



AHU HOR 2.00 ÷ 8.20

Precision air handling unit for operating rooms

Serie EVO



HOR Basic

Air handling unit with integrated control system for operating rooms

HOR Recovery

Air handling unit with integrated control system and air-water heat recovery system for operating rooms

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AHU HOR

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A SOLUTION TAILORED TO MEET YOUR NEEDS

The AHU-HOR series of air handling units have been specifically designed to control the environmental parameters of an operating room, including air renewal, temperature and humidity control, primary filtration and pressure control in the following environments:

- General operating rooms
- Low temperature operating rooms
- Orthopaedic operating rooms
- Sterilization rooms
- Intensive care units
- Diagnostic imaging rooms
- BSL Laboratories
- Biotechnology laboratories

The product range consists of two types of units:

HOR BASIC:

featuring an extractor fan, two-stage filtration on supply air, cooling and dehumidification, heating, humidification with network or self-generated steam.

HOR RECOVERY:

featuring an extractor fan, two-stage filtration on supply air, cooling and dehumidification, heating, humidification with network or self-generated steam and air-water heat recovery system complete with accessories.

All units feature a mono-block design (see details and dimensions on pages 8 and 13) and are furnished with an electrical and control panel, complete with all electric and hydraulic connections of the components already prepared, and therefore supplied ready to use. All air handling units in the AHU-HOR series are designed and built to eliminate chemical and bacteriological contamination inside of them. The units are designed and built in accordance with DIN 1946/4 and EN 1886 2008.



AHU HOR BASIC

Construction characteristics

- Base frame made with 40mm thermal break, extruded aluminium profiles with internal rounded corners, glass-reinforced polyamide corner pieces.
- Closed cell sealing gaskets.
- Sandwich panels with total thickness of 46 mm, made of double galvanized steel sheet pre-coated with plastic using injected polyurethane (reaction to fire class 2B), density 40-45 kg/m³; internal part constructed in stainless steel on request.
- Construction in accordance with the following standards:

Mechanical strength of casing	EN-1886/2008 class D1
Casing tightness	EN-1886/2008 class L2
Thermal bridging factor	EN-1886/2008 TB 2
Thermal transmittance of casing	EN-1886/2008 T 2
Noise reduction panels	ISO 140/III - UNI8270/3, ISO 717/1, UNI 8270/7
Vibration	ISO 2372 and VDI 2056
CE Marking	EEC Dir. 73/23-89/336-91/368-93/44
Safety of machinery	EN 292-2 and EN 61310-1
Acoustics	EN 3744 ISO 11546-2

- The AHU-HOR series of Air Handling UNITS feature:
- Entirely smooth surfaces.
- No protrusions inside the unit
- Adequate spaces between each component, including the coils so that the unit can be properly sanitized.
- No accumulation of stagnate water in the unit both when the machine is at a standstill and in operation.
- Condensate collector basins for heat exchangers and humidification made of stainless steel type AISI 316, dual slope on the bottom, central drain with a discharge pipe outside of the machine; external insulation with insulating sheath having a minimum thickness of 20 mm on the bottom and walls, as well as around the outlet pipe to prevent formation of condensation.
- Mono-block design; standard construction for indoor use and, on request, outdoor use. Lower panels have a central drain to carry out sanitizing operations on the unit.
- Dampers and related frame constructed entirely in extruded natural aluminium with sealed airfoil-shaped fins, spring back seals, stainless steel straps between the fins and frame, self-lubricating bushings, 12 mm diameter pins for surfaces less than 1.8 m², 18 mm pins for larger surfaces.
- First stage filtration on inflow side using Grade G4 folded filters + F6 rigid pocket
- Second stage supply filter using Grade F9 rigid pocket filters
- Return/exhaust filter stage using Grade F5 panel filters
- Hot water heating coil pack made of Cu/Al with copper collectors and stainless steel frame, pre-coated fins available on request
- Chilled water cooling coil pack made of Cu/Al with copper collectors and stainless steel frame, pre-coated fins available on request
- Network or self-generated steam type humidification system
- Post-heating coil included on request
- PLUG FAN type centrifugal fan with directly coupled motor and inverter.

Electrical and control panel:

- Electrical panel accessible from the compartment on the front of the unit in compliance with IEC standards, opens with key
- Electrical wiring suitable for 400 V - 3ph - 50 Hz + G power supply
- Main power switch
- Transformer for auxiliary circuit
- Inverter for supply and return fan
- Electronic controller with open communication protocol
- Network steam humidification system with control valve, actuator, distributor in stainless steel and primary steam trap; as an alternative, humidification system with steam generation via immersed electrodes or, upon request, heating elements
- Temperature control
- Summer and winter humidity control
- Electronic control for supply/ return flow/pressure
- Reduced operating condition setting (unoccupied room) with time slots or using a selector and possibility to enter temperature, humidity, and pressure setpoint values that are different from those used with the system in regular conditions, with reduced air flow rate.
- Valve units, related connection pipes contained in a specific technical compartment isolated from the air flow and therefore accessible when the machine is operating.

Available accessories:

Recirculation damper for operating with partial recirculation and handling sterilization and washing cycles

Accessories supplied separately:

- RT - Remote keypad duplicating the keypad installed on the unit
- Net PC - Network user interface
- Touch Panel - 5.7" 256- colour LCD touch panel for network user interface.



OPERATION

Microprocessor

The microprocessor installed on the electrical panel of the unit is freely programmable.

The standard software that is loaded has been developed and tested in the company and manages all air handling unit operations.

The regulator can interface with all control systems on the market, as a number of communication protocols such as Modbus, Bacnet, etc. are available.

A remote control system for the unit can be created via internet and messages can be sent to report any alarm states.

Air flow control

Based on the number of zones served by the unit, a series of the following air flow/pressure controls are available.

1. Single zone served:
 - Active control of the supply flow at constant value
 - Active control of the room overpressure/depression
2. Multi-zones served:
 - Active control of the supply pressure at constant value
 - Active control of the return pressure at constant value.

In the first case, the unit control is able to ensure constancy of the supply air flow, thus dealing with gradual clogging of the filters installed on the machine and those fitted in the rooms.

As regards the return air, the control provides an input able to receive a signal from a differential pressure transducer installed in the room, through which the overpressure/depression value is maintained constant, in relation to a reference zone.

In the second case, a constant pressure function is provided for both the supply and return, as the input air flow in each zone served has an external CAV box used to control and maintain the respective air flow values constant. As regards the return air, VAV boxes should be provided for each zone in order to maintain the design overpressure/depression of the environment.

Controls can be customized and developed to meet the needs and specific requirements of customers, so that the PLC installed on the unit is able to control all the peripheral devices in the concerned area such as environmental pressure transducers, VAV boxes for managing environmental pressure, and CAV boxes for maintaining air flow constant in every single zone.

Temperature and humidity control

The units in this series are furnished with all the components necessary for controlling temperature and humidity, as well as for managing operations of the humidification system, also this with self-generated or network generated steam.

The units serving a single zone have been developed so that the control system manages all of the environmental parameters, without requiring additional components outside of the machine.

A post-heating coil with the related control on the return air is available on request.

For units serving multiple zones, the basic standard adjustment controls include:

1. Winter saturation with compensation of it based on the outdoor air temperature, with freely configurable parameters
2. Summer saturation with fixed set point for supply air and automatic recalibration of the cooling valve opening based on the humidity value detected in the room. Both parameters can be freely configured
3. Humidity control during the heating stage
4. A post-heating coil with related supply air control is available on request.

Controls can be customized and developed to meet the needs and specific requirements of customers, so that the PLC on the unit is able to control the temperature of every single zone by providing the following:

1. A number of inputs equal to the number of zones served, to detect the temperature of every single zone
2. A number of outputs equal to the number of zones served, to manage local post reheating
3. Additional inputs as required to manage local panels to recalibrate the room temperature and humidity

Occupied and unoccupied mode

The control also provides for the operating status of the room/s, by means of remote contacts in the room. When a room/rooms is/are unoccupied, the condition is recognized and the unit is automatically brought to a reduced pressure and air flow threshold, both in supply and return, automatically activating the unoccupied mode. The corresponding flow and pressure values can be set as desired. The unoccupied mode can be enabled also by means of a timer that can be set by the user as desired. During the unoccupied mode the return fan can be disabled, based on the degree of overpressure that can be achieved with the air flow in this mode. This setting can be activated through the controller.

Unit stop

Each unit includes a series of shut-off dampers with servomotor complete with spring return on each of the air inlets and outlets. When the unit starts, in automatic or manual mode, these dampers receive a signal to open. Likewise, when the unit stops, power to the servomotors is cut off, thus the dampers close, so that the machine is completely disconnected from the ducts and fresh air and exhaust air openings.

AHU HOR BASIC | Technical features

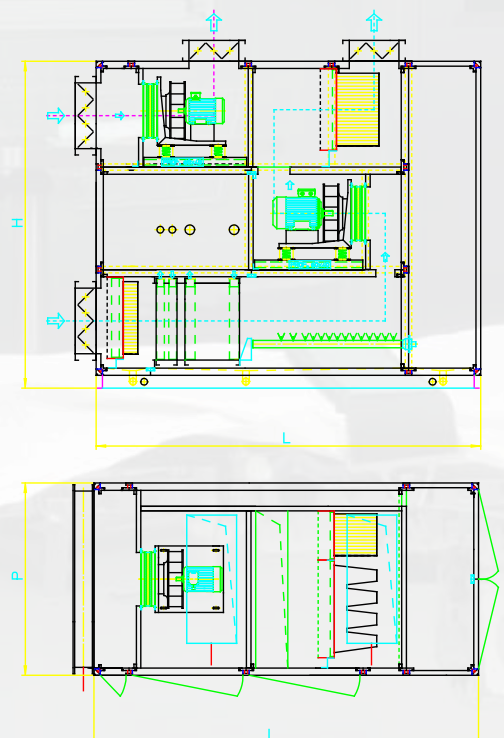
MODEL	HOR	2.00	3.50	5.20	6.80	8.20
Technical data						
Preheating coil capacity*	kW	18.3	31.90	47.5	62.1	74.8
Water flow**	l/h	1050	1835	2774	3628	3860
Water loss (including reg. valve)	kPa	23	25	26	30	31
Cooling coil capacity ^o	kW	30.5	53.4	79.4	103.8	125.2
Water flow ^{oo}	l/h	5250	9181	13640	16215	
19553 Water loss (including reg. valve)	kPa	60	50	55	61	61
Heating coil water content	l	4.0	5.0	8.0	10.0	12.0
Cooling coil water content	l	13.0	20.0	31.0	39.0	43.0
Immersed electrode steam generator capacity	kg/h	15	25	35	45	65
Installed electric power (steam generator)	kW	11.25	18.75	26.25	33.75	48.75
Supply/return fans	N 1/1	1/1	1/1	1/1	1/1	
Nominal supply air flow	m ³ /h	2000	3500	5200	6800	8200
Nominal return/exhaust air flow	m ³ /h	1700	3000	4500	6000	7300
Supply fan static head	Pa	900	900	900	900	1000
Return fan static head	Pa	500	500	500	500	600
Supply fan sound pwr. level (exit side)	dB (A)	94	95	93	93	93
Return fan sound pwr. level (intake)	dB (A)	86	88	85	86	88
Return fan sound pwr. level (exit side)	dB (A)	82	88	88	88	88
Return fan sound pwr. level (intake)	dB (A)	75	81	80	80	82
Electrical data						
Supply/return motor installed rated power	kW	2.2/0.75	3.0/1.1	5.5/2.2	5.5/2.2	7.5/3.0
Supply motor max power consumption	kW	1.43	2.45	3.52	4.70	5.42
Return motor max power consumption	kW	0.49	0.87	1.31	1.72	2.11
Supply/return motors rated current	A	4.55/1.73	6.1/2.4	10.4/4.55	10.4/4.7	13.8/6.4
Electric power supply	V-ph-Hz	400 - 3 - 50 + G				
Dimensions						
Length (L)	mm	2200	2300	2400	2600	2600
Depth (D)	mm	900	1200	1315	1620	1815
Height (H)	mm	2040	2040	2420	2520	2520

(*) Under the following conditions: inlet air temperature -5° C D. B. ÷ R. H. 80%, outlet 22.0 °C;
 (**) Water 70 ÷ 55 °C

(^o) Under the following conditions: inlet air temperature 35° C D. B. ÷ R. H. 50%, outlet 12.5 °C ÷ R. H. 100 %;
 (^{oo}) Water 7 ÷ 12 °C

() Under the following conditions: 100% supply and return air flow.

Please note: Coils are available with heat treatments that are different from those provided herein.



AHU HOR RECOVERY

Construction characteristics

- Base frame made with 40mm thermal break, extruded aluminium profiles with internal rounded corners, glass-reinforced polyamide corner pieces.
- Closed cell sealing gaskets.
- Sandwich panels with total thickness of 46 mm, made of double galvanized steel sheet pre-coated with plastic using injected polyurethane (reaction to fire class 2B), density 40-45 kg/m³, internal part constructed in stainless steel on request.
- Construction in accordance with the following standards:
 - Mechanical strength of casing EN-1886/2008 class D1
 - Casing tightness EN-1886/2008 class L2
 - Thermal bridging factor EN-1886/2008 TB 2
 - Thermal transmittance of casing EN-1886/2008 T 2
 - Noise reduction panels ISO 140/III - UNI8270/3, ISO 717/1, UNI 8270/7
 - Vibration ISO 2372 and VDI 2056
 - CE Marking EEC Dir. 73/23-89/336-91/368-93/44
 - Safety of machinery EN 292-2 and EN 61310-1
 - Acoustics EN 3744 ISO 11546-2
- AHU-HOR series of Air Handling UNITS feature: Entirely smooth surfaces.
- No protrusions inside the unit
- Adequate spaces between each component, including the coils so that the unit can be properly sanitized.
- No accumulation of stagnate water in the unit both when the machine is at a standstill and in operation.
- Condensate collector basins for heat exchangers and humidification made of stainless steel type AISI 316, dual slope on the bottom, central drain with a discharge pipe outside of the machine; external insulation with insulating sheath having a minimum thickness of 20 mm on the bottom and walls, as well as around the outlet pipe to prevent formation of condensation.
- Mono-block design; standard construction for indoor use and, on request, outdoor use.
- Lower panels with central drain to carry out sanitizing operations on the unit.
- Dampers and related frame constructed entirely in extruded natural aluminium with sealed airfoil-shaped fins, spring back seals, stainless steel straps between the fins and frame, self-lubricating bushings, 12 mm diameter pins for surfaces less than 1.8 m², 18 mm pins for larger surfaces.
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- Chilled water cooling coil pack made of Cu/Al with copper collectors and stainless steel frame, pre-coated fins available on request
- Network or self-generated steam type humidification system
- Post-heating coil included on request
- PLUG FAN type centrifugal fan with directly coupled motor and inverter.

Additional features of HOR Recovery:

- Air water recovery system complete with accessories (circulation pump, expansion tank, safety valve and plant loading valve).
- Recovery coil pack on the exhaust and intake circuit in Cu/Al with copper collectors and stainless steel frame; pre-coated fins available on request.

Electrical and control panel:

- Electrical panel accessible from the compartment on the front of the unit in compliance with IEC standards, opens with key
- Electrical wiring suitable for 400 V - 3ph - 50 Hz + G power supply
- Main power switch
- Transformer for auxiliary circuit
- Inverter for supply and return fan
- Electronic controller with open communication protocol
- Network steam humidification system with control valve, actuator, distributor in stainless steel and primary steam trap; as an alternative, humidification system with immersed electrode steam generator or, upon request, heating elements
- Temperature control
- Summer and winter humidity control
- Electronic control for supply/ return flow/pressure
- Reduced operating condition setting (maintain room) with time slots or using a selector and possibility to enter temperature, humidity, and pressure setpoint values that are different from those used with the system in regular conditions, with reduced air flow rate.
- Valve units, related connection pipes, components, and accessories of the recovery system contained in a specific technical compartment isolated from the air flow and therefore accessible when the machine is operating.

Available accessories:

Mod. Basic and Recovery

Recirculation damper for operating with partial recirculation and handling sterilization and washing cycles

Accessories supplied separately:

- RT - Remote keypad duplicating the keypad installed on the unit
- Net PC - Network user interface
- Touch Panel – 5.7" 256- colour LCD touch panel for network user interface.



OPERATION

Microprocessor

The microprocessor installed on the electrical panel of the unit is freely programmable.

The standard software loaded on the device has been developed and tested in the company and manages all air handling unit operations.

The regulator can interface with all control systems on the market, as a number of communication protocols such as Modbus, Bacnet, etc. are available.

A remote control system for the unit can be created via internet and messages can be sent to report any alarm states.

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 - Active control of the return pressure at constant value.

In the first case, the unit control is able to ensure constancy of the supply air flow, thus dealing with gradual clogging of the filters installed on the machine and those fitted in the rooms.

As regards the return air, the control provides an input able to receive a signal from a differential pressure transducer installed in the room, through which the overpressure/depression value is maintained constant, in relation to a reference zone.

In the second case, a constant pressure function is provided for both the supply and return, as the input air flow in each zone served has an external CAV box used to control and maintain the respective air flow values constant. As regards the return air, VAV boxes should be provided for each zone in order to maintain the design overpressure/depression of the room.

Controls can be customized and developed to meet the needs and specific requirements of customers, so that the PLC installed on the unit is able to control all the peripheral devices in the concerned area such as environmental pressure transducers, VAV boxes for managing environmental pressure, and CAV boxes for maintaining air flow constant in every single zone.

Temperature and humidity control

The units in this series are furnished with all the components necessary for controlling temperature and humidity, as well as for managing operation of the humidification system, also this with self-generated or network generated steam.

The units serving a single zone have been developed so that the control system manages all of the environmental parameters, without requiring additional components outside of the machine.

A post-heating coil with the related control on the return air is available on request.

For units serving multiple zones, the basic standard adjustment controls include:

1. Winter saturation with compensation of it based on the outdoor air temperature, with freely configurable parameters
2. Summer saturation with fixed set point for supply air and automatic recalibration of the cooling valve opening based on the humidity value detected in the room. Both parameters can be freely configured
3. Humidity control during the heating stage
4. A post-heating coil with related supply air control is available on request.

Controls can be customized and developed to meet the needs and specific requirements of customers, so that the PLC on the unit is able to control the temperature of every single zone, by providing the following:

1. a number of inputs equal to the number of zones served, to detect the temperature of every single zone
2. a number of outputs equal to the number of zones served, to manage local post reheating
3. additional inputs as required to manage local panels to recalibrate the room temperature and humidity

Occupied and unoccupied mode

The control also provides for the operating status of the room/s, by means of remote contacts in the room. When a room/rooms is/are unoccupied, the condition is recognized and the unit is automatically brought to a reduced pressure and air flow threshold, both in supply and return, automatically activating the unoccupied mode. The corresponding flow and pressure values can be set as desired. The unoccupied mode can be enabled also by means of a timer that can be set by the user as desired. During the unoccupied mode the return fan can be disabled, based on the degree of overpressure that can be achieved with the air flow in this mode. This setting can be activated through the controller.

Unit stop

Each unit includes a series of shut-off dampers with servomotor complete with spring return on each of the air inlets and outlets. When the unit starts, in automatic or manual mode, these dampers receive a signal to open. Likewise, when the unit stops, power to the servomotors is cut off, thus the dampers close, so that the machine is completely disconnected from the ducts and fresh air and exhaust air openings.

AHU HOR RECOVERY | Technical features

MODEL	HOR	2.00	3.50	5.20	6.80	8.20
Technical data						
Recovery sys. temperature ratio (EN 308)	%	50.4	50.7	51	50.5	50.4
Recovered power	kW	9.2	16.2	24.3	31.4	37.7
Rated electric power of circulation pump	kW	0.4	0.4	0.4	0.4	0.4
Preheating coil capacity*	kW	18.3	31.90	47.5	62.1	74.8
Water flow **	l/h	1050	1835	2774	3628	3860
Water loss (including reg. valve)	kPa	23	25	26	30	31
Cooling coil capacity ^o	kW	30.5	53.4	79.4	103.8	125.2
Water flow ^{oo}	l/h	5250	9181	13640	16215	19553
Water loss (including reg. valve)	kPa	60	50	55	61	61
Heating coil water content	l	4.0	5.0	8.0	10.0	12.0
Cooling coil water content	l	13.0	20.0	31.0	39.0	43.0
Immersed electrode steam generator capacity	kg/h	15	25	35	45	65
Installed electric power (steam generator)	kW	11.25	18.75	26.25	33.75	48.75
Supply/return fans	N	1/1	1/1	1/1	1/1	1/1
Nominal supply air flow	m ³ /h	2000	3500	5200	6800	8200
Nominal return/exhaust air flow	m ³ /h	1700	3000	4500	6000	7300
Supply fan static head (with/without recovery)	Pa	700	700	700	700	800
Return fan static head (with/without recovery)	Pa	350	350	350	350	450
Supply fan sound pwr. level (exit side)	dB (A)	94	95	93	93	93
Return fan sound pwr. level (intake)	dB (A)	86	88	85	86	88
Return fan sound pwr. level (exit side)	dB (A)	82	88	88	88	88
Return fan sound pwr. level (intake)	dB (A)	75	81	80	80	82
Electrical data						
Supply/return motor installed rated power	kW	2.2/0.75	3.0/1.1	5.5/2.2	5.5/2.2	7.5/3.0
Supply motor max power consumption	kW	1.43	2.45	3.52	4.70	5.42
Return motor max power consumption	kW	0.49	0.87	1.31	1.72	2.11
Supply/return motors rated current	A	4.55/1.73	6.1/2.4	10.4/4.55	10.4/4.7	13.8/6.4
Electric power supply	V-ph-Hz	400 - 3 - 50 + G				
Dimensions						
Length (L)	mm	2800	2900	3000	3200	3200
Depth (D)	mm	900	1200	1315	1620	1815
Height (H)	mm	2040	2040	2420	2520	2520

Under the following conditions: ext. air - 5°C, return 22 °C ÷ R. H. 50%, fluid water + glycol 15%

(*) Under the following conditions: inlet air temperature -5° C D. B. ÷ R. H. 80%, outlet 22.0 °C;

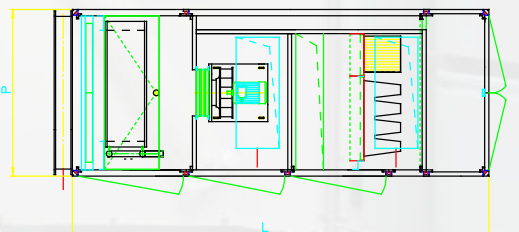
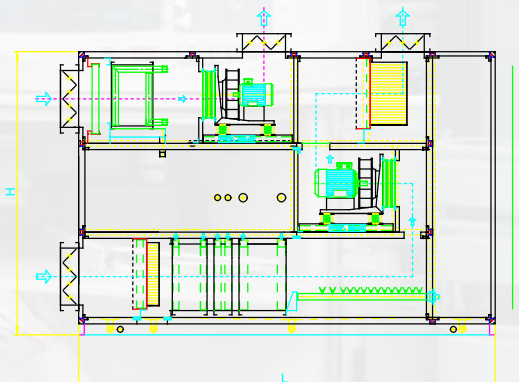
(**) Water 70 ÷ 55 °C

(°) Under the following conditions: inlet air temperature 35° C D. B. ÷ R. H. 50%, outlet 12.5 °C ÷ R. H. 100 %;

(oo) Water 7 ÷ 12 °C

() Under the following conditions: 100% of the supply and return air flow, considering the unit complete with heat recovery system

Please note: Coils are available with heat treatments that are different from those provided herein.



FEATURES AND ATTENTION TO DETAIL

Nonostante uno dei principali obiettivi fosse quello di realizzare unità con dimensioni estremamente compatte, è stata posta particolare attenzione anche alla disposizione ed al dimensionamento dei componenti interni, quali batterie, filtri, ventilatori e camere di umidificazione, in modo di ottenere prestazioni energetiche ed aerauliche di alto livello.

One of the main objectives was to create a unit with extremely compact dimensions; however, special attention was also given to the layout and sizes of the internal components, such as coils, filters, fans, humidification chamber, in order to achieve a high level of energy and aeraulic performance.

1. Fans

All fans, both supply and return, are “plug fans”, i.e. fans without a scroll, directly coupled to the electric motor. These were selected because they provide maximum performance. They have been positioned in a way to maintain the correct safety distances. All of this translates into an efficient ventilation system with stable and silent fan operation.

2. Filters

The extensive filtering surface, both on the supply circuit and the return circuit, results in the filters having a longer service life, reduced head losses, and consequent energy savings.

3. Heat exchanger coils

The geometry of the coils was selected with the goal to minimize head losses. Their position in relation to the fans provides uniform distribution of the air flow on their surfaces, thus maximizing heat exchange.



Exhaust motor-fan unit



Humidification chamber and treatment coils with upper technical compartment for housing valves and recovery system circuit

4. Humidification chamber

The generous length of the humidification chamber ensures total absorption of steam, thus preventing entrainment and condensation effects in the fan sections.

5. Easy sanitizing

The hydraulic connections of the coils to the valve units, the steam supply pipe connection, and the piping of the recovery circuit with all the related accessories are contained inside specific compartments, arranged outside of the air flow. This design makes it easier to gain access to all components and internal surfaces. Furthermore, each section has a bottom panel with central drain, with an appropriate slope to route washing fluids outside, thus preventing water stagnation.

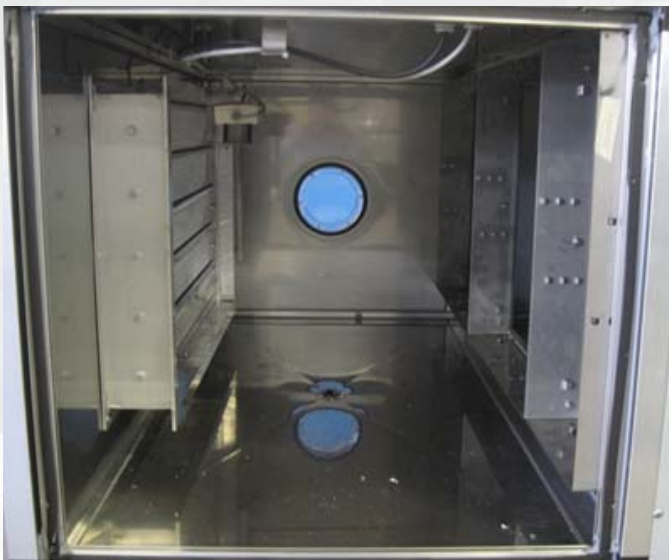
The power and control cableways have been designed to pass through a specific lateral compartment and the section of cable positioned inside the air passage has been reduced to the bare minimum required for connection, maintaining the cable at a minimum distance from the internal surfaces, in order to facilitate cleaning tasks and prevent accumulation of foreign matter.

6. Maintenance

Due to the fact that all electrical, adjustment, and recovery system components are placed in specific compartments outside of the air flow, all control and maintenance operations can be carried out without having to stop all or part of the air handling unit.



Front section of the technical compartment



First stage fresh air filters with the lower draining panel and frame for filter housing



Valve compartment

ACCESSORIES ON REQUEST

Recirculation damper

This accessory, in addition to allowing the unit to operate in partial recirculation conditions, is needed to carry out sterilization and washing operations.

These options are available with adjustable time settings using the regulator and are separate for each function. These conditions can also be activated, by means of the regulator as well as through enabling a dedicated jog button, located on the AHU panel and the related contact can be remote controlled is arranged by the customer.

Dual head fan

With this option the unit is equipped with dual fans for supply and return air. Each fan has its own inverter in order to achieve maximum operating safety. Each fan is intercepted by an automatic damper with servomotor equipped with a positioning microswitch, which intervenes excluding the damaged fan.

Therefore, in the event a fan, motor, or inverter breaks or is damaged, the machine automatically closes the damper upstream from the zone out of commission, without stopping and ensures operation up to 80% of the total capacity with just one fan operating. Upon request two fans can be included, each capable of delivering 100% of the design air flow.

Heat recovery system

A heat recovery system is available on request featuring air-water coils, standard on AHU HOR Recovery, complete with all components required for it to operate including a circulator, safety valve, expansion tank, manual loading with on/off ball valve and automatic air bleeders.

If cooling is required with reading of the outdoor temperature probe less than at least 2°C (settable value), compared to the reading of the temperature probe of the return, the recovery system pump will stop, allowing it to operate in free-cooling conditions. The pump is protected from possible overloads via a circuit breaker installed on the electrical panel of the AHU, which provides a signal to the PLC when tripped.

Protective surface treatment for heat exchanger coils

A series of coil heat exchangers is provided with copper pipes and aluminium fins with copper collectors and a stainless steel frame. Coils are available optionally with a protective surface coating treatment of the fins to ensure greater durability and corrosion resistance of the finned pack, especially in cases where caustic substances for sanitation and sanitization operations are used on the unit.

Heating element steam generator

Instead of an immersed electrode steam generator a steam generator system using a heating element is available on request. This device makes it possible to control the humidity value with high precision and minimizes maintenance tasks, especially in installations where demineralised water is available.

Humidification system for network steam

On request a humidification system is available for network steam.

The field of steam supply pressure is between 0.5 and 4.0 bar. The system ensures precise distribution and is free from any type of entrainment of condensation and without entrainments with the valve closed, thanks to the special ceramic valve. The supply is complete with a thermostatic type condensate drain.

User interface panel

Two options are available on request:

1. Local recalibration terminal of the environmental parameters, with which it is possible to change the temperature and humidity setpoint.
2. Remote panel that reproduces all the functions of those on the air handling unit, with the possibility to modify all the set points and view all the states and alarms of the unit.



Return section with recovery coils

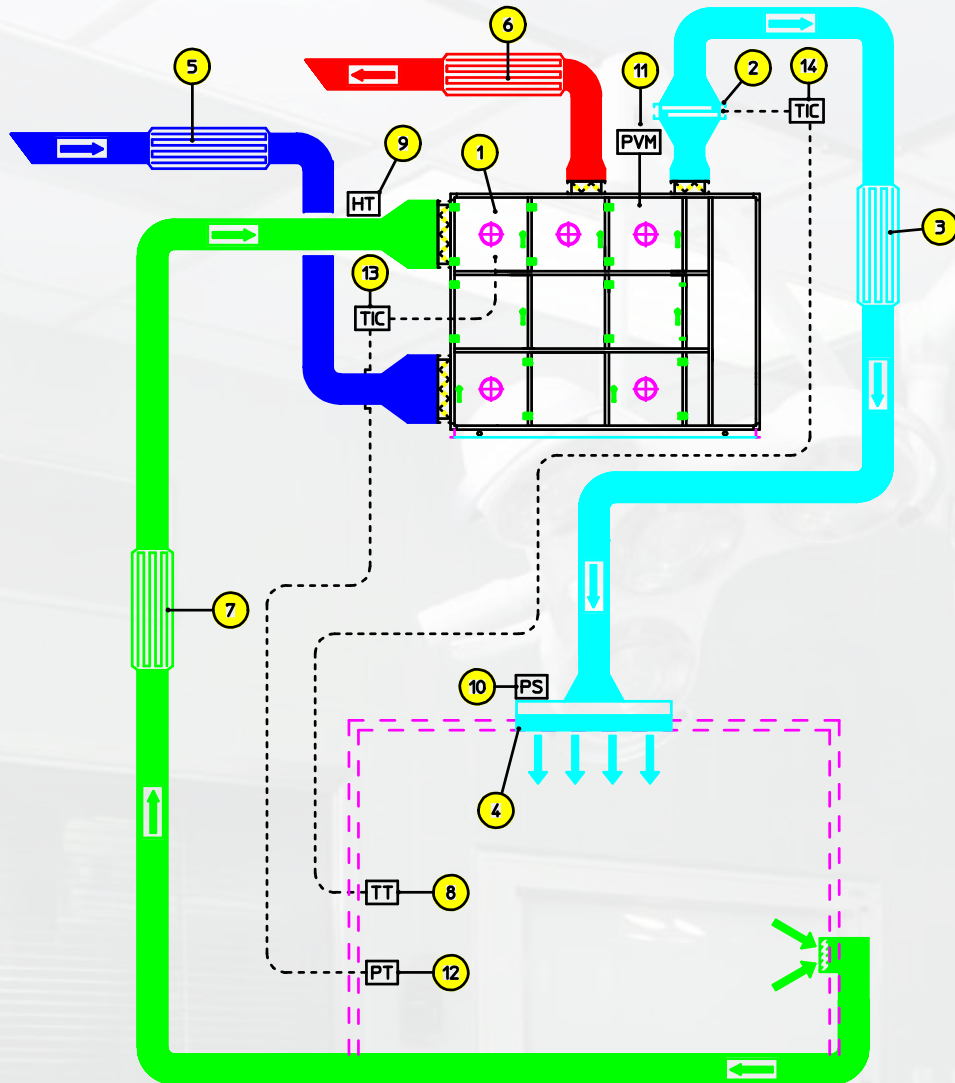


Recirculation damper



Treatment zone with pre-coated coils

PLANT DIAGRAM SERVING ONLY ONE ROOM



Single room diagram

1. AHU HOR precision air handling system
2. Post-heating coil
3. Supply air silencer
4. Laminar flow filtering ceiling
5. Silencer for fresh air side
6. Silencer on exhaust duct
7. Return air silencer
8. Temperature probe with environment recalibration panel
9. Room humidity control sensor
10. Clogged filter indicator
11. Transducer for maintaining air flow at a constant value
12. Room pressure sensor
13. Regulator
14. Regulator

PLANT DIAGRAM SERVING MULTIPLE ROOMS

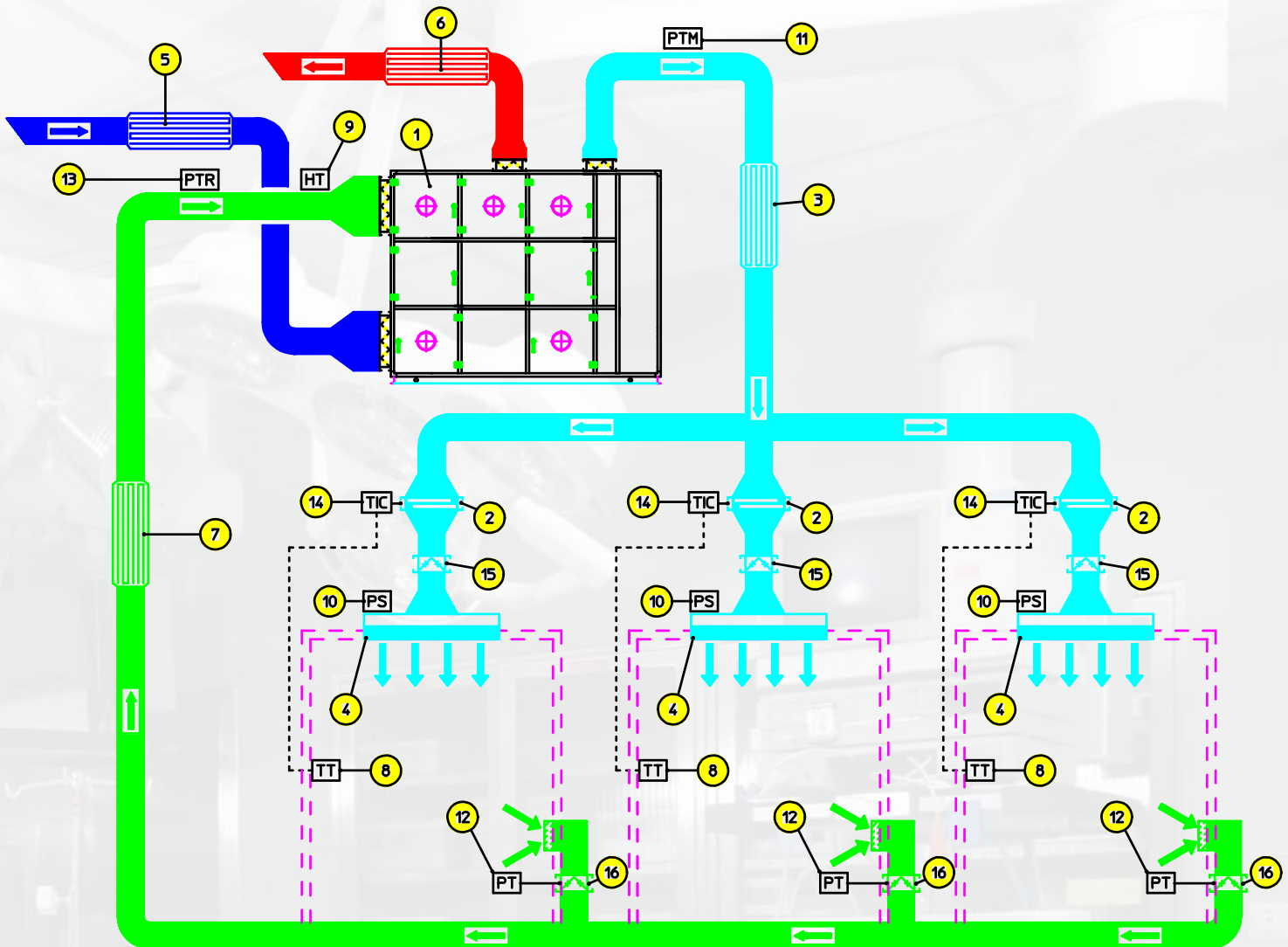


Diagram with 3 rooms

1. AHU HOR precision air handling system
2. Post-heating coils
3. Supply air silencer
4. Laminar flow filtering ceiling
5. Silencer for fresh air side
6. Silencer on exhaust duct
7. Return air silencer
8. Temperature probe with environment recalibration panel
9. Room humidity control sensor
10. Clogged filter indicator
11. Transducer for maintaining supply pressure at a constant value
12. Room pressure sensor
13. Transducer for maintaining return pressure at a constant value
14. Regulator
15. CAV constant air volume box
16. VAV variable air volume box

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