# AIR HANDLING UNITS AND HEAT RECOVERY SYSTEMS

VORTICE.LTD.UK

VORTICE

**VORTICE INDUSTRIAL** is part of a multinational group, **VORTICE GROUP**, which operates through its own companies or local distributors in over 90 countries in the world and has a rich product portfolio that guarantees air quality and climatic comfort.

Realities that are also part of **VORTICE GROUP**:

[ 1 ]
**VORTICE LIMITED**, the UK subsidiary of VORTICE S.p.A. founded in 1977 with headquarters in Burton upon Trent.

[ 2 ]
**VORTICE S.p.A.**, head office located in Tribiano (Milan), founded in 1954.

[ 3 ]
**VORTICE Ventilation System**, company inaugurated in 2013 with headquarters in Changzhou, China.

[ 4 ]
**VORTICE Latam**, based in Alajuela, Costa Rica, founded in 2012.

[ 5 ]
**CASALS VENTILACIÓN AIR INDUSTRIAL S.L.** historic Spanish brand, based in Sant Joan de les Abadesses Girona, was acquired in 2019.

## More than thirty years of experience at the service of the air.

The company was founded in 1994 under the company name LORAN srl, from an entrepreneurial idea of people with thirty years of experience in the field of air handling units.

In 2011 it joined the Vortice Group, a historic Italian brand synonymous with excellence in the design and production of domestic and residential ventilation products. In November 2019, the company changed its name to VORTICE INDUSTRIAL srl.

Today VORTICE INDUSTRIAL represents the beating heart of the VORTICE Group in the development of air handling units, heat recovery units and air conditioning equipment appliances for commercial and industrial applications, strong of a technical and technological competence able to sort out the most demanding application requirements with specific solutions.

Our head office is located in the industrial area of Isola della Scala, in the province of Verona.

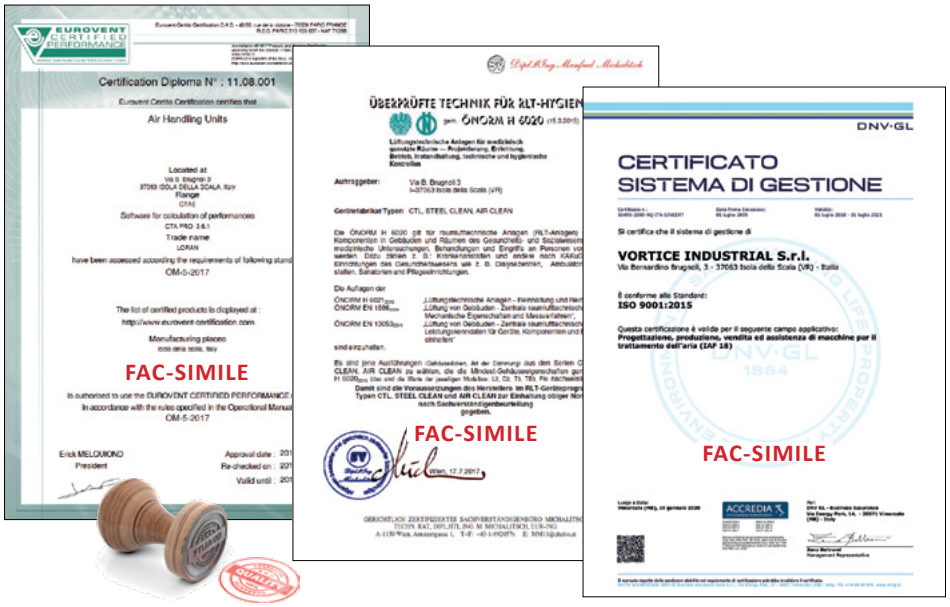
Surface area 12.000 $m^2$ with a production unit of 6.000 $m^2$.

### Require Assistance?

For bespoke units and control options call our technical department on **01283 492949** or email **technical@vortice.ltd.uk**

## Certificates of quality

The quality of our products is documented by means of certificates that guarantee every stage of the company production process, from production to material management, from production control to document management. By operating in this way, the process can be managed in an organised manner, as well as having the guarantee that all production activities are certainly carried out in the manner provided in the project, or in the technical documents. The documentation process serves precisely to demonstrate that the activities are managed in a uniform manner and in accordance with quality standards.




## Online Product Configurator

Our Configurator for Compact products called ZEFIRO, is a fast and immediate tool that allows you with a few simple clicks to:

- configure a product with its accessories
- archive all offers in an internal database
- print a data sheet complete of technical drawing and prices
- accessible from ANY device

... and many other features.

**Scan the QR Code to access to the login page of our Online Product Configurator ZEFIRO**

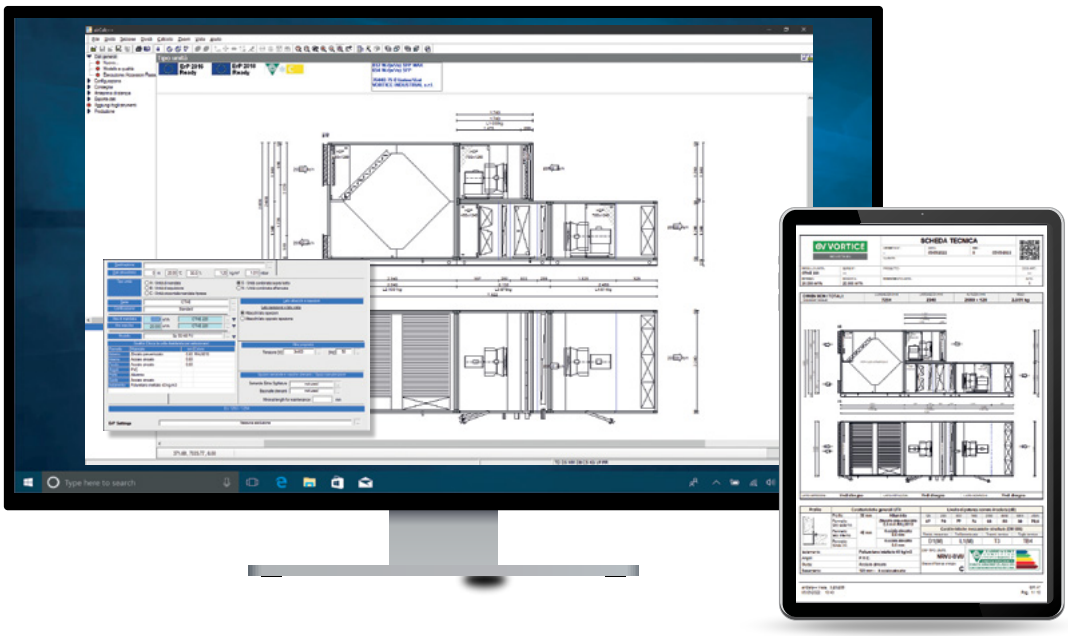
**zefiro.vorticeindustrial.com**

## Selection software

Our company offers the customers a flexible and precise selection software of Air Handling Units, able to provide all the technical data necessary for the performance sizing and dimensions of the units, helping the installer in the design of the complete system.

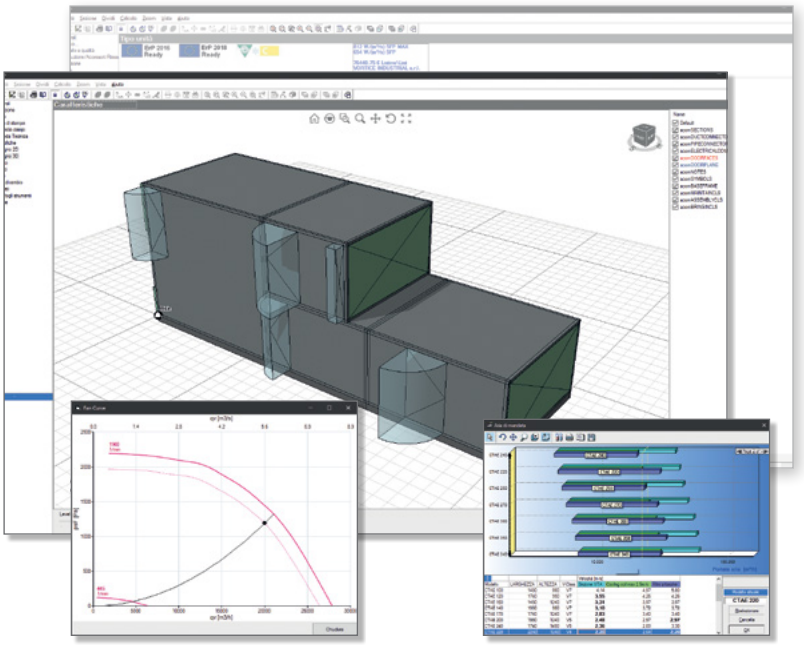
airCalc
AHU Selection Software

It is possible to download it from our official website, after registering for free in the reserved area. Our staff is also at your complete disposal for the activation of the software, clarifications regarding the use and the various configurations.



- Multilingual interface
- Flexible and precise
- Design of air handling units with complex compositions
- Export CAD / BIM drawing
- List of components / materials
- Export of technical data sheet to multilingual PDF
- Integration of the ERP Directive 2018
- Suitable for EUROVENT certification

... and many other features.



EUROVENT CERTIFIED PERFORMANCE
www.eurovent-certification.com

**Scan the QR Code to access to the reserved area of our site, register and download the software**

**www.vorticeindustrial.com**

# CTAE

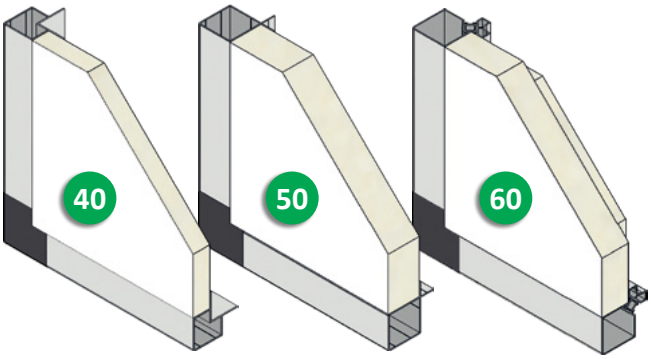
AIR HANDLING UNITS

## Structure and panels

**40** 40 mm anodised aluminium profiles
23 mm polyurethane/mineral wool panels

**50** 50 mm anodised aluminium profiles
48 mm polyurethane/mineral wool panels

**60 TT** 60 mm aluminium profiles with termal break
63 mm polyurethane/mineral wool panels




## Air volume

Air volume from 300 m3/h to 150.000 m3/h

## Metal sheets

**ZN** Galvanized steel sheet (EN 10142)
Available thicknesses 6/10 or 10/10 mm

**ZNP** Prepainted hot-dip galvanized sheet
(UNI EN 10169, EN 10327) Z100 coating
Available thicknesses 6/10 or 10/10 mm

**AL** Aluminium sheet 5754 H 111 with magnesium
Available thicknesses 6/10 or 10/10 mm

**304** Austenitic stainless steel sheet AISI 304 cold rolled, with 2B brilliant surface finish (EN 10088/97)
Available thicknesses 6/10 or 10/10 mm

**316** Austenitic stainless steel sheet AISI 316 cold rolled, with 2B brilliant surface finish (EN 10088/97)
Available thicknesses 6/10 or 10/10 mm

## Certificazione

VORTICE INDUSTRIAL S.r.l. participates in the Eurovent Certified Performance programme for Air Handling Units.

Check ongoing validity of certificate:
www.eurovent-certification.com

EUROVENT CERTIFIED PERFORMANCE
AHU - 11 08 001
Range - CTAE
www.eurovent-certification.com

| Result SP63 TB PU | Eurovent Classification according to EN1886 | | | | | |
|---|---|---|---|---|---|---|
| D1 | Casing strength class | D1 | D2 | D3 | | |
| | Max. relative deflection mm x m-1 | 4.00 | 10.00 | EXCEEDING10 | | |
| L1 | Casing air leakage class at -400 Pa | L1 | L2 | L3 | | |
| | Max. leakage rate (f400) l x s-1 x m-2 | 0.15 | 0.44 | 1.32 | | |
| L1 | Casing air leakage class at +700 Pa | L1 | L2 | L3 | | |
| | Max. leakage rate (f700) l x s-1 x m-2 | 0.22 | 0.63 | 1.90 | | |
| ePM1 80% (F9) | Filter bypass leakage class | ePM1 80% (F9) | EPM1 70% (F8) | ePM1 55% (F7) | ePM10 70% (F6) | ISO Coarse |
| | Max. filter bypass leakage rate k in % of the volume flow rate | 0.50 | 1 | 2 | 4 | 6 |
| T2 | Thermal transmittance | T1 | T2 | T3 | T4 | T5 |
| | (U) W/m2 x K | U <= 0.5 | 0.5 < U <= 1 | 1 < U <= 1.4 | 1.4 < U <= 2 | No requirements |
| TB2 | Thermal bridging factor | TB1 | TB2 | TB3 | TB4 | TB5 |
| | (kb) W x m-2 x K-1 | 0.75 < Kb <= 1 | 0.6 < Kb <= 0.75 | 0.45 < Kb <= 0.6 | 0.3 < Kb <= 0.45 | No requirements |

## Controls

The CTAE air-handling unit control has been designed to meet a wide variety of control requirements for air conditioning and air quality with the aim of providing a complete solution to the end user.

The control is supplied mounted on the unit and complete with internal wiring, ready for interfacing with the main models of transducers and actuators available on the market.

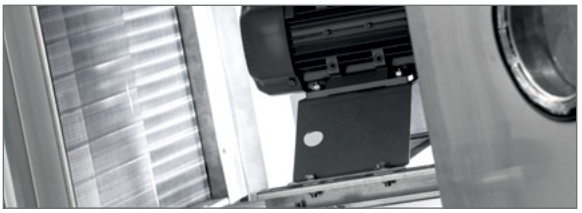
The remote LCD display or the one housed on board the machine allows the configuration of the parameters and the monitoring of the operating status of the plant.
All the components are located in an internal technical compartment or on a metal frame installed on the machine.

- Temperature control
- Humidity control
- Continuous control of the external air
- Control of external air dampers
- Control of heat recoveries device
- Control of enthalpy free-cooling
- Control of fans airflow
- Control of unit start-up and transitional periods
- Antifreeze management
- Alarm management / alarm history record
- Periodic fans maintenance management
- Supervision system management

Modbus

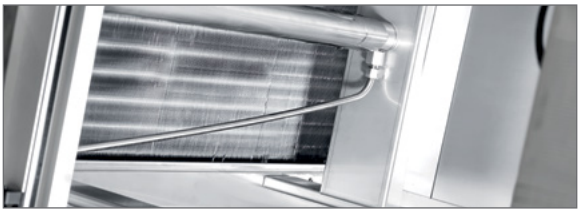
ASHRAE BACnet®

## HYGIENIC VERSION FOR HOSPITAL AND PHARMACEUTICAL SECTOR



## Features

- 60 mm anodised aluminium profiles with thermal break
- 63 mm polyurethane panels with draining bottom
- Internal/external AISI 304/316 stainless steel sheets
- Baseframe, supporting frame, screws, coils, drainpan in INOX
- Absence of internal unit edges
- Side-removable sound attenuators



LEGALLY CERTIFIED EXPERT OFFICE
Verified technology for hygiene in AHU
ÖNORM H 6020
ÖNORM H 6021
VDI 6022-1
MICHALITSCH, EUR-ING, VIENNA

# STEELCLEAN

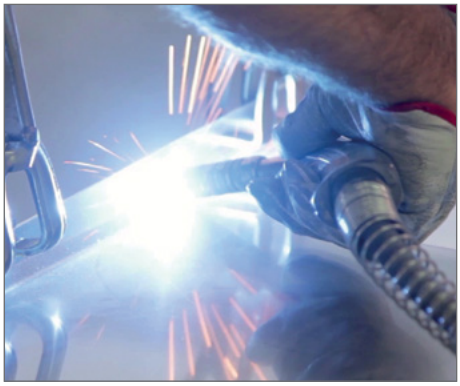
WASHABLE UNITS FOR FOOD INDUSTRY

## Air volume

Air volume from 5000 m3/h to 100.000 m3/h

## Features

- Internal structure composed of AISI 304 stainless steel watertight chambers
- 75 mm or 100 mm thick sandwich panels in AISI 304 or AISI 316 stainless steel
- AISI 304 or 316 stainless steel carpentry and screws
- Absence of internal unit edges
- Easy cleaning and internal disinfection, fully washable
- High degree of noise reduction
- Absence of thermal bridges



Dipl.-Ing. Manfred Michalitsch

ÜBERPRÜFTE TECHNIK FÜR RLT-HYGIENE

gem. ÖNORM H 6020 (15.3.2015)

Lüftungstechnische Anlagen für medizinisch genutzte Räume — Projektierung, Errichtung, Betrieb, Instandhaltung, technische und hygienische Kontrollen

Auftraggeber: Via B. Brugnoli 3
I–37063 Isola della Scala (VR)

Gerätefabrikat Typen: CTL, STEEL CLEAN, AIR CLEAN

Die ÖNORM H 6020 gilt für raumlufttechnische Anlagen (RLT-Anlagen) und deren Komponenten in Gebäuden und Räumen des Gesundheits- und Sozialwesens, in denen medizinische Untersuchungen, Behandlungen und Eingriffe an Personen vorgenommen werden. Dazu zählen z. B.: Krankenanstalten und andere nach KAKuG bewilligte Einrichtungen des Gesundheitswesens wie z. B. Dialysezentren, Ambulatorien, Kuranstalten, Sanatorien und Pflegeeinrichtungen.

Die Auflagen der

ÖNORM H 6021 „Lüftungstechnische Anlagen - Reinhaltung und Reinigung",
ÖNORM EN 1886 „Lüftung von Gebäuden - Zentrale raumlufttechnische Geräte – Mechanische Eigenschaften und Messverfahren",
ÖNORM EN 13053 „Lüftung von Gebäuden - Zentrale raumlufttechnische Geräte – Leistungskenndaten für Geräte, Komponenten und Bauelemente"

sind einzuhalten.

Es sind jene Ausführungen (Gehäusedicken, Art der Dämmung) aus den Serien CTL, STEEL CLEAN, AIR CLEAN zu wählen, die die Mindest-Gehäuseeigenschaften gem. ÖNORM H 6020 (das sind die Werte der jeweiligen Modelbox: L2, D2, T3, TB3, F9) nachweislich erfüllen.

**Damit sind die Voraussetzungen des Herstellers im RLT-Geräteprogramm Typen CTL, STEEL CLEAN und AIR CLEAN zur Einhaltung obiger Normen nach Sachverständigenbeurteilung gegeben.**

Wien, 17.7.2017

GERICHTLICH ZERTIFIZIERTES SACHVERSTÄNDIGENBÜRO MICHALITSCH
TECHN. RAT, DIPL.-HTL-ING. M. MICHALITSCH, EUR-ING.
A-1150 Wien, Anschützgasse 1, T+F: +43-1-8920576 E: MM11@chello.at

The **STEELCLEAN** units have been designed specifically for applications in the food industry and for production processes where a high degree of cleanliness is required.

Materials certified according to VDI 6022 are subjected to extensive testing to ensure that they do not facilitate the growth of bacteria or fungi and are also tested for the release of hazardous substances.

Finally these units are easy to clean because the surfaces are sealed and can withstand approved cleaning agents and disinfection methods.

# AIRCLEAN

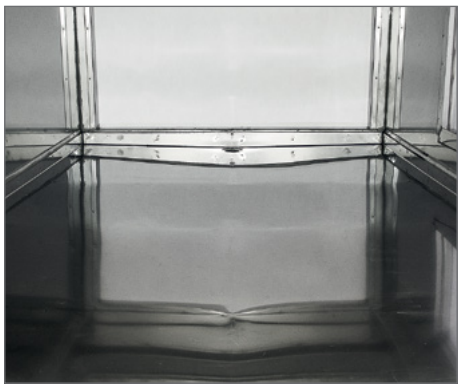
## HYGIENIC UNITS FOR FOOD INDUSTRY

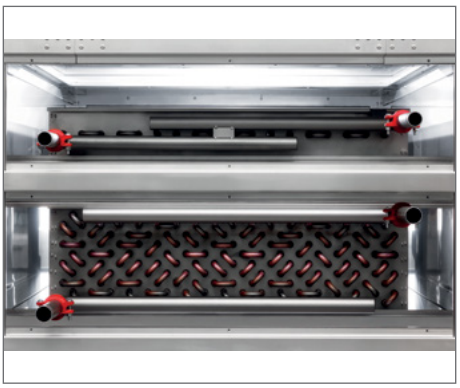
## Air volume

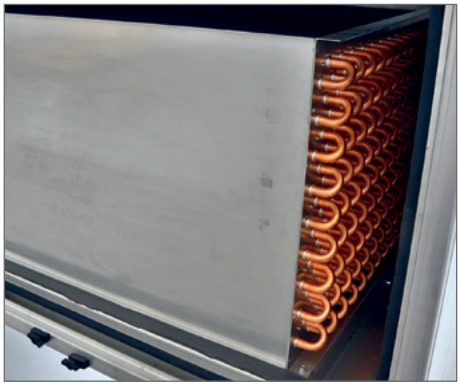
Air volume from 5000 m3/h to 100.000 m3/h

## Features

- AISI 304 or AISI 316 stainless steel structure
- 53 mm thick thermal break sandwich panels in AISI 304 or AISI 316 stainless steel
- AISI 304 or AISI 316 stainless steel carpentry and screws
- Absence of internal unit edges
- Easy cleaning and internal disinfection
- High degree of noise reduction
- Absence of thermal bridges
- Fully sanitised unit







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Wien, 17.7.2017

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Materials certified according to VDI 6022 are subjected to extensive testing to ensure that they do not facilitate the growth of bacteria or fungi and are also tested for the release of hazardous substances.

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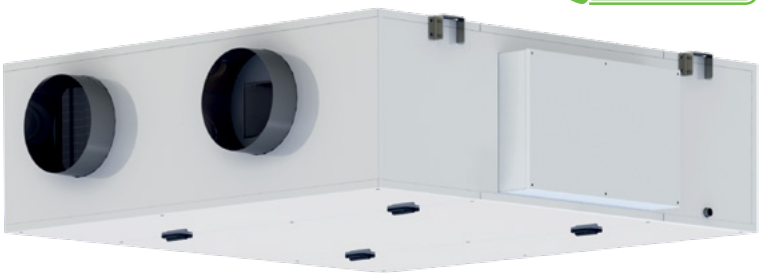
# VORT NRG FLAT

HEAT RECOVERY UNITS WITH
PLATE HEAT EXCHANGER



## Features

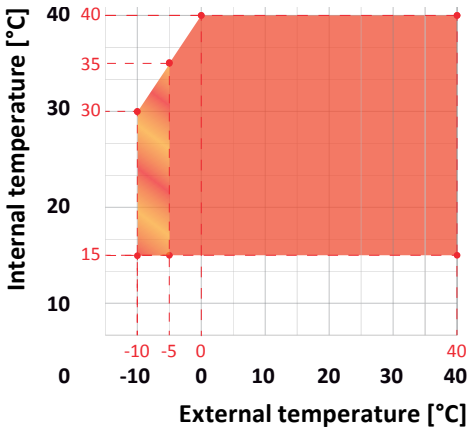
- Self-supporting structure
- **25 mm** thick steel panels 6/10 with polyurethane insulation
- Air filters of various efficiencies
- Plate heat exchanger with by-pass
- **EC centrifugal** fans with forward blades

## Controls

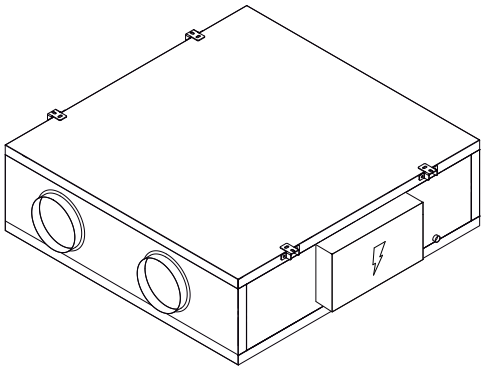
| | |
|---|---|
| **ECO** | Control with $CO_2$ probe |
| **PLUS** | Constant pressure control |
| **TOP** | Constant air-flow control |

Control panel with graphic LCD display

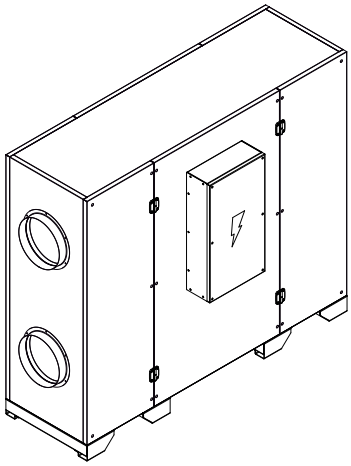
## Operating limits




## Configurations



**Horizontal [H]**



**Vertical [V]**

| MODEL | | 005 | 006 | 010 | 015 | 020 | 030 | 040 |
|---|---|---|---|---|---|---|---|---|
| Nominal airflow rate | $m^3/h$ | 410 | 650 | 1000 | 1620 | 2150 | 3040 | 3980 |
| Winter Thermal Efficiency (ηt_nrvu) (1) | % | 76,4 | 77,3 | 76,9 | 78,5 | 79,0 | 75,8 | 76,7 |
| Winter Thermal Efficiency (2) | % | 84,4 | 84,9 | 84,7 | 86,0 | 86,2 | 83,9 | 84,5 |
| $SFP_{int}$ | $W/(m^3/s)$ | 950 | 670 | 988 | 1066 | 1127 | 861 | 994 |
| $SFP_{lim}$ 2018 | $W/(m^3/s)$ | 1186 | 1202 | 1176 | 1196 | 1190 | 1059 | 1045 |

(1) ratio between the thermal gain of the inlet air and the thermal loss of the exhaust air, both referred to the external temperature, measured under dry reference conditions, with balanced mass flow and a thermal difference of the internal/external air of 20K, excluding the thermal gain generated by the fan motors and the internal leakage, in accordance with the provisions of attached V of EU Regulation No 1253/2014

(2) outside air: -5 °C / 80 % RH - Inside air: 20 °C / 50 % RH

# VORT NRG FLAT EVO

HEAT RECOVERY UNITS WITH
PLATE HEAT EXCHANGER

## Features

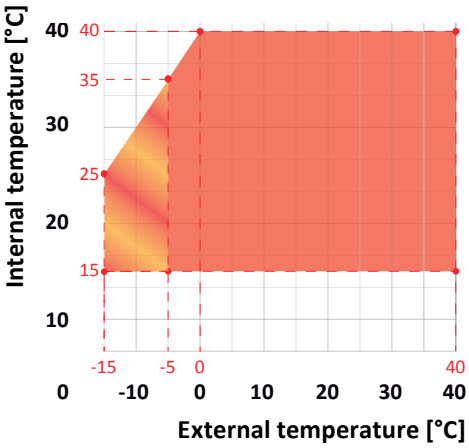
- Self-supporting structure
- **50 mm** thick steel panels 6/10 with polyurethane insulation
- Air filters of various efficiencies
- Plate heat exchanger with by-pass
- **EC brushless** fans with backward blades

## Controls

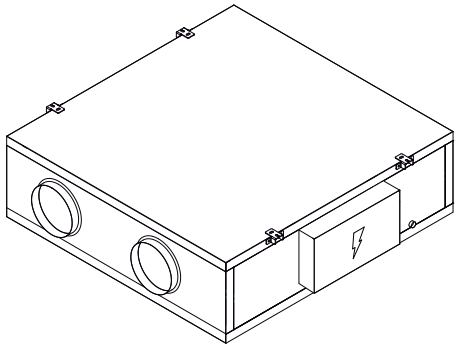
| | |
|---|---|
| **ECO** | Control with $CO_2$ probe |
| **PLUS** | Constant pressure control |
| **TOP** | Constant air-flow control |

Control panel with graphic LCD display

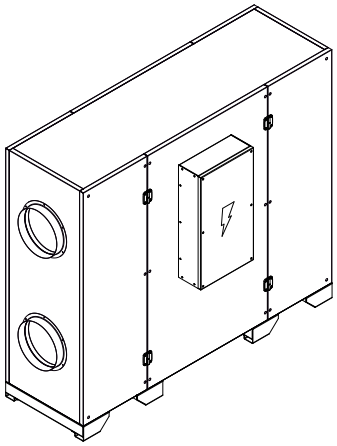
## Operating limits



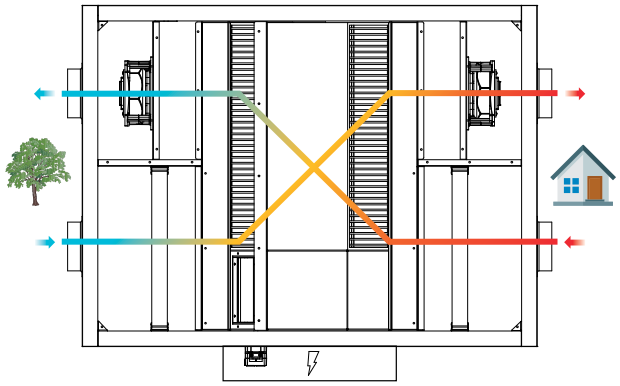

## Configurations



**Horizontal [H]**



**Vertical [V]**



- In winter the return air from the room crosses the plate heat exchanger, where it gives up part of its thermal load and cools down before being exhausted. The fresh air crosses the plate heat exchanger in the opposite direction and heats up before the introduction into the room.
- In summer the unit operates in reverse mode and the air cools down before the introduction into the room.
- The unit also operates in free-cooling mode by opening the by-bass damper located on the plate heat exchanger.

The modulation of the airflow rate will allow a precise control of the supply air temperature.

| MODEL | | 005 | 006 | 010 | 015 | 020 | 030 | 040 |
|---|---|---|---|---|---|---|---|---|
| Nominal airflow rate | $m^3/h$ | 410 | 650 | 1000 | 1620 | 2150 | 3040 | 3980 |
| Winter Thermal Efficiency ($\eta t_nrvu$) [1] | % | 80,8 | 81,4 | 81,6 | 81,8 | 82,0 | 82,2 | 82,0 |
| Winter Thermal Efficiency [2] | % | 88,0 | 88,4 | 88,5 | 88,7 | 88,9 | 89,0 | 88,9 |
| $SFP_{int}$ | $W/(m^3/s)$ | 786 | 580 | 714 | 764 | 840 | 1011 | 1004 |
| $SFP_{lim}$ 2018 | $W/(m^3/s)$ | 1318 | 1326 | 1315 | 1297 | 1282 | 1248 | 1206 |

[1] ratio between the thermal gain of the inlet air and the thermal loss of the exhaust air, both referred to the external temperature, measured under dry reference conditions, with balanced mass flow and a thermal difference of the internal/external air of 20K, excluding the thermal gain generated by the fan motors and the internal leakage, in accordance with the provisions of attached V of EU Regulation No 1253/2014

[2] outside air: -5 °C / 80 % RH - Inside air: 20 °C / 50 % RH

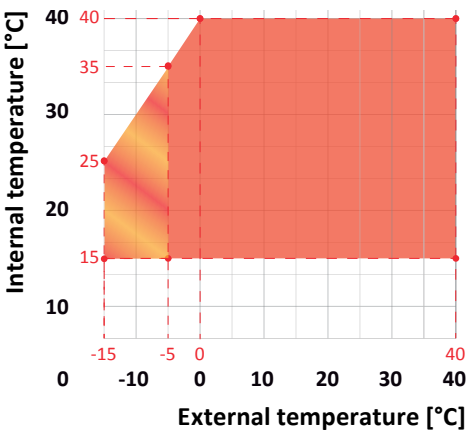
# VORT NRG FLAT EVO V

HEAT RECOVERY UNITS WITH
PLATE HEAT EXCHANGER

## Features

- Self-supporting structure
- **50 mm** thick steel panels 6/10 with polyurethane insulation
- Air filters of various efficiencies
- Plate heat exchanger with by-pass
- **EC brushless** fans with backward blades

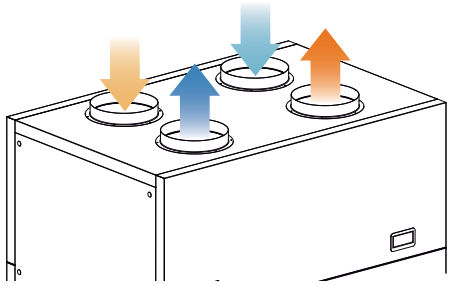
## Operating limits




## Controls

| | |
|---|---|
| **ECO** | Control with $CO_2$ probe |
| **PLUS** | Constant pressure control |
| **TOP** | Constant air-flow control |

Control panel with graphic LCD display



| MODEL | | 005 | 006 | 010 | 015 | 020 | 030 | 040 |
|---|---|---|---|---|---|---|---|---|
| Nominal airflow rate | $m^3/h$ | 410 | 650 | 1000 | 1620 | 2150 | 3040 | 3980 |
| Winter Thermal Efficiency (ηt_nrvu) (1) | % | 80,8 | 81,4 | 81,6 | 81,8 | 82,0 | 82,2 | 82,0 |
| Winter Thermal Efficiency (2) | % | 88,0 | 88,4 | 88,5 | 88,7 | 88,9 | 89,0 | 88,9 |
| $SFP_{int}$ | $W/(m^3/s)$ | 786 | 580 | 714 | 764 | 840 | 1011 | 1004 |
| $SFP_{lim}$ 2018 | $W/(m^3/s)$ | 1318 | 1326 | 1315 | 1297 | 1282 | 1248 | 1206 |

(1) ratio between the thermal gain of the inlet air and the thermal loss of the exhaust air, both referred to the external temperature, measured under dry reference conditions, with balanced mass flow and a thermal difference of the internal/external air of 20K, excluding the thermal gain generated by the fan motors and the internal leakage, in accordance with the provisions of attached V of EU Regulation No 1253/2014

(2) outside air: -5 °C / 80 % RH - Inside air: 20 °C / 50 % RH

# VORT NRG MEGA

## HEAT RECOVERY UNITS WITH PLATE HEAT EXCHANGER

## Features

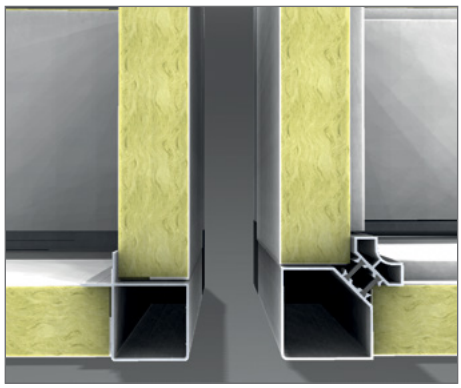
**50** 50 mm anodised aluminium profiles
48 mm polyurethane/mineral wool panels

**60TT** 60 mm aluminium profiles with termal break
63 mm polyurethane/mineral wool panels

- Air filters of various efficiencies
- **Plate** heat exchanger with by-pass
- **EC brushless** fans with backward blades

## Controls

**ECO** Control with $CO_2$ probe
**PLUS** Constant pressure control
**TOP** Constant air-flow control



| MODEL | | 010 | 020 | 030 | 045 | 060 |
|---|---|---|---|---|---|---|
| Nominal airflow rate | $m^3/h$ | 1000 | 2000 | 3000 | 4500 | 6000 |
| Winter Thermal Efficiency (ηt_nrvu) [1] | % | 80,9 | 81,6 | 80,6 | 82,8 | 83,0 |
| Winter Thermal Efficiency [2] | % | 88,0 | 88,5 | 87,8 | 89,5 | 89,7 |
| $SFP_{int}$ | $W/(m^3/s)$ | 801 | 904 | 1022 | 974 | 978 |
| $SFP_{lim}$ 2018 | $W/(m^3/s)$ | 1296 | 1273 | 1203 | 1206 | 1151 |

| MODEL | | 080 | 100 | 130 | 170 | 240 |
|---|---|---|---|---|---|---|
| Nominal airflow rate | $m^3/h$ | 8000 | 10000 | 13000 | 17000 | 21500 |
| Winter Thermal Efficiency (ηt_nrvu) [1] | % | 84,5 | 83,0 | 81,2 | 83,5 | 83,2 |
| Winter Thermal Efficiency [2] | % | 90,9 | 89,7 | 88,2 | 90,1 | 89,8 |
| $SFP_{int}$ | $W/(m^3/s)$ | 810 | 1066 | 954 | 1097 | 1076 |
| $SFP_{lim}$ 2018 | $W/(m^3/s)$ | 1145 | 1101 | 1045 | 1116 | 1107 |

[1] ratio between the thermal gain of the inlet air and the thermal loss of the exhaust air, both referred to the external temperature, measured under dry reference conditions, with balanced mass flow and a thermal difference of the internal/external air of 20K, excluding the thermal gain generated by the fan motors and the internal leakage, in accordance with the provisions of attached V of EU Regulation No 1253/2014

[2] outside air: -5 °C / 80 % RH - Inside air: 20 °C / 50 % RH

# VORT NRG MEGA R

HEAT RECOVERY UNITS WITH
ROTARY WHEEL

## Features

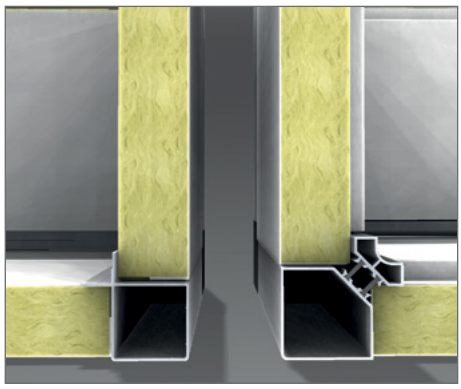
**50** 50 mm anodised aluminium profiles
48 mm polyurethane/mineral wool panels

**60TT** 60 mm aluminium profiles with termal break
63 mm polyurethane/mineral wool panels

- Air filters of various efficiencies
- **Rotary wheel** heat exchanger
- **EC brushless** fans with backward blades

## Controls

**ECO** Control with $CO_2$ probe
**PLUS** Constant pressure control
**TOP** Constant air-flow control



| MODEL | | 010 | 020 | 030 | 045 | 060 |
|---|---|---|---|---|---|---|
| Nominal airflow rate | $m^3/h$ | 1000 | 2000 | 3000 | 4500 | 6000 |
| Winter Thermal Efficiency (ηt_nrvu) [1] | % | 82,6 | 81,8 | 81,9 | 81,9 | 82,9 |
| Winter Thermal Efficiency [2] | % | 82,1 | 82,2 | 81,6 | 81,3 | 82,3 |
| $SFP_{int}$ | $W/(m^3/s)$ | 822 | 802 | 750 | 1031 | 829 |
| $SFP_{lim}$ 2018 | $W/(m^3/s)$ | 1301 | 1254 | 1206 | 1144 | 1087 |

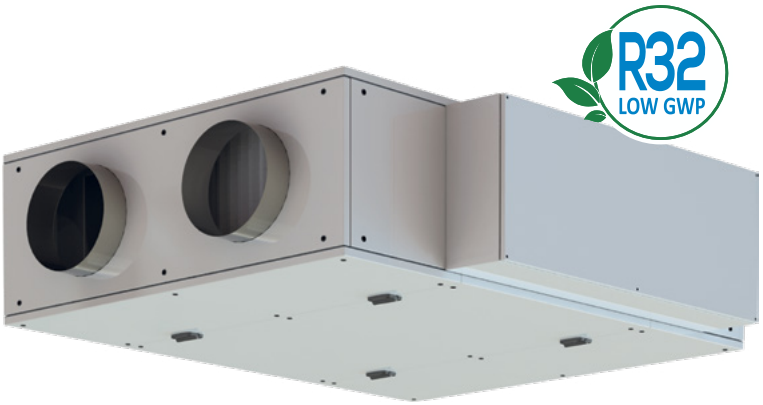
| MODEL | | 080 | 100 | 130 | 170 | 240 |
|---|---|---|---|---|---|---|
| Nominal airflow rate | $m^3/h$ | 8000 | 10000 | 13000 | 17000 | 21500 |
| Winter Thermal Efficiency (ηt_nrvu) [1] | % | 82,3 | 82,7 | 81,5 | 81,7 | 81,0 |
| Winter Thermal Efficiency [2] | % | 81,8 | 82,0 | 81,1 | 81,1 | 80,6 |
| $SFP_{int}$ | $W/(m^3/s)$ | 890 | 911 | 959 | 954 | 949 |
| $SFP_{lim}$ 2018 | $W/(m^3/s)$ | 1031 | 1028 | 980 | 983 | 980 |

[1] ratio between the thermal gain of the inlet air and the thermal loss of the exhaust air, both referred to the external temperature, measured under dry reference conditions, with balanced mass flow and a thermal difference of the internal/external air of 20K, excluding the thermal gain generated by the fan motors and the internal leakage, in accordance with the provisions of attached V of EU Regulation No 1253/2014

[2] outside air: -5 °C / 80 % RH - Inside air: 20 °C / 50 % RH

# RXC/Hi

## INTEGRATED REFRIGERANT CIRCUIT HEAT RECOVERY UNITS

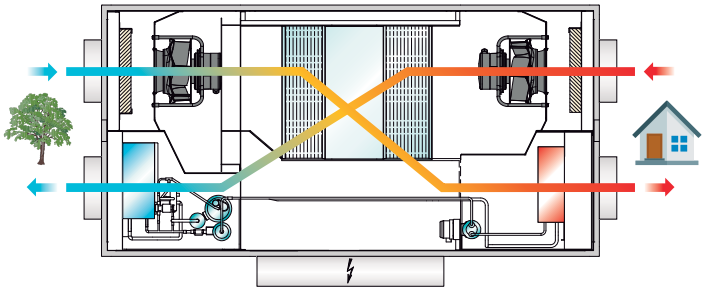



## Features

**1° STEP** Plate heat exchanger
**2° STEP** Heat pump refrigerant circuit

- Self-supporting structure
- **25 mm** thick steel panels 6/10 with polyurethane/mineral wool insulation
- Air filters of various efficiencies
- **Plate** heat exchanger with by-pass
- Integrated refrigerant circuit in heat pump
- **EC brushless** fans with backward blades
- Control panel with remotable LCD graphic display

## Operating mode



### HEATING

In winter the return air crosses the plate heat exchanger and feeds the heat pump source exchanger (evaporator). Through the vapour compression refrigeration cycle, the fresh air is heated by the heat pump user exchanger (condenser).
The modulation of the thermal capacity will allow to precisely control the supply air temperature.
To prevent the formation of surface frost, the unit provides controlled management of a defrosting cycle obtained by reversing the refrigeration cycle.

### COOLING

In summer the return air, after passing through the plate heat exchanger, goes to feed the heat pump source exchanger, which operates as a condenser.

The fresh air, after passing through the plate heat exchanger, is cooled by the heat pump user heat exchanger, which operates as an evaporator.

### FREE-COOLING

When the outside temperature is lower than the inside temperature of the room to be air-conditioned, if this needs cooling, the units operate in free-cooling mode and all integrated heat recovery stages are disabled.

| MODEL | | 005 | 010 | 015 | 025 | 035 |
|---|---|---|---|---|---|---|
| Nominal airflow rate | $m^3/h$ | 500 | 1000 | 1500 | 2500 | 3500 |
| Thermal efficiency recovery in cooling mode (1) | % | 77,3 | 77,5 | 75,6 | 74,6 | 73,8 |
| Thermal efficiency recovery in heating mode (2) | % | 84,0 | 85,1 | 83,4 | 80,8 | 80,2 |
| $SFP_{int}$ | $W/(m^3/s)$ | 655 | 745 | 788 | 1081 | 976 |
| Total unit EER (1) | - | 3,8 | 3,7 | 3,6 | 3,4 | 3,6 |
| Total unit COP (2) | - | 7,7 | 7,5 | 7,5 | 6,7 | 7,8 |

(1) fresh air inlet +35 °C / 40% RH, return air +26 °C / 50% RH

(2) fresh air inlet -5 °C / 80% RH, return air +20 °C / 50% RH

# RXH/Hi

## INTEGRATED REFRIGERANT CIRCUIT HEAT RECOVERY UNITS

## Features

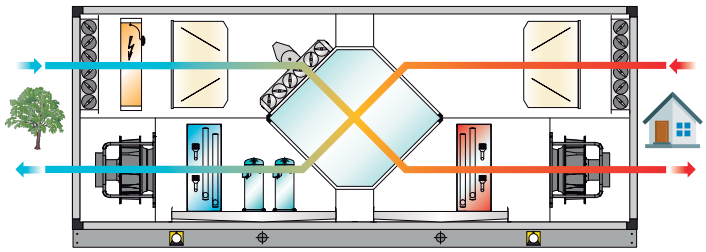
**1° STEP** Plate heat exchanger
**2° STEP** Heat pump refrigerant circuit

**50** 50 mm anodised aluminium profiles
48 mm panels with polyurethane or mineral wool insulation

**60TT** 60 mm anodised aluminium profiles
63 mm panels with polyurethane or mineral wool insulation

- Air filters of various efficiencies
- **Plate** heat exchanger with by-pass
- **EC brushless** fans with backward blades
- Integrated refrigerant circuit in heat pump
- Control panel with remotable LCD graphic display

## Operating mode



### HEATING

In winter the return air crosses the plate heat exchanger and feeds the heat pump source exchanger (evaporator). Through the vapour compression refrigeration cycle, the fresh air is heated by the heat pump user exchanger (condenser).
The modulation of the thermal capacity will allow to precisely control the supply air temperature.
To prevent the formation of surface frost, the unit provides controlled management of a defrosting cycle obtained by reversing the refrigeration cycle.

### COOLING

In summer the return air crosses the heat exchanger and feeds the heat pump source exchanger (condenser). The fresh air instead crosses the heat exchanger and is cooled by the heat pump user heat exchanger (evaporator).

### FREE-COOLING

When the outside temperature is lower than the inside temperature of the room to be air-conditioned, if this needs cooling, the units operate in free-cooling mode and all integrated heat recovery stages are disabled.

| MODEL | | 011 | 021 | 031 | 041 | 061 | 081 | 101 |
|---|---|---|---|---|---|---|---|---|
| Nominal airflow rate | $m^3/h$ | 1000 | 2000 | 3000 | 4500 | 6000 | 8000 | 10000 |
| Thermal efficiency recovery in cooling mode [1] | % | 77,9 | 78,4 | 77,9 | 77,9 | 78,1 | 78,5 | 74,9 |
| Thermal efficiency recovery in heating mode [2] | % | 92,9 | 94,2 | 94,4 | 94,6 | 94,7 | 95,3 | 89,1 |
| $SFP_{int}$ | W/(l/s) | 2,09 | 1,96 | 2,15 | 2,18 | 2,18 | 2,19 | 1,99 |
| Total unit EER [1] | - | 6,79 | 5,57 | 5,97 | 5,98 | 5,46 | 6,09 | 5,63 |
| Total unit COP [2] | - | 12,60 | 13,98 | 11,10 | 13,03 | 11,63 | 12,36 | 10,31 |

| MODEL | | 062 | 082 | 102 | 132 | 172 | 242 |
|---|---|---|---|---|---|---|---|
| Nominal airflow rate | $m^3/h$ | 6000 | 8000 | 10000 | 13000 | 17000 | 24000 |
| Thermal efficiency recovery in cooling mode [1] | % | 78,1 | 78,5 | 74,9 | 75,1 | 75,3 | 74,9 |
| Thermal efficiency recovery in heating mode [2] | % | 94,7 | 95,3 | 89,1 | 89,7 | 90,2 | 89,8 |
| $SFP_{int}$ | W/(l/s) | 2,18 | 2,19 | 1,99 | 2,13 | 2,09 | 2,26 |
| Total unit EER [1] | - | 5,41 | 5,92 | 5,62 | 5,32 | 5,36 | 5,76 |
| Total unit COP [2] | - | 11,92 | 12,69 | 10,40 | 11,97 | 11,95 | 15,18 |

[1] fresh air inlet +35 °C / 40% RH, return air +26 °C / 50% RH

[2] fresh air inlet -5 °C / 80% RH, return air +20 °C / 50% RH

# RWH/Hi

## INTEGRATED REFRIGERANT CIRCUIT HEAT RECOVERY UNITS

## Features

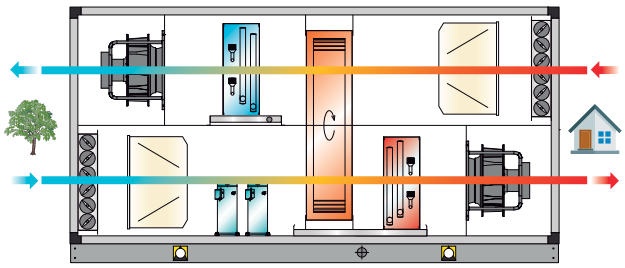
**1° STEP** Rotary heat wheel exchanger
**2° STEP** Heat pump refrigerant circuit

**50** 50 mm anodised aluminium profiles
48 mm panels with polyurethane or mineral wool insulation

**60TT** 60 mm anodised aluminium profiles
63 mm panels with polyurethane or mineral wool insulation

- Air filters of various efficiencies
- **Rotary** heat wheel exchanger
- **EC brushless** fans with backward blades
- Integrated refrigerant circuit in heat pump
- Control panel with remotable LCD graphic display

## Operating mode



### HEATING

In winter the return air crosses the rotary wheel exchanger and feeds the heat pump source exchanger (evaporator). Through the vapour compression refrigeration cycle, the fresh air is heated by the heat pump user exchanger (condenser).
The modulation of the thermal capacity will allow to precisely control the supply air temperature.
To prevent the formation of surface frost, the unit provides controlled management of a defrosting cycle obtained by reversing the refrigeration cycle.

### COOLING

In summer the return air crosses the rotary wheel exchanger and feeds the heat pump source exchanger (condenser). The fresh air instead crosses the rotary wheel exchanger and is cooled by the heat pump user heat exchanger (evaporator).

### FREE-COOLING

When the outside temperature is lower than the inside temperature of the room to be air-conditioned, if this needs cooling, the units operate in free-cooling mode and all stages of integrated heat recovery are disabled.

| MODEL | | 011 | 021 | 031 | 041 | 061 | 081 | 101 |
|---|---|---|---|---|---|---|---|---|
| Nominal airflow rate | $m^3/h$ | 1000 | 2000 | 3000 | 4500 | 6000 | 8000 | 10000 |
| Thermal efficiency recovery in cooling mode [1] | % | 81,7 | 80,9 | 80,0 | 80,1 | 80,3 | 80,4 | 80,1 |
| Thermal efficiency recovery in heating mode [2] | % | 81,9 | 81,2 | 80,5 | 80,4 | 80,6 | 80,8 | 80,5 |
| $SFP_{int}$ | W/(l/s) | 2,02 | 1,82 | 1,86 | 1,98 | 1,86 | 1,83 | 1,76 |
| Total unit EER [1] | - | 5,53 | 5,43 | 5,82 | 6,06 | 5,43 | 5,76 | 5,54 |
| Total unit COP [2] | - | 11,88 | 15,33 | 15,66 | 14,27 | 15,02 | 16,39 | 18,80 |

| MODEL | | 062 | 082 | 102 | 132 | 172 | 242 |
|---|---|---|---|---|---|---|---|
| Nominal airflow rate | $m^3/h$ | 6000 | 8000 | 10000 | 13000 | 17000 | 24000 |
| Thermal efficiency recovery in cooling mode [1] | % | 80,3 | 80,4 | 80,1 | 80,0 | 79,0 | 78,0 |
| Thermal efficiency recovery in heating mode [2] | % | 80,6 | 80,8 | 80,5 | 80,0 | 78,0 | 78,0 |
| $SFP_{int}$ | W/(l/s) | 1,86 | 1,83 | 1,76 | 2,04 | 2,13 | 2,20 |
| Total unit EER [1] | - | 5,39 | 5,77 | 5,53 | 5,34 | 5,64 | 5,97 |
| Total unit COP [2] | - | 11,44 | 13,13 | 12,96 | 14.08 | 17,89 | 19,29 |

[1] fresh air inlet +35 °C / 40% RH, return air +26 °C / 50% RH

[2] fresh air inlet -5 °C / 80% RH, return air +20 °C / 50% RH

# SXH/HP

## SWIMMING POOL HEAT PUMP AIR HANDLING UNITS

## Features

**1° STEP** Plate heat exchanger
**2° STEP** Heat pump refrigerant circuit

**50** 50 mm anodised aluminium profiles
48 mm polyurethane/mineral wool panels

**60TT** 60 mm anodised aluminium profiles
63 mm polyurethane/mineral wool panels

### EXECUTION FOR SWIMMING POOL

- External side in **prepainted** steel sheet
- Internal side in **prepainted** steel sheet
- Internal guides in **galvanized painted** steel
- **Plate** heat exchanger with by-pass, frame and heat exchanger with **epoxy protection**
- Air filters of various efficiencies
- **EC brushless** fans with backward blades with **epoxy coated**
- Integrated refrigerant circuit in heat pump
- Control panel with remotable LCD graphic display

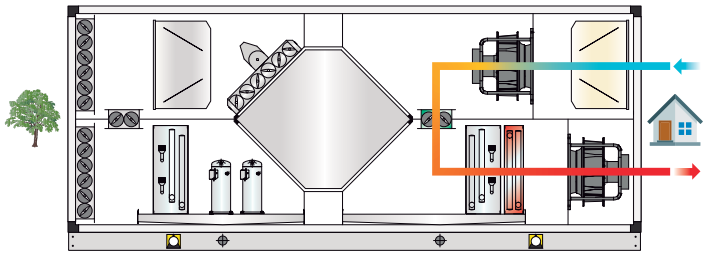
| MODEL | | 021 | 031 | 041 | 061 | 081 |
|---|---|---|---|---|---|---|
| Nominal airflow rate | $m^3/h$ | 2000 | 3000 | 4500 | 6000 | 8000 |
| Thermal efficiency recovery (1) | % | 79,5 | 78,9 | 79,9 | 79,7 | 79,4 |
| Thermal power of refrigerant circuit (1) | kW | 8,5 | 14,2 | 20,0 | 28,1 | 34,3 |
| Total thermal power of unit (1) | kW | 24,8 | 38,6 | 57,1 | 77,7 | 100,2 |
| COP refrigerant circuit (1) | w/w | 4,4 | 4,3 | 4,3 | 4,4 | 4,2 |
| SFP factor (2) | W/(l/s) | 1,54 | 1,56 | 1,68 | 1,67 | 1,76 |

| MODEL | | 101 | 131 | 171 | 241 |
|---|---|---|---|---|---|
| Nominal airflow rate | $m^3/h$ | 10000 | 13000 | 17000 | 24000 |
| Thermal efficiency recovery (1) | % | 79,3 | 80,0 | 79,5 | 78,3 |
| Thermal power of refrigerant circuit (1) | kW | 43,2 | 64,1 | 80,7 | 104,0 |
| Total thermal power of unit (1) | kW | 124,7 | 170,1 | 221,3 | 285,6 |
| COP refrigerant circuit (1) | w/w | 4,3 | 4,5 | 4,4 | 4,5 |
| SFP factor (2) | W/(l/s) | 1,68 | 1,61 | 1,69 | 1,84 |

(1) 100% external air flow, external air conditions 0°C / 80% R.H. ambient air conditions 30°C / 60% R.H.

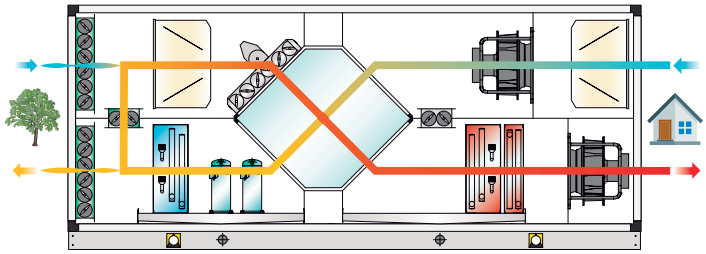
(2) in compliance with EN 13779

## Operating mode



### START-UP MODE OR NIGHT HEATING MODE

The unit operates in 100% recirculation mode without external air supply. The air in the pool room is recirculated and heated by the water coil in the unit and supplied by an external energy source (e.g. boiler). The heat pump circuit is in standby. The fans operate in flow modulation to minimize the power consumption of the unit.

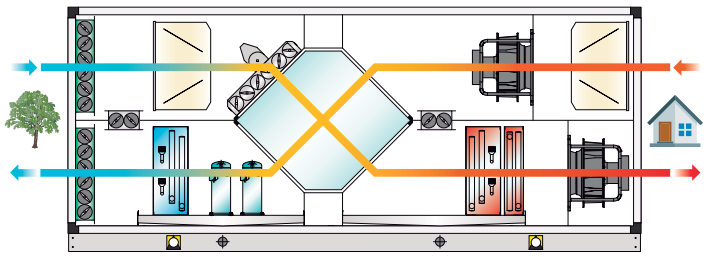


### DEHUMIDIFICATION MODE WITH "ALPHA" CYCLE

The unit operates with the minimum amount of fresh air to ensure the hygiene requirements of the pool room.

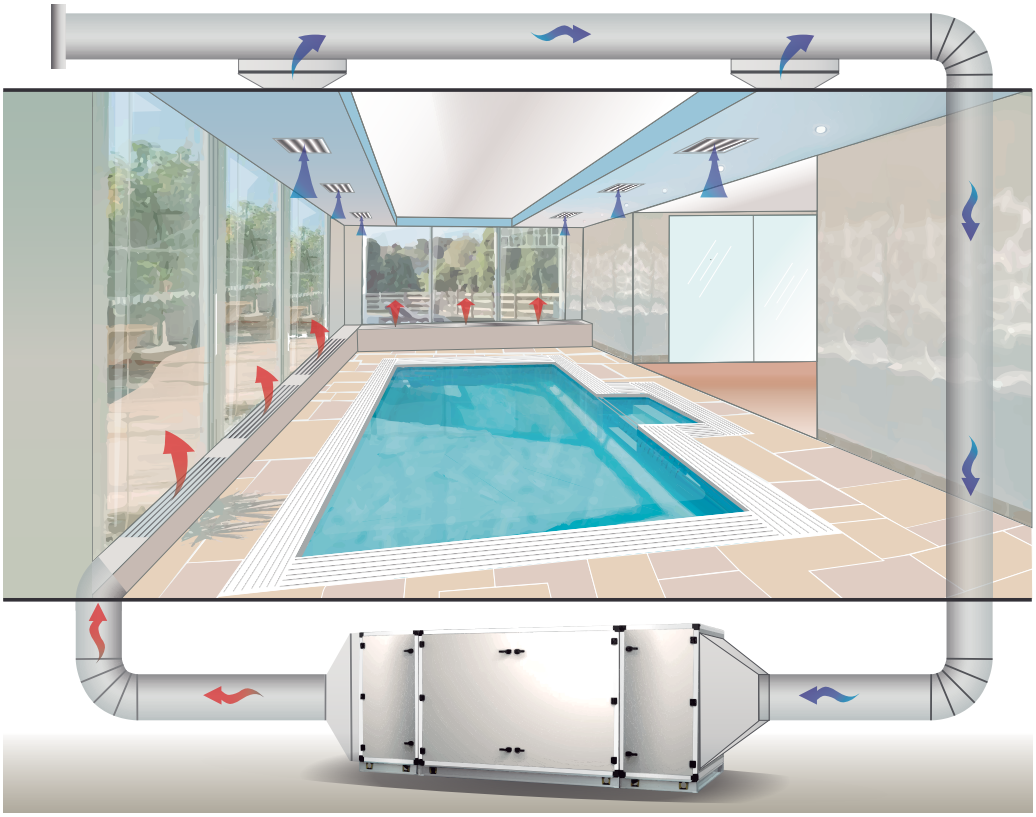
In this mode, the fresh air is sufficient to ensure adequate dehumidification of the room, if this is not sufficient, part of the air downstream of the heat pump evaporator (dehumidified) is recirculated to supplement the dehumidification. In this way a percentage (variable) of the airflow is expelled, fully integrated with fresh air.

The fresh air is pre-heated in the heat exchanger and then in the condenser of the heat pump; in case the temperature is not yet warm enough, it will be integrated with the hot water coil.



### DEHUMIDIFICATION MODE WITH FRESH AIR

The unit operates with 100% fresh air. The by-pass damper on the heat exchanger pack of the cross-flow heat recovery is closed and the unit operates by heating all the fresh air.
Dehumidification takes place using fresh air. The heat pump circuit recovers the energy expelled from the room and heats the supply air.



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