bypass and bypass damper.
- e) In exhaust air side, there shall be a stainless drainpan or a stainless drainpan with eliminator.

### 3.10 ROTARY HEAT EXCHANGER

- a) Heat recovery calculations shall be made in accordance with VDI 2071.
- b) The controller of the heat exchanger are in conformity with CE and IP54 protection class. Controller of the storage mass (rotor) controls AC motor continuously and its acceleration and deceleration ramped.
- c) Storage mass shall be driven by V-belt system.
- d) Frame of the heat exchanger could be galvanized steel, aluminium or stainless steel (to be confirmed from manufacturer)
- e) Segments of the storage mass shall be assembled and dispatched in single piece.
- f) The heat exchanger can be placed inside of air-handling unit or between the unit cells.
- g) If an access door is indicated, it can be designed to both sides of the storage mass.
- h) If purge section is indicated, it can be designed to lessen mixing of exhaust air and fresh air by directing a small part of fresh air to exhaust section.

### 3.11 FAN SECTION

- a) The fans shall be double-inlet, centrifugal, V-belt driven type and equipped with appropriate motor, vibration dampers and nonflammable fan discharge flexible.
- b) Fan rotor shall be statically and dynamically balanced in accordance with the class G6.3 of ISO 1940/1 and VDI 2060.
- c) The ball bearings of the fan shall have an operating life of L10h 20,000 hours within the limits of operating conditions permitted for the fan.
- d) Standard fan motors shall be capable to operate at 380V/3P/50Hz.
- e) The motor shall be completely closed-type. Protection grade: IP55, Operation type: S1 (continuous operation), Insulation class: F (105 K) and heat increase class: B (80 K).

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 **ALARKO**



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- f) The motors shall feature direct or star-delta starting, depending on the power.  
g) Sound intensity values (in dB), measured at 63-8000 Hz octave bands, for the fan inlets and outlets shall not exceed the specified values.

#### 4. REFERENCE STANDARDS

EN 1886

EN 779

ISO 7235

DIN 4102

ASTM B 68M

EN 12735

TS EN 573-3

VDI 2060

VDI 2017

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