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## SAMP is a company in continuous development, specialised in designing and building air handling units.

SAMP UNITS are of the highest quality thanks to its 40 years' experience on the market and choice of highly specialized customized products that require continuous technical up dating thus enabling the improvements achieved to be transferred from one range to another. SAMP's commitment to targeted research and development has led the company to constantly improve product and thus system reliability and performance paying a great deal of attention to achieving the best results in terms of construction, energy consumption and acoustics.

In fact SAMP is able to offer the market innovative solutions, thus making its products unique in terms of the choice of materials, assembly methods and a wide-ranging series of solutions including:

- AHUs construction completes of electrical control panel and regulation.
- Autonomous Package units construction with hot and chilled water production.
- Energy-saving systems.
- Sizing and selection of materials and components for noise levels containment in case of particulars needs.
- Size and choice of materials and components to limit noise level in the event of special requirements.

Another of SAMP's strong points is the attention paid to achieving the best reliability standards.

### RANGE

The standard range consists of 33 sizes with nominal air flows between 2,000 and 91,000m<sup>3</sup>/h (front coil speed 2.5m/sec.).

### APPLICATIONS

SAMP is able to meet all system requirements. In fact, it produces air handling units for a wide range of sectors such as:

- CIVIL ENGINEERING
- AIRPORTS
- COMMERCIAL
- LARGE-SCALE RETAIL TRADE
- HOTELS
- MUSEUMS, THEATRES, CINEMAS AND AUDITORIUMS
- TELEVISION AND RECORDING STUDIOS
- LIBRARIES
- DATA PROCESSING CENTRES
- PHARMACEUTICAL
- FOOD
- HOSPITALS
- ELECTRONICS
- CLEAN ROOMS
- NAVAL
- CONTROLLED TEMPERATURE AND CONTAMINATION PRODUCTION PROCESSES

The SAMP logo is a stylized, red, lowercase 's' followed by 'amp' in a bold, sans-serif font. A registered trademark symbol (®) is located at the bottom right of the 'p'.

## AHU STANDARD SERIES AIR HANDLING UNITS

The following pages highlight the general structural features adopted by a series of standard AHUs and reference tables detailing the dimensions for each size.

### STRUCTURE

AHU series AIR HANDLING UNITS are able to meet the following classes of UNI EN-1886/2008 standards, depending on the type of configuration:

- |                                  |                    |
|----------------------------------|--------------------|
| • Casing mechanical resistance : | Class D1 - D2      |
| • Casing leakage, pressure :     | Class L2 - L3      |
| • Heat-bridge factor :           | TB1, TB2, TB3, TB4 |
| • Casing thermal U value:        | T1, T2, T3, T4     |
| • By pass filters :              | F9                 |

Various resistance and heat insulation classes can be achieved with particular specifications depending on type of structure

Other structural features refer to following standards:

- |                            |  |
|----------------------------|--|
| • Noise reduction panels : | ISO 140/III, UN I8270/3, ISO 717/1, UNI 8270/7 |
| • Vibration :              | ISO 2372 and VDI 2056                          |
| • CE marking :             | CEE Directives 73/23-89/336-91/368-93/44       |
| • Machine safety :         | EN 292-2 and EN 61310-1                        |
| • Noise :                  | EN 3744 ISO 11546-2                            |

### FILTERS

Filters comply to the following standards:

Filtration efficiency groups G,F and H: EN 779/2002 and EN 1822

### HEAT RECOVERY UNITS

Heat recovery units can be static cross-flow type, rotary type and water-air coil type. For all recovery units the efficiency is calculated according to EN 308 standards.

### MOTORS

Electric motors are closed type, self-ventilating type and comply with the following standards:

- |  |                        |
|--|------------------------|
| • General prescriptions, rotary electrical machines: | IEC 60034-1, IEC 60085 |
| • Start-up :   | IEC 60034-12           |
| • Connection, rotation sense:                        | IEC 60034-8            |
| • Construction types :                               | IEC 60034-7            |
| • Built-in thermal protection :                      | IEC 60034-11           |
| • Noise limits :                                     | IEC 60034-9            |
| • Mechanical vibration :                             | IEC 60034-14           |
| • Protection degree :                                | IEC 60034-5            |
| • Balancing :  | DIN VDE 0530, Part14   |

In addition to the above standards, motors have:

- IP55 protection
- Class F
- Balancing level R.
- Aluminium and die-cast iron casing, depending on size
- Adjustable terminal board positioned on top
- Voltage 400-660/3F/50-60Hz.

# FANS

Depending on the application fans are of the double suction forward curved, flat blade backward inclined, backward inclined airfoil, scroll-less, single suction and axial types and comply with all the following standards:

- Operating features: DIN 24163 or BS 848 p.1
- Sound power level: DIN 45635 or BS 848 p. 2
- Balancing: DIN ISO 1940-1 or ANSI S2-19
- Vibration: ISO 2372 or VDI 2056

From a structural point of view, fans have the following:

Statically and dynamically balanced wheels in accordance with DIN ISO 1940-1, minimum quality standard of G 6.3 and performance in accordance with DIN 24163.

All fans used are made with frame; minimum construction R.

Fan motor unit also includes:

- Motor slide
- Flanged vibration-damping collar
- Spring vibration-damping supports.

# REFERENCE STANDARDS

SAMP builds its plants in compliance with the regulations in force including:

**UNI 10339 AERAULIC SYSTEMS FOR COMFORT** in accordance with American IAQ (Indoor Air Quality) standards as regards external and recirculated air filtration efficiency.

**ISO 14644 – 1 AIR CLEANLINESS CLASSES** of air bacterial contamination controls. This Standard regulates the clean room classification.

**UNI ENV 1631 CLEAN ROOM TECHNOLOGY** hat sets out controlled contamination environment requirements.

**EN 1886 TIGHTNESS TEST CERTIFICATES** for treatment machines with mechanical resistance and structure leakage tests.



## CONSTRUCTION

### FRAME AND LOAD-BEARING STRUCTURE

Frame is made with high resistance aluminium alloy (UNI 9006/1) extruded sections with 40 x 40 or 70 x 70 sizes; coupling is made of with 3-way joints in glass filled nylon or aluminium.

Profiles are of concealed screw type with double vacuum finning, a solution that guarantees there are no protrusions within the unit and profiles are uniform thus making the structure highly rigid. Basement runs under all sections, standard basement height is 80 mm, however heights of 160, 250 and 300 mm are available on request.

### GASKET

The standard gasket type is to be glued to the profile. It is made of different materials depending on specific needs in order to guarantee a perfect airtight. Special gaskets, fixed by pressure, that guarantee continuity even in the corners, are used with the newly designed thermally insulated panels recently developed by SAMP, for both doors and panels to guarantee maximum seal (see construction details in next section at Fig. 5)

### PROFILE TYPES AND PROFILE-PANEL COUPLING

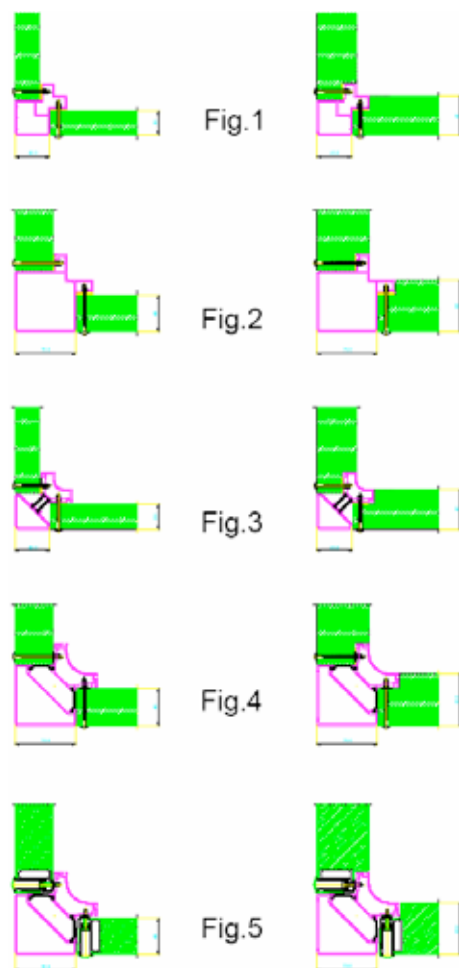
Standard profile is available in two sizes, 40 and 70 mm, to be fit on 28 and 46 mm thick panels for the first type (see Fig. 1), and 46 and 60 mm thick for the second type (see Fig. 2).

Cold bridge free profiles, also available in 40 and 70 mm sizes (see Figs. 3 and 4) have rounded internal corners and are also used on sanitized units to make a proper wasing of the internal surfaces. In fact, in these cases profile is coupled with panels with a 46 mm thick (coupling 4046, see Fig. 3) and 60 mm thick (coupling 7060, see Fig. 4) step so as to create a flush surface within the air handling unit, with rounded joints between profile rebates.

Cold bridge free profiles are made of two aluminium elements, one external and the other internal. They are joined mechanically but also separated thermally by glass filled polyamide bars, material that not only guarantees high mechanical resistance but also reduces significantly the thermal bridges. This configuration significantly reduces heat loss through the AHU casing and possible condensation on the external face of the section. Typical applications could be, for example, low temperature treatments or when high casing heat insulation values are requested. The 70 mm thick cold bridge free profile (see Figs 4 and 5), that has recently undergone extensive modification, both as regards the two aluminium elements, and polyamide bar shape and coupling, is able to achieve a thermal bridge factor of TB1 in accordance with UNI EN 1886.

New 60 mm thick cold bridge free profile (see construction details shown in Fig. 5), made separating the metal sheets and placing an extruded plastic layer of more than 40 mm in thickness inbetween, is able to achieve with special structural features and innovative heat insulation materials an overall casing U-value of T1 in accordance with the provisions of UNI EN 1886.

Currently this result has only been achieved mucher thicker panels to those designed and developed by SAMP. Handling units can be made with welded stainless steel sections for special applications on request.



## PANELS

Panels are of the sandwich type made in double box folded metal sheet with two types of insulation:

- hot injected polyurethane with an average density of 40/45 kg/m<sup>3</sup> and Class 1 flame resistance;
- positioned and glued fibre mineral wool panel, with a density of 90/100 kg/m<sup>3</sup> and Class 0 flame resistance.

Stepped panels are used (panel-profile coupling 4046 and 7060) when a unit with a smooth internal wall is requested so that internal surface between panels and profiles is uniform.

Standard panels are fixed with stainless steel self-tapping screws. The above-mentioned cold bridge free panels are fixed with self-drilling screws housed in nylon bushes fitted with a plug. Inside and outside of panelling can be made with different types of metal sheet depending on choice:

- Stainless steel sheet AISI 304, AISI 316
- Hot galvanised sheet
- Hot galvanised sheet coated with coloured plastic film of between 150 and 200 microns in thickness (plasticized-sheet)
- Smooth or embossed aluminium sheet
- Hot galvanised sheet pre-painted with dry 25 +3 micron film on exposed side and 5 micron film on unexposed side
- Drilled hot galvanised sheet

Special cold bridge free panels can be made with the same type of insulation and sheet metal as above upon request.

## COILS

Coils (heat exchangers) are one of the basic components of the air handling units. Their type and structure depends on the heat transmission coefficient, its variables and load losses resulting from crossing air speed.

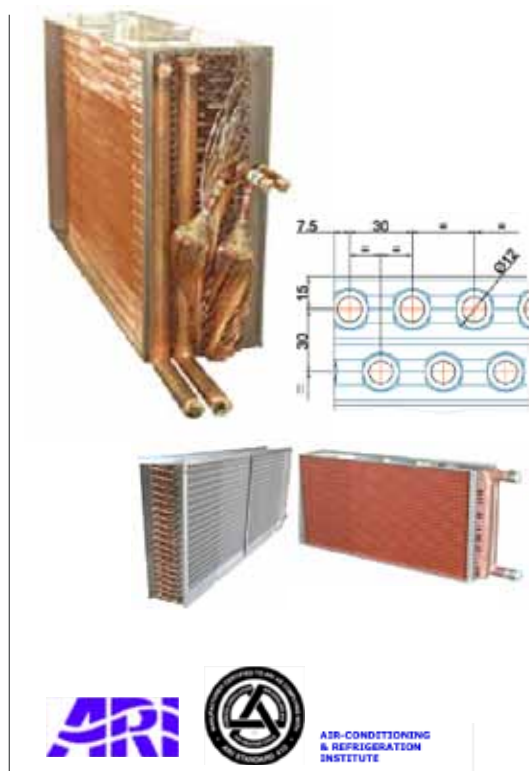
SAMP normally uses finned heat exchangers with space between tubes of 30, 40 or 60 mm.

Coils with internally scored pipes or a turbulencer are used to improve exchange coefficient, especially those used for cooling.

The following coils can be supplied for special uses, to prevent corrosion from condensate of an electro-chemical nature or air full of corrosive components:

- coils with copper pipes and fins;
- coils with copper pipes and tinned copper fins;
- coils with tinned copper pipes and fins;
- coils with copper pipes and pre-painted aluminium fins;
- Heresite, Blygold and Fin guard Silver treated coils.
- Stainless steel coils;
- Dip-galvanised steel or painted spiroid coils.
- Coils with hydrophilic coated fins.

SAMP can supply ARI Standard 410-2001 certified coils and test its coils in accordance with ISPEL, RINA, TUV, LLOYD'S, REGISTER, BUREAU VERITAS and APAVE, etc. standards on request.





## COILS: TECHNICAL AND STRUCTURAL FEATURES

The following paragraphs detail standard coil components.

Pipe diameter is usually from 5/8", in 99% pure copper, in accordance with DIN standards 1754, 1787, 1784 and 1761; copper thickness ranges from 0.41 mm when working with water and 0.75 mm for superheated water.

Fins are in 99.5% pure aluminium, 0.15 mm thick and comply with DIN standards 1725, 1784 and 1788. Coil fins are of a high quality as made of rolled aluminium alloys with special properties in terms of mechanical resistance, good heat conductivity, low specific weight and duration in critical environmental conditions.

Fins have self-spacing collars, with double fold, to guarantee fins at the same distance and reduce the risk of corrosion, because the treated air is not in contact with copper pipes.

The normally space between fins is 2.5 or 3.0 mm; in special cases, spaces of 2.0 or 4.0 mm can be used. The space between fins for anti-freeze coils is between 4.0 and 7.0 mm.

A very important aspect in the construction of coils to increase their efficiency is:

1. perfect pipe-fin adherence, irrespective of the pipe diameter tolerance, guaranteed by a mechanical pipe expansion process that ensures a greater heat transmission to the air;
2. ribs, impressed on fins, contribute to create turbulence on the treated air improving the exchange coefficient; moreover they enable the condensate scroll easily downwards obstructing, in this way, the dragging drops.

Bends are always thicker than pipes; they are calibrated and braze welded with phosphorus copper alloy. Copper pipes are fixed to collector with a brass alloy or low silver content alloy (~5%).

They are made with technologically up-to-date equipment to reduce thinning walls risks on the external radius of the bend and avoid multiple foldings on the internal wall of the bend.

As already mentioned bends are braze welded. Brazing, also known as soldering, is called this because, in the past, it was carried out on a brazier. 'Base material' must have a higher melting temperature than the filler material to 'weld' for brazing occurs. As a result of capillarity, the filler material is sucked by two bodies of base material, penetrating until the space in-between is completely filled.

Connections are normally threaded and equipped with rubber caps protecting thread and prevent any waste or other materials entering. They come with a rubber washer which hampers the air passage and, as for the hole in the casing panel, the disc is on underpressure towards the inside of the unit. The panel hole has a rubber gasket O-ring to prevent air currents to reduce the panel insulation into dust or transmit moisture.

Connections are also fitted with a rubber disc on internal side of panel in positive air pressure area when coil is downstream from fan to prevent air escape.

Lower coil connection has a water drain through hole with locking screw. This is used to drain the coil during assembly stage. As per the upper connection a hole has been done with locking screw to release air in the piping. On request coil connections can be supplied with flanges, counterflanges, bolts and washers for piping connections.

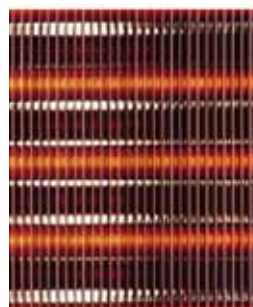
The coils frames are made of 1.5 mm thick suitably reinforced and painted 'Sendzimir' galvanised steel sheet.

Edge to anchor to internal cladding of air handling unit is 30 or 40 mm.

The holes of hot-blast pipe plates have calibrated collars, with relative play, to allow differences in temperature and avoid copper piping wear.

The coil circuits are normally made to obtain counter-current circulation between water and air.

Supply is normally from the bottom upwards to facilitate bubble air release. The number of circuits depends on the speed of the water and therefore of the relative flow rate.



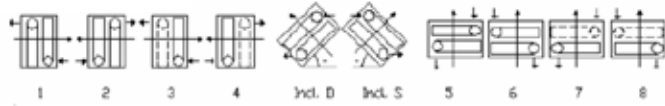


Water inlet and outlet connections are normally on the same side. In this case, the number of circuits also depends on the total number of pipes that must be the same for all circuits.

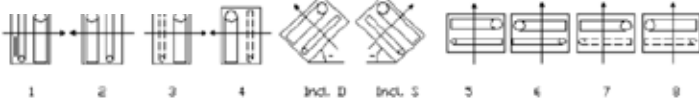
Collector type or diameter that corresponds to connection diameter depends on water flow rate and number of circuits.

All coils are tested before being installed within air handling units. This test is carried out at the coil manufacturer. The tightness is tested with an air pressure of 30 bar with the coil immersed in water.

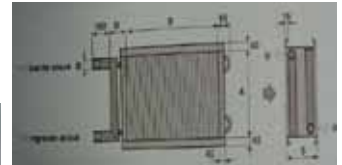
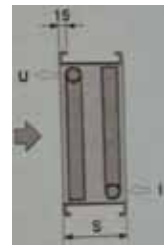
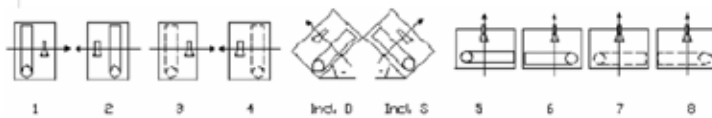
### Water Coil



### Steam Coil



### Direct expansion coil



## CONDENSATE COLLECTION TANKS

All condensate collection tanks are contained within of the bottom panelling of the air handling unit. This type of construction has the following advantages:

- no condensation phenomenon and thus no mould, fungi, etc.;
- significant reduction in heat loss through tank surface.

The following materials are normally used to make tanks:

- Peraluman as standard material;
- stainless steel AISI 304L;
- stainless steel AISI 316.

SAMP has developed a fiberglass condensate collection tank for specific applications. It is also fitted on standard units as it offers a series of advantages, the main ones being:

- very long life;
- resistance to any type of humidifying water or condensate;
- compatibility with use in all sectors: chemical, pharmaceutical, food, etc.;
- easy to clean and sterilise;
- perfect slope because tank is obtained individually from mould;;
- perfect smoothy side in view (mirror surface);
- insulation made from same material as tank, without risk of insulation detaching;
- no welding or joints and therefore no risk of leaks;
- connected corners for easy cleaning;
- thickness and strengthening sufficient to support the heaviest loads without breakage or strain;
- perfectly uniform size and configuration machines;
- fitted inside air handling units, with support base and therefore on bottom of panels with built-in sealing system;
- single tank unit;
- central discharge.



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## FAN SECTIONS

Standard units use PLUG-FANs or double inlet rotary fans. Industrial, stainless steel or polypropylene twinned, single inlet fan units complete with accessories such as condensate drainage plug, inspection hatches and special EPOX paints or ATEX version are used on request.

High efficiency PLUG-FANs can be divided into three categories:

- fans with painted sheet steel impeller with backward curved blades;
- fans with painted sheet steel impeller with backward curved airfoil blades;
- fans with fiberglass reinforced polyamide impeller with backward curved blades.

A great deal of attention is paid to the impeller balancing grade that is carried out in accordance with DIN ISO 1940 standards with  $G = 2.5$  tolerance.

Impellers are fitted with aluminium or steel hubs provided with tab housing and clamping screws.

Nozzles for different types of impellers are optimised to achieve high performance and aerodynamically shaped to ensure uniform air distribution on impeller.

Spring shock absorbers equipped with an anti-vibration connector on the fan suction vent are applied between the common base and internal fan section base to prevent any vibrations being transmitted to the external structure.

Fan performance is guaranteed by appropriate tests and inspections in accordance with DIN24163/BS 848 Part 1/ISO 5801/AMCA 210.

All fans assembled with their own motor are tested individually in the factory and an appropriate certificate issued.

PLUG-FANs are widely used in all sectors; there are significant advantages that can be summarised as follows:

- Completely eliminating transmission and, as a result, relative maintenance due to belt wear resulting in periodic belt replacement and tension adjustment.
- Machines are much cleaner internally than traditional fans; in fact internal dirt caused by 'black smoke' generated by belt wear is prevented by eliminating transmission.
- Significant reduction in fan maintenance as directly coupled with motor, they do not have any type of bearing thus eliminating maintenance and risk of breakdowns.
- Perfect balancing level guaranteed as all fans/motors are tested (as a unit) in the manufacturer's workshop.
- Eliminating vibration generated by transmission.
- Motor bearings last longer; motor bearing life in the PLUG-FAN configuration cannot be compared with that of the transmission driven configuration as bearings are not stressed by belt traction and the resulting variable load.
- Significantly lower rotation speeds are obtained with the same total static pressure and air flow.



- Possibility of an uniform air distribution on the next component, or free choice of the exhaust outlet flow direction (high, low, side), without having to add plenums with further space problems.

On request, PLUG-FANs can be equipped with an electronic air flow measuring device. This makes it easy to determine fan capacity, and to check and keep it constant once installed.

System consists of:

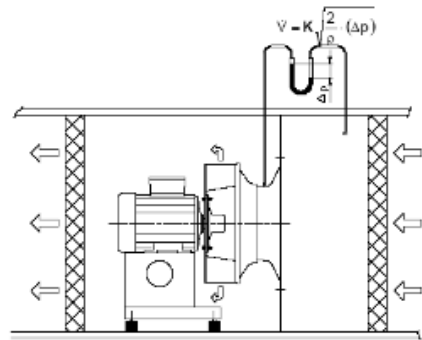
- Ring with pressure tubes on the nozzle.
- Static pressure tubes upstream from fan.
- Flexible hose to connect two pressure tubes to the instrument.
- Pressure measuring device.

Static pressure in suction side chamber and average nozzle pressure must be measured to calculate air flow. Care must be taken not to allow static pressure, measured in front of nozzle, to be altered by percentages of dynamic pressure. Signal can also be used for adjustment purposes if differential pressure is measured with a pressure sensor.

PLUG-FANs must be equipped with an inverter to make the most of their features and operational flexibility.

SAMP equips its air handling units with an inverter that has been especially designed for this specific use, already programmed for various applications, including macro supply and return fan applications. Control panel intelligence provides users direct and understandable instructions at any time. The main advantages of the inverters used by SAMP can be summarised as follows:

- Built in EMC filter.
- Variable saturation reactors – up to 25% less harmonic distortion.
- Maximum yield at 40°C and beyond.
- Real time clock and calendar.
- Built in timer.
- Series built in BACnet, N2, FNL and Modbus as standard.
- Two PID standard controllers.
- 'Book' installation.
- Traceability fault
- Custom HVAC software.



Technical data and models are shown below:

#### Power supply

Voltage and power range	Three phase, from 380 to 480 V, +10/-15% (from 0.75 to 355 kW) Three phase, from 200 to 240 V, +10/-15% (from 0.75 to 75 kW) Single phase, from 200 to 240 V, +10/-15% (50% derating) Input self-identification
Frequency	from 48 to 63 Hz
Power factor	0.98

#### Motor connection

Voltage	Three phase, from 0 to U nom.
Frequency	from 0 to 500 Hz
Rated current	(both for IP 21 and IP 54) <i>With room temperature between -15 and +40°C</i>
Rated output current (I <sub>2N</sub> ), without derating	<i>With room temperature between +40 and +50°C</i>
Derating of 1%/°C above 40°C, max. derating 10%	
Adjustable switching frequency	from 0.75 to 110 kW 1 kHz, 4 kHz, 8 kHz, 12 kHz from 132 to 355 kW 1 kHz or 4 kHz

#### Environmental limits

##### Environmental temperature and humidity

Transport and storage	from -40 to 70°C
Operation	from -15 to 50°C (without ice)
Altitude	
Output current	rated current available between 0 and 1000 m, 1% reduction every 100 m between 1000 and 2000 m
Relative humidity	less than 95% (without condensate)
Protection classes	IP21 or IP 54 IP21 for walls or floor unit IP54 for wall units

#### Inputs and outputs

<b>2 analogue inputs</b>	that can be set by current or voltage
Voltage signal	from 0 (2) to 10 V, R <sub>in</sub> > 312 kΩ single impulse
Current signal	from 0 (4) to 20 mA, R <sub>in</sub> = 100 Ω single impulse
Potentiometer reference values	10 V ± 2 % max. 10 mA, R < 10 kΩ
<b>2 analogue outputs</b>	from 0 (4) to 20 mA, load < 500 Ω
Auxiliary internal voltage	24 V DC ±10 %, max. 250 mA
<b>6 digital inputs</b>	from 12 V to 24 V DC with internal or external power supply
<b>3 relay outputs</b>	Max switching voltage 250 V AC/30 V DC Max direct current 2 A rms
<b>PTC and PT 100</b>	PTC each of 6 digital or analogue inputs can be reconfigured for PTC PT 100, both digital outputs can be used to power the sensor
<b>Field bus</b>	Built in as standard (RS 485), BACnet, Modbus, N2 and FLN Connection options available LonWorks, Profibus, DeviceNet, etc.

#### Protection functions

Overvoltage control
Under voltage control
Dispersion to earth supervision
Motor short circuit protection
Inputs and output supervision
Over current protection
Phase loss identification
Load loss supervision, also used to detect belt breakage.
Overload supervision
Stall protection

#### Product compliance

Low voltage Directive 73/23/EEC and supplements
Machine Directive 98/37/EC
EMC Directive 89/336/EEC and supplements
Quality System ISO 9001
Environmental System ISO 14001
CE, UL, cUL and GOST R markings
Galvanic insulation compliance with PELV
EMC Distribution limited to 1 standard environment

(Conform EN61800-3)

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Double inlet centrifuge fans, normally used by SAMP, can be divided into three main categories:

- *Double inlet centrifugal fans with forward-curved blades.*
- *Double inlet centrifugal fans with backward-curved blades.*
- *Double inlet centrifugal fans with airfoil backward-curved blades.*
- *These fans basically consist of the following parts:*

### Scrolls:

Made of 'Sendzimir' galvanised steel sheet.

Side-back is closed with Pittsburgh system. There are series of standard holes in the sides to enable frame and base supports to be applied.

Suction and delivery sections are the same size, allowing dynamic losses due to variations in speed to be eliminated.

Scrolls are made of sheet steel welded with reinforced profiles and divided horizontally for very large fans.

### Shafts:

All shafts are sized with a high safety coefficient and critical speed well over the maximum permitted operating speed. They are made of turned and milled carbon steel.

Shafts have tab housing in correspondence with impeller hub and another at each end.

All shafts are coated with protective paint.

### Impellers:

As mentioned above, impellers are divided into various categories:

High efficiency **flat profile backward curved blade impellers** in corrosion-resistant steel, with welded and EPOX enamel painted blades. Impellers are statically and dynamically balanced with a tolerance level of  $G = 2.5$  in accordance with DIN ISO standards 1940-1 (VDI 2060).

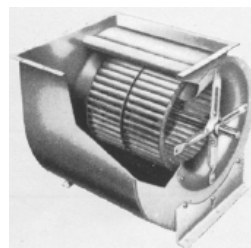
High efficiency **backward curved airfoil blade impellers** in corrosion-resistant steel, with welded and EPOX enamel painted blades. Impellers are statically and dynamically balanced with a tolerance level of  $G = 2.5$  in accordance with DIN ISO standards 1940-1 (VDI 2060).

**Forward curved blade impellers** of the Tab-lock type, in 'Sendzimir' galvanised steel, statically and dynamically balanced according to ISO 1940 standards with level G4.

### Bearings:

Bearings are a very important aspect of fan construction. The following types of supports and bearings can be used depending on the operational features and type of fan:

- Self-aligning supports which contain single row ball bearings, with eccentric fixing collar.
- Cast iron supports in two halves with double row aligning ball bearings.
- Cast iron supports in two halves with double row aligning needle roller bearings.
- Water-tight bearings, lubricated for life, housed in a rubber damper ring supported by a steel three- or four-armed spider.
- Bearings for some types of fans require supports fitted onto steel sections welded to the frame. They are equipped with greasers to lubricate bearings periodically.
- Bearings are of a size that guarantees a minimum duration L10 of 20,000 hours or 40,000 at maximum speed.



SAMP pays a great deal of attention to ventilating section construction, both from the quality and construction point of view. In fact the fan and motor are fitted to a single base made entirely from aluminium profiles of varying sections, depending on the type of fan and size of the motor installed in the fan section.

Belt tightening slide, made as single piece with very simple functional adjustment screws to tighten belts, is always installed behind fan. All fans used are made with a frame; minimum version R.

SAMP does not recommend positioning motor on fan side. Spring shock absorbers equipped with an anti-vibration connector on the fan suction vent are applied between the common base and internal fan section base to prevent any vibrations being transmitted to the external structure.

In this regard SAMP is equipped with appropriate instruments to measure all vibrations transmitted to the exterior of its air handling units.

All SAMP air handling unit fan sections come complete with a fork-type microswitch to guarantee high safety standards.

Ventilating sections can be equipped and completed with various accessories, such as:

- Transmission protection with casing in widely spaced metal mesh to avoid fan efficiency losses and increased noise. Casing is easy to inspect in the event of transmission replacement or maintenance.
- Additional internal fan section insulation achieved with thermal soundproofing or soundproofing material.

Other types of fan, for medium and high pressures, with backward curved blade impellers, ATEX or other special applications can be fitted on request.

Electric motors used comply with EU/CEMEP standards with efficiency class EFF2 or EFF1. Active parts of motors have been optimised to meet the requirements of these classes. Procedure to decide efficiency is based on individual loss method in accordance with IEC 60034-2.

Flameproof motors certified in accordance with Directive 94/9/EG (ATEX), in the VIK version with special voltages or frequencies can be supplied on request.

When present, transmission between motor and fan is achieved with high efficiency rubber V-belts in accordance with DIN standards and statically and dynamically balanced cast iron pulleys.

All pulleys have a conical hub and variable pitch for powers up to 1.5 kW.



## HUMIDIFYING SECTIONS

SAMP equips its units with a vast range of humidification systems to meet the specific customer requirements. The following are the most commonly adiabatic and isothermal used systems.

### Adiabatic systems

#### Disposable Evaporating unit

Adiabatic system consists of an evaporating in cellulose fibre in thicknesses of 100, 150 and 200 mm to guarantee 60%, 70% and 80% efficiency respectively. The pack is inserted in a special Peraluman frame, complete with special distribution tank to guarantee uniform sprinkling. Aluminium distribution is of an appropriate size for water flow required





to achieve system efficiency, with water distribution holes, fiberglass condensate collection and drainage tank.

Condensate collection tank can also be made of Peraluman or AISI 304 or AISI 316 stainless steel like frame and water distribution pipe. Another option is that of equipping system with a manual shutter and/or solenoid valve on the distribution pipe. On request evaporating unit is also available in fiber-glass or flocked PVC.

#### Evaporating unit with pump

A recirculating pump with 400/3/50 motor is installed within the Peraluman or stainless steel tank if recirculation of the water is planned. Relative aluminium piping is equipped with manual stainless steel shutters to check flow and bleed off. Tank is also fitted with an overflow to check water and float level so that it can be refilled automatically. On request, system can also come complete with a control unit with microprocessor to monitor, manage and control environmental humidity and water quality.

#### Nozzle washers with pump

These consist of nylon nozzles with a flow rate of 300 l/hr each at the minimum operating pressure of 2 bar, fitted to PVC distribution pipes appropriate sized, according to relative water flow, to obtain maximum efficiency and best water particle nebulization, thus avoiding overlapping and precipitation before absorption. Stainless steel pump, adequate for ensuring the necessary water flow and pressure, is installed within unit to limit noise and vibrations and avoid any obstacles outside the unit. Suction filters are in stainless steel mesh and tank is in Peraluman complete with connection for rapid filling, brass float and overflow. Drop separator and splash guard have a Peraluman frame and poly-propylene fins. Pump is fitted with a dial gauge to display the pressure of the water leaving the pump and a special PVC butterfly valve to calibrate the flow. Entire system is within a Peraluman chamber to avoid splash contact with panels and keep them clean, preventing any dripping. On request, tank, drop separator, splash guard, float, manual adjustment valve, double chamber and distribution ramps can be in

AISI 304 or 316 stainless steel.

#### High pressure sprinklers

High pressure sprinklers consist of a control unit, with flow rate of up to 500 l/hr, that can be interfaced with the most modern supervision systems. Special pumps (power supply 400V/3 Ph/50Hz) demineralized water at a pressure of around 80 bar and channel it into the distribution grill within the air handling unit. They come complete with throttle valves to optimise water consumption and stainless steel nozzles which spray water at a rate of between 3 and 10 micron, thus permitting rapid absorption into the air. These systems guarantee a reduction in running costs and power consumption, requiring only 4 Watts/hr of electricity every l/hr of sprayed water, thus limiting the water lost to not more than 10-15%. Collection tank, condensate drain, internal infill and panels in correspondence with humidification chamber are in stainless steel to resist corrosion as a result of demineralized water (obtained using reverse osmosis plants). In fact, this system uses dematerialised water, with no mineral salts, which would soon block spray nozzles. As a result of osmosis water is also disinfected eliminating the bacterial colonies in untreated drinking water osmosis.



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## Isothermal systems

Saturated steam humidifier under pressure from 1 to 4 bar up to flow rate of 500 kg/hr (higher flow rates on request)

These consist of cast iron or, as an option, stainless steel valve body, with saturation chamber, silencer and filter in stainless steel mesh, complete with stainless steel primary steam trap.

Valve is fitted with electric rotary servocontrol with either 24V or pneumatic power supply.

Steam distributors are entirely in stainless steel with injector nozzles for uniform steam distribution along entire length of hose, even with minimal load.

'Multi-ramp' distributors with vertical hoses fed by a common horizontal collector are available as an option to further optimise steam distribution and limit humidification chamber length. Steam at atmospheric pressure can be produced with the most modern systems described below if there is no mains steam.



### Steam produced by immersed electrodes

This consists of electrodes that, when immersed in untreated water, exploit its conductivity, heating it until steam is produced. Maximum system capacity, obtained parallel coupling individual units, is of 180 kg/hr.

Steam produced is modulated by feed and exhaust valves that increase or reduce the amount of water inside the cylinder, proportionate to the amount of steam necessary. It is possible to modulate steam production from 20 to 100% with a signal from an environmental probe; operating status can always be checked on control panel display.



### Steam produced by resistance

This consists of electrical resistances that, when immersed in drinking, softened or demineralised water, produce steam up to a maximum capacity of 180 kg/hr. Steam production is modulated by relays that vary electric power, guaranteeing excellent control precision.

It is possible to modulate steam production from 20 to 100% with a signal from an environmental probe; operating status can always be checked on control panel display.

Alternatively, steam can be produced with gas instead of electricity as described above to significantly reduce running costs.

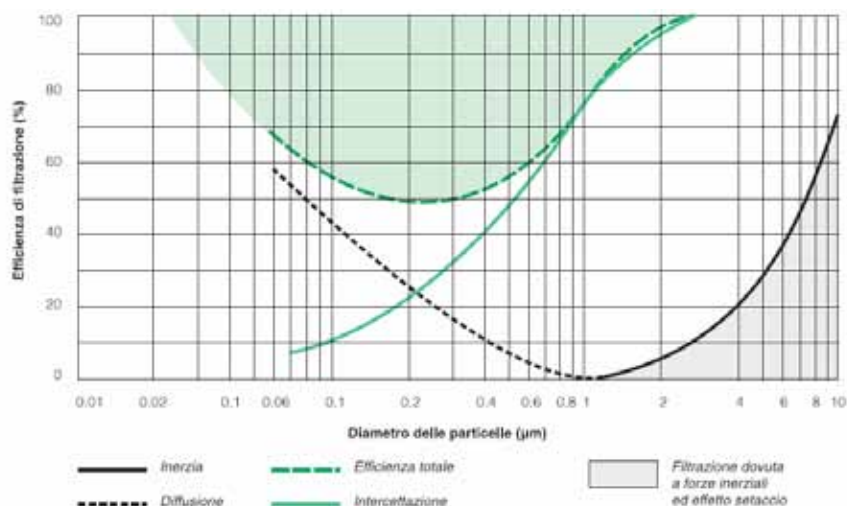
### Steam produced with gas

This consists of a combustion system complete with a burner that uses methane, propane or butane gas to generate steam from drinking, softened or demineralised water up to a maximum capacity of 180 kg/hr. It is possible to modulate steam production from 25 to 100% with a signal from an environmental probe; operating status can always be checked on control panel display.

All the above systems have been designed and built in accordance with the safety laws in force.



The graph to the right shows the relative efficiency of four dust filtration mechanisms and their cumulative effect, according to diameter of particles, determined at typical operating air speed for high efficiency pocket filters.



## General ventilation filter classification according to EN 779/2002

In 2002, the European Standardisation Committee (ESC), in revising standards EN799, classified filters into two groups according to their filtering efficiency. Coarse dust filters (group G) only undergo gravimetric-type tests while those for fine dust (group F) are also tested with the spectral method. Filters are then subdivided into filtration classes with a numeric value from 1 to 9 according to the average efficiency value, respectively ponderal and fractional for 0.4 µm particles. Whereas UNI standards 10339 define class 1 to 4 filters of average efficiency (M) and those from 5 to 9 of high efficiency (A), specifying that the latter must be preceded by filters of a lower category. The table below shows a correlation between the two classification methods.

Classe del filtro	Efficienza media ponderale	Efficienza media per particelle di 0,4 µm	Caduta di pressione finale	Classe del filtro	Efficienza di filtrazione
prEN 779	Am %	Em %	Pa	UNI 10339	
<b>G 1</b>	50 ≤ Am < 65	-	250	1	M
<b>G 2</b>	65 ≤ Am < 80	-	250	2	M
<b>G 3</b>	80 ≤ Am < 90	-	250	3	M
<b>G 4</b>	90 ≤ Am	-	250	4	M
<b>F 5</b>	-	40 ≤ Em < 60	450	5	A
<b>F 6</b>	-	60 ≤ Em < 80	450	6	A
<b>F 7</b>	-	80 ≤ Em < 90	450	7	A
<b>F 8</b>	-	90 ≤ Em < 95	450	8	A
<b>F 9</b>	-	95 ≤ Em	450	9	A

### Absolute HEPA & ULPA filter classification according to EN 1822

High and very high efficiency filter performance and classification is regulated by the ESC in accordance with EN standard 1822 consisting of 5 parts. Test method enables filtration efficiency of the most critical sizes to be measured in two phases. The first stage of the test involves examining filtering media performance at the actual filter operating speed and consists in determining the particle with the maximum penetration (MPPS). The second stage consists in testing the finished filter so that filtration efficiency can be determined for MPPS particles; absolute filter can be classified as HEPA (H) or ULPA (U) in this way, according to the table shown below. The first type of tests must be carried out for class H10, H11 and H12 filters to measure overall efficiency. Whereas filters with a higher efficiency class than H12 must be scanned individually to identify any losses by carefully checking local penetration, determining overall efficiency. Eight different filtration efficiency levels are classified using these methods. UNI standards 10339 (under revision by CTI) define absolute filters as very high efficiency filtering elements (AS) and recommend they are preceded by category M and A pre-filters defined above. However, these standards have little relevance to clean rooms and controlled contamination environments.

Classificazione dei filtri	Efficienza integrale MPPS	Efficienza locale MPPS	Metodi di prova a cui vengono sottoposti i singoli elementi filtranti	Classe del filtro	Efficienza di filtrazione
E N 1822-1	E %	E %		prUNI 10339 rev.	
H 10	85	-	prova di tipo (EN 1822-4/EN1822/5)	10	AS
H 11	95	-	prova di tipo (EN 1822-4/EN1822/5)	11	AS
H 12	99,5	-	prova di tipo (EN 1822-4/EN1822/5)	12	AS
H 13	99,95	99,75	MPPS scan method / oil thread method	13	AS
H 14	99,995	99,975	MPPS scan method / oil thread method	14	AS
U 15	99,9995	99,9975	MPPS scan method (EN 1822-4)	15	AS
U 16	99,99995	99,99975	MPPS scan method (EN 1822-4)	16	AS
U 17	99,999995	99,9999	MPPS scan method (EN 1822-4)	17	AS



## TYPES OF FILTER

### Automatic rotary filter

Rotary filters are automatic winding filters for filtering media, complete with synthetic high dust accumulation reel, suitable for air conditioning systems and pre-filtration for high and very high efficiency filters.

#### Structural features

Rotary filter structure is usually in galvanised sheet metal and filters consist of:

- an initial protective casing containing a clean filtering reel to prevent contact with air to be filtered, fitted with a stop device to indicate filtering media has finished;
  - a supporting frame with drive rollers and lateral guides in which filtering media flows from first to second casing;
  - a second protective casing containing dirty filtering reel to prevent release of dust on filtered air side; complete with a tubular operator housed in its axle, suitable for driving filtering media;
  - a control and signalling system consisting of an electric control panel protected by a stop button and security keys, limit switch and a differential pressure switch that can be adjusted between 100 and 250 Pa that regulates filtering media winding according to clogging level;
  - a filtering reel with media wound around a cardboard tube, in synthetic fibre with rising density.
- Filter is supplied completely assembled inside air handling unit. Construction complies with Community Directives in force.



#### Operating limits

Temperature: from -10°C to + 50°C

Relative humidity: 100%

Initial pressure loss: 70 Pa

Operating pressure loss: 120 Pa

Max. pressure loss: 300 Pa

Min. traverse speed: 1.5 m/sec.

#### Operation

Filtering media is wound by an operator unit housed within drive axle. This unit that replaces traditional mechanical components (pinion, chain, spur wheel etc.) basically consists of an asynchronous single phase motor, limit switch, electromagnetic brake and planetary-type reducer.

#### Applications

Primary filtration of coarse dust in air handling plants, climate control units and pre-filtration of high efficiency filters..



## Corrugated synthetic fibre filtering cells

### General features

Corrugated filtering cells are used in air handling and filtering systems thanks to their large filtering surface area, excellent mechanical resistance and low pressure losses at high air flow rates.

### Filtering media

Filtering media is in gauged density synthetic fibre with high performance at G3 and G4 efficiency levels. They can be partially regenerated with warm water and detergents when final recommended pressure loss is reached.

### Frame

Most traditional version is made with galvanised sheet steel U section with electrowelded galvanised steel thread mesh protection. Filtering media supporting mesh enables folds to be constantly spaced and ensures valid mechanical consistency. This version can be opened for differentiated disposal between frame and filtering media.



### Operating limits

Continuous operating temperature: 80°C

Relative humidity: 90%

Final pressure loss recommended for filter replacement: 250 Pa

Max. admissible pressure loss: 400 Pa

### Applications

Air handling units and pre-filtration for high efficiency filters.

## Synthetic fibre floppy pocket filters

### General features

Floppy pocket filters are used in air conditioning and ventilation systems, both as final and pre-filters, thanks to their strong structure, large filtering surface area and special welding of filtering panel guaranteeing a perfect seal.

### Filtering media

Synthetic fibre of differing density that guarantees progressive filtration in direction of air flow; external layer is coated with a very high resistance film. Single filtering element consists of a series of spaced welded airtight pockets. This structure enables high and uniform dust accumulation.



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## Frame

Shaped galvanised steel with rounded edges. Each pocket has its own supporting frame; special joint covers bring individual pockets together within perimeter frame.

## AHU counter frame

Filtering elements are fixed inside AHUs without cladding, coupling filter counter frame to internal sections that make up AHU frame. This type of structure makes a double effect possible – reducing internal pressure losses considerably and lengthening working life of filters, thus reducing running costs and energy consumption.

## Disposal

Metal and fibrous parts can be quickly separated as assembly is simple to dismantle, thus enabling various components to be disposed of separately.

## Operating limits

Continuous operating temperature: 80°C

Relative humidity: 100%

Final pressure loss recommended for filter replacement: 450 Pa

Max. admissible pressure loss: 800 Pa

## Applications

Filtering air in those civilian climate control systems and industrial applications that require a highly efficient system as regards fine dust and particles from a few  $\Omega\text{m}$  to a fraction of a  $\Omega\text{m}$  in size (from F5 to F9, according to efficiencies available). Particularly suitable for those applications where air quality features must be kept at high levels throughout the working life of the filtration system. Filters are also used as pre-filtration for very high efficiency and absolute filters.

## Multi-dihedral rigid pocket filters

### General features

Rigid pocket filters are used in conditioning systems as final filters and for absolute filter pre-filtration thanks to their large filtering surface area, low pressure loss, combustibility and compact and robust shape.

### Filtering media

Fiberglass paper with constant gauged folds achieved with continuous thermoplastic spacer threads. This close and uniform filter pack has a large surface area in which to capture fine dust within various filter panels.

### Frame

Frame consists of a robust structure in moulded plastic material. Casing contains filter packs arranged in a V shape with a multidihedral configuration, also known as rigid pockets.



### AHU counter frame

Filtering elements are fixed inside AHUs without cladding, coupling filter counter frame to internal sections that make up AHU frame. This type of structure makes a double effect possible – reducing internal pressure losses considerably and lengthening working life of filters, thus reducing running costs and energy consumption.

### Sealant

Seal between filter packs and framework is guaranteed by a polyurethane-based resin sealant.

### Disposal

Rigid pocket filters are made with materials that do not oxidize. They are entirely combustible without releasing heavy metals or toxic gases; therefore, they can be disposed of in municipal incinerators in accordance with the laws in force.

### Operating limits

Continuous operating temperature: 70°C

Relative humidity: 100%

Final pressure loss recommended for filter replacement: 450 Pa

Max. admissible pressure loss: 1000 Pa

### Applications

Filtering air in those civilian climate control systems and industrial applications that require a highly efficient system as regards fine dust and particles from a few  $\Omega\text{m}$  to a fraction of a  $\Omega\text{m}$  in size (from F5 to F9, according to efficiencies available). Particularly suitable for those applications where air quality features must be kept at high levels throughout the working life of the filtration system. Filters are also used as pre-filtration for very high efficiency and absolute filters.

## HEPA poly-dihedral absolute filters for ducted flow

### General features

Poly-dihedral absolute filters are used in conditioning installations, even to replace traditional deep pleated filters, due to their high surface filtering, low pressure loss and excellent dust collecting ability. Efficiencies available range from H10 to H14.

### Filtering media

Fiberglass water repellent paper, with constant gauged folds achieved with continuous thermoplastic spacer threads. This close and uniform filter pack has a large surface area in which to capture fine dust.

Specific filtering papers with high accumulation and/or low initial pressure losses can be used for particular applications.



## Frame

Metal frame with side handles. Various types of frame are available to meet numerous installation requirements:

- models with galvanised steel frame
- models with stainless steel frame
- models with plastic polymer frame.

## HEPA filter counter frame

SAMP makes a special modular counter frame, welded on each element, in order to obtain a monolithic structure able to guarantee a perfect individual filtering cell seal, for AHUs supplied with HEPA filters.

Absolute filter counter frame is an exclusive SAMP design. Each AHU is then equipped with all the necessary elements to carry out DOP tests on filtering bench.

## Sealant

Seal between filter packs and framework is guaranteed by a polyurethane-based resin sealant.

## Seal

Semi-round elastomer section in one piece without joins for a better seal.

## Operating limits

Continuous operating temperature: 80°C for version with galvanised sheet frame, 70°C for plastic polymer frames

Relative humidity: 100 %

Final pressure loss recommended for replacement: 600 Pa

Max. admissible pressure loss: 1000 Pa

## Applications

Controlled contamination environments for the pharmaceutical, photographic, electronic and food industries, laboratories and hospitals.

## Multi-dihedral deodorisation filters

### General features

Multi-dihedral deodorisation filters can be installed in air handling units and ventilation and conditioning installations to deodorise external air.

### Frame

Controlled contamination environments for the pharmaceutical, photographic, electronic and food industries, laboratories and hospitals.

### AHU counter frame

Filtering elements are fixed inside AHUs without cladding, directly coupling filter counter frame to internal sections that make up AHU frame. This type of structure makes a double effect possible - reducing pressure losses considerably and increasing pollutant time in contact with absorbent material thus improving filter efficiency and lengthening working life of filters, thus reducing running costs and energy consumption.

### Filtering media

Activated carbon micro-granules trapped in two layers of unwoven fabric. Filter packs obtained from a special pleating process results in a large contact surface area for substances to be captured.

### Operating limits

Continuous operating temperature: 50°C

Relative humidity: 70%

Final pressure loss recommended for filter replacement: 100 Pa

Max. admissible pressure loss: 400 Pa



## Applications

These types of filters are suitable for climate control systems in offices, banks, clinics, theatres and commercial complexes where absorption of pollutant gases and organic fumes of various types and origins is required.

## FCylindrical pollutant gas cartridge filters

### General features

Cylindrical pollutant gas cartridge filters have been developed for the de-odorisation and physical and chemical adsorption of pollutant gases in industrial applications.

### Cartridge support frame plate

This consists of galvanised sheet steel plate with holes to house cartridges. Stainless steel plate is available for particular applications.

### AHU counter frame

Filtering elements are fixed inside AHUs without cladding, directly coupling filter support plates to internal sections that make up AHU frame. This type of structure makes a double effect possible - reducing pressure losses considerably and increasing pollutant time in contact with absorbent material thus improving filter efficiency and lengthening working life of filters, thus reducing running costs and energy consumption.



### Cartridges

Cartridges consist of cylindrical elements with hole to load activated carbon. Carbon bed is held in micro-stretched galvanised steel nets.

### Blocking filters

Filtering cartridges have pins (on front bar) that must be inserted into slots on plate. Subsequent rotation of cartridge ensure it is held in place.

### Seal

Seal is in closed cell neoprene, fitted to front bar.

### Filtering media

- Activated carbon in small mineral cylinders for organic odours.
- Activated carbon in impregnated granules or small cylinders for acid vapours.
- Alumina spheres impregnated with potassium permanganate for corrosive environments

### Operating limits

Temperature: 50°C

Relative humidity: 70%

Initial pressure loss: 200-280 Pa

Carbon bed traverse speed: 0.35-0.45 m/sec.

### Applications

They may be combined with other types of filters in conditioning units thanks to their standard sizes. They are especially recommended in installations that require pollutant gas controls, for example, in airports, refineries, museums, etc.

**NB:** best to install upstream and downstream from units with Class  $\geq$  F5 (EN 779) carbon pre-filters. Upstream filter prevents dust from clogging pores of material, thus increasing its working life whilst those downstream protect installation by capturing any particles of material that may be released as a result of granules rubbing against passage of air.

## HEAT RECOVERY SECTIONS

In compliance with the laws in force and in response to the continuous demand for energy savings, SAMP air handling units can be fitted with static or rotary air/air or air/water heat recovery units with closed circuit glycol-water coil.

### Static Recovery Units

These are static type plate recovery units without moving parts thus very reliable and safe. Moreover, using this equipment in air-conditioning systems significantly reduces running costs, as recovering energy that would otherwise be lost in the form of heat.

**Operation.** On entering recovery unit two air flows, that of re-generated air and that of exhaust air, are divided into passages between two plates, bringing, in turn, hot and cold air. These passages are sealed with solutions that *are appropriate for every application* to prevent possible contamination between two air flows. Exchange takes place through plates that make up passage walls and efficiency reaches values of between 40% and 75%.

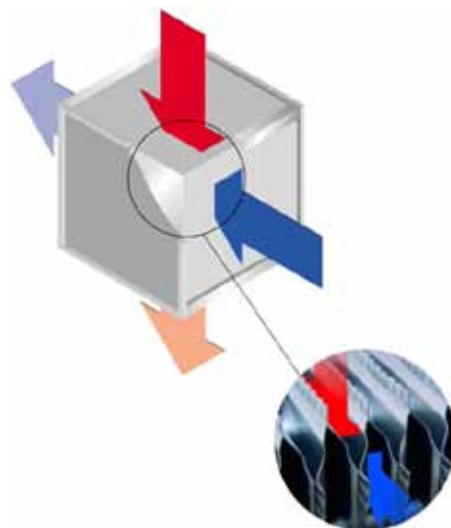
Exchanger unit material is of fundamental importance, more for corrosion resistance than heat transmission. Plates are normally made of thick, self-spaced aluminium sheet metal with variable spacing depending on type of use (short, medium and wide steps), suitable for 'standard' applications where there are no corrosive materials and/or agents. Aluminium is protected by a coat of non-toxic, polyurethane-based, corrosion-resistant paint in environments with an aggressive atmosphere. AISI 316L stainless steel alloys could be used if operating temperatures are very high (higher than 200°C) or for industrial process applications.

**Mechanical resistance.** Delivery and recovery circuits are at different pressures during recovery unit operation; this is due to system power, fan positioning and system load losses. SAMP makes a special model with supplementary sealing for greater resistance, guaranteed for differential pressures of up to 2,500 Pa, for applications requiring high speeds and/or high differential pressures (for examples hospital structures).

**Fields of application.** SAMP proposes use of these recovery units for the most varied types of application, such as hospitals, swimming pools, painting cabins, kitchens/air extraction equipment, etc.

**Maintenance and Cleaning.** Mechanical maintenance is not necessary for this type of recovery unit. Using filtering benches upstream from delivery and discharge flows is necessary if there is dust or pollutants.

However, equipment can be cleaned with compressed air (for





dust deposits), taking care not to damage exchange unit, or spraying a detergent solution (e.g., Decade, ND-150, Chem Zyme, Primasept, Poly-Det, Oakite 86M or similar) for fatty deposits, avoiding solutions which are aggressive for steel.

### Rotary Recovery units

These are rotary air-air heat exchangers in aluminium, both to exchange only sensitive heat and to recover sensitive + latent heat. These systems guarantee the highest performance with between 60% and 80% efficiency, depending on operating conditions, thanks to a very high exchange surface area in relation volume.

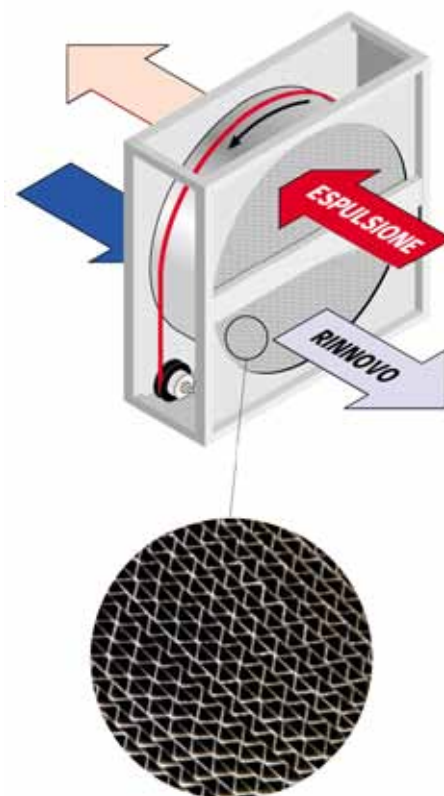
Weight of energy savings is even more important in this case as high efficiency and the ability to recover moisture, as well as sensitive heat (rotors with hygroscopic treatment), enable installed power in an installation to be significantly reduced.

**Operation.** Heat exchange in rotary heat recovery units takes place accumulating heat within the rotor; in fact, whilst the cylinder turns slowly, exhaust air passes through one half of the casing and releases heat to the matrix of the rotor that accumulates it. The replacement air that passes through the other half absorbs the accumulated heat. Parts that absorb and transfer heat continuously invert with rotation and process can continue indefinitely. Rotor rotation speed can be constant or adjusted with a speed control.

**Material.** Exchange unit rotor is the main part of the machine; aluminium is generally used as its physical characteristics (corrosion resistance, inflammability and long life) are suitable in almost all applications the recovery unit is used for (AL version).

Rotor is protected with a non-toxic corrosion-resistant paint for environments with an aggressive atmosphere. Painted rotor is obtained winding aluminium tape already equipped with protection. Moreover, pre-painted aluminium exchange unit can be included in a standard or pre-painted frame. Seal between rotor and frame is guaranteed by an adjustable brush seal installed on rotor and flow separating crossbeam.

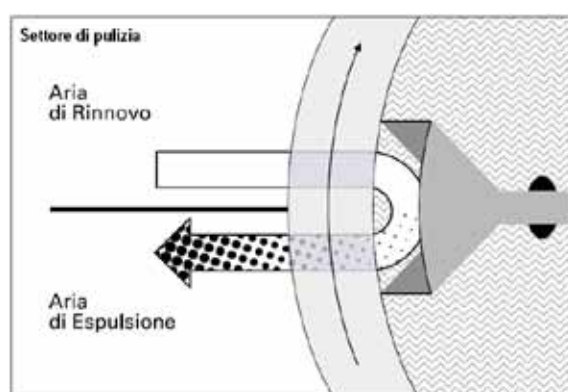
**Hygroscopic treatment.** The main feature of this type of recovery unit is the hygroscopic treatment, i.e. the ability to recover latent heat. In this case, the standard aluminium or pre-painted aluminium matrix that makes up rotor can be chemically treated with an alkaline potassium carbonate solution so as to create an oxidised surface able to make the rotor hygroscopic. The oxidation makes the surface porous at a microscopic level, thus allowing moisture to be transferred between the two air currents.



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**Absorption treatment.** This is a new type of rotary heat recovery unit that can be classified as a sorption rotor. In this case, the standard aluminium or pre-painted aluminium matrix is covered with a layer of silica gel that guarantees high moisture transfer. Moreover, coating contains anti-bacterial and fungicide products that prevent mould and fungi from forming on rotor surface. The result of this treatment is more than double the output of a traditional rotary hygroscopic recovery unit. This not only results in savings in the running costs but also a reduction in installation costs by adapting other components (chillers, batteries, boilers, steam producers, etc.) to the new, reduced heat load. Therefore, the overall installation cost is often less, despite the cost of the heat recovery unit.

**Cleaning sector.** A small quantity of replacement air allows continuous cleaning of rotor. Exhaust air dirties the rotor during rotation and could contaminate replacement air after half a turn. Recovery unit is fitted with a cleaning sector on the incoming air side, downstream of the rotor, at the point where the latter passes from discharge to intake, to eliminate this phenomenon. Positioning it in such a way that replacement air pressure is higher than that of exhaust air, a certain amount of replacement air can be transferred into the discharge air channels, enabling the rotor to be cleaned.



## SILENCERS:

Silencer section is an increasingly important component in air handling units as nowadays the problem of noise pollution is considered a priority. SAMP recommends that silencers be installed on machines as a greater guarantee of noise reduction.

Over the years, SAMP has developed and tested various types of silencer, choosing in the end two macro types that guarantee very high noise reduction levels, maximum reliability and long life. Silencers used by SAMP are basically divided into two categories:

1. Silencers for standard applications.
2. Silencers for hospital, food or special applications.

Silencers for standard applications consist of a 0.8 mm thick galvanised sheet steel frame. Rock-wool soundproofing material with a density of 60 kg/m<sup>3</sup> coated against black fiberglass flaking, class M0 fire resistance and non-combustible in classes A, B and C in accordance with Directive 96/98/EC Marine Equipment (Shipping Register).

All sound proofing data has been tested in accordance with ISO 11694 by an accredited institute. Silencer construction may vary according to specifications requested using soundproofing panels with a thickness of 100, 200 and 300 mm. All panels used by SAMP in its AHUs come complete with an aerodynamic profile for better efficiency.

Silencers can be made with Melinex and micro-stretched net coated panels.

Silencers for hospital, food and special applications have two new innovative items. The first is a frame made with a special aerodynamic profile that reduces load losses by up to 30% compared to traditional coulisse (discharge). The other innovation is the external finish of the soundproofing material that is coupled with fiberglass resistant to abrasion up to a speed of 20 m/sec with waterproof, fully washable, non-flammable impregnating treatment, in accordance with DIN 4102 A2.

Stainless steel models with 100, 200 and 300 mm thick panels can also be chosen for this type of silencer. Length is variable and can be selected by customers; standard measurements are 600, 900, 1200, 1500, 1800 and 2000 mm (bullnose excluded).



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## INSPECTION HATCHES:

These are hatches with die-cast hinge, stainless steel pins and glass-filled nylon handles with a stainless steel core, complete with lock and built-in key. Hatches open in opposite direction to pressure generated by airflow within machine and, that is, outwards in depressurized sections and inwards in sections with positive pressure, thanks to a double frame made with sections exclusively designed by SAMP. Inspection hatches can have the following accessories:

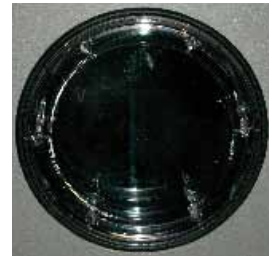
- Peraluman or stainless steel step steady for units with an appropriate internal height.
- Lighting points in inspectable sections, made with galvanised steel ducting and shunt boxes with IP 65 protection, armoured lamp-holders finished with epoxy paint and external double-pole switches IP 65. Lighting points can be of the traditional type with incandescent light bulbs with low voltage power (24 V), fluorescent or ADPE.
- double glazed hatch with double seal.
- Fork type micro-switches.

### Pressure tube accessories:

Consisting of holes for pressure tubes and measuring instruments complete with sealed pass-alls.

### PROBE ACCESS SPACES

All AHUs have 180 mm long plenums with a small drawer to introduce probes and/or anti-freeze thermostat, situated between pre-heating and cooling batteries and a space of 80 mm between remaining batteries (see photo to the side).



## PARTS AND ACCESSORIES

### Grids

These can be in galvanised steel, aluminium or stainless steel, or a rain resistant version with a bird-proof net.

### Internal metalwork

Filter-holder guides, coils supports and all internal metalwork are in aluminium sheeting. On request, they can be in stainless steel.

### Condensate collection and humidification tanks

In aluminium alloy; they can also be in stainless steel and fibreglass with structure and features described in previous sections. All tanks are contained within AHU panels.

### Anti-vibration joints

To fasten channelling and fans; they are flanged in fireproof PVC-coated polyester fabric.

### Roofing

Galvanised, pre-painted galvanised or plasticised galvanised steel or flat or profiled aluminium or stainless steel roofing can be supplied for units installed outside.

### Accessories and versions on request

- Double glazed inspection hatch in UV-resistant polycarbonate with double seal and internal fastening system.
- Internal step steady with rice grain finish.
- Anti-freeze resistance for humidification tanks.
- Manometers.
- Pressure switches.
- Knife switches.
- Inverters cabled to motor.
- Electrical control panel complete with regulating device.
- ATEX versions in accordance with Directive 94/9/CE ATEX

### SPECIAL VERSIONS

On request, units can be built for use in particular sectors (food, hospital, pharmaceutical, etc.). In these cases, following options are offered:

- Panels in sheet of different thicknesses from standard.
- Additional protection by plastofilm internal sheet with scratch and acid proof material.
- Panels in AISI 304 and AISI 316 steel.
- AISI 304 and AISI 316 stainless steel outer frame.
- Heating and cooling batteries in pre-painted Cu/Al and Cu/CuSn with epoxy painted galvanised steel or stainless steel frame or batteries entirely in stainless steel.
- Steam batteries in Fe/Al, with galvanised iron pipes and fins, galvanised steel pipes and Al fins, stainless steel pipes and aluminium fins and entirely in stainless steel.
- Stainless steel tanks, arranged inside each section with relative central discharge, to sanitise unit.
- Internal infill in stainless steel.
- Stainless steel filter counter frames.
- Epoxy painted fan motors.
- Epoxy painted fans with hatch and discharge plug for washing.
- Stainless steel fans.
- Scroll-less fans, directly coupled to motor.
- Steam humidification sections with double stainless steel casing distributors fitted on board AHU, powered by independent producers or adapted for mains steam, with any accessories such as valve body, electric or pneumatic actuator and condensate discharger.
- High pressure water adiabatic humidification sections.

# SAMP AHU

## DIMENSIONAL DATA STANDARD UNITS

Modello AHU	Portata aria (m³/h)			Sezione di attraversamento	Dimensioni frontali esterne
	V = 2,2 m/s	V = 2,5 m/s	V = 2,8 m/s	B x H (mm)	B x H (mm)
<b>2.25</b>	1.940	2.200	2.470	500 x 480	800 x 800
<b>2.50</b>	2.200	2.500	2.800	500 x 540	800 x 900
<b>3.00</b>	2.640	3.000	3.360	700 x 480	1.010 x 800
<b>3.50</b>	3.080	3.500	3.920	700 x 540	1.010 x 900
<b>4.30</b>	3.790	4.300	4.820	1.000 x 480	1.315 x 800
<b>5.00</b>	4.400	5.000	5.600	1.000 x 540	1.315 x 900
<b>6.00</b>	5.280	6.000	6.720	1.000 x 660	1.315 x 1010
<b>7.20</b>	6.340	7.200	8.070	1.000 x 780	1.315 x 1160
<b>8.60</b>	7.570	8.600	9.640	1.000 x 960	1.315 x 1.315
<b>11.50S</b>	10.120	11.500	12.880	1.300 x 960	1.620 x 1.315
<b>11.50V</b>	10.120	11.500	12.880	1.000 x 1.260	1.315 x 1.620
<b>14.00</b>	12.320	14.000	15.680	1.600 x 960	1.930 x 1.315
<b>15.00</b>	13.200	15.000	16.800	1.300 x 1.260	1.620 x 1.620
<b>18.20</b>	16.020	18.200	20.390	1.600 x 1.260	1.930 x 1.620
<b>22.50</b>	19.800	22.500	25.200	1.600 x 1.560	1.930 x 1.930
<b>25.50</b>	22.440	25.500	28.560	2.200 x 1.260	2.570 x 1.650
<b>32.00</b>	27.280	31.000	34.720	2.200 x 1.560	2.570 x 1.960
<b>32.50</b>	28.160	32.000	35.840	1.900 x 1.860	2.260 x 2.260
<b>36.00</b>	32.120	36.500	40.880	2.500 x 1.620	2.880 x 1.960
<b>38.00</b>	32.560	37.000	41.440	2.200 x 1.860	2.570 x 2.260
<b>41.00</b>	36.080	41.000	45.920	2.800 x 1.620	3.190 x 1.960
<b>42.00</b>	36.960	42.000	47.040	2.500 x 1.860	2.880 x 2.260
<b>44.00</b>	38.280	43.500	48.720	2.200 x 2.160	2.570 x 2.570
<b>47.00</b>	41.360	47.000	52.640	2.800 x 1.860	3.190 x 2.260
<b>48.00</b>	42.680	48.500	54.320	2.500 x 2.160	2.880 x 2.570
<b>50.00</b>	43.560	49.500	55.440	2.200 x 2.490	2.570 x 2.880
<b>55.00</b>	47.960	54.500	61.040	2.800 x 2.160	3.190 x 2.570
<b>56.50</b>	50.160	57.000	63.840	2.500 x 2.520	2.880 x 2.880
<b>63.00</b>	55.880	63.500	71.120	2.800 x 2.520	3.190 x 2.880
<b>70.00</b>	61.900	70.300	78.800	3.100 x 2.520	3.500 x 2.880
<b>77.00</b>	67.900	77.100	86.400	3.400 x 2.520	3.800 x 2.880
<b>84.00</b>	73.850	83.900	94.000	3.700 x 2.520	4.100 x 2.880
<b>91.00</b>	79.850	90.700	101.750	4.000 x 2.520	4.400 x 2.880

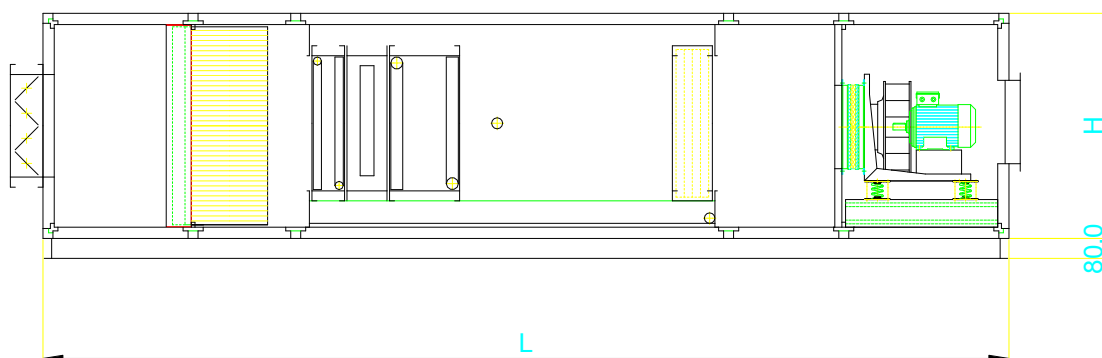




## MAIN CONFIGURATIONS

### PRIMARY AIR HANDLING UNIT EQUIPPED FOR STEAM HUMIDIFICATION

Unit configured to treat replacement air in rooms consisting of external air inlet damper, flat prefilters G4 efficiency, floppy pocket filters F8 efficiency, heating and cooling batteries, empty section provided for steam humidification and blower fan.



MOD AHU	Portata (m³/h)	L (mm)	P (mm)	H (mm)
2.25	2.200	3.900	800	800
2.50	2.500	3.950	800	900
3.00	3.000	4.000	1.010	800
3.50	3.500	4.050	1.010	900
4.30	4.300	4.050	1.315	800
5.00	5.000	4.150	1.315	900
6.00	6.000	4.200	1.315	1.010
7.20	7.200	4.350	1.315	1.160
8.60	8.600	4.450	1.315	1.315
11.50S	11.500	4.600	1.620	1.315
11.50V	11.500	4.600	1.315	1.620
14.00	14.000	4.650	1.930	1.315
15.00	15.000	4.700	1.620	1.620
18.20	18.200	4.900	1.930	1.620
22.50	22.500	5.250	1.930	1.930
25.50	25.500	5.350	2.570	1.650
32.00	31.000	5.600	2.570	1.960
32.50	32.000	5.600	2.260	2.260
36.00	36.500	5.800	2.880	1.960
38.00	37.000	6.000	2.570	2.260
41.00	41.000	5.950	3.190	1.960
42.00	42.000	6.000	2.880	2.260
44.00	43.500	6.100	2.570	2.570
47.00	47.000	6.050	3.190	2.260
48.00	48.500	6.150	2.880	2.570
50.00	49.500	6.300	2.570	2.880
55.00	54.500	6.200	3.190	2.570
56.50	57.000	6.300	2.880	2.880
63.00	63.500	6.300	3.190	2.880
70.00	70.300	6.300	3.400	2.880
77.00	77.100	6.300	3.700	2.880
84.00	83.900	6.300	4.100	2.880
91.00	90.700	6.300	4.400	2.880

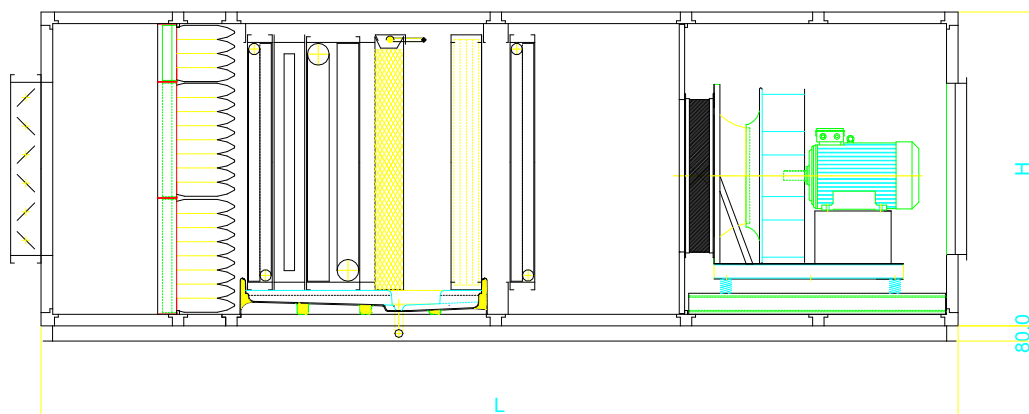
SIZES

**samp**

## MAIN CONFIGURATIONS

### PRIMARY AIR HANDLING UNIT WITH DISPOSABLE ADIABATIC HUMIDIFICATION

Unit configured to treat replacement air in rooms consisting of external air inlet damper, flat prefilters G4 efficiency, floppy pocket filters F8 efficiency, heating and cooling batteries, section for disposable adiabatic humidification pack, post-heating coil and blower fan.

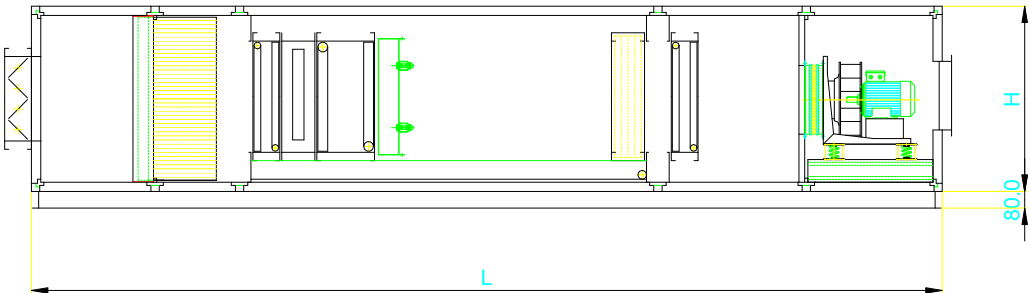


#### SIZES

MOD AHU	Portata (m³/h)	L (mm)	P (mm)	H (mm)
2.25	2.200	3.500	800	800
2.50	2.500	3.500	800	900
3.00	3.000	3.550	1.010	800
3.50	3.500	3.600	1.010	900
4.30	4.300	3.660	1.315	800
5.00	5.000	3.700	1.315	900
6.00	6.000	3.750	1.315	1.010
7.20	7.200	3.850	1.315	1.160
8.60	8.600	3.900	1.315	1.315
11.50S	11.500	4.050	1.620	1.315
11.50V	11.500	4.050	1.315	1.620
14.00	14.000	4.250	1.930	1.315
15.00	15.000	4.250	1.620	1.620
18.20	18.200	4.350	1.930	1.620
22.50	22.500	4.650	1.930	1.930
25.50	25.500	5.000	2.570	1.650
32.00	31.000	5.150	2.570	1.960
32.50	32.000	5.150	2.260	2.260
36.00	36.500	5.500	2.880	1.960
38.00	37.000	5.500	2.570	2.260
41.00	41.000	5.500	3.190	1.960
42.00	42.000	5.500	2.880	2.260
44.00	43.500	5.650	2.570	2.570
47.00	47.000	5.650	3.190	2.260
48.00	48.500	5.650	2.880	2.570
50.00	49.500	5.650	2.570	2.880
55.00	54.500	5.750	3.190	2.570
56.50	57.000	5.750	2.880	2.880
63.00	63.500	5.800	3.190	2.880
70.00	70.300	5.800	3.400	2.880
77.00	77.100	5.800	3.700	2.880
84.00	83.900	5.800	4.100	2.880
91.00	90.700	5.800	4.400	2.880

# PRIMARY AIR HANDLING UNIT EQUIPPED FOR HIGH PRESSURE ADIABATIC HUMIDIFICATION

Unit configured to treat replacement air in rooms consisting of external air inlet damper, flat prefilters G4 efficiency, floppy pocket filters F8 efficiency, heating and cooling batteries, section for high pressure adiabatic humidification, post-heating coil and blower fan.



MOD AHU	Portata (m³/h)	L (mm)	P (mm)	H (mm)
2.25	2.200	4.400	800	800
2.50	2.500	4.450	800	900
3.00	3.000	4.500	1.010	800
3.50	3.500	4.550	1.010	900
4.30	4.300	4.550	1.315	800
5.00	5.000	4.650	1.315	900
6.00	6.000	4.700	1.315	1.010
7.20	7.200	4.850	1.315	1.160
8.60	8.600	4.950	1.315	1.315
11.50S	11.500	5.000	1.620	1.315
11.50V	11.500	5.000	1.315	1.620
14.00	14.000	5.150	1.930	1.315
15.00	15.000	5.200	1.620	1.620
18.20	18.200	5.400	1.930	1.620
22.50	22.500	5.700	1.930	1.930
25.50	25.500	5.800	2.570	1.650
32.00	31.000	6.000	2.570	1.960
32.50	32.000	6.000	2.260	2.260
36.00	36.500	6.200	2.880	1.960
38.00	37.000	6.350	2.570	2.260
41.00	41.000	6.350	3.190	1.960
42.00	42.000	6.350	2.880	2.260
44.00	43.500	6.400	2.570	2.570
47.00	47.000	6.400	3.190	2.260
48.00	48.500	6.450	2.880	2.570
50.00	49.500	6.600	2.570	2.880
55.00	54.500	6.600	3.190	2.570
56.50	57.000	6.600	2.880	2.880
63.00	63.500	6.600	3.190	2.880
70.00	70.300	6.600	3.400	2.880
77.00	77.100	6.600	3.700	2.880
84.00	83.900	6.600	4.100	2.880
91.00	90.700	6.600	4.400	2.880

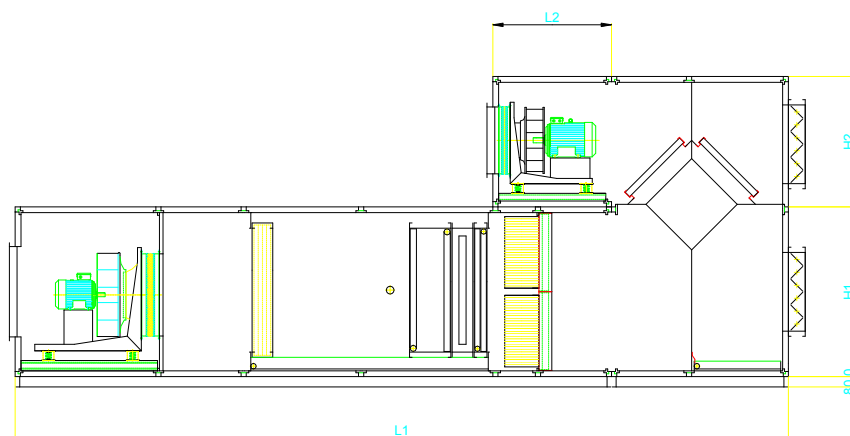
SIZES



## MAIN CONFIGURATIONS

### PRIMARY AIR HANDLING UNIT WITH HEAT RECOVERY AND STEAM HUMIDIFICATION UNIT

Unit configured to treat replacement air in rooms, complete with heat recovery section. This model includes: extractor fan, cross-flow regenerator with external air inlet damper, discharge damper, by-pass damper for free-cooling, flat G4 efficiency pre-filters for intake and outlet, F8 efficiency floppy pocket filters, heating and cooling batteries, section equipped for steam humidification and blower fan.



#### SIZES

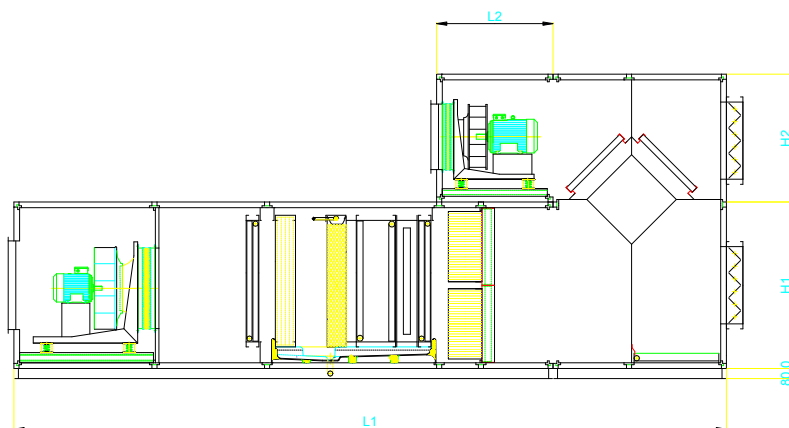
MOD AHU	Portata (m³/h)	L1* (mm)	L2* (mm)	L3** (mm)	P (mm)	H1 (mm)	H2 (mm)
2.25	2.200	4.550	1.300	250	800	800	800
2.50	2.500	4.700	1.350	250	800	900	900
3.00	3.000	4.550	1.350	250	1.010	800	800
3.50	3.500	4.750	1.400	250	1.010	900	900
4.30	4.300	4.700	1.400	250	1.315	800	800
5.00	5.000	4.900	1.450	250	1.315	900	900
6.00	6.000	5.050	1.550	250	1.315	1.010	1.010
7.20	7.200	5.350	1.600	350	1.315	1.160	1.160
8.60	8.600	5.500	1.700	450	1.315	1.315	1.315
11.50S	11.500	5.700	1.900	450	1.620	1.315	1.315
11.50V	11.500	6.050	1.800	450	1.315	1.620	1.620
14.00	14.000	5.800	1.900	500	1.930	1.315	1.315
15.00	15.000	5.950	1.900	500	1.620	1.620	1.620
18.20	18.200	6.250	2.000	500	1.930	1.620	1.620
22.50	22.500	6.750	2.150	650	1.930	1.930	1.930
25.50	25.500	6.750	2.400	650	2.570	1.650	1.650
32.00	31.000	7.100	2.450	650	2.570	1.960	1.960
32.50	32.000	7.400	2.450	650	2.260	2.260	2.260
36.00	36.500	7.200	2.450	650	2.880	1.960	1.960
38.00	37.000	7.600	2.650	650	2.570	2.260	2.260
41.00	41.000	7.250	2.700	650	3.190	1.960	1.960
42.00	42.000	7.600	2.700	650	2.880	2.260	2.260
44.00	43.500	8.000	2.850	650	2.570	2.570	2.570
47.00	47.000	7.750	2.850	650	3.190	2.260	2.260
48.00	48.500	8.000	2.850	800	2.880	2.570	2.570
50.00	49.500	8.300	2.850	800	2.570	2.880	2.880
55.00	54.500	8.250	3.000	800	3.190	2.570	2.570
56.50	57.000	8.300	3.000	800	2.880	2.880	2.880
63.00	63.500	8.450	3.000	800	3.190	2.880	2.880
70.00	70.300	8.450	3.000	800	3.400	2.880	2.880
77.00	77.100	8.450	3.000	800	3.700	2.880	2.880
84.00	83.900	8.450	3.000	800	4.100	2.880	2.880
91.00	90.700	8.450	3.000	800	4.400	2.880	2.880

\*La lunghezza della AHU nell'esecuzione in linea è data dalla somma di L1 ed L2.

\*\*L3 = incremento di lunghezza sezione di recupero per inserimento serranda di by-pass di ricircolo nell'esecuzione sovrapposta.

## PRIMARY AIR HANDLING UNIT WITH HEAT RECOVERY AND DISPOSABLE ADIABATIC HUMIDIFICATION UNIT

Unit configured to treat replacement air in rooms, complete with heat recovery section. This model includes: extractor fan, cross-flow regenerator with external air inlet damper, discharge damper, by-pass damper for free-cooling, flat G4 efficiency pre-filters for intake and outlet, F8 efficiency floppy pocket filters, heating and cooling batteries, equipped for high pressure adiabatic humidification, post-heating coil and blower fan.



MOD AHU	Portata (m³/h)	L1* (mm)	L2* (mm)	L3** (mm)	P (mm)	H1 (mm)	H2 (mm)
2.25	2.200	4.150	1.300	250	800	800	800
2.50	2.500	4.250	1.350	250	800	900	900
3.00	3.000	4.100	1.350	250	1.010	800	800
3.50	3.500	4.300	1.400	250	1.010	900	900
4.30	4.300	4.310	1.400	250	1.315	800	800
5.00	5.000	4.450	1.450	250	1.315	900	900
6.00	6.000	4.600	1.550	250	1.315	1.010	1.010
7.20	7.200	4.850	1.600	350	1.315	1.160	1.160
8.60	8.600	4.950	1.700	450	1.315	1.315	1.315
11.50S	11.500	5.150	1.900	450	1.620	1.315	1.315
11.50V	11.500	5.500	1.800	450	1.315	1.620	1.620
14.00	14.000	5.400	1.900	500	1.930	1.315	1.315
15.00	15.000	5.500	1.900	500	1.620	1.620	1.620
18.20	18.200	5.700	2.000	500	1.930	1.620	1.620
22.50	22.500	6.150	2.150	650	1.930	1.930	1.930
25.50	25.500	6.400	2.400	650	2.570	1.650	1.650
32.00	31.000	6.650	2.450	650	2.570	1.960	1.960
32.50	32.000	6.950	2.450	650	2.260	2.260	2.260
36.00	36.500	6.900	2.450	650	2.880	1.960	1.960
38.00	37.000	7.100	2.650	650	2.570	2.260	2.260
41.00	41.000	6.800	2.700	650	3.190	1.960	1.960
42.00	42.000	7.100	2.700	650	2.880	2.260	2.260
44.00	43.500	7.550	2.850	650	2.570	2.570	2.570
47.00	47.000	7.350	2.850	650	3.190	2.260	2.260
48.00	48.500	7.500	2.850	800	2.880	2.570	2.570
50.00	49.500	7.650	2.850	800	2.570	2.880	2.880
55.00	54.500	7.800	3.000	800	3.190	2.570	2.570
56.50	57.000	7.750	3.000	800	2.880	2.880	2.880
63.00	63.500	7.950	3.000	800	3.190	2.880	2.880
70.00	70.300	7.950	3.000	800	3.400	2.880	2.880
77.00	77.100	7.950	3.000	800	3.700	2.880	2.880
84.00	83.900	7.950	3.000	800	4.100	2.880	2.880
91.00	90.700	7.950	3.000	800	4.400	2.880	2.880

SIZES

**samp**

\*Length of in-line AHU comes from sum of L1 and L2.

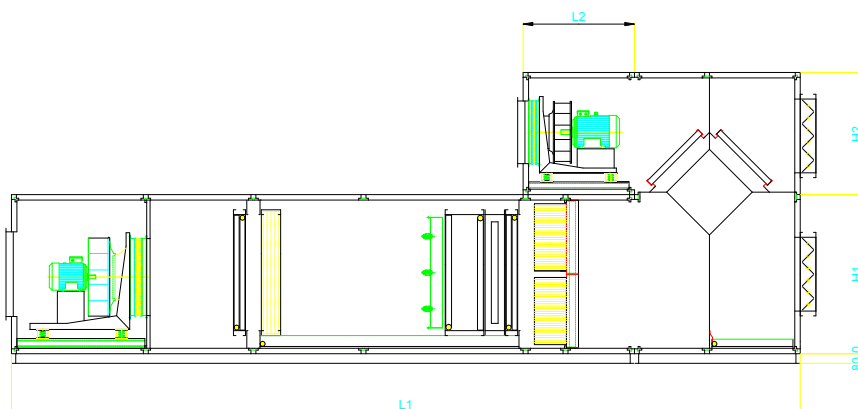
\*\*L3 = increase in recovery section length to include recirculation by-pass damper in overlap version.



## MAIN CONFIGURATIONS

### PRIMARY AIR HANDLING UNIT WITH HEAT RECOVERY UNIT EQUIPPED FOR HIGH PRESSURE ADIABATIC HUMIDIFICATION

Unit configured to treat replacement air in rooms, complete with heat recovery section. This model includes: extractor fan, cross-flow regenerator with external air inlet damper, discharge damper, by-pass damper for free-cooling, flat G4 efficiency pre-filters for intake and outlet, F8 efficiency floppy pocket filters, heating and cooling batteries, equipped for high pressure adiabatic humidification, post-heating coil and blower fan.



#### SIZES

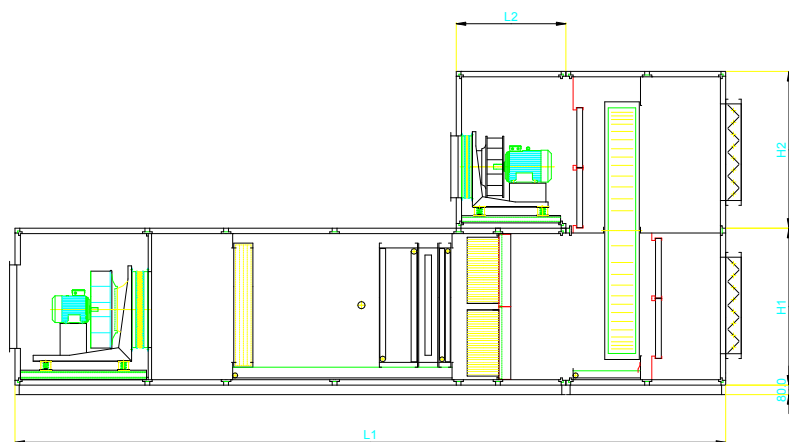
MOD AHU	Portata (m³/h)	L1* (mm)	L2* (mm)	L3** (mm)	P (mm)	H1 (mm)	H2 (mm)
2.25	2.200	5.050	1.300	250	800	800	800
2.50	2.500	5.200	1.350	250	800	900	900
3.00	3.000	5.050	1.350	250	1.010	800	800
3.50	3.500	5.250	1.400	250	1.010	900	900
4.30	4.300	5.200	1.400	250	1.315	800	800
5.00	5.000	5.400	1.450	250	1.315	900	900
6.00	6.000	5.550	1.550	250	1.315	1.010	1.010
7.20	7.200	5.850	1.600	350	1.315	1.160	1.160
8.60	8.600	6.000	1.700	450	1.315	1.315	1.315
11.50S	11.500	6.100	1.900	450	1.620	1.315	1.315
11.50V	11.500	6.450	1.800	450	1.315	1.620	1.620
14.00	14.000	6.300	1.900	500	1.930	1.315	1.315
15.00	15.000	6.450	1.900	500	1.620	1.620	1.620
18.20	18.200	6.750	2.000	500	1.930	1.620	1.620
22.50	22.500	7.200	2.150	650	1.930	1.930	1.930
25.50	25.500	7.200	2.400	650	2.570	1.650	1.650
32.00	31.000	7.500	2.450	650	2.570	1.960	1.960
32.50	32.000	7.800	2.450	650	2.260	2.260	2.260
36.00	36.500	7.600	2.450	650	2.880	1.960	1.960
38.00	37.000	7.950	2.650	650	2.570	2.260	2.260
41.00	41.000	7.650	2.700	650	3.190	1.960	1.960
42.00	42.000	7.950	2.700	650	2.880	2.260	2.260
44.00	43.500	8.300	2.850	650	2.570	2.570	2.570
47.00	47.000	8.100	2.850	650	3.190	2.260	2.260
48.00	48.500	8.300	2.850	800	2.880	2.570	2.570
50.00	49.500	8.600	2.850	800	2.570	2.880	2.880
55.00	54.500	8.650	3.000	800	3.190	2.570	2.570
56.50	57.000	8.600	3.000	800	2.880	2.880	2.880
63.00	63.500	8.750	3.000	800	3.190	2.880	2.880
70.00	70.300	8.750	3.000	800	3.400	2.880	2.880
77.00	77.100	8.750	3.000	800	3.700	2.880	2.880
84.00	83.900	8.750	3.000	800	4.100	2.880	2.880
91.00	90.700	8.750	3.000	800	4.400	2.880	2.880

\*Length of in-line AHU comes from sum of L1 and L2.

\*\*L3 = increase in recovery section length to include recirculation by-pass damper in overlap version.

## PRIMARY AIR HANDLING UNIT WITH ROTARY TYPE HEAT RECOVERY AND STEAM HUMIDIFICATION UNIT

Unit configured to treat replacement air in rooms, complete with heat recovery section. This model includes: extractor fan, rotary regenerator with external air inlet damper, discharge damper, flat G4 efficiency pre-filters for intake and outlet, F8 efficiency floppy pocket filters, heating and cooling batteries, section equipped for steam humidification, blower fan.



MOD AHU	Portata (m³/h)	L1* (mm)	L2* (mm)	L3** (mm)	P (mm)	H1 (mm)	H2 (mm)
2.25	2.200	4.250	1.550	250	800	800	800
2.50	2.500	4.300	1.700	250	800	900	900
3.00	3.000	4.300	1.550	200	1.010	800	800
3.50	3.500	4.500	1.600	200	1.010	900	900
4.30	4.300	4.600	1.750	100	1.315	800	800
5.00	5.000	4.800	1.700	100	1.315	900	900
6.00	6.000	4.800	1.800	100	1.315	1.010	1.010
7.20	7.200	4.950	1.950	150	1.315	1.160	1.160
8.60	8.600	4.950	2.050	250	1.315	1.315	1.315
11.50S	11.500	5.200	2.500	300	1.620	1.315	1.315
11.50V	11.500	-	-	-	-	-	-
14.00	14.000	5.300	2.700	100	1.930	1.315	1.315
15.00	15.000	5.250	2.400	300	1.620	1.620	1.620
18.20	18.200	5.550	2.700	200	1.930	1.620	1.620
22.50	22.500	5.800	2.850	350	1.930	1.930	1.930
25.50	25.500	6.200	3.650	150	2.570	1.650	1.650
32.00	31.000	6.400	3.550	150	2.570	1.960	1.960
32.50	32.000	6.400	3.150	150	2.260	2.260	2.260
36.00	36.500	6.500	3.750	150	2.880	1.960	1.960
38.00	37.000	6.600	3.750	150	2.570	2.260	2.260
41.00	41.000	6.650	3.900	100	3.190	1.960	1.960
42.00	42.000	6.700	3.900	100	2.880	2.260	2.260
44.00	43.500	6.750	3.900	610	2.570	2.570	2.570
47.00	47.000	6.850	4.050	100	3.190	2.260	2.260
48.00	48.500	7.100	4.050	250	2.880	2.570	2.570
50.00	49.500	-	-	-	-	-	-
55.00	54.500	7.100	4.150	250	3.190	2.570	2.570
56.50	57.000	-	-	-	-	-	-
63.00	63.500	7.300	4.150	250	3.190	2.880	2.880
70.00	70.300	°	°	°	3.400	2.880	2.880
77.00	77.100	°	°	°	3.700	2.880	2.880
84.00	83.900	°	°	°	4.100	2.880	2.880
91.00	90.700	°	°	°	4.400	2.880	2.880

**SIZES**

**samp**

\*\*Length of in-line AHU comes from sum of L1 and L2.

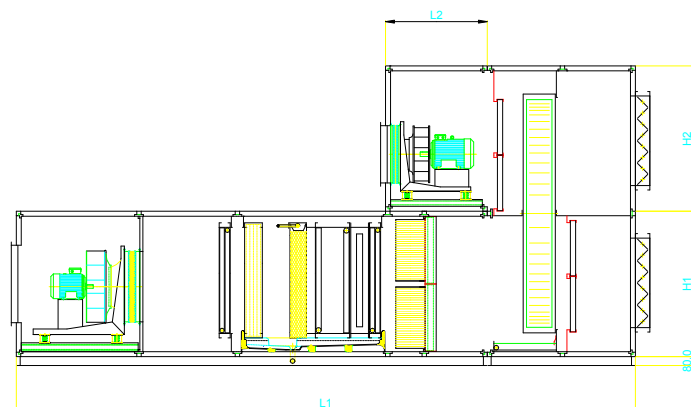
\*\*L3 = increase in recovery section length to include recirculation by-pass damper in overlap version

° Special version on request.

## MAIN CONFIGURATIONS

### PRIMARY AIR HANDLING UNIT WITH ROTARY TYPE HEAT RECOVERY AND DISPOSABLE ADIABATIC HUMIDIFICATION UNIT

Unit configured to treat replacement air in rooms, complete with heat recovery section. This model includes: extractor fan, rotary regenerator with external air inlet damper, discharge damper, flat G4 efficiency pre-filters for intake and outlet, F8 efficiency floppy pocket filters, heating and cooling batteries, disposable adiabatic humidification pack section, post-heating coil and blower fan.



#### SIZES

MOD AHU	Portata (m³/h)	L1* (mm)	L2* (mm)	L3** (mm)	P (mm)	H1 (mm)	H2 (mm)
2.25	2.200	3.850	1.550	250	800	800	800
2.50	2.500	3.850	1.700	250	800	900	900
3.00	3.000	3.850	1.550	200	1.010	800	800
3.50	3.500	4.050	1.600	200	1.010	900	900
4.30	4.300	4.210	1.750	100	1.315	800	800
5.00	5.000	4.350	1.700	100	1.315	900	900
6.00	6.000	4.350	1.800	100	1.315	1.010	1.010
7.20	7.200	4.450	1.950	150	1.315	1.160	1.160
8.60	8.600	4.400	2.050	250	1.315	1.315	1.315
11.50S	11.500	4.500	2.500	300	1.620	1.315	1.315
11.50V	11.500	-	-	-	-	-	-
14.00	14.000	4.900	2.700	100	1.930	1.315	1.315
15.00	15.000	4.800	2.400	300	1.620	1.620	1.620
18.20	18.200	5.000	2.700	200	1.930	1.620	1.620
22.50	22.500	5.200	2.850	350	1.930	1.930	1.930
25.50	25.500	5.850	3.650	150	2.570	1.650	1.650
32.00	31.000	5.950	3.550	150	2.570	1.960	1.960
32.50	32.000	5.950	3.150	150	2.260	2.260	2.260
36.00	36.500	6.200	3.750	150	2.880	1.960	1.960
38.00	37.000	6.100	3.750	150	2.570	2.260	2.260
41.00	41.000	6.200	3.900	100	3.190	1.960	1.960
42.00	42.000	6.200	3.900	100	2.880	2.260	2.260
44.00	43.500	6.300	3.900	610	2.570	2.570	2.570
47.00	47.000	6.450	4.050	100	3.190	2.260	2.260
48.00	48.500	6.600	4.050	250	2.880	2.570	2.570
50.00	49.500	-	-	-	-	-	-
55.00	54.500	6.650	4.150	250	3.190	2.570	2.570
56.50	57.000	-	-	-	-	-	-
63.00	63.500	6.800	4.150	250	3.190	2.880	2.880
70.00	70.300	°	°	°	3.400	2.880	2.880
77.00	77.100	°	°	°	3.700	2.880	2.880
84.00	83.900	°	°	°	4.100	2.880	2.880
91.00	90.700	°	°	°	4.400	2.880	2.880

\* Length of in-line AHU comes from sum of L1 and L2.

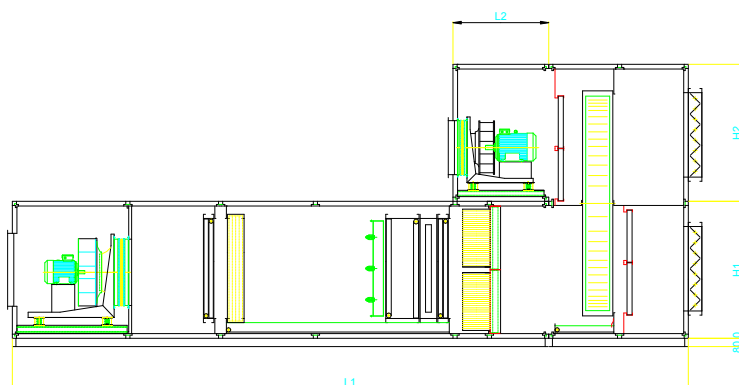
\*\*L3 = increase in recovery section length to include recirculation by-pass damper in overlap version

° Special version on request.

**samp**

## PRIMARY AIR HANDLING UNIT WITH ROTARY TYPE HEAT RECOVERY EQUIPPED FOR HIGH PRESSURE HUMIDIFICATION

Unit configured to treat replacement air in rooms, complete with heat recovery section. This model includes: extractor fan, cross-flow regenerator with external air inlet damper, discharge damper, flat G4 efficiency pre-filters for intake and outlet, F8 efficiency floppy pocket filters, heating and cooling batteries, equipped for high pressure adiabatic humidification, post-heating coil and blower fan.



MOD AHU	Portata (m³/h)	L1* (mm)	L2* (mm)	L3** (mm)	P (mm)	H1 (mm)	H2 (mm)
2.25	2.200	4.750	1.550	250	800	800	800
2.50	2.500	4.800	1.700	250	800	900	900
3.00	3.000	4.800	1.550	200	1.010	800	800
3.50	3.500	5.000	1.600	200	1.010	900	900
4.30	4.300	5.100	1.750	100	1.315	800	800
5.00	5.000	5.300	1.700	100	1.315	900	900
6.00	6.000	5.300	1.800	100	1.315	1.010	1.010
7.20	7.200	5.450	1.950	150	1.315	1.160	1.160
8.60	8.600	5.450	2.050	250	1.315	1.315	1.315
11.50S	11.500	5.450	2.500	300	1.620	1.315	1.315
11.50V	11.500	-	-	-	-	-	-
14.00	14.000	5.800	2.700	100	1.930	1.315	1.315
15.00	15.000	5.750	2.400	300	1.620	1.620	1.620
18.20	18.200	6.050	2.700	200	1.930	1.620	1.620
22.50	22.500	6.250	2.850	350	1.930	1.930	1.930
25.50	25.500	6.650	3.650	150	2.570	1.650	1.650
32.00	31.000	6.800	3.550	150	2.570	1.960	1.960
32.50	32.000	6.800	3.150	150	2.260	2.260	2.260
36.00	36.500	6.900	3.750	150	2.880	1.960	1.960
38.00	37.000	6.950	3.750	150	2.570	2.260	2.260
41.00	41.000	7.050	3.900	100	3.190	1.960	1.960
42.00	42.000	7.050	3.900	100	2.880	2.260	2.260
44.00	43.500	7.050	3.900	610	2.570	2.570	2.570
47.00	47.000	7.200	4.050	100	3.190	2.260	2.260
48.00	48.500	7.400	4.050	250	2.880	2.570	2.570
50.00	49.500	-	-	-	-	-	-
55.00	54.500	7.500	4.150	250	3.190	2.570	2.570
56.50	57.000	-	-	-	-	-	-
63.00	63.500	7.600	4.150	250	3.190	2.880	2.880
70.00	70.300	°	°	°	3.400	2.880	2.880
77.00	77.100	°	°	°	3.700	2.880	2.880
84.00	83.900	°	°	°	4.100	2.880	2.880
91.00	90.700	°	°	°	4.400	2.880	2.880

SIZES

**samp**®

\* Length of in-line AHU comes from sum of L1 and L2.

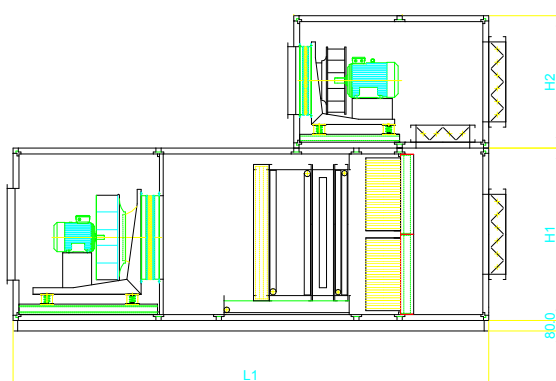
\*\*L3 = increase in recovery section length to include recirculation by-pass damper in overlap version

° Special version on request.

## MAIN CONFIGURATIONS

### ALL-AIR-CONDITIONING UNIT WITH FREE-COOLING SECTION

Unit configured to treat all-air-conditioning installations complete with free-cooling section with damper circuit. This model includes: intake fan, free-cooling section with external air inlet damper, discharge and recirculation dampers sized for total flow rate, flat G4 efficiency pre-filters, F8 efficiency floppy pocket filters, heating and cooling batteries and blower fan.



#### SIZES

MOD AHU	Portata (m³/h)	L1* (mm)	L2** (mm)	P (mm)	H1 (mm)	H2 (mm)
2.25	2.200	2.900	4.000	800	800	800
2.50	2.500	2.950	4.100	800	900	900
3.00	3.000	2.950	4.150	1.010	800	800
3.50	3.500	3.050	4.300	1.010	900	900
4.30	4.300	3.050	4.400	1.315	800	800
5.00	5.000	3.100	4.550	1.315	900	900
6.00	6.000	3.200	4.800	1.315	1.010	1.010
7.20	7.200	3.200	4.950	1.315	1.160	1.160
8.60	8.600	3.350	5.350	1.315	1.315	1.315
11.50S	11.500	3.600	5.450	1.620	1.315	1.315
11.50V	11.500	3.600	5.600	1.315	1.620	1.620
14.00	14.000	3.550	5.600	1.930	1.315	1.315
15.00	15.000	3.750	5.950	1.620	1.620	1.620
18.20	18.200	3.800	6.200	1.930	1.620	1.620
22.50	22.500	4.150	6.550	1.930	1.930	1.930
25.50	25.500	4.300	6.850	2.570	1.650	1.650
32.00	31.000	4.500	7.550	2.570	1.960	1.960
32.50	32.000	4.500	7.700	2.260	2.260	2.260
36.00	36.500	4.700	7.550	2.880	1.960	1.960
38.00	37.000	4.700	7.750	2.570	2.260	2.260
41.00	41.000	4.800	7.950	3.190	1.960	1.960
42.00	42.000	4.850	8.100	2.880	2.260	2.260
44.00	43.500	5.100	8.400	2.570	2.570	2.570
47.00	47.000	4.850	8.700	3.190	2.260	2.260
48.00	48.500	4.850	8.700	2.880	2.570	2.570
50.00	49.500	4.850	8.700	2.570	2.880	2.880
55.00	54.500	4.950	8.850	3.190	2.570	2.570
56.50	57.000	4.950	8.850	2.880	2.880	2.880
63.00	63.500	4.950	8.900	3.190	2.880	2.880
70.00	70.300	4.950	8.900	3.400	2.880	2.880
77.00	77.100	4.950	8.900	3.700	2.880	2.880
84.00	83.900	4.950	8.900	4.100	2.880	2.880
91.00	90.700	4.950	8.900	4.400	2.880	2.880

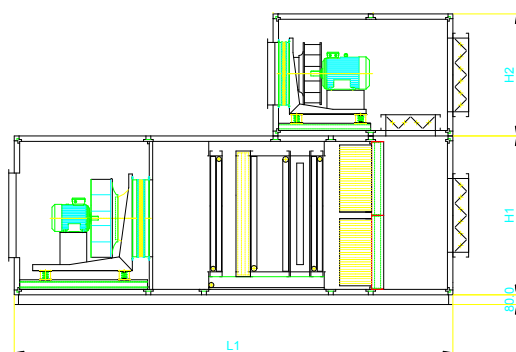
\* L1 = Overlapped AHU length

\*\* L2 = In line AHU length

**samp**

## ALL-AIR-CONDITIONING UNIT WITH FREE-COOLING AND POST-HEATING SECTION

Unit configured to treat all-air-conditioning installations complete with free-cooling section with damper circuit. This model includes: intake fan, free-cooling section with external air inlet damper, discharge and recirculation dampers sized for total flow rate, flat G4 efficiency pre-filters, F8 efficiency floppy pocket filters, heating and cooling batteries, post heating coil and blower fan.



MOD AHU	Portata (m³/h)	L1* (mm)	L2** (mm)	P (mm)	H1 (mm)	H2 (mm)
2.25	2.200	3.150	4.250	800	800	800
2.50	2.500	3.200	4.350	800	900	900
3.00	3.000	3.200	4.400	1.010	800	800
3.50	3.500	3.300	4.550	1.010	900	900
4.30	4.300	3.300	4.650	1.315	800	800
5.00	5.000	3.350	4.800	1.315	900	900
6.00	6.000	3.450	5.050	1.315	1.010	1.010
7.20	7.200	3.450	5.200	1.315	1.160	1.160
8.60	8.600	3.600	5.600	1.315	1.315	1.315
11.50S	11.500	3.850	5.700	1.620	1.315	1.315
11.50V	11.500	3.850	5.850	1.315	1.620	1.620
14.00	14.000	3.800	5.850	1.930	1.315	1.315
15.00	15.000	4.000	6.200	1.620	1.620	1.620
18.20	18.200	4.050	6.450	1.930	1.620	1.620
22.50	22.500	4.400	6.800	1.930	1.930	1.930
25.50	25.500	4.550	7.100	2.570	1.650	1.650
32.00	31.000	4.750	7.800	2.570	1.960	1.960
32.50	32.000	4.750	7.950	2.260	2.260	2.260
36.00	36.500	4.950	7.800	2.880	1.960	1.960
38.00	37.000	4.950	8.000	2.570	2.260	2.260
41.00	41.000	5.050	8.200	3.190	1.960	1.960
42.00	42.000	5.100	8.350	2.880	2.260	2.260
44.00	43.500	5.350	8.650	2.570	2.570	2.570
47.00	47.000	5.100	8.950	3.190	2.260	2.260
48.00	48.500	5.100	8.950	2.880	2.570	2.570
50.00	49.500	5.100	8.950	2.570	2.880	2.880
55.00	54.500	5.200	9.100	3.190	2.570	2.570
56.50	57.000	5.200	9.100	2.880	2.880	2.880
63.00	63.500	5.200	9.150	3.190	2.880	2.880
70.00	70.300	5.200	9.150	3.400	2.880	2.880
77.00	77.100	5.200	9.150	3.700	2.880	2.880
84.00	83.900	5.200	9.150	4.100	2.880	2.880
91.00	90.700	5.200	9.150	4.400	2.880	2.880

\*L1 = Overlapped AHU length

\*\*L2 = In line AHU length

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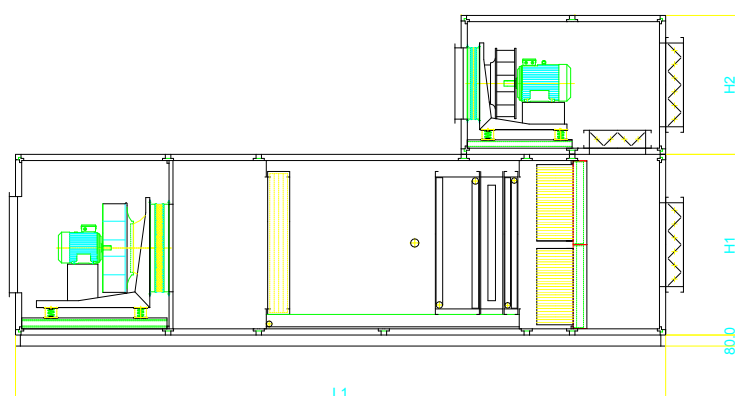
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## MAIN CONFIGURATIONS

### ALL-AIR-CONDITIONING UNIT WITH FREE-COOLING AND STEAM HUMIDIFICATION SECTION

Unit configured to treat all-air-conditioning installations complete with free-cooling section with damper circuit. This model includes: intake fan, free-cooling section with external air inlet damper, discharge and recirculation dampers sized for total flow rate, flat G4 efficiency pre-filters, F8 efficiency floppy pocket filters, heating and cooling batteries, empty section equipped for steam humidification and blower fan.



### SIZES

MOD AHU	Portata (m³/h)	L1* (mm)	L2** (mm)	P (mm)	H1 (mm)	H2 (mm)
2.25	2.200	3.650	4.750	800	800	800
2.50	2.500	3.700	4.850	800	900	900
3.00	3.000	3.650	4.850	1.010	800	800
3.50	3.500	3.750	5.000	1.010	900	900
4.30	4.300	3.750	5.100	1.315	800	800
5.00	5.000	3.800	5.250	1.315	900	900
6.00	6.000	3.750	5.350	1.315	1.010	1.010
7.20	7.200	3.850	5.600	1.315	1.160	1.160
8.60	8.600	4.000	6.000	1.315	1.315	1.315
11.50S	11.500	4.300	6.150	1.620	1.315	1.315
11.50V	11.500	4.450	6.300	1.315	1.620	1.620
14.00	14.000	4.250	6.300	1.930	1.315	1.315
15.00	15.000	4.500	6.700	1.620	1.620	1.620
18.20	18.200	4.550	6.950	1.930	1.620	1.620
22.50	22.500	5.000	7.400	1.930	1.930	1.930
25.50	25.500	5.200	7.750	2.570	1.650	1.650
32.00	31.000	5.350	8.400	2.570	1.960	1.960
32.50	32.000	5.350	8.550	2.260	2.260	2.260
36.00	36.500	5.650	8.500	2.880	1.960	1.960
38.00	37.000	5.850	8.900	2.570	2.260	2.260
41.00	41.000	5.750	8.900	3.190	1.960	1.960
42.00	42.000	5.950	9.200	2.880	2.260	2.260
44.00	43.500	6.350	9.650	2.570	2.570	2.570
47.00	47.000	5.800	9.650	3.190	2.260	2.260
48.00	48.500	5.900	9.750	2.880	2.570	2.570
50.00	49.500	5.900	9.750	2.570	2.880	2.880
55.00	54.500	5.900	9.800	3.190	2.570	2.570
56.50	57.000	6.000	9.900	2.880	2.880	2.880
63.00	63.500	5.950	9.900	3.190	2.880	2.880
70.00	70.300	5.950	9.900	3.400	2.880	2.880
77.00	77.100	5.950	9.900	3.700	2.880	2.880
84.00	83.900	5.950	9.900	4.100	2.880	2.880
91.00	90.700	5.950	9.900	4.400	2.880	2.880

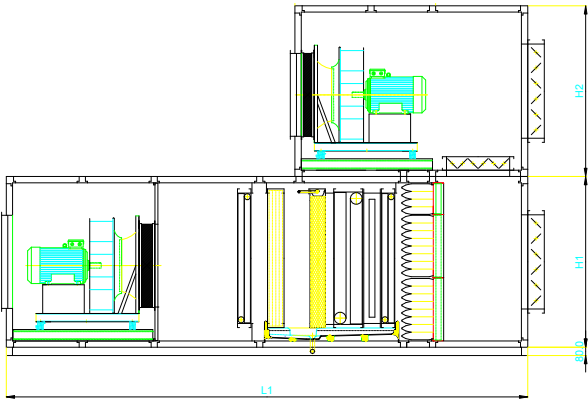
\* L1 = Overlapped AHU length

\*\*L2 = In line AHU length

**samp**

## ALL-AIR-CONDITIONING UNIT WITH FREE-COOLING AND ADIABATIC HUMIDIFICATION SECTION

Unit configured to treat all-air-conditioning installations complete with free-cooling section with damper circuit. This model includes: intake fan, free-cooling section with external air inlet damper, discharge and recirculation dampers sized for total flow rate, flat G4 efficiency pre-filters, F8 efficiency floppy pocket filters, heating and cooling batteries, disposable adiabatic humidification section, post heating coil and blower fan.



MOD AHU	Portata (m³/h)	L1* (mm)	L2** (mm)	P (mm)	H1 (mm)	H2 (mm)
2.25	2.200	3.250	4.350	800	800	800
2.50	2.500	3.250	4.400	800	900	900
3.00	3.000	3.250	4.400	1.010	800	800
3.50	3.500	3.300	4.550	1.010	900	900
4.30	4.300	3.360	4.710	1.315	800	800
5.00	5.000	3.350	4.800	1.315	900	900
6.00	6.000	3.300	4.900	1.315	1.010	1.010
7.20	7.200	3.350	5.100	1.315	1.160	1.160
8.60	8.600	3.450	5.450	1.315	1.315	1.315
11.50S	11.500	3.750	5.600	1.620	1.315	1.315
11.50V	11.500	3.900	5.750	1.315	1.620	1.620
14.00	14.000	3.850	5.900	1.930	1.315	1.315
15.00	15.000	4.050	6.200	1.620	1.620	1.620
18.20	18.200	4.000	6.400	1.930	1.620	1.620
22.50	22.500	4.400	6.800	1.930	1.930	1.930
25.50	25.500	4.850	7.400	2.570	1.650	1.650
32.00	31.000	4.900	7.950	2.570	1.960	1.960
32.50	32.000	4.900	8.100	2.260	2.260	2.260
36.00	36.500	5.350	8.200	2.880	1.960	1.960
38.00	37.000	5.350	8.400	2.570	2.260	2.260
41.00	41.000	5.300	8.450	3.190	1.960	1.960
42.00	42.000	5.450	8.700	2.880	2.260	2.260
44.00	43.500	5.900	9.200	2.570	2.570	2.570
47.00	47.000	5.400	9.250	3.190	2.260	2.260
48.00	48.500	5.400	9.250	2.880	2.570	2.570
50.00	49.500	5.250	9.100	2.570	2.880	2.880
55.00	54.500	5.450	9.350	3.190	2.570	2.570
56.50	57.000	5.450	9.350	2.880	2.880	2.880
63.00	63.500	5.450	9.400	3.190	2.880	2.880
70.00	70.300	5.450	9.400	3.400	2.880	2.880
77.00	77.100	5.450	9.400	3.700	2.880	2.880
84.00	83.900	5.450	9.400	4.100	2.880	2.880
91.00	90.700	5.450	9.400	4.400	2.880	2.880

\*L1 = Overlapped AHU length

\*\*L2 = In line AHU length

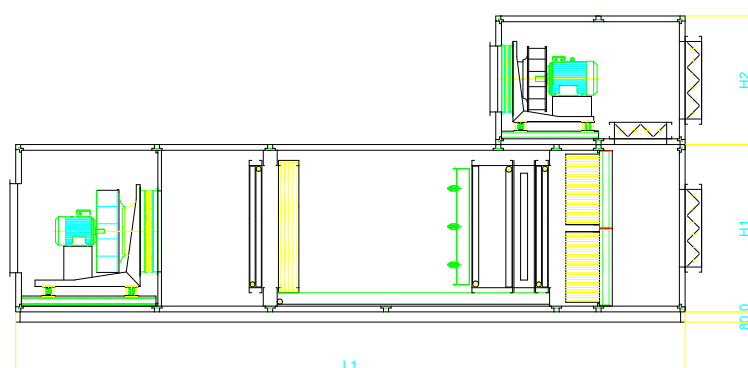
SIZES



## MAIN CONFIGURATIONS

### ALL-AIR-CONDITIONING UNIT WITH FREE-COOLING SECTION EQUIPPED FOR HIGH PRESSURE ADIABATIC HUMIDIFICATION

Unità configurata per il trattamento di impianti a tutt'aria completa di sezione free-cooling con terna di serrande; questa esecuzione comprende: ventilatore diripresa, sezione free-cooling con serranda di presa aria esterna, serranda di espulsione e serranda di ricircolo dimensionate per la portata totale, pre-filtri piani eff. G4, filtri a tasche flosce eff. F8, batteria di riscaldamento, batteria di raffreddamento, predisposizione per sezione di umidificazione adiabatica ad alta pressione, batteria di post-riscaldamento e ventilatore di mandata.



#### SIZES

MOD AHU	Portata (m³/h)	L1* (mm)	L2** (mm)	P (mm)	H1 (mm)	H2 (mm)
2.25	2.200	4.150	5.250	800	800	800
2.50	2.500	4.200	5.350	800	900	900
3.00	3.000	4.150	5.350	1.010	800	800
3.50	3.500	4.250	5.500	1.010	900	900
4.30	4.300	4.250	5.600	1.315	800	800
5.00	5.000	4.300	5.750	1.315	900	900
6.00	6.000	4.250	5.850	1.315	1.010	1.010
7.20	7.200	4.350	6.100	1.315	1.160	1.160
8.60	8.600	4.500	6.500	1.315	1.315	1.315
11.50S	11.500	4.700	6.550	1.620	1.315	1.315
11.50V	11.500	4.850	6.700	1.315	1.620	1.620
14.00	14.000	4.750	6.800	1.930	1.315	1.315
15.00	15.000	5.000	7.200	1.620	1.620	1.620
18.20	18.200	5.050	7.450	1.930	1.620	1.620
22.50	22.500	5.450	7.850	1.930	1.930	1.930
25.50	25.500	5.650	8.200	2.570	1.650	1.650
32.00	31.000	5.750	8.800	2.570	1.960	1.960
32.50	32.000	5.750	8.950	2.260	2.260	2.260
36.00	36.500	6.050	8.900	2.880	1.960	1.960
38.00	37.000	6.200	9.250	2.570	2.260	2.260
41.00	41.000	6.150	9.300	3.190	1.960	1.960
42.00	42.000	6.300	9.550	2.880	2.260	2.260
44.00	43.500	6.650	9.950	2.570	2.570	2.570
47.00	47.000	6.150	10.000	3.190	2.260	2.260
48.00	48.500	6.200	10.050	2.880	2.570	2.570
50.00	49.500	6.200	10.050	2.570	2.880	2.880
55.00	54.500	6.300	10.200	3.190	2.570	2.570
56.50	57.000	6.300	10.200	2.880	2.880	2.880
63.00	63.500	6.250	10.200	3.190	2.880	2.880
70.00	70.300	6.250	10.200	3.400	2.880	2.880
77.00	77.100	6.250	10.200	3.700	2.880	2.880
84.00	83.900	6.250	10.200	4.100	2.880	2.880
91.00	90.700	6.250	10.200	4.400	2.880	2.880

\*L1 = Overlapped AHU length





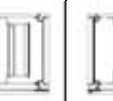
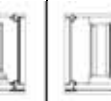
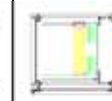
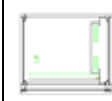
\*\*L2 = In line AHU length

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# AHU DIMENSIONAL TABLE

									
MOD. AHU	Presa aria frontale con filtro a celle	Presa aria superiore / camera miscela con filtro a celle	Presa aria frontale con filtro a tasche	Presa aria superiore / camera miscela con filtro a tasche	Batteria di pre-riscaldamento	Batteria di raffreddamento	Batteria di post-riscaldamento	Umidificazione a pacco	Umidificazione a vapore
	L	L	L ♦	L ♦	L	L	L	L	L ●
2.25	450	450	1000	1000	400	450	250	700	850
2.50	450	450	1000	1000	400	450	250	700	850
3.00	450	450	1000	1000	400	450	250	700	850
3.50	450	450	1000	1000	400	450	250	700	850
4.30	450	500	1000	1000	400	450	250	700	850
5.00	450	500	1000	1000	400	450	250	700	850
6.00	450	500	1000	1000	400	450	250	700	900
7.20	450	600	1000	1000	400	450	250	700	1050
8.60	450	700	1000	1050	400	450	250	700	1150
11.50V	450	700	1000	1050	400	450	250	700	950*
11.50O	450	600	1000	1000	400	450	250	700	1150
14.00	450	650	1000	1000	400	450	250	700	1200
15.00	450	800	1000	1150	400	450	250	700	950*
18.20	450	800	1000	1150	400	450	250	800	950*
22.50	450	800	1150	1150	400	450	250	800	1150*
25.50	630	850	1150	1200	400	450	250	800	950*
32.00	630	950	1150	1300	400	450	250	800	1150*
32.50	630	1150	1150	1500	400	450	250	800	1250*
36.00	630	950	1300	1300	400	450	250	900	1050*
38.00	630	950	1300	1300	400	450	250	800	1350*
41.00	630	950	1300	1300	400	450	250	900	1150*
42.00	630	950	1300	1300	400	450	250	900	1250*
44.00	630	1300	1300	1650	400	450	250	800	1600*
47.00	630	1300	1300	1650	400	450	250	900	1350*
48.00	630	1300	1300	1650	400	450	250	900	1450*
50.00	630	1300	1300	1650	400	450	250	800	1650*
55.00	630	1300	1300	1650	400	450	250	900	1600*
56.50	630	1300	1300	1650	400	450	250	900	1500*
63.00	630	1300	1300	1650	400	450	250	900	1650*
70.00	630	1300	1300	1650	400	450	250	800	1650*
77.00	630	1300	1300	1650	400	450	250	900	1600*
84.00	630	1300	1300	1650	400	450	250	900	1500*
91.00	630	1300	1300	1650	400	450	250	900	1650*

## LEGENDA

- ♦ Le lunghezze sono riferite ai filtri a sacco L = 330 mm ed ai filtri a tasche rigide. Per i filtri a tasche flosce L = 635 mm, aggiungere 300 mm ai dati tabulati. Quando i filtri a tasche sono inseriti a valle delle seguenti sezioni:
  - Sezioni con camera a tre serrande
  - Sezioni di recupero
 considerare una lunghezza fissa di 500 mm (in sostituzione dei dati tabulati) per i filtri a sacco con L = 330 mm e per i filtri a tasche rigide e 800 mm per i filtri a tasche flosce L = 635 mm.

- Le lunghezze della camera di umidificazione a vapore sono dimensionate in riferimento alle seguenti condizioni operative:
  - A. E. 100 %
  - Temperatura di preriscaldamento pari a 20 °C
  - ΔX pari a 5,5 g/kg
  - \* Per lunghezze sezioni contrassegnate con asterisco (\*) previsti n° 2 distributori.
- Le Lunghezze delle sezioni di recupero sono dimensionate considerando il by-pass del recuperatore per il free-cooling totale.

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# AHU SECTIONS

Umidificazione ad ugelli a singola rampa	Camera combinata di miscela		Recuperatore statico sovrapposto senza by-pass di ricircolo	Recuperatore statico sovrapposto con by-pass di ricircolo	Recuperatore statico in linea	Recuperatore rotativo sovrapposto senza by-pass di ricircolo	Recuperatore rotativo sovrapposto con by-pass di ricircolo	Recuperatore rotativi n linea	Sezione ventilante (dim. max flusso orizzontale)	Sezione filtro assoluto con ispezione
L	L		L ●●	L ●●	L ●●	L	L	L	L	L
1300	800	500	1150	1400	1150	850	1100	1100	930	1100
1300	800	500	1250	1500	1250	850	1100	1200	970	1100
1300	800	500	1250	1500	1250	1000	1200	1200	970	1100
1300	800	500	1250	1500	1250	1000	1200	1200	1030	1100
1300	1000	500	1150	1400	1150	1050	1150	1400	1130	1100
1300	1000	500	1250	1500	1250	1150	1250	1400	1200	1100
1300	1000	500	1400	1650	1400	1150	1250	1400	1200	1100
1300	1200	600	1550	1900	1550	1150	1300	1500	1260	1100
1300	1200	700	1700	2150	1700	1150	1400	1500	1530	1100
1300	1400	700	2000	2450	2000	-	-	-	1530	1100
1300	1200	600	1700	2150	1700	1200	1500	1800	1530	1100
1300	1300	650	1700	2200	1700	1200	1300	2000	1630	1100
1300	1400	800	2000	2450	2000	1300	1600	1800	1630	1100
1300	1600	800	2000	2450	2000	1300	1500	2000	1730	1100
1300	1600	800	2250	2850	2250	1300	1650	2000	1890	1100
1300	1600	850	2000	2650	2000	1450	1600	2700	1920	1200
1300	1900	950	2300	2950	2300	1600	1750	2700	2060	1200
1300	2200	1150	2600	3250	2600	1600	1750	2300	2060	1200
1300	1900	950	2300	2950	2300	1600	1750	2900	2320	1300
1300	1900	950	2600	3250	2600	1600	1750	2700	2320	1300
1300	1900	950	2300	2950	2300	1700	1800	2900	2450	1300
1300	1900	950	2600	3250	2600	1700	1800	2900	2450	1300
1300	2450	1300	2900	3550	2900	1650	2260	2700	2450	1300
1300	2450	1300	2600	3250	2600	1700	1800	2900	2450	1300
1300	2450	1300	2600	3250	2600	1700	1950	2900	2450	1300
1300	2450	1300	2900	3700	2900	-	-	-	2450	1300
1300	2450	1300	2900	3700	2900	1750	2000	2900	2450	1300
1300	2450	1300	2900	3700	2900	-	-	-	2450	1300
1300	2450	1300	2900	3700	2900	R	R	R	2450	1300
1300	2450	1300	2900	3700	2900	R	R	R	2450	1300
1300	2450	1300	2900	3700	2900	R	R	R	2450	1300
1300	2450	1300	2900	3700	2900	R	R	R	2450	1300
1300	2450	1300	2900	3700	2900	R	R	R	2450	1300

Batteria elettrica: lunghezza fissa pari a 400 mm

- Esecuzione con recuperatore rotativo non disponibile  
R Esecuzione con recuperatore rotativo a richiesta

Silenziatori (disponibili le seguenti lunghezze standard):

Lunghezza silenziatore (mm)	Lunghezza sezione (mm)
600	800
900	1100
1200	1400
1500	1700
1800	2000
2000	2200

N.B. Samp, nell'ottica del continuo sviluppo e aggiornamento dei propri prodotti si riserva la facoltà di apportare senza preavviso modifiche ai dati riportati sul presente catalogo.

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