System for dual flow controlled mechanical ventilation with heat recovery
Excellent air quality for greater comfort in buildings and a better quality of life

Air quality determines the condition of a building, influences the health and the well-being of its occupants.

Today, energy efficiency regulations have resulted in increasingly insulated buildings, thus reducing energy expenditure but at the same time preventing the natural flow of air.

For this reason a controlled mechanical ventilation system is required to introduce fresh air into buildings in a constant and controlled manner, while monitoring and diluting indoor pollutants such as moisture, CO₂, Radon, VOC, (volatile organic compounds) and formaldehyde.
WHAT CONTROLLED MECHANICAL VENTILATION IS

Building regulations on energy efficiency, applied primarily to new buildings, have caused modern buildings to provide low energy consumption. In this way, properties have improved in terms of insulation, and energy requirements have been significantly reduced. At the same time, however, buildings are consequently less ventilated and periodically opening a window is not enough because air renewal is not constant. Air quality is a fundamental aspect in determining health in buildings, especially as today we spend longer time indoor: it is estimated that we spend between 75% and 90% of our time in closed environments.

The excessive reduction in oxygen and significant increase in components and gas such as Radon, carbon monoxide, ozone, formaldehyde, VOC can prove harmful to our health.

Controlled mechanical ventilation with heat recovery is a system that takes in fresh air from the outside, which, once filtered, guarantees the well-being and hygienic conditions of the building.

The ventilation units feature two fans, one to take out air and the other to bring in fresh air contemporarily. A cross flow, countercurrent heat exchanger recovers the energy contained in the outgoing air and transfers it to the incoming air guaranteeing an efficiency of over 90%. In this way the energy consumption of the building is reduced while at the same time the air in the house in purified by removing pollutants and moisture.
**ADVANTAGES AND BENEFITS**

- **Improved health and hygiene**: constant renewal of air, monitoring of indoor pollutants, non-proliferation of mould and the reduction of pollutants from the outside.

- **Cost saving**: reduction of energy consumption.

- **Sustainability**: reduction of CO$_2$ emissions and protection of the environment.

- **Improvement of comfort**: air is always healthy with controlled temperature and moisture, without drafts and temperature changes. Moreover, stagnation of stale air and formation of mould in the rooms is avoided.

- **Property value**: the building is better preserved over time, thereby maintaining a higher value.

- **Energy efficiency class**: higher energy certification.

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**Sick Building Syndrome**

The Sick Building Syndrome is caused by the absence of a correct ventilation for building occupants, which results in an environment that does not adequately meet certain health characteristics. When affected by the Sick Building Syndrome, building occupants present a number of symptoms such as:

- stinging eyes
- lacrimation
- mild allergic-type symptoms
- asthenia
- headache
- inability to concentrate
- irritation of the respiratory tract, mucous membrane and skin.

WHO (World Health Organization) reports suggest that 20% of the Western population is affected by the sick building syndrome.
6. Stale air extraction
The stale air is extracted and expelled outside the building by the fan inside the heat recovery unit.
HOW THE VALSIR HRV SYSTEM WORKS

1. Incoming stream
Incoming stream brought from the outside by the fan inside the heat recovery unit.

2. Heat-recovery unit
High efficiency heat recovery unit with countercurrent air-air heat exchanger with efficiencies of ≥ 90%.

3. Silencers
The silencers guarantee greater acoustic comfort.

4. Introduction of fresh air into the rooms
Introduction of fresh air into bedrooms, living rooms and studios.

5. Removal of stale air from the rooms
Stale air is extracted from internal rooms where the greatest amount of pollutants are produced such as bathrooms and kitchens.
**THE RANGE**

**Ventilation unit with heat recovery**

Valsir supplies various types of heat recovery units, with and without thermal integration, with various installation possibilities and air volumes:

- **Aria**: high efficiency heat recovery unit with dual flow, available both in the horizontal and vertical version.
- **Idronica**: heat recovery unit with dehumidification and integration in renewal with hydronic battery available both in the horizontal and vertical version.
- **Isoterma**: heat recovery unit with isotherm dehumidification in recirculation with integrated cooling circuit available both in the horizontal and vertical version.
- **Maxima**: heat recovery unit with dehumidification and integration in renewal with integrated cooling circuit available both in horizontal and vertical version.

**System components**

For the installation of the HRV system in buildings, Valsir supplies a wide range of accessories and components:

- Distribution box
- Grid adapters
- Filters
- Valves
- Grids
- Pipes and fittings.
HIGHLY EFFICIENT HEAT RECOVERY UNITS

The Valsir HRV Aria system provides a wide range of highly efficient dual flow heat recovery units for all types of installations.

The Aria range is composed of two models in different sizes that can be installed in the ceiling or on the wall and four models in different sizes that can be installed on the floor with higher air attachment for surface areas from 40 m² to 250 m² (suitable for apartments, villas and small commercial spaces).

All the Aria units are equipped with a bypass for free cooling in summer months and remote panel with multifunction control.

The available accessories are: electrical heating elements and water coils for pre and post heating, moisture probes, VOC probes and probes for CO₂ for the control and dilution of pollutants.

Furthermore, all the Aria units can be fitted with an additional filter in class F7, (in addition to the standard G4 filter) to further improve the purity of the air introduced. The Aria distribution system is easily and rapidly installed and is composed of articles that are suitable for all systems.

Horizontal/vertical Aria

- Range composed of two models with air flows up to 240 m³/h.
- Casing and cover in polypropylene foam with reinforcements in galvanized sheet metal for horizontal ceiling installation or vertical installation on the wall.
- Ideal for tight spaces.
- Easy to install.
- Plug & Play system.
- Units equipped with automatic bypass.
- Units equipped with G4 or F7 efficiency class filters.

Vertical Aria

- Range composed of four models for air flows up to 420 m³/h.
- Vertical installation.
- Sandwich panel freestanding structure insulated with polyurethane foam with a thickness of 15 mm and an external finish in prepainted white.
- Ideal for tight spaces.
- Easy to install.
- Plug & Play system.
- Units equipped with automatic bypass.
- Units equipped with G4 or F7 efficiency class filters.
HEAT RECOVERY UNITS WITH DEHUMIDIFIER

The HRV system with dehumidifier for radiant systems consists of a range composed of two models equipped with highly efficient dual flow heat recovery units for horizontal or vertical installations.

All the units are available in a version with internal cooling circuit (with cooling integration or isothermal dehumidification only) or with water coil and they are equipped with remote panel with multifunction control.

The main accessories are: moisture probe, VOC probe and probes for CO$_2$ for the control and dilution of pollutants and two or three way valves. Possibility of functioning in HRV mode only or in HRV mode with dehumidification and partial recirculation.

Flow of renewal air from 80 to 260 m$^3$/h.
Flow of total air treated from 260 to 520 m$^3$/h.
Dehumidification from 27 to 63 l/h (up to 84 l/h with the Idronica model).

Air treatment units: Idronica, Isoterma and Maxima

- Fans with low consumption EC motor.
- High efficiency recovery unit (up to 90%).
- Sandwich panel load-bearing structure with a thickness of 20 mm, thermal and soundproofing insulation.
- G4 filters.
- Cooling circuit (Isoterma and Maxima only) including rotary compressor, dehydrating filter, thermostatic expansion valve, evaporator and condenser (air or water depending on the model).
- Water coil for integration and dehumidification (Idronica model only).
- Can interface with with radiant control system.
- Unit and radiant plant can be managed independently with control of mixing valve, dew-point alarm, opening and closing of radiant zones (by means of additional thermostats for single zones).
- Horizontal installation in ceiling or vertical installation on the wall.

**Idronica**
- Air treatment unit, with recirculation and partial renewal, equipped with highly efficient heat recovery unit powered by water coil for integration and dehumidification.
- Range composed of two models for air flows up to 520 m$^3$/h.

**Isoterma**
- Air treatment unit, with recirculation and partial renewal, equipped with highly efficient heat recovery unit equipped with integrated cooling circuit for summer dehumidification.
- Range composed of two models for air flows up to 520 m$^3$/h.

**Maxima**
- Air treatment unit, with recirculation and partial renewal, equipped with highly efficient heat recovery unit equipped with integrated cooling circuit for summer dehumidification and cooling integration if necessary.
- Range composed of two models for air flows up to 520 m$^3$/h.
Insulated round EPE pipe

Insulated pipe in polyethylene foam (EPE) available in diameters 125, 160 and 180 mm (thickness 16 mm/30 kg/m³).
Simple and rapid installation with a perfect seal, it is used to connect the fan unit to the outside to enable the flow of inbound and outbound air.
Ideal for controlled mechanical ventilation plants, thanks to the insulation that reduces heat loss avoiding the formation of condensation.

HRV bare flex hose

Flexible duct available in diameters 127, 160, 180 and 203 mm, made from additive polyolefin resin film, antibacterial and anti-mould and spiral in spring steel wire.
Suitable for controlled mechanical ventilation and air conditioning systems.
HRV insulated flex hose

Flexible duct available in diameters 127, 160, 180 and 203 mm, made from additive polyolefin resin film, antibacterial and anti-mould and spiral in spring steel wire. Thermally insulating cover in polyester fibre (thickness 25 mm/16 kg/m²). Exterior protection in aluminate film (flame retardant). The robust thermo-bonded polyester fibre avoids dispersion of the microfibers during the passage of air thus remaining intact over time. Suitable for controlled mechanical ventilation and air conditioning. Reduction of condensation and heat loss.

HRV insulated Al Phon flex hose

Flexible duct available in diameters 127, 160, 180 and 203 mm, made with a wall in AL/PET/AL (aluminium/polyester/aluminium) that is micro perforated to reduce the noise of the air, and spiral in spring steel wire. Thermally insulating cover in polyester fibre (thickness 25 mm/16 kg/m²). The robust thermo-bonded polyester fibre avoids dispersion of the microfibers during the passage of air thus remaining intact over time. Exterior protection in aluminate polyolefin film (flame-retardant). Ideal for controlled mechanical ventilation and air conditioning. Reduction of condensation and heat loss.
Ariatube: HRV round corrugated pipe

Developed in collaboration with Sanitized, a Swiss company and world leader in the production of antimicrobial and antibacterial materials, guarantees maximum performance and service life of HRV plants. Compliance to regulations has been certified by the German hygiene institute HY.

- Available in diameters 63, 75 and 90 mm.
- Prevents the onset of allergies and asthma.
- Guarantees a reduction of over 99% of the bacteria commonly present on the internal surface of pipes.
- Prevents the formation of bacteria and fungi.
- Prevents the onset of bad odours thanks to the use of zinc pyrithione, biocidal active ingredient.

HRV oval corrugated pipe

Corrugated semi-rigid oval pipe made of high density polyethylene, antibacterial and antistatic. Available in sizes 50x102 and 60x132 mm.

The radial system allows less pressure loss as compared with traditional systems and the mechanical connections ensure seal and a clean, homogenous and quality installation.
When designing a HRV plant, aesthetic must also be taken into account. For this reason, Valsir supplies a complete range of grids and valves for indoors and outdoors, for inbound and outbound air.

Made of ABS, paintable PVC or inox steel and available in various sizes, they guarantee a perfect integration in all types of environments.
Energy-using products account for a large proportion of the consumption of natural resources. To limit consumption the European Union has issued directives and regulations such as the delegated regulation 1254/2014, which regulates the labelling of residential ventilation units to indicate their energy consumption.

The energy label allows the user to easily compare the energy efficiency of different products.

Unlike other electrical components, the energy classes on the labels for residential ventilation are determined by one parameter: specific energy consumption, or SEC. This value shows the energy saving potential of the unit in kWh per m² per year.

<table>
<thead>
<tr>
<th>SEC Class</th>
<th>SEC [kWh/a·m²]</th>
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<tbody>
<tr>
<td>A+ (high efficiency)</td>
<td>SEC &lt; -42</td>
</tr>
<tr>
<td>A</td>
<td>-42 ≤ SEC &lt; -34</td>
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<tr>
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<tr>
<td>F</td>
<td>-10 ≤ SEC &lt; 0</td>
</tr>
<tr>
<td>G (minimum efficiency)</td>
<td>0 ≤ SEC</td>
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Technical support

Valsir provides complete support during design and on site, thanks to a high-level technical department that consists of a team of engineers with international experience that are capable of providing solutions to all installation needs.

Valsir Academy

Valsir has an important training facility - Valsir Academy - dedicated to clients, distributors, plumbers and planners that provides perfectly equipped courses, theoretical and practical courses on the use and the design of plumbing and heating systems. Courses are provided both inside the training facility and on customers’ premises.
SOFTWARE

Silvestro software

The design of floor and radiator heating systems, water supply as well as waste and drainage systems, is extremely easy and the issue of the project technical documents is rapid when using the Silvestro software program. Rapid, simple, unique, Silvestro has numerous strong points:

• rapid learning curve thanks to a simple and intuitive interface
• completely graphic background that facilitates input of the project details
• automatic drawing of the loops in the floor radiant systems
• automatic repositioning of the stack points on the plan view
• generation of calculation reports that are exportable in an .xls format
• import and export of files in .dwg format
• immediate update of software with a guided procedure
• creation of complete bill of materials from the project files

Valsir is BIM ready

Valsir has embraced the BIM philosophy, the modelling process that allows the improvement of planning, design, construction and the management of buildings, concurring with the transition of the industry toward the digital representation of buildings. “BIM oriented” planning offers extraordinary competitive advantages: greater efficiency and productivity, fewer errors, less downtime, lower costs, enhanced interoperability, maximum sharing of information, a more punctual and coherent supervision of the project. Valsir captures the essence of this system creating a series of Revit applications and models designed for simple and fast use.
Quality

The constant commitment of Valsir to the creation of quality products is demonstrated by over 170 product approvals obtained around the world from the most strict certification bodies (figure updated on 01/03/2017), and by a quality system that is certified to UNI EN ISO 9001:2008.

Sustainability

Efficient processes and reliable products are no longer the only parameters used to perform an assessment of the quality of a company’s conduct: the capacity of the company and its management to design and implement production process that are sustainable from an environmental point of view is of equal importance.

Valsir has started a project of Corporate Social Responsibility and has published its 1st Sustainability Report that gathers facts and figures relating to the daily commitment of Valsir in terms of social, economic and environmental responsibility.

For more information, download here the 1st Sustainability Report.