ZEPHIR³

CPAN-XHE3 Size1-Size6 Series
Air flow from 1.000 to 14.000 m^3/h (300 to 3.900 l/s)

Technical
Bulletin
BT12M007GB-05

Outdoor air management and purification
Simplified system design
Unrivalled Energy efficiency
Maximum flexibility and versatility

The complete packaged Primary Air supply System with thermodynamic energy recovery

CLIVET®

CLEAR AIR

Fundamental. But less and less available.

Everyday we consume approximately one kilogram of food, three litres of liquid and **over 10.000 litres of air**.

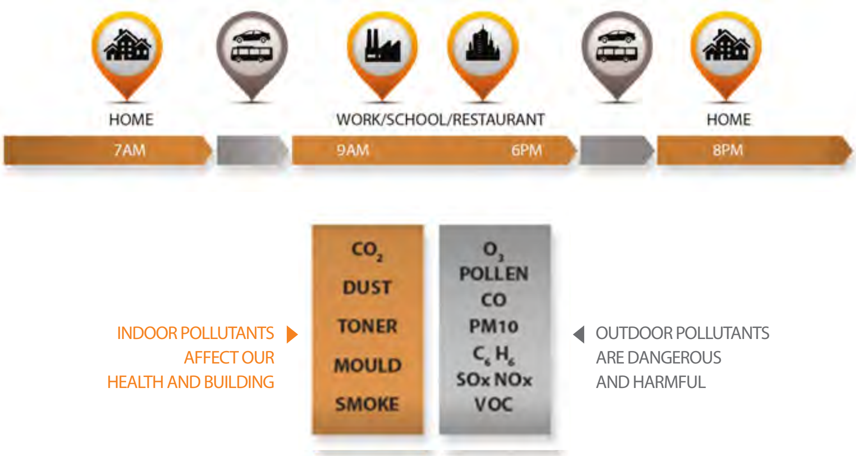
However, although we can choose the food and drinks we consume, we are rarely able to act over quality of the air that we breathe.

Fresh and clean air exists in nature.

It exists in nature but it is increasingly hard to benefit from it because of its continued degradation caused by human action.

The air quality we breathe is threatened by many pollution sources.

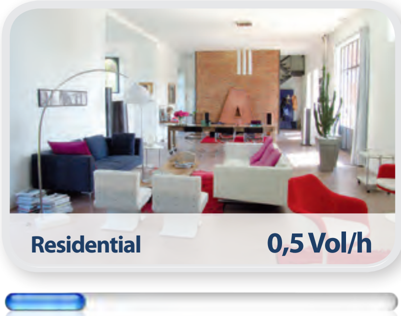
We spend 90% of our time indoors where numerous pollutants accumulate. Simply introducing untreated outdoor air to dilute indoor pollutants is not a solution, because of additional polluting agents present in outdoor air.

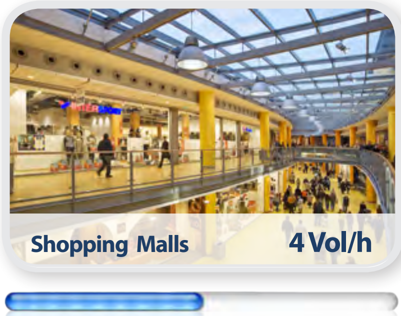


AIR RENEWAL
Determines the comfort level in buildings.

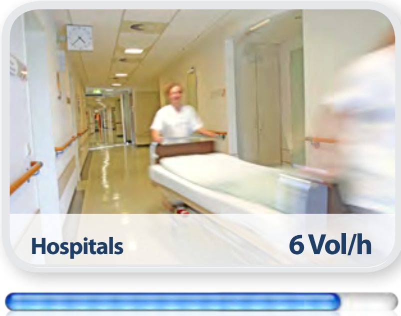
The role of Primary Air

Correct building air renewal air is done through primary air system
- Extraction of exhaust air,
- Filtration of outdoor air,
- Temperature and humidity at the desired conditions.



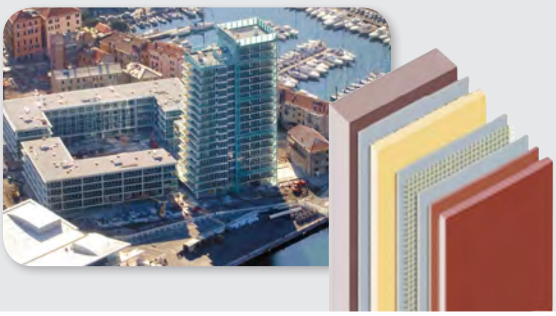


The amount of renewed air varies in accordance with building purpose and is fixed by certain laws, rules an regulations: a hospital requires 20 times more than a house. Typically, the Primary Air flow increases in relation to crowding, to the concentration of internal pollutanys and to the air quality required in the building.



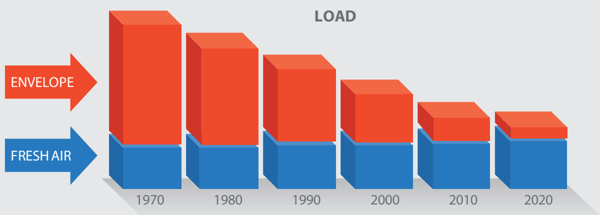
Primary air today.
Even more important.

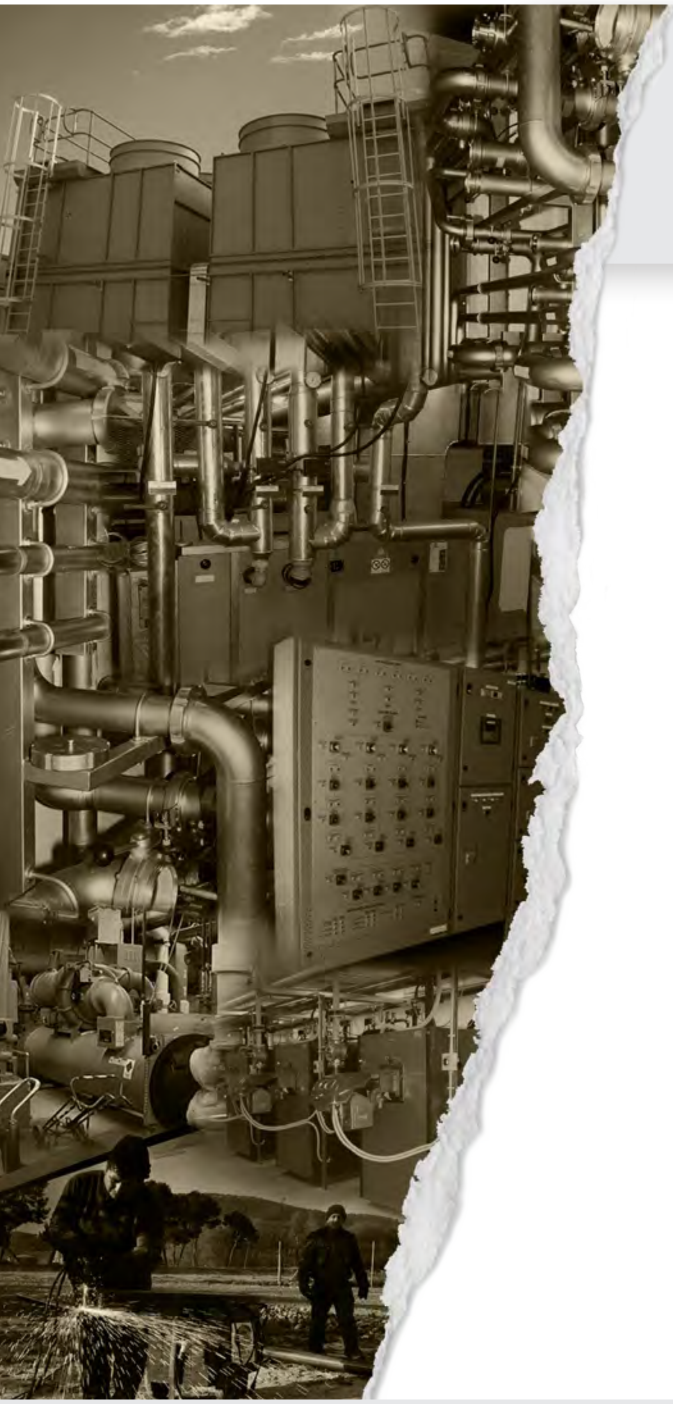
To reduce the building's energy requirement **the modern construction methods** have pratically removed polluted air infiltrations:
- Today housing is virtually **sealed**
- Air renewal is essential to prevent **the accumulation of indoor pollutants.**



Primary Air costs.
More and more.

High **insulation** results in:
- the load for the air renewal can even exceed **60% of the he overall requirements of the building**
- The neccessary energy is therefore one of **the main costs** for the operating systems.





PRIMARY AIR YESTERDAY

Difficult to achieve. And to manage.

Bespoke systems
Focus on costs and time control.

The traditional Primary Air systems are based on the modular air handling units that need heat stations, cooling stations, fluid distribution networks, pumps, control systems. All these components must be selected individually and then assembled, commissioned and tested in site.

Intrusive
Less space in the building.

Units, pipelines, electric supply and control lines , air distribution ducts run through the whole building. They take up space that could be used for productive activities and they challenge designers and operators to integrations often difficult.

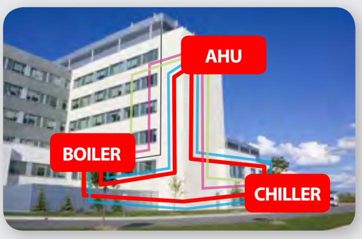
Complicated integration
Design and commissioning time.

The system success and reliability depends on the proper operation of its single components and their effective interaction. This requires careful design of the control system, its perfect implementation and an heavy commissioning to set and to keep it at the desired result.

High Energy costs
Auxiliary consumption costs.

In traditional systems heating and cooling capacity is **produced centrally**

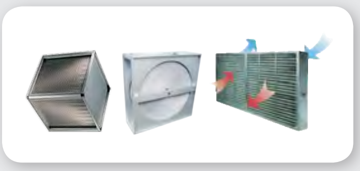
- It must be **transfered** to the air handling units by hot and chilled water.
- The **consumpions** for pumping, storage and heat losses along the pipes reduce the system's actual seasonal efficiency in comparison with the rated value of the single components.



Passive recovery systems
Higher consumption.

Capacity of the **passive exchangers** depends largely on the operating conditions

- It decreases **until it reaches zero** in conditions other than design
- The increased fan power due to **high pressure drops** remains constant instead
- The fan energy consumption increases
- **Less-than-expected** net energy recovered
- Risk of **contamination** between the air flows.



ZEPHIR³. A REVOLUTION IN PRIMARY AIR

Comfort, saving and system semplification.

The whole **Primary Air plant** in a **single stand-alone System**

The active thermodynamic circuit
produces capacity amplifying the energy contained in the exhaust air

Extracts and expels
the stale air from the space and recovers its thermal energy

It operates with
100% outdoor air

It supplies Primary Air
purified and air-conditioned

For any applications

- HYDRONIC SYSTEMS WITH TERMINALS / FAN-COILS
- DIRECT EXPANSION AND VRF SYSTEMS
- RADIANT SYSTEMS AND CHILLED BEAMS
- REFURBISHMENT OF AIR HANDLING UNITS
- RENOVATION OF EXISTING SYSTEMS

Self contained. Easy.

Fully stand-alone.

It autonomously produces heating and cooling capacity to handle Primary Air:

- **No connection** to external heating and cooling stations
- **80% less works on site**
- **Industrial** product optimized and tested for maximum reliability of results

Efficient and reliable.

Saves energy in the annual cycle.

Reversible heat pump technology

- **Recovers** energy from exhaust air, a heat source that is favourable and steady over time
- The capacity produced satisfies **most of the whole system's demand**
- **Eliminate the waste** typical of central systems, such as pumping, storage, thermal loss on the pipework
- **30% saving on ventilation**

100% CLIVET TECHNOLOGY

The Primary Air system, industrialised.

Packaged system

Industrial quality.

ZEPHIR3 contains all the components required to operate perfectly. These have already been optimised and tested by Clivet to ensure 100% efficient and reliable results.

1. AIR RETURN AND EXHAUST SECTION WITH ENERGY RECOVERY

2. FRESH AIR HANDLING AND INLET SECTION

3. THERMODYNAMIC INVERTER AND MANAGE AND CONTROL ELECTRONICS SECTION

EX. Exhaust air
SA. Supply air

RA. Return air
OA. Outdoor air

Safe

No cross contamination.

A resistent steel wall keeps the two flows separate . All the technological components are located in individual compartments that can be easily accessed for routine maintenance.

Compact

Versatile positioning.

Requires 50% less space compared with a primary air handling unit at modular sections. It has already all the settings and power components.

Heat pump technology

Single system annual cycle.

Electric reversible heat pump systems are the heart of Clivet's specialised system solutions

- Single system for the whole **annual cycle**
- Efficiency increases further during the most frequent part load operation
- Annual saving **of up to 50%** compared to traditional systems

Qualified proposal.

It does not use fossil fuels.

ZEPHIR³ has **full electric operating**

- **No gas** or other fossil fuels
- **No direct emissions** into the atmosphere
- **No heating stations,** chimneys, explosion safety devices and regular servicing
- Further **savings**

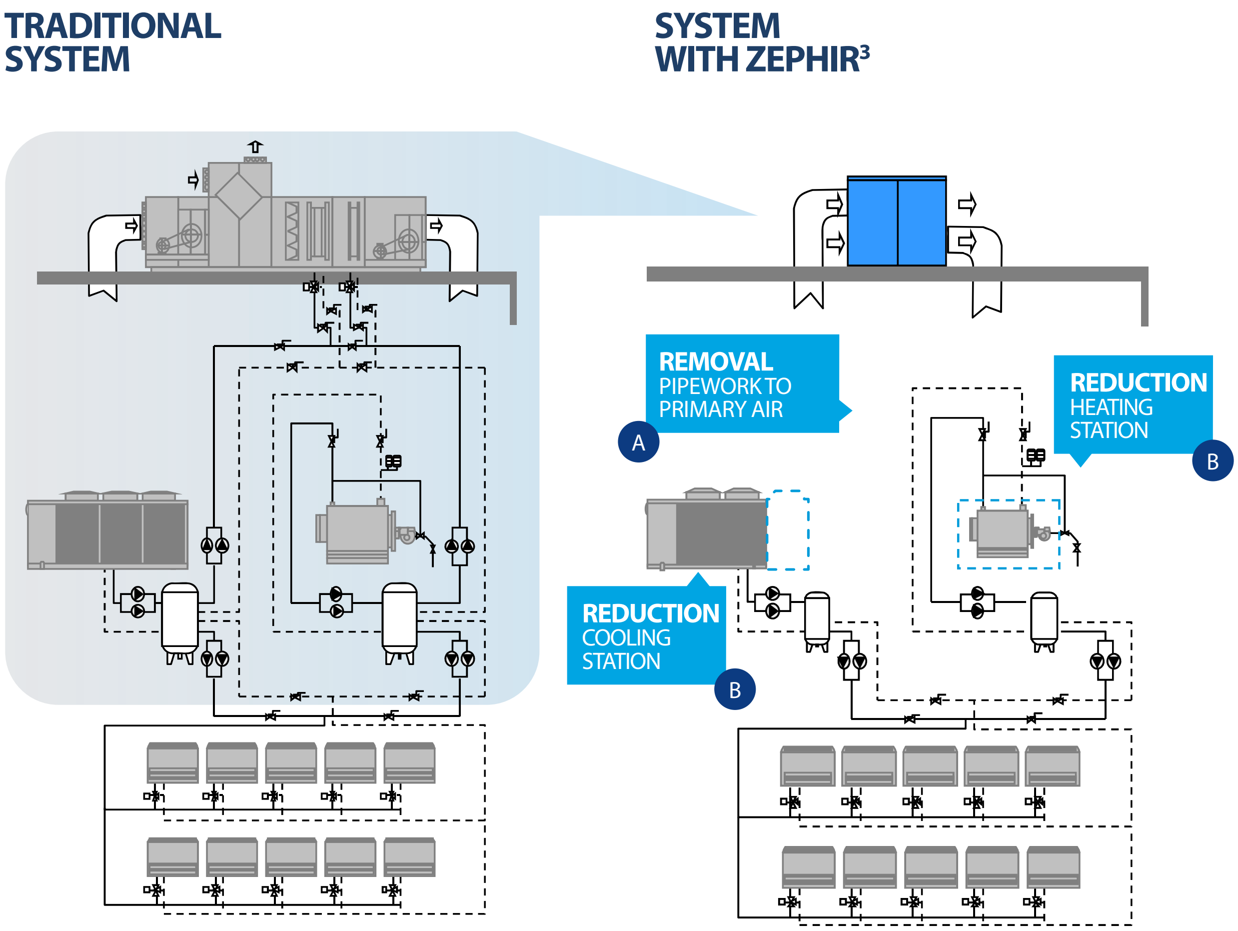
SIMPLIFIES THE SYSTEM

More value for the building. And for the users.

Maximum integration

ZEPHIR3 is autonomous: it eliminates the circuit of hot and cold fluids distribution for Primary Air and replaces most of the capacity produced by traditional heating and cooling stations.

- Free up space for other uses
- Further improve the start-up investment



A Elimination of fluids network for Primary Air.
There is non necessary piping and thermal insulation, pumping stations and storage tanks, controls, shafts, installation and testing works

B Cooling and heating stations reduction.
Traditional heating and cooling stations are required only for the secondary local air-conditioning system:

- they have compact size and low start-up costs
- they are activated only for limited times and in severe ambient conditions
- they produce lower direct energy consumption, that is electricity and fossil fuels
- they produce lower auxiliary energy consumption for pumping, losses and thermal inertia of the fluid distribution network.

DECENTRALISED SYSTEM

Flexibility of investment and installation.

Location of the Primary Air system

ZEPHIR³ makes it easier to split the primary air system into similar areas of the building

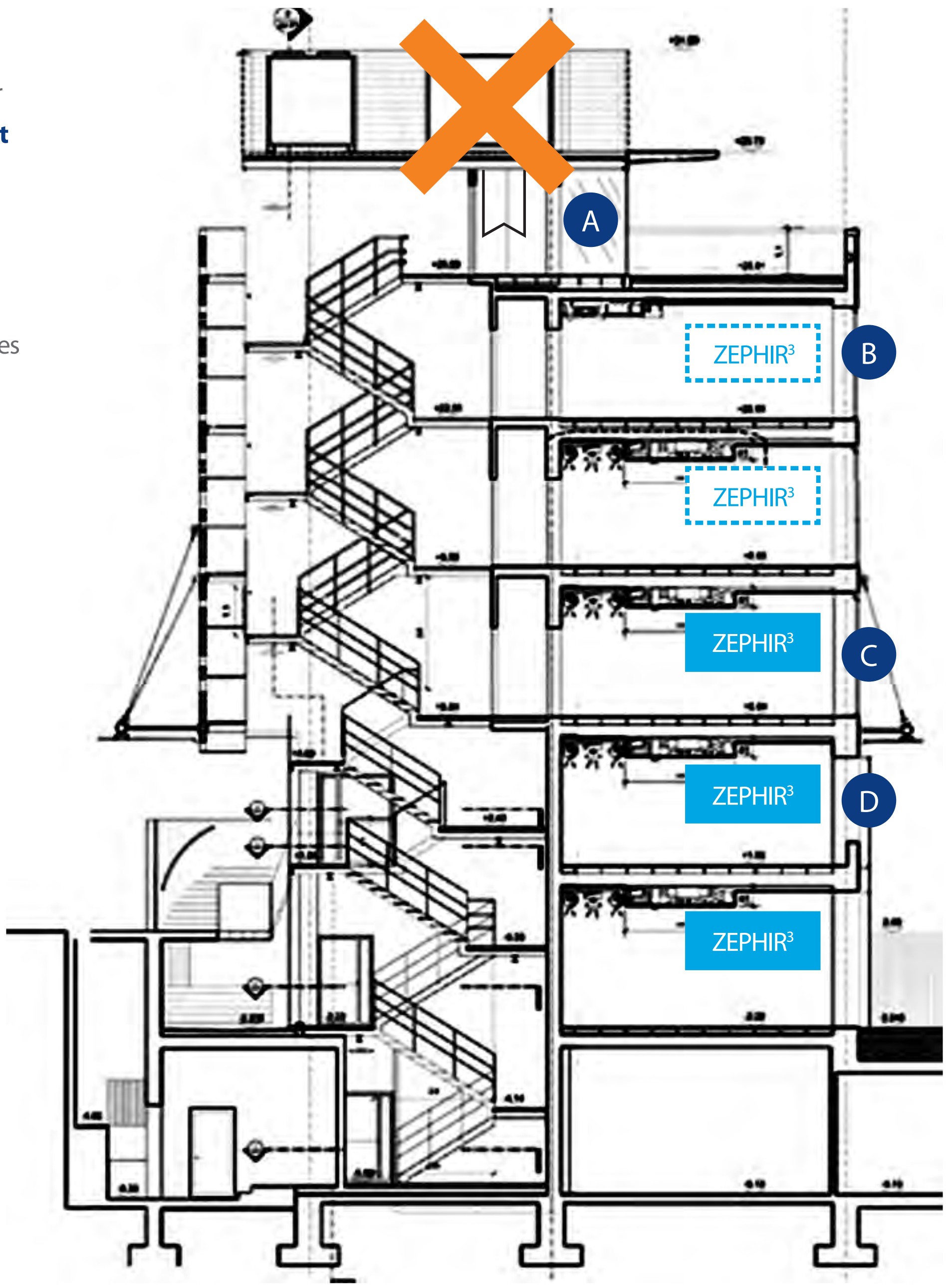
- Further increase of efficiency as it produces energy locally, only when and where it is required
- Further increase of the comfort because the unit successfully adapts to the different loads
- Modular design, therefore simpler

A Free up space
No need for large-size central ductworks for supply and return air

B Spread out investment over time
Purchase only as the areas become occupied

C Best architectural integration
Smaller capacity modules are easier to position

D More durable
It can be easily installed indoors, sheltered from the bad weather

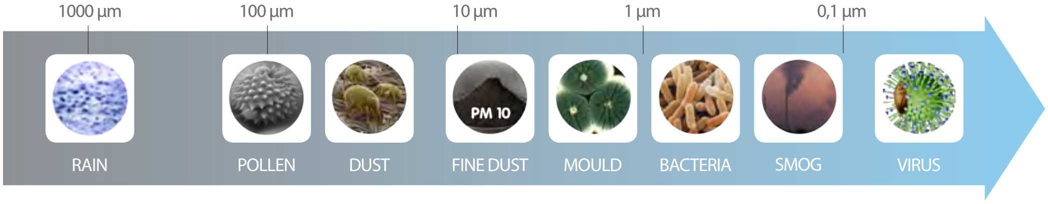


EXAMPLE
OF DECENTRALIZATION
PER FLOOR

HIGH AIR QUALITY
Purification and Comfort while Saving.

99% pure air
Innovative technology.

The ZEPHIR³ electronic filters are effective on smoke, fine dust especially PM10, PM2,5, PM1, viruses and bacteria. Therefore they ensure higher air quality even in the most polluted urban areas.
The filtering efficiency is equivalent to the H10 classification used in traditional filters, i.e. the class identified as "absolute filter" for traditional filters.

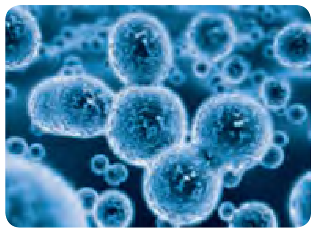


Continuous humidity control
Total comfort.

The quality of the indoor air depends largely on humidity: one of Primary Air system's main tasks is to control it. In summer mode, ZEPHIR³ always dehumidifies outdoor air via the thermodynamic circuit. Therefore it corrects the temperature until it reaches the supply air desired value, free of charge, thanks to the post-heating modulating system with hot gas recovery. In winter mode, when required by the outdoor conditions and system application, ZEPHIR³ can humidify renewal air with the optional steam section, with immersed electrodes or steam-powered section.

Continuous extraction of exhaust air
Eliminates indoor pollutants.

The supply of purified air dilutes the pollutants, which are automatically removed by the section of air extraction.
The two sections are entirely separated and prevent cross flow contamination.



Saving in the total life cycle costs
Compared with traditional filters.

Along with energy saving for ventilation we have:

- A considerable saving on maintenance: the washable electronic filters do not need to be replaced periodically like traditional ones
- 50% reduction of annual operating costs compared with a traditional system with bag filters.

Accurate control
Comfort with no waste.

ZEPHIR³ continuous capacity control

- It carefully controls supply conditions, reliably
- It ensures users the desired comfort
- It provides only the energy actually required
- It allows for considerable energy saving

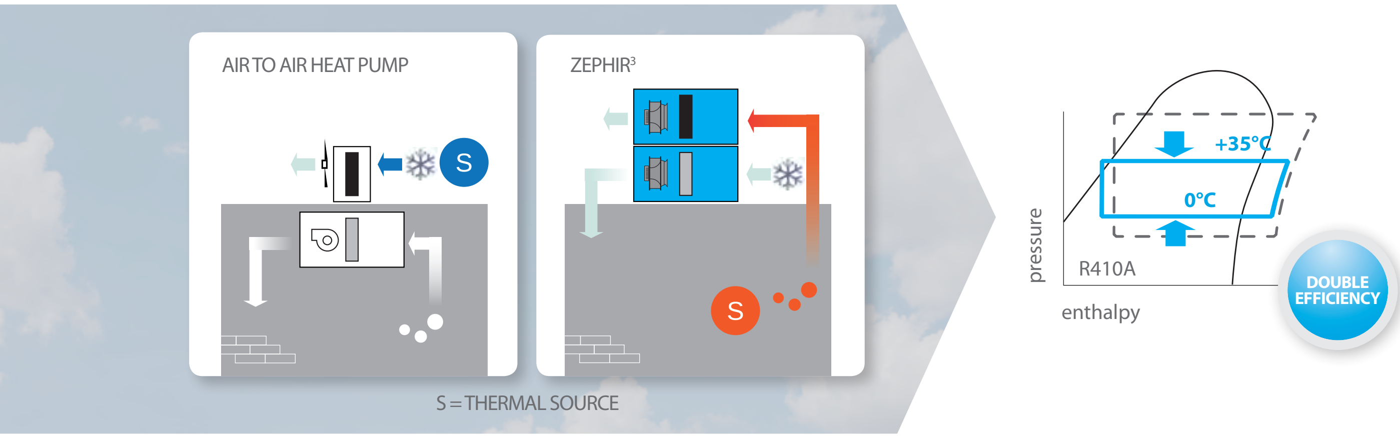
HIGH ENERGY EFFICIENCY

Production at low energy consumption. Management costs saving.

1. Exhaust air as a favourable thermal source stable over time.

It halves the energy required for the compressors.

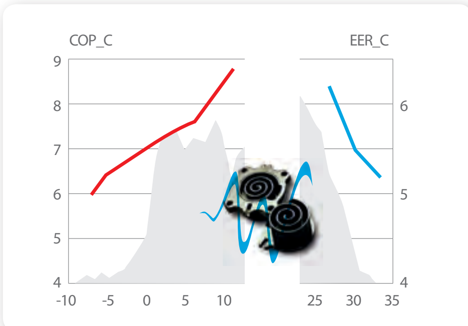
ZEPHIR3's thermodynamic circuit uses this source to produce heating and cooling energy in a more efficient way compared to traditional generators that employ outdoor air as a source. Indeed with higher evaporating temperatures on the cold exchanger and lower condensing temperatures on the heat exchanger, it reduces the compressors' absorption by as much as 50%.



2. Continuous capacity control

Very high seasonal efficiency.

ZEPHIR³ supplies only the energy actually required.
So further it increases its efficiency in partial load operation, which is the more frequently operate condition. The annual consumption of primary energy is reduced by 50% compared with traditional systems.



3. Dinamic Free-Cooling

Great savings on running costs.

With this ZEPHIR³ feature:

- It intakes fresh and clean outdoor air without the **compressors activation**
- It cools the spaces **free of charge** for a considerable amount of hours of operation
- It's even more effective in buildings with **high space loads**

4. Re-heat free of charge

It recovers the heat from hot gas.

During dehumidification:

- It eliminates the **energy cost** to pump and store hot water from the heating station or the heat recovery on the chiller.
- The **energy efficiency** of the thermodynamic circuit further increases due to favourable condensation
- **Accurate modulating control** of the supply temperature

HIGH ENERGY EFFICIENCY

Top ventilation technology. No waste.

5. High efficiency air circulation

Because the ventilation is always on.

The fan sections are equipped with electronically controlled motors directly coupled to the reverse blade impeller. They eliminate inefficiencies, wear and maintenance of traditional belt and pulley transmissions. As standard they are equipped with a "soft start" function, which drastically reduces inrush current and further limits the electric consumption of the system. At the same performances, ZEPHIR³ saves up to 30% compared with traditional ventilation systems.

6. Efficient recovery

Ventilation not reduced.

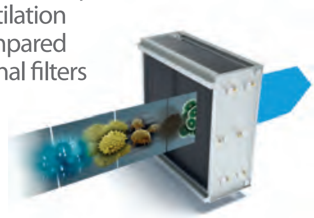
The ZEPHIR³ thermodynamic recovery eliminates the high pressure drops of passive recovery which in traditional systems requires more power for ventilation. This higher electrical consumption in an annual cycle often loses the savings on the recovered energy.

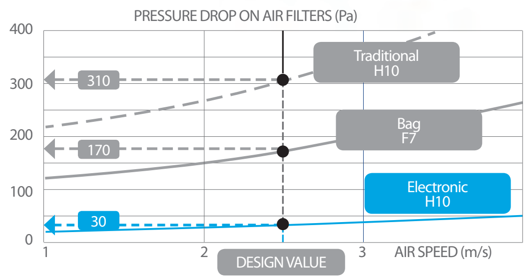
7. No waste filtration

High efficiency purification only.

High efficiency electronic filters

- Equivalent to the traditional H10
- Negligible pressure drops
- Savings on ventilation above 10% compared with conventional filters





8. Constant or variable air flow

Constant: just the amount required.

The nominal air flow is set on the display

- Simplified system calibration and testing
- Constant air flow, by adjusting the fan speed
- Offsets the constant clogging of filters
- For all air diffusion systems that cannot support variations in air flow, as in the majority of induction and chilled beam systems

Variable: the quantity required only.

It can automatically reduce the air flow in accordance with the actual crowding detected by the CO_2 probe

- Further increase of energy saving for air handling.
- Suitable also for other pollutants such as tobacco smoke, formaldehyde, cooking odours (VOC, Volatile Organic Compounds).

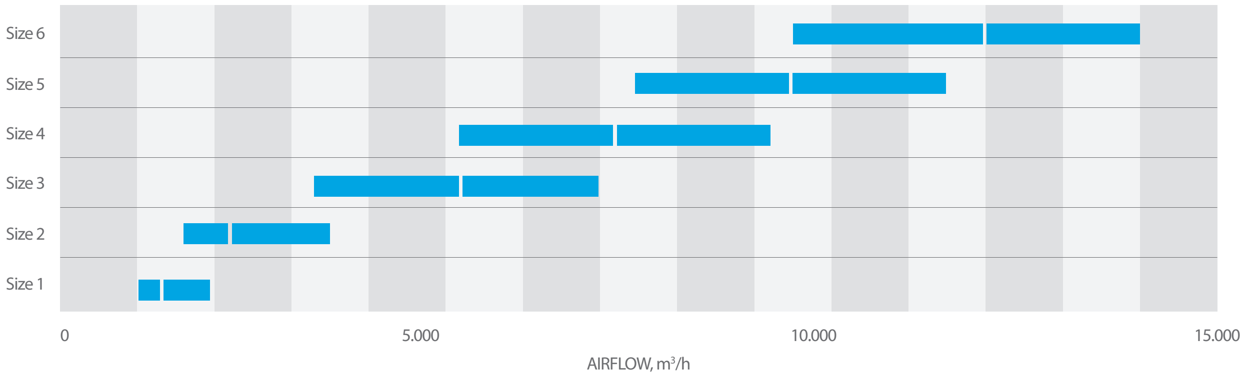
UNIVERSAL APPLICATION

In different climates and system types.

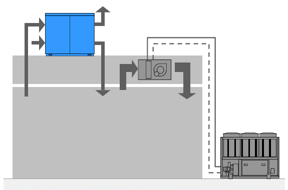
Always the right choice

Simplified design.

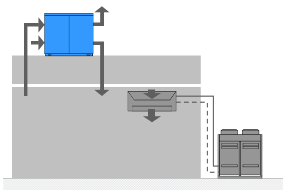
The Primary Air flow depends on the the building features and its use.
The capacity required for the air handling depends on both the outdoor air conditions and the secondary air conditioning system.
The ZEPHIR³ air flow can be chosen accurately for each model (Size).
Two models with the same air flow differ from heating and cooling capacities of the thermodynamic circuit, thus from the different supply conditions.
This is the reason why for different places and system applications there is always the suitable ZEPHIR³ model.



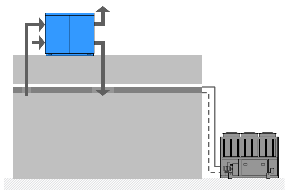
DIRECT SUPPLY TO THE SPACE, WITH HYDRONIC TERMINAL UNITS



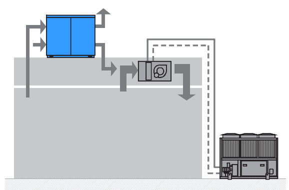
DIRECT SUPPLY TO THE SPACE, WITH VRF SYSTEMS



DIRECT SUPPLY TO THE SPACE, WITH RADIANT SYSTEMS



SUPPLY TO INTAKE OF LOCAL UNITS

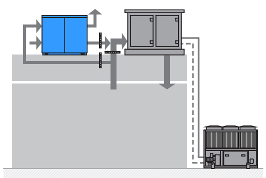


Perfect for redevelopment

Opportunity for energy efficiency.

Introduction of outdoor air into the existing systems:

- Without adding capacity to the heat and cool control stations
- Modernizing of existing air handling units at full recirculation



RETROFIT OF EXISTING SYSTEMS

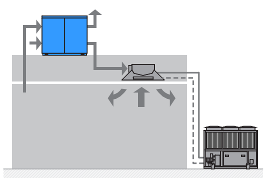
Double saving

In Radiant and Chilled Beam systems.

The chilled water can be produced at high temperature by the secondary system, as the dehumidification of ZEPHIR³ is completely independent. There is a further double benefit for the refrigeration unit:

- Power reduction of 20%
- Efficiency increase of 30%

MIXED HYDRONIC SYSTEM WITH INDUCTION DEVICES AND RETROFIT OF THE EXISTING CHILLED BEAM SYSTEMS



ZEPHIR³ ADDS VALUE TO THE BUILDING

Cost-effectively.

Greater comfort and reduced CO_2 emissions

Improves the energy rating of the building.

ZEPHIR³ increases comfort in buildings, reduces the consumption of primary energy, and reduces CO_2 emissions by up to 50% compared with traditional systems. It contributes in an important way to improve energy rating of the building, thus increasing its market value.

Amazing saving in the Total Life Cycle Cost

In the initial investment. And also in its operation and maintenance.

From the system choices depend the sustainability of the building operation and the comfort of the people who will live in the building, for the duration of its operating life. ZEPHIR³ simplifies the installation and increases overall efficiency, to guarantee at the same time a competitive initial investment and saving in system management which results in greater cash flow over the years.

Access to financial facilities

An affordable investment

In many countries, the improvement of the energy performance of the building brings further advantages:

- Economic incentives for the initial investment
- Subsidized energy supply
- Favourable finance plans

Important contribution to LEED credits

Energy and innovation

The ZEPHIR³ performance can help obtain LEED points precisely in the areas that are distinguished by the large number of possible credits:

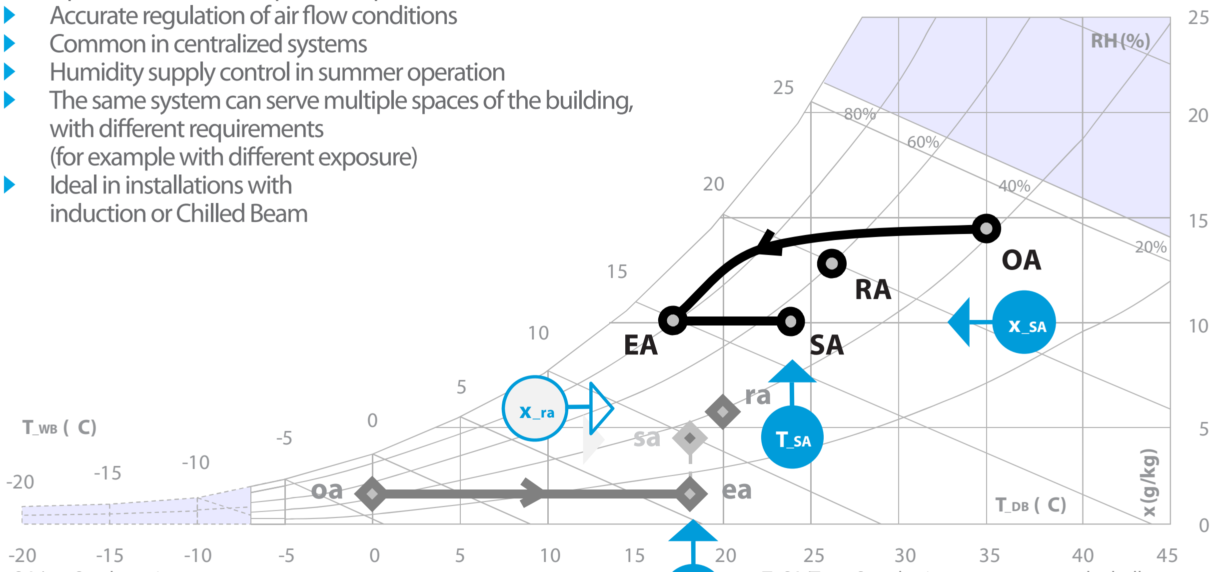
- Energy and Atmosphere (EA)
- Internal Environment Quality (IEQ)
- Innovation and Design process (ID)

CLIVET IS COMMITTED TO THE PROMOTION OF THE PRINCIPLES OF SUSTAINABLE BUILDING AND IS AN ORDINARY MEMBER OF GBC ITALY.

OPERATION WITH CONSTANT SUPPLY TEMPERATURE

When the room loads are handled by the secondary system.

- Exploits part of the ZEPHIR³ usable capacity
- Operation does not depend on space conditions
- Accurate regulation of air flow conditions
- Common in centralized systems
- Humidity supply control in summer operation
- The same system can serve multiple spaces of the building, with different requirements (for example with different exposure)
- Ideal in installations with induction or Chilled Beam



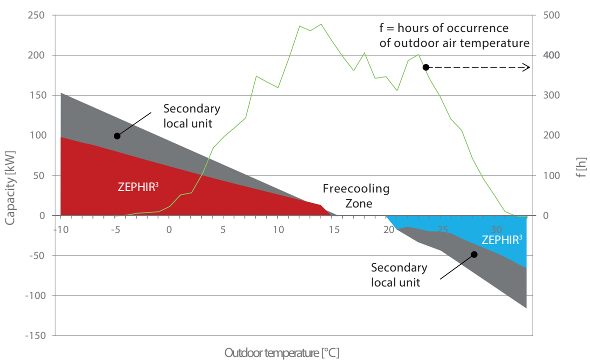
OA/oa. Outdoor air
EA/ea. Off-coil exit air
SA/sa. Supply air
RA/ra. Extracted air

T_SA/T_sa. Supply air temperature set, dry bulb
x_SA Supply Humidity ratio set
X_ra. Extracted air humidity ratio set

Note. For clarity the characteristic points are identified with capital letters in cooling and dehumidification, with lowercase letters in heating and any humidification.

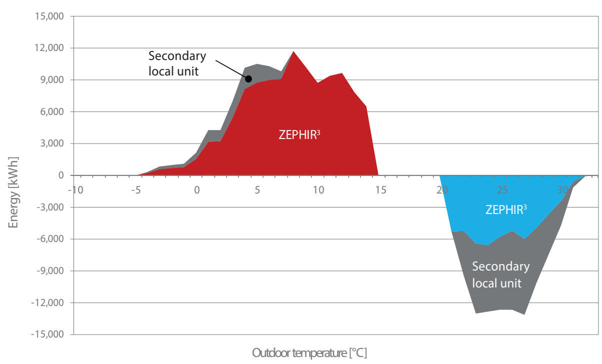
Case study. Hospital building in Rome.

HEAT LOAD DISTRIBUTION



Data refer to the use in a Hospital building, operating in continuous cycle operation.
24 hours a day for 365 days a year.
Location: Rome, Italy.
Source of climate data: U.S. Department of Energy.
ZEPHIR3 Size 5 system, nominal air flow 9.500 m³/h

THERMAL LOAD DISTRIBUTION



Location	ZEPHIR³ Thermal energy heating ratio	ZEPHIR³ Thermal energy cooling ratio
ROME	91%	51%
LONDON	86%	57%
VALENCIA	94%	52%

OPERATION WITH CONSTANT SUPPLY TEMPERATURE

Case study, energy analysis.

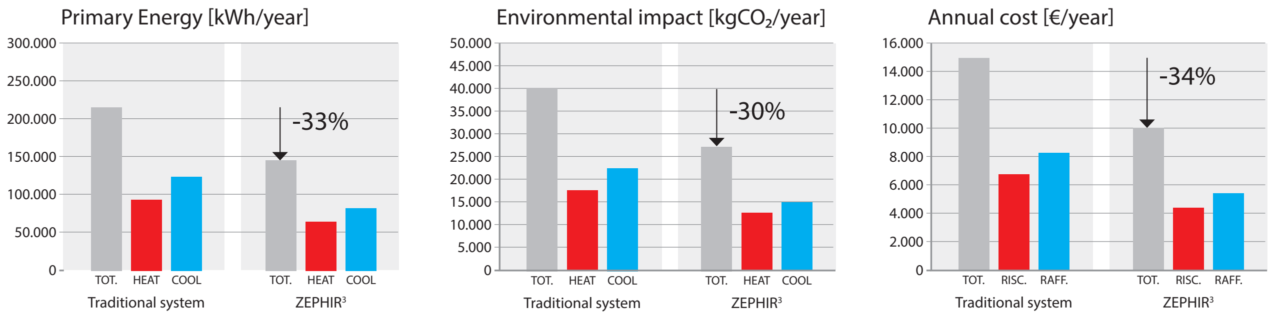
REDEVELOPMENT

ZEPHIR³ used in the upgrading of an existing building.
The capacity of the cooling and heating control systems remains unchanged.
The production of chilled water at high temperatures increases the efficiency of the cool station.
Reduction in CO_2 emissions compared to a traditional system with modular air handling units of a hydronic type with passive heat recovery of FI 60%

HOSPITAL

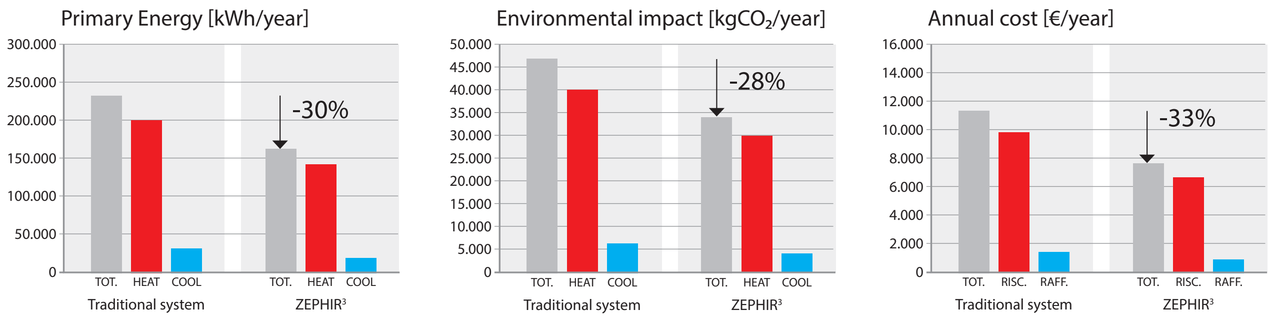
Wards area
Surface: 1.200 m²
Secondary system: hydronic with chilled beam terminals

ROME



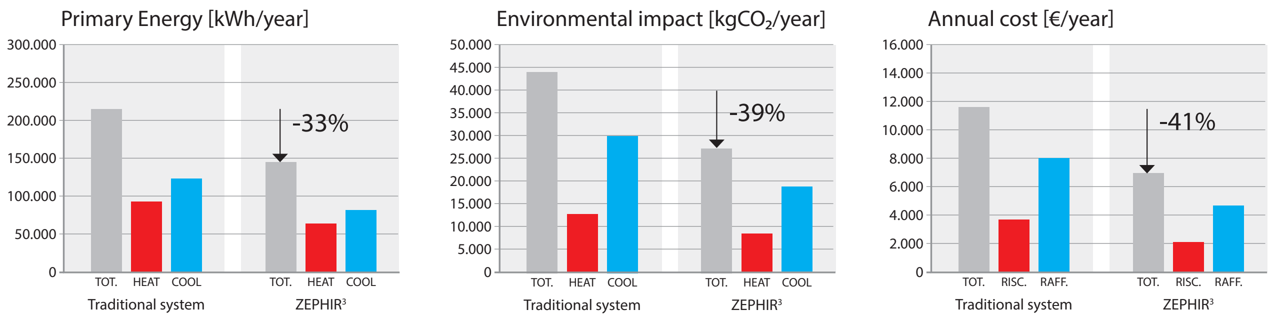
Methane gas cost 0,7 EUR/Nm³ - Electric energy cost 0,15 EUR/kWh

LONDON



Methane gas cost 0,5 EUR/Nm³ - Electric energy cost 0,10 EUR/kWh

VALENCIA

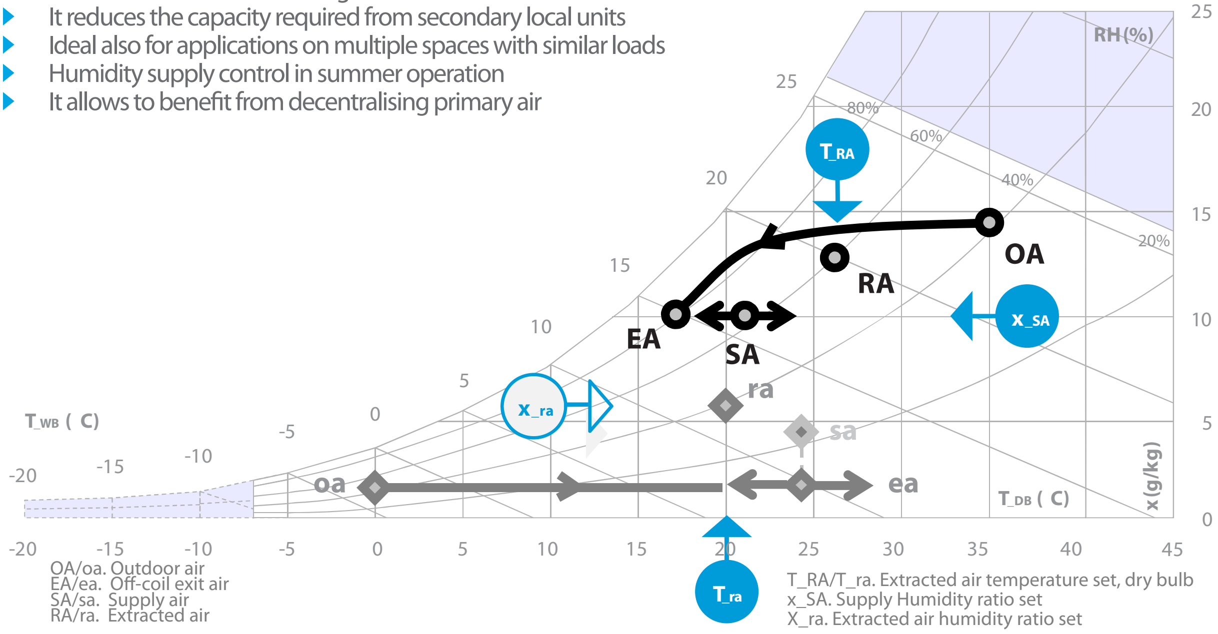


Methane gas cost 0,6 EUR/Nm³ - Electric energy cost 0,10 EUR/kWh

OPERATION AT MAXIMUM AVAILABLE CAPACITY

To maximise the heating and cooling capacity of ZEPHIR³

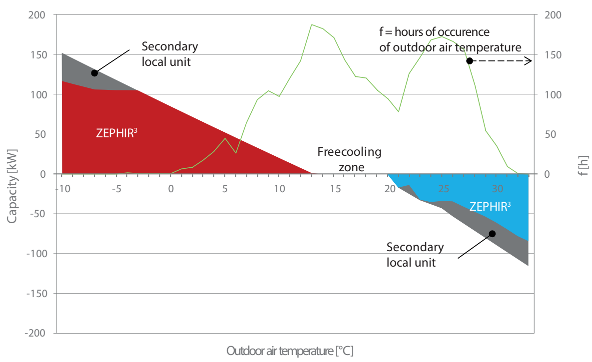
- Operation also depends on space conditions
- It satisfies most of the building load
- It reduces the capacity required from secondary local units
- Ideal also for applications on multiple spaces with similar loads
- Humidity supply control in summer operation
- It allows to benefit from decentralising primary air



Note. For clarity the characteristic points are identified with capital letters in cooling and dehumidification, with lowercase letters in heating and any humidification.

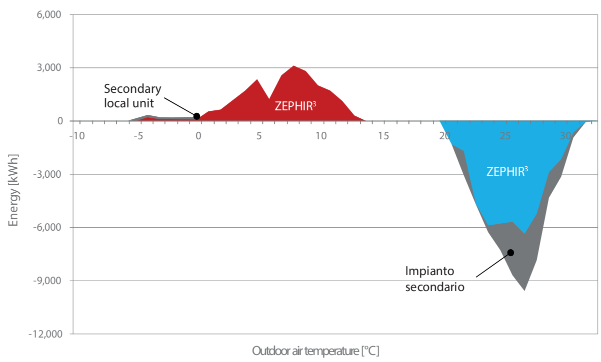
Case study. Office Building in Rome.

HEAT LOAD DISTRIBUTION



Data refer to the use in an Office Building, operating at discontinuous cycles.
12 hours a day for 260 days a year.
Location: Rome, Italy.
Source of climate data: U.S. Department of Energy.
ZEPHIR3 Size 5 system, nominal air flow 9.500 m³/h

THERMAL ENERGY DISTRIBUTION



Location	ZEPHIR³ Thermal energy heating ratio	ZEPHIR³ Thermal energy cooling ratio
ROME	98%	74%
LONDON	97%	83%
VALENCIA	99%	73%

OPERATION AT MAXIMUM AVAILABLE CAPACITY

Case study, energy analysis.

NEW BUILDING

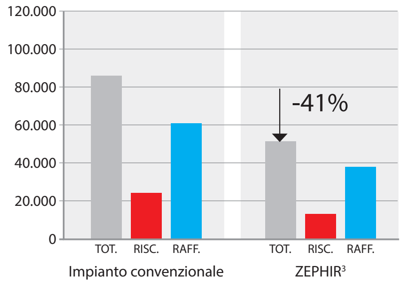
Primary air is decentralised thanks to ZEPHIR³, used as the first capacity step.
Reduced operation of the secondary system.

OFFICE BUILDING

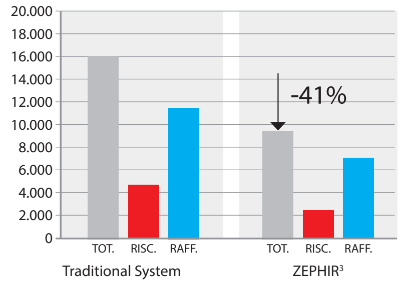
Open space offices
Size: 2.200 m²
Secondary system: hydronic with fan-coils

ROME

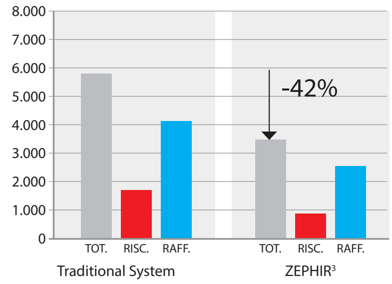
Primary energy [kWh/year]



Environmental impact [kgCO₂/year]



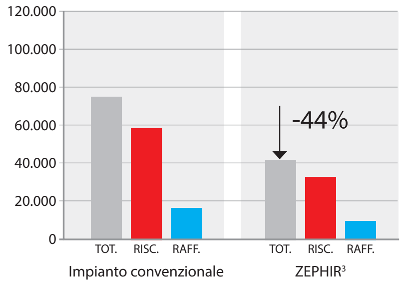
Annual cost [€/year]



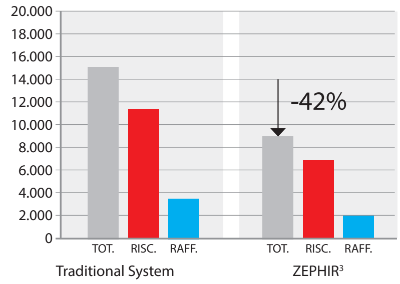
Methane gas cost 0,7 EUR/Nm³ - Electric energy cost 0,15 EUR/kWh

LONDON

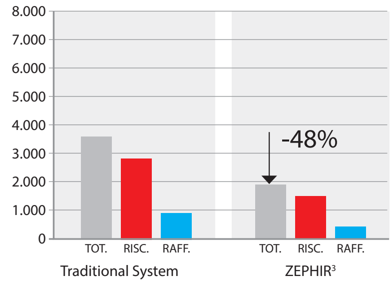
Primary energy [kWh/year]



Environmental impact [kgCO₂/year]



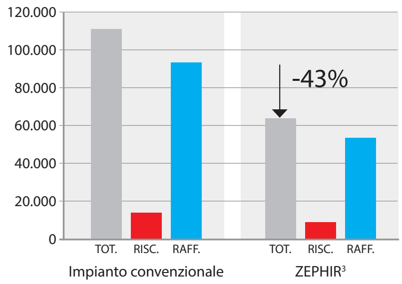
Annual cost [€/year]



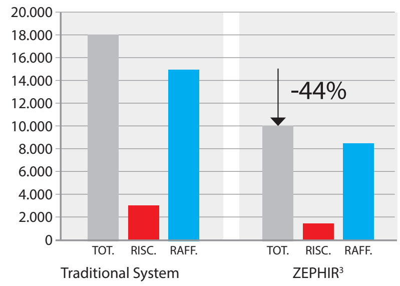
Methane gas cost 0,5 EUR/Nm³ - Electric energy cost 0,10 EUR/kWh

VALENCIA

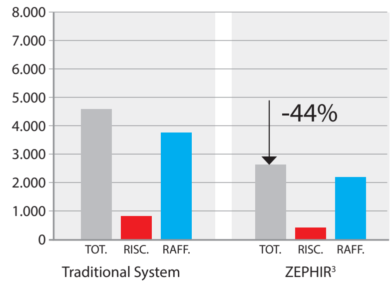
Primary energy [kWh/year]



Environmental impact [kgCO₂/year]



Annual cost [€/year]

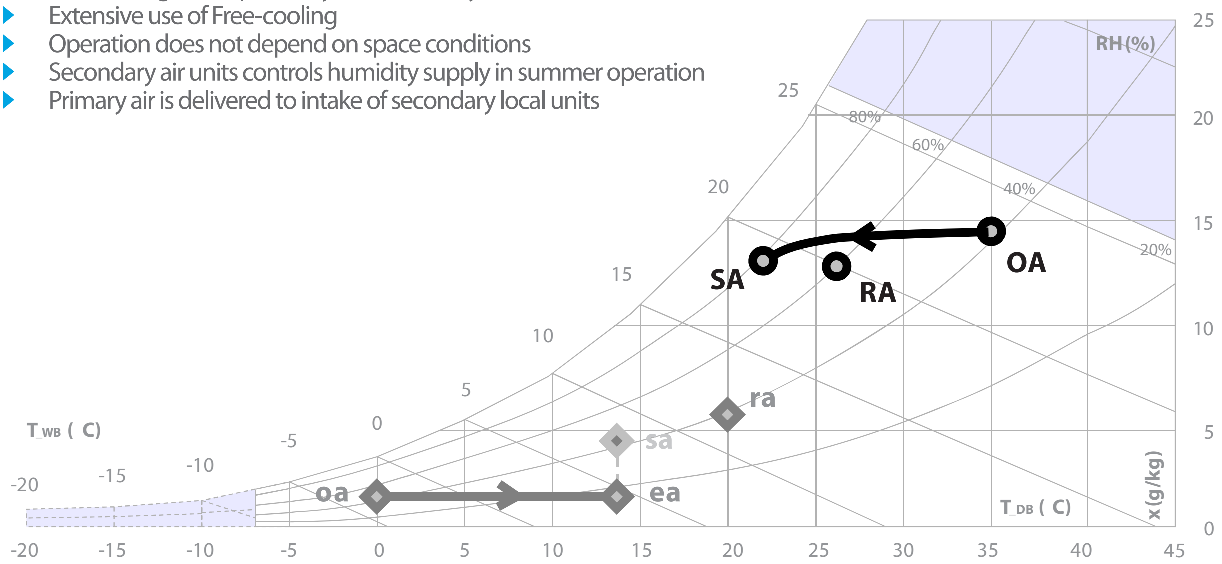


Methane gas cost 0,6 EUR/Nm³ - Electric energy cost 0,10 EUR/kWh

OPERATION WITH HIGH AIRFLOW

When ZEPHIR[3] operates as an active thermodynamic recovery and the secondary local system controls space conditions

- Common conditions for shopping Malls
- Air handling is completed by the secondary local units.
- Extensive use of Free-cooling
- Operation does not depend on space conditions
- Secondary air units controls humidity supply in summer operation
- Primary air is delivered to intake of secondary local units

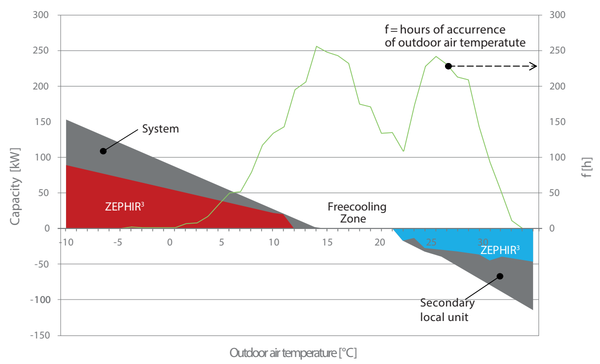


OA/oa. Outdoor air
SA/sa. Supply air
RA/ra. Extracted air

Note. For clarity the characteristic points are identified with capital letters in cooling and dehumidification, with lowercase letters in heating and any humidification.

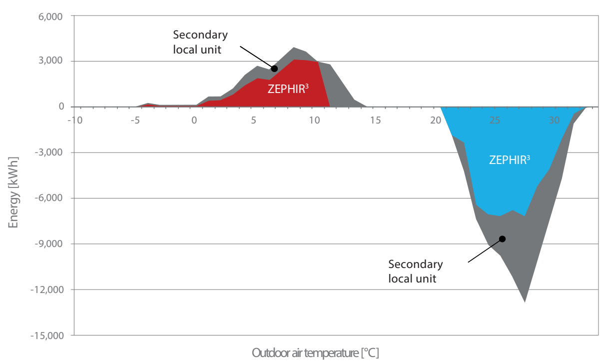
Case study. Shopping Mall in Rome.

HEAT LOAD DISTRIBUTION



Data refer to the use in a shopping mall, operating at discontinuous cycles.
12 hours a day for 365 days a year.
Location: Rome, Italy.
Source of climate data: U.S. Department of Energy.
ZEPHIR3 Size 4 system, nominal air flow 9.200 m³/h

THERMAL ENERGY DISTRIBUTION



Location	ZEPHIR³ Thermal energy heating ratio	ZEPHIR³ Thermal energy cooling ratio
ROME	63%	66%
LONDON	67%	73%
VALENCIA	61%	59%

OPERATION WITH HIGH AIRFLOW

Case study, energy analysis.

NEW BUILDING

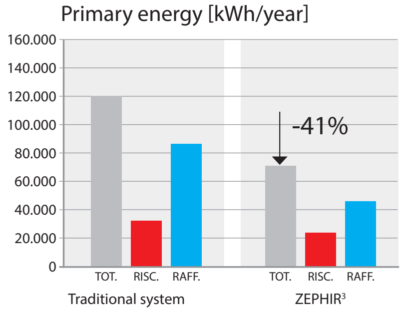
ZEPHIR³ centrally provides purified and partially treated renewal air to each shop. Improvement in the energy performance of the building and reduction in building management costs.

SHOPING MALL

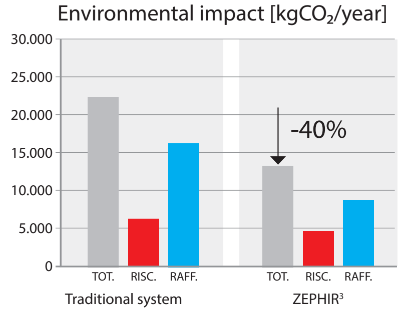
Shopping
Surface: 1.600 m²
Secondary system: hydronic with ductable and cassette terminal units

ROME

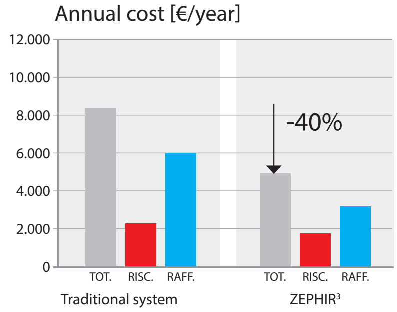
Primary energy [kWh/year]



Environmental impact [kgCO_2/year]



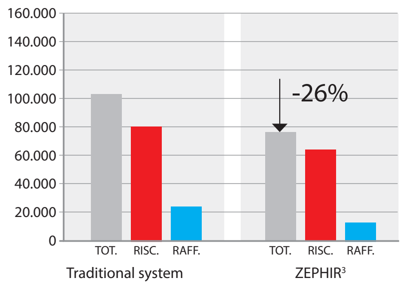
Annual cost [€/year]



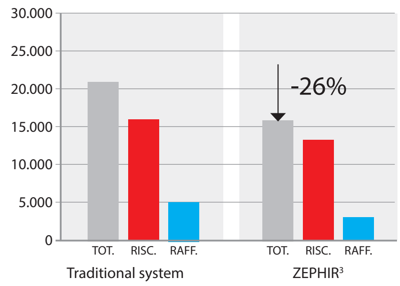
Methane gas cost 0,7 EUR/Nm³ - Electric energy cost 0,15 EUR/kWh

LONDON

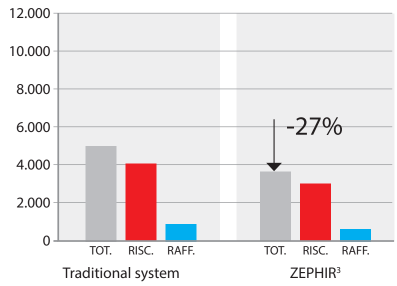
Primary energy [kWh/year]



Environmental impact [kgCO_2/year]



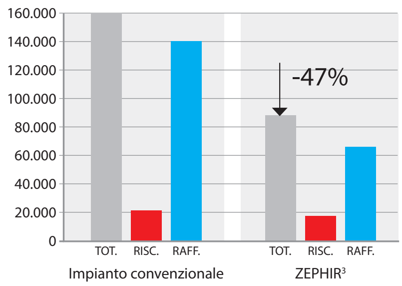
Annual cost [€/year]



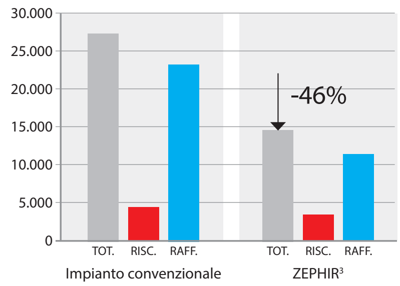
Methane gas cost 0,5 EUR/Nm³ - Electric energy cost 0,10 EUR/kWh

VALENCIA

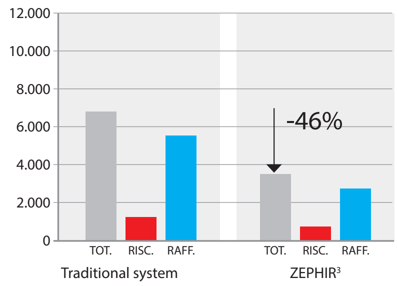
Primary energy [kWh/year]



Environmental impact [kgCO_2/year]



Annual cost [€/year]



Methane gas cost 0,6 EUR/Nm³ - Electric energy cost 0,10 EUR/kWh

PERFORMANCE DATA

System selection and performance data

The energy performances (power output, power consumption, efficiency) of the ZEPHIR³ system varies according with the following data:

- Outdoor air flow
- Outdoor air conditions
- Indoor air conditions
- Supply air conditions

Outdoor air flow

Design outdoor air flow is determined in accordance with specific laws, rules and regulations in force, with two possible modes:

- Prescriptive approach: it is a common based on the amount of fresh air provided per occupant and per number of occupants. These two variables often depend on the surface area of the zone serviced and its intended use

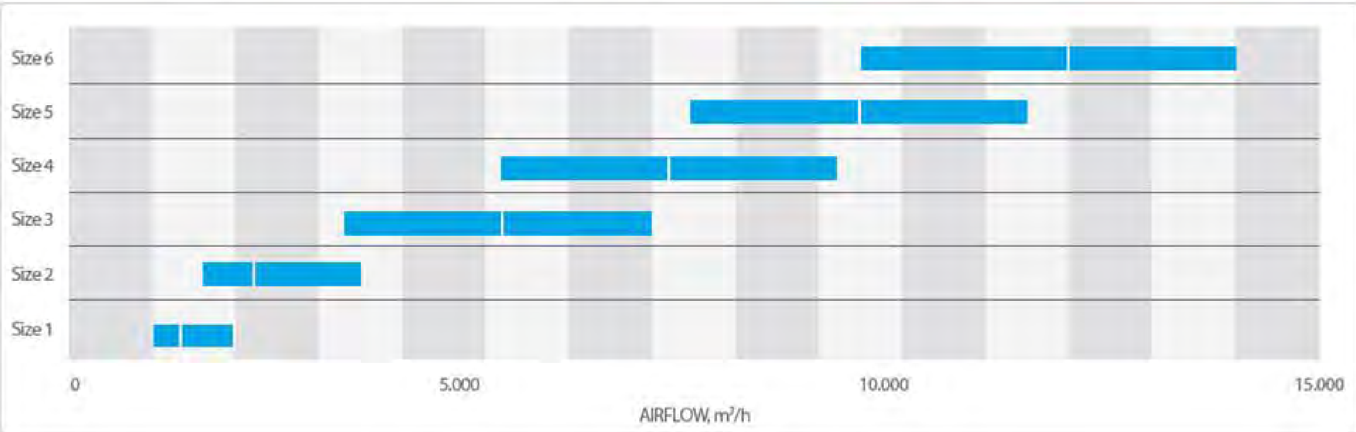
Performance approach: it is a common in technical standards, such as the European standard EN13779:2007 which provides different air flow rates depending on the indoor air quality (IDA) required. This choice made by the Client and the Designer results in specific values of the quantity of fresh air introduced per person or floor surface and the level of CO_2 concentration or specific pollutants.

The outdoor flow air is the first input required to select ZEPHIR³ among its available sizes.

Each size features a minimum and maximum air flow value.

Between the two values:

- It is possible to select the required value
- The standard (or nominal) air flow is included. At this value the capacity supplied by the thermodynamic circuit is able to carry out the typical treatment required of Primary Air systems in continental and Mediterranean climates. Cooling and dehumidification treatment results from nominal external temperatures of 35°C b.s. / 24 ° C b.u. up to specific moisture flow equal to 10 g / kg. In heating, the treatment results from an outdoor conditions of –7°C until the supply temperature is around to 20°C.



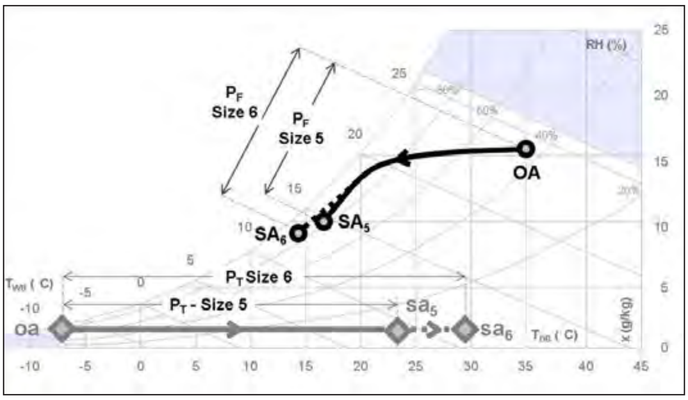
At the same outdoor air flow, two different sized ZEPHIR³ differ for their maximum heating and cooling capacity of the thermodynamic circuit which determines the possible treatment and therefore the supply conditions.

Example

The desired outdoor air flow is equal to 9.500 m3/h. This value can be satisfied by two different sizes:

- Size 5, at nominal air flow
- Size 6, at minimum air flow

At the same outdoor air flow and outdoor and indoor air condition, the greater cooling and heating capacity of the Size 6 compared with Size 5 can obtain stronger air handling.



AT THE SAME AIR FLOW, SAY 9.500 m3/h, SIZE 5 AND SIZE 6 CAN HANDLE OUTDOOR AIR FROM 35°C BS / 24°c BU TO 16°C / 9,5 g/kg AND 13°C / 8,4 g/kg RESPECTIVELY, OR FROM –7°C TO 23°C AND 29 °C RESPECTIVELY.

Outdoor air conditions

Compared with a traditional reverse cycle air-to-air heat pump, the air flows on the energy exhangers of the ZEPHIR³ are inverted. For this reason also the energy performance follows a different pattern.

In full load operation of the thermodynamic circuit:

- In cooling mode, as the outdoor air temperature (which passes through the evaporator of the thermodynamic circuit) decreases, the total cooling capacity is reduced and the thermodynamic efficiency of the system is increased.
- In heating mode, as the outdoor air temperature (which passes through the condenser of the thermodynamic circuit) decreases, both the heating capacity and the thermodynamic efficiency of the system are increased.

This performance may vary when capacity modulation occurs, according to the selected operating mode.

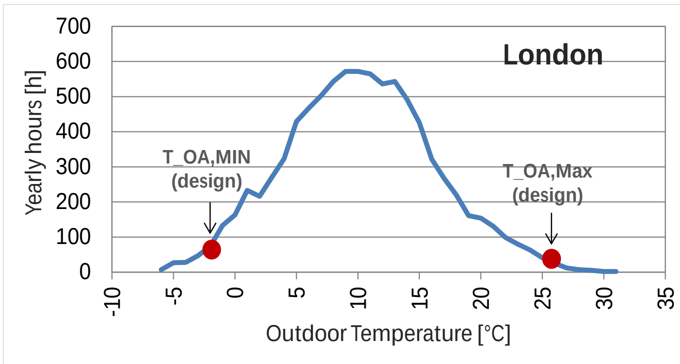
The choice of size of the ZEPHIR³ is usually based on the design outdoor air conditions in accordance with the laws, rules or regulations in force in this case.

These conditions must be within the operating range of the system, by selecting the option 'RECH - Hydronic recovery device for extended operating range' when ambient conditions may require it.

The maximum outdoor air conditions typically occurs for a few hours per year.

If the selection is carried out under these conditions, it would result in over-sizing the system, thus increasing costs and a reducing both the total efficiency and the regulation accuracy.

When severe conditions occur, ZEPHIR³ may temporarily reduce the air flow to maintain the thermodynamic circuit in operation.



CLIMATE PROFILE FOR LONDON, UK (SOURCE ASHRAE). ON THE TOTAL NUMBER OF ANNUAL HOURS, THE MOST SEVERE EXTERNAL TEMPERATURE COMPARED TO THE PROJECT TEMPERATURE HAS AN OCCURRENCE PROBABILITY OF LESS THAN 1%.

All outdoor air conditions, between the minimum and maximum design temperature, affect the actual seasonal efficiency and therefore the energy consumption of the system. The number of operating hours in these conditions represents the most part of the total number of annual hours.

For this reason, the performance of ZEPHIR³ is detailed under different outdoor air temperatures, so as to evaluate the seasonal efficiency in accordance with the climate profile in different locations.

Indoor air conditions

Indoor air conditions affects the energy performance of the ZEPHIR³ to a lesser extent than the outdoor air.

Also in this case, the size selection is usually done in accordance with the design indoor air conditions as required by the rules and regulations in force for the specific case, so to meet the occupants needs.

Please note that design indoor air humidity has a very important role in the lifespan of the system.

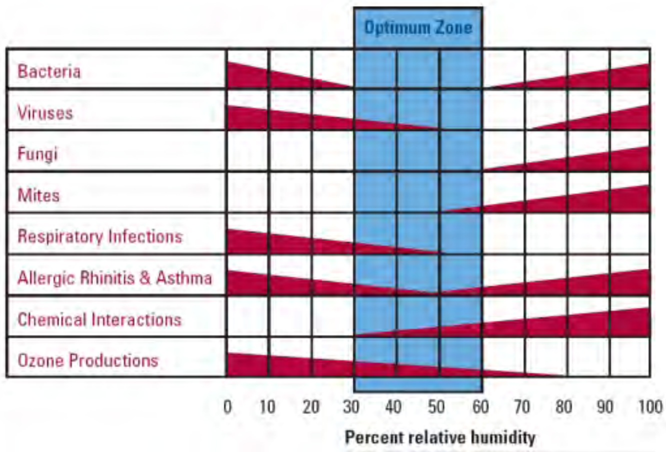
It actually influences both the sizing and the energy consumption of the Primary Air system and therefore the entire building, independently of the system type used (traditional or ZEPHIR³).

In summertime, increasing by 5% increase in the design relative humidity of the indoor air (from 50% to 55%) does not charge the comfort quality perceived by the occupants.

However it reduces up to 15% the cooling capacity required by the primary air system. This results in a reduction of as much as 30% of the power absorbed by the thermodynamic circuit of the ZEPHIR³, thanks to partial load high efficiency.

Similarly in wintertime, when a modest reduction in the design relative humidity of the indoor air occur. Also in this case the latent load of the occupants contributes to an increase in indoor humidity, particularly in applications with high crowding such as shopping malls, offices and restaurants.

This choice verifies that the indoor air conditions and in particular its humidity fall within the operating range of the ZEPHIR³ which uses the extracted air as heat source.



OPTIMAL VALUES OF THE RELATIVE HUMIDITY TO INDOOR AIR (SOURCE ASHRAE). THE RIGHT CHOICE OF PROJECT CONDITIONS CAN NEARLY ALWAYS REDUCE ENERGY CONSUMPTION WITHOUT AFFECTING THE QUALITY OF COMFORT PERCEIVED

Supply air conditions

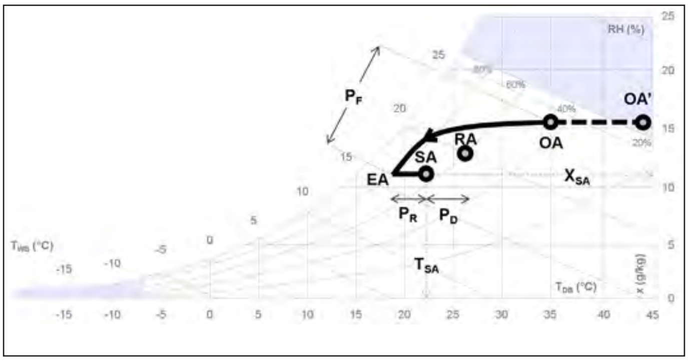
Depending on the system application and the chosen mode of use, the supply air conditions can be set by the user or automatically managed by the controln system of the ZEPHIR³ in accordance with its settings.

General considerations in cooling and dehumidification

The total cooling capacity P_F of the ZEPHIR[3] system is provided by the thermodynamic circuit: it determines the cooling and dehumidification handling from the outdoor air OA to the temperature EA off-coil exit from the thermodynamic exchanger (evaporator). The supply air humidity ratio X_SA is crucial for the control of the internal hygrometric conditions in many applications.

The P_R reheat capacity increases the air temperature to the value of the supply temperature T_SA, without changing the humidity ratio.

The reheat capacity is delivered by recovering, in part or in total, the condensation heat which would otherwise be rejected outdoor, with a triple benefit when compared with traditional systems:



COOLING AND DEHUMIDIFICATION, AND REHEATING WITH PROVISION OF ADDITIONAL AVAILABLE POWER TO THE SPACE. FOR GREATER CLARITY THE TYPICAL FEATURES ARE IDENTIFIED BY CAPITAL LETTERS.

- No fuel consumption and no local emission
- No auxiliary consumption to pump hot fluid from the boiler
- Decrease in condensation temperature and thus a further increase in the thermodynamic efficiency of the system.

Setting primary supply air at dry bulb temperature T_SA lower than the space air temperature T_RA, helps cooling the spaces and lessens the use of the econdary local unit. This contribution is therefore defined as additional capacity available to the space P_D.

ZEPHIR3 system can also be used in particularly hot climates as long as care is taken to select the appropriate size (usually the bigger of the two available at constant air flow) and to select humidity ratio supply values x_SA that can meet the operating and comfort needs without over-sizing.

The optional 'RECH - Hydronic recovery device for extended operating range' pre-conditions outdoor air from OA' conditions to OA (air entering the thermodynamic exchanger).

This duty is included in the total cooling capacity of the system P_F.

General considerations in heating and any humidification

The thermal power P_T of the ZEPHIR[3] system is delivered by the thermodynamic circuit: it determines the heating treatment of the outdoor air from the outdoor air temperature T_oa until it reaches the supply temperature T_sa.

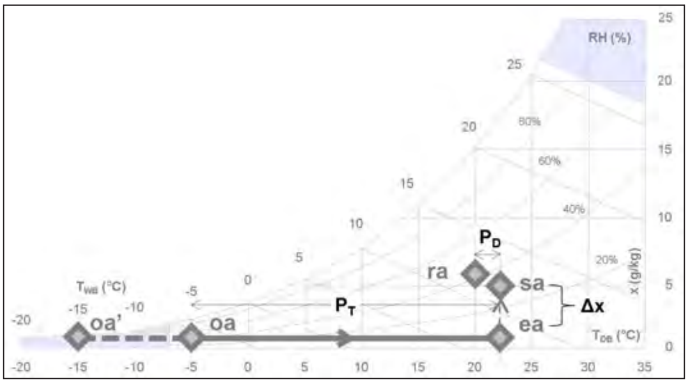
In this case the re-heating is never active.

Setting primary supply air at dry bulb temperature T_sa higher than the space air temperature T_ra, helps heating the spaces and lessens the use of the econdary local unit.

This contribution is therefore defined as additional capacity available to the space P_D.

Low values of external specific humidity in cold climates often require air humidification before being released to the ambient.

Internal conditions of comfort are thus maintained for the occupants, which is the main functionality of the ZEPHIR[3].



HEATING AND DEHUMIDIFICATION, WITH PROVISION OF ADDITIONAL AVAILABLE POWER TO THE SPACE. FOR GREATER CLARITY, THE TYPICAL FEATURES ARE IDENTIFIED BY SMALL LETTERS.

In fact, the high crowding in service sector applications often spontaneously raises the ambient humidity thus reducing the need for humidification.

If required, the ZEPHIR[3] comes with the 'Steam humidification module' option: the modulating capacity control depends on return air conditions and supplies only the required amountof steam, keeping substantially uncharged the temperature of the Primary Air.

The optional 'RECH - Hydronic recovery device for extended operating range' pre-conditions outdoor air from OA' conditions to OA (air entering the thermodynamic exchanger). This duty is included in the heating capacity of the system P_T. Defrost cycles may temporarily occur.

Operation with constant supply control (CS)

In this operating mode the outdoor air is treated according to the supply air conditions set in accordance with one of the two following criteria:

- with two fixed seasonal sets, for operation in cooling and heating mode respectively
- with two dynamic seasonal sets, in which the supply temperature is offset automatically in accordance with the external dry bulb temperature T_OA, with climatic regulation.

There is no feedback from the space.

In cooling mode the humidity control of the supply air is standard and a priority.

The automatic capacity control of the thermodynamic circuit modulates the cooling capacity of the system P_F to dehumidify the outdoor air to the value of the humidity ratio of the supply air X_SA.

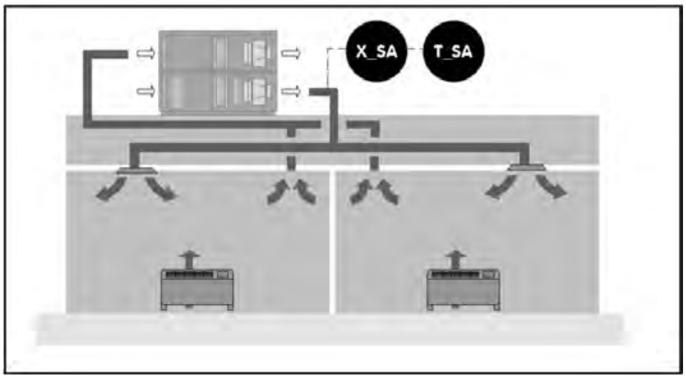
The control of the supply temperature T_SA is carried out through reheating by hot gas recovery, with modulating capacity cotrol.

In heating mode the automatic capacity control of the thermodynamic circuit modulates the thermal power P_T to heat the outdoor air to the value of the supply air temperature T_SA.

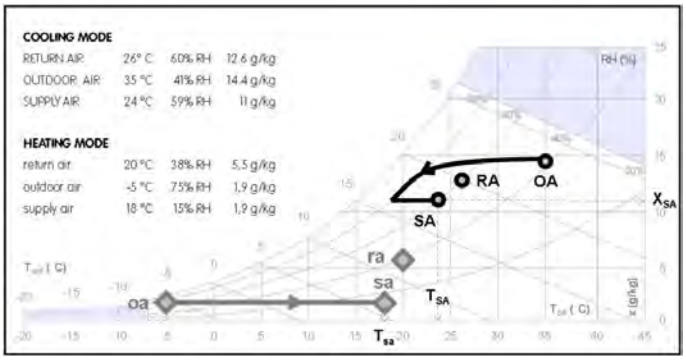
Humidity control is optional. When selected, it activates the on board humidifier to increase the specific humidity of the supply air X_SA, depending on return air conditions.

Size

Please, locate the pages relative to the size with the required outdoor air flow.



APPLICATION PRINCIPLE IN COOLING OPERATION. THE MAIN REGULATION SETTINGS ARE HIGHLIGHTED



TYPICAL TREATMENTS IN COOLING AND HEATING. THE POST-HEATING TREATMENT IS HIGHLIGHTED.

Performance data in cooling mode

1. Locate the performance table based on the humidity ratio of the supply air required X_SA
2. Locate the outdoor air temperature T_OA and CS lines, corresponding to the mode of use (referred to as SET) with constant supply regulation
3. Locate the required supply air temperature, T_SA
4. The table shows the total cooling pcapacity P_F, the reheating capacity P_R, the furhter power available to the ambient P_D, the electrical power P_A absorbed by the thermodynamic circuit. The table also shows the efficiencies of the system which are described below.

SIZE 5 - AIR FLOW 9.500 m³/h (STANDARD) - COOLING

SUPPLY HUMIDITY RATIO = 10 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
35 / 24	MC	16,4	88,6	–	30,5	31,6	**2,8**	2,6
	CS	20		11,5	19,1	29,9	**3,3**	3,1
		22		17,8	12,7	29,0	**3,7**	3,4
		24		24,2	6,4	28,1	**4,0**	3,7
32 / 23	MC	[illegible]	79,1	[illegible]	32,1	23,1	**3,4**	3,1
	CS	[illegible]		[illegible]	19,1	21,7	**4,2**	3,8
		[illegible]		[illegible]	12,7	21,0	**4,7**	4,2
		24		25,8	6,4	20,3	**5,2**	4,6
30 / 22	MC	16,5	65,4	–	30,2	16,4	**4,0**	3,4
	CS	20		11,1	19,1	15,3	**5,0**	4,3
		22		17,5	12,7	14,7	**5,6**	4,8
		24		23,9	6,4	14,1	**6,3**	5,3
28 / 21	MC	17,0	54,4	–	28,6	12,8	**4,3**	3,5
	CS	20		9,5	19,1	11,7	**5,5**	4,5
		22		15,9	12,7	11,0	**6,4**	5,2
		24		22,3	6,4	10,3	**7,4**	5,9
25 / 19	MC	18	33,6	–	27,0	5,7	**5,9**	4,1
	CS	20		8,0	19,1	5,3	**7,8**	5,3
		22		14,3	12,7	4,8	**10,0**	6,5

Performance data in heating mode

1. Locate the air temperature T_OA and CS lines, corresponding to the mode of use (referred to as SET) with fixed-point supply regulation
2. Locate the required supply air temperature, T_SA
3. The table shows the supply air humidity ratio X_SA, the heating capacity of the system P-T, the Additional capacity available to the space P_D, the electrical power P_A absorbed by the thermodynamic circuit. The table also shows the efficiencies of the system which are described below.

SIZE 5 - AIR FLOW 9.500 m³/h (STANDARD) - HEATING

Performance in Heating

T_OA	SET	T_SA	X_SA	P_T	P_D	P_A	COP_C	COP_S
-7 / -8	MC	28,7	1,5	125,7	27,7	29,8	**4,2**	3,9
	CS	22		102,4	6,4	17,5	**5,9**	5,2
		20		95,5	–	14,6	**6,5**	5,7
		18		88,5	–	12,6	**7,0**	6,1
-5 / -6	MC	30	1,9	122,0	31,8	29,2	**4,2**	3,9
	CS	22		94,7	6,4	15,0	**6,3**	5,6
		20		87,8	–	13,1	**6,7**	5,8
		18		80,8	–	11,8	**6,8**	5,8
0 / -1	MC	[illegible]	3,1	[illegible]	31,8	20,8	**4,9**	4,5
	CS	[illegible]		[illegible]	6,4	12,3	**6,1**	5,3
		[illegible]		[illegible]	–	10,9	**6,3**	5,3
		18		61,9	–	9,5	**6,5**	5,4
2 / 1	MC	30	3,7	95,4	31,8	18,5	**5,2**	4,6
	CS	22		68,1	6,4	11,4	**6,0**	5,1
		20		61,3	–	9,9	**6,2**	5,1
		18		54,5	–	8,5	**6,4**	5,2
7 / 6	MC	28	5,4	69,9	25,4	13,1	**5,3**	4,6
	CS	22		50,0	6,4	8,5	**5,9**	4,8
		20		43,2	–	6,9	**6,3**	4,8
		18		36,8	–	5,1	**7,2**	5,2
12 / 11	MC	23	7,8	30,3	9,5	5,6	**5,4**	4,0
	CS	22		32,7	6,4	4,7	**7,0**	4,9

Operation at the maximum capacity available (MC)

In this operating mode the supply air temperature T_SA can vary in accordance with the temperature of the air extracted from the ambient T_RA and their deviation from the set value.

There is feedback from the space.

In cooling mode the humidity control of the supply air is standard and a priority.

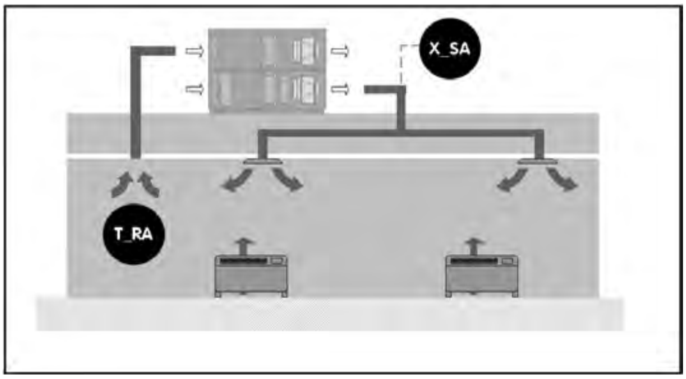
The automatic capacity control of the thermodynamic circuit modulates the cooling capacity of the system P_F to dehumidify the outdoor air to the value of the humidity ratio of the supply air X_SA.

The control of the supply temperature T_SA is carried out through reheating by hot gas recovery, with modulating capacity cotrol.

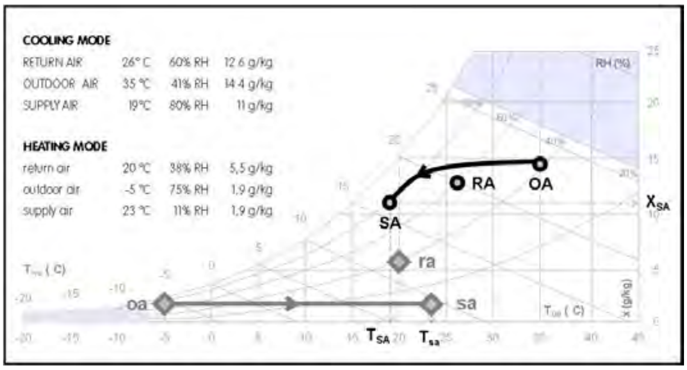
The re-heating capacity increases as the temperature of the air collected from the space (T_RA) is closer to the set value.

When the re-heating is zero, we have the maximum value of additional capacity available to the space P_D, witch reduces the load assigned to the secondary system.

In heating mode, the automatic capacity control of the thermodynamic circuit modulates the heating capacity P_T to heat the outdoor air. The heating capacity P_T decreases as the return air temperature from space T_RA is closer to the set value.



APPLICATION PRINCIPLE DIAGRAM IN COOLING OPERATION. THE MAIN REGULATION SETTINGS ARE HIGHLIGHTED



TYPICAL TREATMENTS IN COOLING AND HEATING MODE, WITH AMBIENT VALUE NOT MET.

Size

Please, locate the pages relative to the size with the required outdoor air flow.

Performance data in cooling mode

1. Locate the performance table based on the humidity ratio of the supply air required X_SA
2. Locate the outdoor air temperature T_OA and MC lines, corresponding to the operating mode (referred to as SET) in maximum available capacity
3. The table shows the total cooling pcapacity P_F, the reheating capacity P_R, the furhter power available to the ambient P_D, the electrical power P_A absorbed by the thermodynamic circuit. The table also shows the efficiencies of the system which are described below.

SIZE 5 - AIR FLOW 9.500 m³/h (STANDARD) - COOLING

SUPPLY HUMIDITY RATIO = 10 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
35 / 24	MC	16,4	88,6	–	30,5	31,6	**2,8**	2,6
	CS	20		11,5	19,1	29,9	**3,3**	3,1
		22		17,8	12,7	29,0	**3,7**	3,4
		24		24,2	6,4	28,1	**4,0**	3,7
32 / 23	MC	15,9	79,1	–	32,1	23,1	**3,4**	3,1
	CS	20		13,0	19,1	21,7	**4,2**	3,8
		22		19,4	12,7	21,0	**4,7**	4,2
		24		25,8	6,4	20,3	**5,2**	4,6
30 / 22	MC	16,5	65,4	–	30,2	16,4	**4,0**	3,4
	CS	20		11,1	19,1	15,3	**5,0**	4,3
		22		17,5	12,7	14,7	**5,6**	4,8
		24		23,9	6,4	14,1	**6,3**	5,3
28 / 21	MC	17,0	54,4	–	28,6	12,8	**4,3**	3,5
	CS	20		9,5	19,1	11,7	**5,5**	4,5
		22		15,9	12,7	11,0	**6,4**	5,2
		24		22,3	6,4	10,3	**7,4**	5,9
25 / 19	MC	18	33,6	–	27,0	5,7	**5,9**	4,1
	CS	20		8,0	19,1	5,3	**7,8**	5,3

Performance data in cooling mode

1. Locate the air temperature T_OA and the MC line, corresponding to the operating mode (referred to as SET) at maximum available capacity
2. The table shows the supply air humidity ratio X_SA, the heating capacity of the system P-T, the Additional capacity available to the space P_D, the electrical power P_A absorbed by the thermodynamic circuit. The table also shows the efficiencies of the system which are described below.

SIZE 5 - AIR FLOW 9.500 m³/h (STANDARD) - HEATING

Performance in Heating

T_OA	SET	T_SA	X_SA	P_T	P_D	P_A	COP_C	COP_S
-7 / -8	MC	28,7	1,5	125,7	27,7	29,8	**4,2**	3,9
	CS	22		102,4	6,4	17,5	**5,9**	5,2
		20		95,5	–	14,6	**6,5**	5,7
		18		88,5	–	12,6	**7,0**	6,1
-5 / -6	MC	30	1,9	122,0	31,8	29,2	**4,2**	3,9
	CS	22		94,7	6,4	15,0	**6,3**	5,6
		20		87,8	–	13,1	**6,7**	5,8
		18		80,8	–	11,8	**6,8**	5,8
0 / -1	MC	30	3,1	[illegible]	31,8	20,8	**4,9**	4,5
	CS	22		[illegible]	6,4	12,3	**6,1**	5,3
		20		68,8	–	10,9	**6,3**	5,3
		18		61,9	–	9,5	**6,5**	5,4
2 / 1	MC	30	3,7	95,4	31,8	18,5	**5,2**	4,6
	CS	22		68,1	6,4	11,4	**6,0**	5,1
		20		61,3	–	9,9	**6,2**	5,1
		18		54,5	–	8,5	**6,4**	5,2
7 / 6	MC	28	5,4	69,9	25,4	13,1	**5,3**	4,6
	CS	22		50,0	6,4	8,5	**5,9**	4,8
		20		43,2	–	6,9	**6,3**	4,8
		18		36,8	–	5,1	**7,2**	5,2
12 / 11	MC	23	7,8	30,3	9,5	5,6	**5,4**	4,0
	CS	22		32,7	6,4	4,7	**7,0**	4,9

Note:

The CS lines, corresponding to the operation mode (indicated as SET) with fixed point supply regulation, now show some operating points that may be encountered in the operation mode at maximum available capacity (MC) when the temperature in the space is partially or totally satisfied, on the basis of the parameters on the extraction section:

- In cooling with reheating activated
- In heating with modulating capacity regulation

Operation with high air flow (HA)

Available only for the maximum air flow rate for each size.

In this operation mode of use the outdoor air is treated until it reaches the supply temperature provided by a default regulation diagram:

There is no feedback from the space.

In cooling operation mode, the automatic capacity control of the thermodynamic circuit modulates the total cooling capacity of the system (P_F) to cool the outdoor air until it reaches the value of the supply air temperature (X_SA). In this treatment the outdoor air is also dehumidified. Re-heat is not active.

In heating mode the automatic capacity control of the thermodynamic circuit modulates the heating capacity (P_T) to heat the outdoor air until it reaches the value of the supply air temperature (T_SA). To control humidity, the steam humidification module, is available(optional).

Size

Locate the pages relative to the size with the maximum outdoor air flow.

Performance data in cooling mode

1. Locate the performance table entitled "Supply humidity ratio = not controlled"
2. Locate the outdoor air conditions T_OA. All rows are identified with HA, corresponding to the mode of use (indicated like SET) with high air flow
3. The table shows the supply conditions T_SA and X_SA, the total cooling capacity P_F, Additional capacity available for space P_D, the power absorbed by the thermodynamic circuit P_A. The table also shows the system efficiencies, which are described below

Performance data in heating mode

1. Locate the outdoor air conditions T_OA. All rows are identified with HA, corresponding to the mode of use (indicated like SET) with high air flow
2. The table shows the supply conditions T_SA and X_SA, the total cooling capacity P_F, Additional capacity available for space P_D, the power absorbed by the thermodynamic circuit P_A. The table also shows the system efficiencies, which are described below

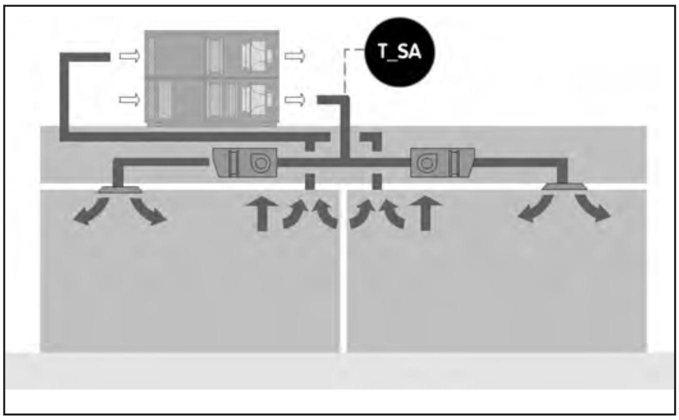
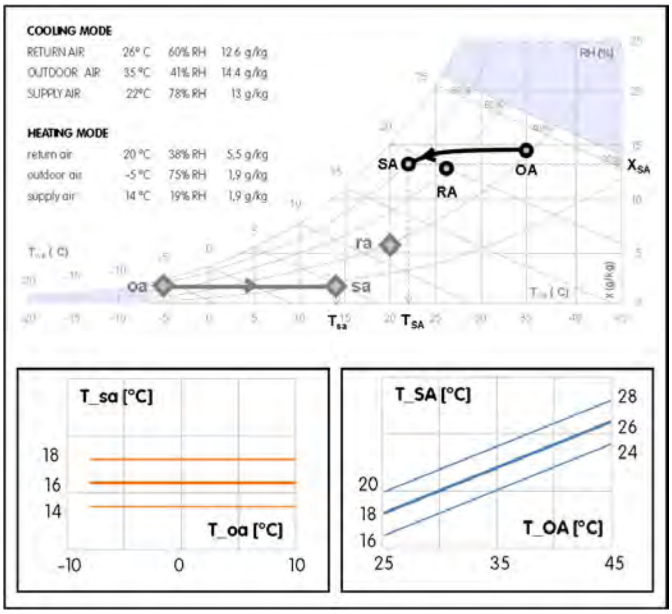


DIAGRAM SHOWING THE OPERATING PRINCIPLE IN COOLING OPERATION. THE MAIN REGULATION SETTINGS ARE HIGHLIGHTED



TYPICAL TREATMENTS IN COOLING AND HEATING MODE. THE SUPPLY TEMPERATURES ARE HIGHLIGHTED IN HEATING AND COOLING MODE BASED ON THE OUTDOOR AIR TEMPERATURE (CLIMATIC CONTROL)

SIZE 5 - AIR FLOW 11.500 m³/h (MAXIMUM) - COOLING

SUPPLY HUMIDITY RATIO = not controlled

Performance in cooling and in dehumidification								
T_OA	SET	T_SA	X_SA	P_F	P_D	P_A	EER_C	EER_S
45 / 26	HA	26	13,1	70,1	0,0	14,2	**4,9**	3,9
40 / 25	HA	24	12,6	69,7	7,7	14,3	**4,9**	3,8
35 / 24	HA	22	12,4	65,6	15,4	13,4	**4,9**	3,8
32 / 23	HA	21	12,0	59,5	19,3	11,8	**5,0**	3,8
30 / 22	HA	20	[illegible]	54,7	23,1	10,7	**5,1**	3,8
28 / 21	HA	19	10,9	52,0	27,0	10,0	**5,2**	3,8
25 / 19	HA	18	10,2	37,3	30,8	6,0	**6,2**	3,8

SIZE 5 - AIR FLOW 11.500 m³/h (MAXIMUM) - HEATING

Performance in Heating								
T_OA	SET	T_SA	X_SA	P_T	P_D	P_A	COP_C	COP_S
-7 / -8	MC	19,6	1,5	113,5	–	21,4	**5,3**	4,5
	CS	18		106,8	–	17,9	**6,0**	4,9
	HA	16		98,5	-	14,2	**6,9**	5,5
-5 / -6	MC	21,6	1,9	112,5	6,2	22,3	**5,0**	4,3
	CS	20		106,0	–	18,5	**5,7**	4,7
		18		97,7	–	14,7	**6,6**	5,3
	HA	16		89,3	–	11,7	**7,6**	5,8
0 / -1	MC	27,3	3,1	[illegible]	28,1	25,1	**4,5**	3,9
	CS	22		[illegible]	7,7	14,3	**6,4**	5,0
		20		[illegible]	–	11,2	**7,4**	5,5
		18		75,0	–	9,6	**7,8**	5,6
	HA	16		66,7	–	8,1	**8,2**	5,6
	MC	29,3		112,1	35,8	25,8	**4,3**	3,8

System energy efficiency

The performance tables show the operating efficiency values of ZEPHIR³ in cooling mode (EER) and in heating mode (COP), further divided in:

- Thermodynamic efficiency of the system (EER_C in cooling mode and COP_C in heating mode)
- Overall efficiency of the system (EER_S in cooling and COP_S in heating)

The thermodynamic efficiency of the system is the relationship between the total power delivered by the system and the power absorbed by the thermodynamic circuit.

In cooling mode the total capacity supplied includes the re-heating capacity, which in a traditional system should be supplied separately.

The overall system efficiency also includes fan power input.

The available static pressure is assumed to be 150 Pa on the supply section and 100 Pa on the extraction section.

The overall system efficiency also includes the optional 'RECH - Hydronic recovery device for extended operating range', when required.

Seasonal energy performances

The actual efficiency of a system must be assessed during the entire annual operating cycle and not only at design conditions.

For this reason, the performance tables also show the seasonal values of supplied energy (E_T), absorbed energy (E_A), thermodynamic energy efficiency of the system (SE_C) and the overall energy efficiency of the system (SE_S), in three European locations representing three climates:

- Cold climate: reference city Stockholm. Similar performance in Bruxelles, Munich, Wien, Warsaw.
- Temperate climate: reference city London. Similar performance for Paris, Milan, Bilbao and Frankfurt.
- Mediterranean climate: reference city Rome. Similar performance for Barcelona, Lisbon and Palermo.
- Hot and dry climate: reference city Valencia. Similar performance for Athens and Bangalore
- Hot and humid climate: reference city Tunis. Similar performance for Algiers, Casablanca, Cairo.

The analysis uses the Bin Method procedure, where the seasonal values are obtained by regularly calculating performance at different temperatures and multiplying the results by the number of hours of occurrence of each temperature.

Continuous operation, for a total of 8,760 hours/year, is considered.

The seasonal energy performance is shown in different operating modes

- Operation with constant supply control: the values are provided based on the supply air temperature T_SA, in both cooling and heating mode
- Oparation at maximum available capacity: as the air supply temperature (T_SA) is variable, both in cooling and heating mode, in this operating mode the seasonal energy performance is shown in the row featuring the '-' symbol in T_SA
- Use with high air flow: as the supply air temperature T_SA in cooling mode is variable, in this mode of operation the seasonal energy performance is shown in the row featuring the '-' symbol in the T_SA field of the table.

In heating mode the values are provided based on the typical setting of the supply air temperature, equal to 16°C.

SIZE 1 - AIR FLOW 1.000 m³/h (MINIMUM) - COOLING

SUPPLY HUMIDITY RATIO = 9 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
35 / 24	MC	14,7	10,7	-	**3,78**	4,04	2,6	2,5
	CS	20		1,77	**2,01**	3,78	3,3	3,2
		22		2,44	**1,34**	3,69	3,6	3,4
		24		3,11	**0,67**	3,60	3,8	3,7
32 / 23	MC	14	9,88	-	**4,15**	3,51	2,8	2,7
	CS	20		2,14	**2,01**	3,24	3,7	3,5
		22		2,81	**1,34**	3,16	4,0	3,8
		24		3,48	**0,67**	3,08	4,3	4,1
30 / 22	MC	14,1	8,66	-	**3,98**	2,52	3,4	3,2
	CS	20		1,98	**2,01**	2,31	4,6	4,3
		22		2,65	**1,34**	2,23	5,1	4,7
		24		3,31	**0,67**	2,16	5,5	5,1
28 / 21	MC	13,1	7,88	-	**4,32**	2,24	3,5	3,3
	CS	20		2,31	**2,01**	1,96	5,2	4,8
		22		2,98	**1,34**	1,88	5,8	5,3
		24		3,65	**0,67**	1,80	6,4	5,9
25 / 19	MC	14,2	5,45	-	**3,95**	1,23	4,4	3,9
	CS	20		1,94	**2,01**	1,07	6,9	6,0
		22		2,61	**1,34**	1,01	8,0	6,8

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	853	197	**4,3**	3,7
20	1.152	172	**6,7**	5,7
22	1.253	162	**7,7**	6,5
24	115	18	**6,4**	5,7
LONDON				
-	1.364	322	**4,2**	3,8
20	1.833	281	**6,5**	5,7
22	1.992	266	**7,5**	6,5
24	326	53	**6,2**	5,7
ROME				
-	11.220	2.787	**4,0**	3,6
20	14.900	2.440	**6,1**	5,4
22	16.114	2.321	**6,9**	6,1
24	6.046	976	**6,2**	5,7
VALENCIA				
-	13.825	3.594	**3,8**	3,5
20	18.110	3.175	**5,7**	5,1
22	19.515	3.032	**6,4**	5,8
24	9.980	1.702	**5,9**	5,4

SUPPLY HUMIDITY RATIO = 10 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
45 / 28 *	MC	15,8	14,7	-	**3,42**	5,96	2,5	2,4
	CS	20		1,41	**2,01**	5,71	2,8	2,7
		22		2,08	**1,34**	5,59	3,0	2,9
		24		2,75	**0,67**	5,47	3,2	3,1
40 / 25	MC	17,6	10,1	-	**2,81**	3,30	3,1	2,9
	CS	20		0,80	**2,01**	3,18	3,4	3,3
		22		1,47	**1,34**	3,08	3,8	3,6
		24		2,14	**0,67**	2,99	4,1	3,9
35 / 24	MC	15,7	9,57	-	**3,45**	3,03	3,2	3,0
	CS	20		1,44	**2,01**	2,86	3,8	3,6
		22		2,11	**1,34**	2,78	4,2	4,0
		24		2,78	**0,67**	2,70	4,6	4,3
32 / 23	MC	15,7	8,43	-	**3,45**	2,36	3,6	3,3
	CS	20		1,44	**2,01**	2,21	4,5	4,1
		22		2,11	**1,34**	2,14	4,9	4,6
		24		2,78	**0,67**	2,07	5,4	5,0
30 / 22	MC	15,6	7,37	-	**3,48**	1,91	3,9	3,5
	CS	20		1,47	**2,01**	1,76	5,0	4,6
		22		2,14	**1,34**	1,70	5,6	5,1
		24		2,81	**0,67**	1,63	6,2	5,7
28 / 21	MC	15,2	6,41	-	**3,62**	1,52	4,2	3,8
	CS	20		1,61	**2,01**	1,36	5,9	5,2
		22		2,28	**1,34**	1,29	6,7	6,0
		24		2,95	**0,67**	1,23	7,6	6,7
25 / 19	MC	15,7	4,23	-	**3,45**	0,79	5,4	4,4
	CS	20		1,44	**2,01**	0,70	8,1	6,6
		22		2,11	**1,34**	0,65	9,7	7,7

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	665	127	**5,2**	4,2
20	885	112	**7,9**	6,1
22	987	106	**9,3**	7,2
24	94	12	**7,6**	6,5
LONDON				
-	1.068	210	**5,1**	4,3
20	1.414	186	**7,6**	6,3
22	1.573	175	**9,0**	7,3
24	266	36	**7,3**	6,5
ROME				
-	8.896	1.851	**4,8**	4,1
20	11.579	1.647	**7,0**	5,9
22	12.792	1.556	**8,2**	6,9
24	4.950	680	**7,3**	6,4
VALENCIA				
-	11.105	2.436	**4,6**	4,0
20	14.222	2.186	**6,5**	5,6
22	15.627	2.075	**7,5**	6,4
24	8.249	1.203	**6,9**	6,1
TUNIS				
-	15.896	3.779	**4,2**	3,7
20	19.903	3.441	**5,8**	5,0
22	21.727	3.290	**6,6**	5,6
24	13.661	2.279	**6,0**	5,3

SUPPLY HUMIDITY RATIO = 11g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
45 / 28 *	MC	17	13,6	-	**3,08**	5,12	2,7	2,6
	CS	20		1,07	**2,01**	4,93	3,0	2,9
		22		1,74	**1,34**	4,82	3,2	3,0
		24		2,41	**0,67**	4,70	3,4	3,3
45 / 26	MC	20,3	9,72	-	**1,91**	2,75	3,5	3,3
	CS	22		0,57	**1,34**	2,65	3,9	3,6
		24		1,24	**0,67**	2,53	4,3	4,1
40 / 25	MC	19	8,95	-	**2,41**	2,47	3,6	3,4
	CS	20		0,40	**2,01**	2,42	3,9	3,6
		22		1,07	**1,34**	2,33	4,3	4,0
		24		1,74	**0,67**	2,24	4,8	4,4
35 / 24	MC	17	8,32	-	**2,95**	2,26	3,7	3,4
	CS	20		0,94	**2,01**	2,15	4,3	4,0
		22		1,61	**1,34**	2,08	4,8	4,4
		24		2,28	**0,67**	2,01	5,3	4,9
32 / 23	MC	17	7,11	-	**2,88**	1,73	4,1	3,7
	CS	20		0,87	**2,01**	1,64	4,9	4,4
		22		1,54	**1,34**	1,58	5,5	4,9
		24		2,21	**0,67**	1,51	6,2	5,6
30 / 22	MC	17	6,05	-	**2,91**	1,34	4,5	4,0
	CS	20		0,90	**2,01**	1,26	5,5	4,9
		22		1,57	**1,34**	1,21	6,3	5,5
		24		2,24	**0,67**	1,15	7,2	6,3
28 / 21	MC	17	4,89	-	**2,88**	0,96	5,1	4,3
	CS	20		0,87	**2,01**	0,88	6,5	5,5
		22		1,54	**1,34**	0,83	7,8	6,4
		24		2,21	**0,67**	0,77	9,2	7,5

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	49	10	**5,1**	4,2
20	58	9	**6,5**	5,3
22	64	8	**7,8**	6,2
24	71	8	**9,2**	7,2
LONDON				
-	143	29	**5,0**	4,3
20	167	27	**6,3**	5,3
22	186	25	**7,4**	6,2
24	205	23	**8,7**	7,3
ROME				
-	2.659	536	**5,0**	4,3
20	3.115	498	**6,3**	5,3
22	3.463	469	**7,4**	6,2
24	3.811	440	**8,7**	7,2
VALENCIA				
-	4.584	962	**4,8**	4,1
20	5.329	897	**5,9**	5,1
22	5.895	851	**6,9**	5,9
24	6.461	802	**8,1**	6,8
TUNIS				
-	8.111	1.868	**4,3**	3,8
20	9.271	1.758	**5,3**	4,6
22	10.149	1.683	**6,0**	5,2
24	11.028	1.601	**6,9**	5,9

SIZE 1 - AIR FLOW 1.000 m³/h (MINIMUM) - HEATING

Performance in Heating

T_OA	SET	T_SA	x_SA	P_T	P_D	P_A	COP_C	COP_S
-20 / -21 *	MC	25,2	0,20	16,8	**1,74**	5,89	2,9	2,8
	CS	22		15,6	**0,67**	4,60	3,4	3,2
		20		14,8	-	3,93	3,8	3,6
		18		14,1	-	3,26	4,3	4,1
-15 / -16 *	MC	30	0,50	16,4	**3,35**	6,28	2,6	2,5
	CS	22		13,4	**0,67**	3,37	4,0	3,7
		20		12,7	-	2,80	4,5	4,2
		18		12,0	-	2,33	5,2	4,7
-12 / -13 *	MC	30	0,80	15,1	**3,35**	5,39	2,8	2,7
	CS	22		12,2	**0,67**	2,80	4,4	4,1
		20		11,4	-	2,33	4,9	4,5
		18		10,7	-	1,85	5,8	5,2
-7 / -8	MC	29,5	1,50	13,6	**3,18**	3,97	3,4	3,3
	CS	22		10,8	**0,67**	2,33	4,6	4,3
		20		10,0	-	1,94	5,2	4,7
		18		9,30	-	1,63	5,7	5,2
-5 / -6	MC	30	1,90	12,9	**3,35**	3,70	3,5	3,3
	CS	22		9,96	**0,67**	1,99	5,0	4,6
		20		9,23	-	1,68	5,5	5,0
		18		8,49	-	1,41	6,0	5,4
0 / -1	MC	30	3,10	10,9	**3,35**	2,75	4,0	3,7
	CS	22		7,96	**0,67**	1,38	5,8	5,1
		20		7,23	-	1,09	6,6	5,7
		18		6,51	-	0,87	7,5	6,2
2 / 1	MC	30	3,70	10,00	**3,35**	2,39	4,2	3,9
	CS	22		7,17	**0,67**	1,13	6,3	5,5
		20		6,46	-	0,92	7,1	6,0
		18		5,73	-	0,71	8,0	6,5
7 / 6	MC	30	5,40	8,07	**3,35**	1,70	4,7	4,3
	CS	22		5,26	**0,67**	0,70	7,6	6,1
12 / 11	MC	30	7,80	6,19	**3,35**	1,10	5,6	4,9

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	64.534	15.695	**4,1**	3,8
22	41.011	7.035	**5,8**	5,0
20	29.692	4.820	**6,2**	5,3
18	26.896	3.900	**6,9**	5,7
LONDON				
-	49.952	10.659	**4,7**	4,3
22	24.805	3.681	**6,7**	5,7
20	10.495	1.559	**6,7**	5,8
18	9.388	1.238	**7,6**	6,3
ROME				
-	25.759	5.237	**4,9**	4,4
22	10.423	1.477	**7,1**	5,8
20	2.986	432	**6,9**	5,9
18	2.660	340	**7,8**	6,4
VALENCIA				
-	19.553	3.869	**5,1**	4,5
22	6.600	918	**7,2**	5,9
20	1.437	206	**7,0**	5,9
18	1.278	162	**7,9**	6,4
TUNIS				
-	15.061	2.850	**5,3**	4,5
22	3.409	452	**7,5**	5,8
20	39	5	**7,1**	5,7
18	34	4	**8,0**	6,2

Notes
* System with "Hydronic recovery device for extended operating range" option
T_OA = Dry bulb/wet bulb outdoor air temperature [°C]
SET = mode: MP = Maximum Capaciy,PF = Fixed Point, HA = High Flow Rate
T_SA = Dry bulb supply air temperature [°C]
X_SA = Supply air humidity ratio [g/kg]
P_F = Overall cooling capacity of the system (kW)
P_T = Heating capacity of the system [kW]
P_R = Post-heating capacity [kW]
P_D = Additional capacity available to the space [kW]
P_A = Electricity absorbed by the thermodynamic circuit [kW]
EER_C = Thermodynamic efficiency of the system in cooling mode
EER_S = Overall efficiency of the system in cooling mode (thermodynamic circuit and fans)
COP_C = Thermodynamic efficiency of the system in heating mode
COP_S = Overall efficiency of the system in heating mode (thermodynamic circuit and fans)
E_T = Seasonal thermal/cooling energy supplied [kWh]
E_A = Overall seasonal electricity absorbed [kWh]
SE_C = Thermodynamic seasonal efficiency of the system
SE_S = Overall seasonal efficiency of the system (thermodynamic circuit and fans)
In heating mode, the performances are considered with maximum air temperature supply T_SA equal to 30°C
The performance refers to a standard ZEPHIR³ unit (not fitted with a 'Steam-powered humidification module' option)
Return air in cooling mode = 26°C DB
Return air in heating mode = 20°C / 12°C
Available static pressure: supply 150 Pa, return 100 Pa
Performance values do not include the effect of fan motor heat
Source: ASHRAE weather data (International weather for energy calculation)

SIZE 1 - AIR FLOW 1.300 m³/h (STANDARD) - COOLING

SUPPLY HUMIDITY RATIO = 10 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
35 / 24	MC	16	12,20	-	**4,22**	4,40	2,8	2,6
	CS	20		1,61	**2,61**	4,17	3,3	3,1
		22		2,48	**1,74**	4,04	3,6	3,4
		24		3,35	**0,87**	3,92	4,0	3,7
32 / 23	MC	16,3	10,70	-	**4,22**	3,45	3,1	2,9
	CS	20		1,61	**2,61**	3,25	3,8	3,5
		22		2,48	**1,74**	3,13	4,2	3,9
		24		3,35	**0,87**	3,02	4,7	4,3
30 / 22	MC	16,2	9,33	-	**4,27**	2,56	3,6	3,3
	CS	20		1,65	**2,61**	2,38	4,6	4,2
		22		2,52	**1,74**	2,28	5,2	4,7
		24		3,40	**0,87**	2,19	5,8	5,2
28 / 21	MC	15,8	8,07	-	**4,44**	1,95	4,1	3,7
	CS	20		1,83	**2,61**	1,76	5,6	5,0
		22		2,70	**1,74**	1,66	6,5	5,7
		24		3,57	**0,87**	1,57	7,4	6,4
25 / 19	MC	16	5,30	-	**4,40**	0,96	5,5	4,4
	CS	20		1,78	**2,61**	0,85	8,3	6,5
		22		2,66	**1,74**	0,80	10,0	7,7

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	833	156	**5,3**	4,1
20	1.105	138	**8,0**	5,9
22	1.237	130	**9,5**	7,0
24	116	16	**7,4**	6,2
LONDON				
-	1.340	259	**5,2**	4,2
20	1.764	230	**7,7**	6,1
22	1.970	216	**9,1**	7,2
24	332	47	**7,0**	6,1
ROME				
-	11.172	2.320	**4,8**	4,1
20	14.412	2.079	**6,9**	5,7
22	15.989	1.956	**8,2**	6,7
24	6.164	880	**7,0**	6,1
VALENCIA				
-	13.968	3.116	**4,5**	3,9
20	17.691	2.818	**6,3**	5,3
22	19.517	2.663	**7,3**	6,2
24	10.285	1.589	**6,5**	5,7

SUPPLY HUMIDITY RATIO = 11g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
45 / 28*	MC	18	17,3	-	**3,57**	6,41	2,7	2,6
	CS	20,0		0,96	**2,61**	6,23	2,9	2,8
		22		1,83	**1,74**	6,06	3,2	3,0
		24		2,70	**0,87**	5,89	3,4	3,2
40 / 25	MC	20	11,4	-	**2,83**	3,66	3,1	2,9
	CS	20,0		0,22	**2,61**	3,62	3,2	3,0
		22		1,09	**1,74**	3,46	3,6	3,4
		24		1,96	**0,87**	3,31	4,0	3,8
35 / 24	MC	18	10,6	-	**3,57**	3,26	3,3	3,0
	CS	20,0		0,96	**2,61**	3,14	3,7	3,4
		22		1,83	**1,74**	3,02	4,1	3,8
		24		2,70	**0,87**	2,91	4,6	4,2
32 / 23	MC	18	9,11	-	**3,61**	2,35	3,9	3,5
	CS	20,0		1,00	**2,61**	2,25	4,5	4,1
		22		1,87	**1,74**	2,16	5,1	4,6
		24		2,74	**0,87**	2,06	5,8	5,2
30 / 22	MC	18	7,71	-	**3,61**	1,65	4,7	4,1
	CS	20,0		1,00	**2,61**	1,56	5,6	4,8
		22		1,87	**1,74**	1,49	6,4	5,5
		24		2,74	**0,87**	1,41	7,4	6,3
28 / 21	MC	18	6,33	-	**3,70**	1,19	5,3	4,4
	CS	20,0		1,09	**2,61**	1,10	6,7	5,5
		22		1,96	**1,74**	1,03	8,0	6,5
		24		2,83	**0,87**	0,96	9,5	7,6

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	63	12	**5,3**	4,2
20	74	11	**6,7**	5,2
22	83	10	**8,0**	6,2
24	92	10	**9,5**	7,2
LONDON				
-	184	36	**5,1**	4,3
20	214	33	**6,4**	5,4
22	239	31	**7,6**	6,3
24	263	29	**9,0**	7,3
ROME				
-	3.431	667	**5,1**	4,3
20	3.989	620	**6,4**	5,4
22	4.441	583	**7,6**	6,3
24	4.894	547	**9,0**	7,3
VALENCIA				
-	5.897	1.208	**4,9**	4,2
20	6.788	1.131	**6,0**	5,1
22	7.524	1.071	**7,0**	5,9
24	8.259	1.008	**8,2**	6,8
TUNIS				
-	10.398	2.446	**4,3**	3,6
20	11.738	2.321	**5,1**	4,3
22	12.881	2.214	**5,8**	4,9
24	14.023	2.103	**6,7**	5,6

SUPPLY HUMIDITY RATIO = 12 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
45 / 28*	MC	19	15,7	-	**2,96**	5,30	3,0	2,8
	CS	20		0,35	**2,61**	5,23	3,1	2,9
		22		1,22	**1,74**	5,05	3,4	3,2
		24		2,09	**0,87**	4,87	3,7	3,4
45 / 26	MC	22	11,0	-	**1,74**	3,22	3,4	3,2
	CS	22,0		0,00	**1,74**	3,22	3,4	3,2
		24		0,87	**0,87**	2,96	4,0	3,7
40 / 25	MC	21	9,87	-	**2,31**	2,60	3,8	3,5
	CS	22		0,57	**1,74**	2,51	4,2	3,8
		24		1,44	**0,87**	2,35	4,8	4,4
35 / 24	MC	19	8,98	-	**2,96**	2,21	4,1	3,7
	CS	20		0,35	**2,61**	2,17	4,3	3,9
		22		1,22	**1,74**	2,07	4,9	4,4
		24		2,09	**0,87**	1,97	5,6	5,0
32 / 23	MC	19	7,54	-	**3,00**	1,48	5,1	4,4
	CS	20		0,39	**2,61**	1,45	5,5	4,7
		22		1,26	**1,74**	1,37	6,4	5,5
		24		2,13	**0,87**	1,30	7,4	6,3
30 / 22	MC	19	6,05	-	**2,96**	1,07	5,7	4,6
	CS	20		0,35	**2,61**	1,05	6,1	5,0
		22		1,22	**1,74**	0,98	7,4	6,0
		24		2,09	**0,87**	0,92	8,9	7,0

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	48	7	**6,4**	4,5
20	51	7	**7,2**	5,0
22	60	7	**9,2**	6,2
24	69	6	**11,5**	7,5
LONDON				
-	140	22	**6,2**	4,8
20	151	22	**6,9**	5,3
22	175	20	**8,7**	6,5
24	199	18	**10,8**	7,9
ROME				
-	2.602	419	**6,2**	4,8
20	2.802	405	**6,9**	5,3
22	3.255	374	**8,7**	6,5
24	3.708	343	**10,8**	7,9
VALENCIA				
-	4.541	766	**5,9**	4,7
20	4.861	744	**6,5**	5,1
22	5.596	691	**8,1**	6,3
24	6.332	639	**9,9**	7,5
TUNIS				
-	8.294	1.587	**5,2**	4,1
20	8.781	1.518	**5,8**	4,6
22	9.919	1.457	**6,8**	5,3
24	11.061	1.367	**8,1**	6,2

SIZE 1 - AIR FLOW 1.300 m³/h (STANDARD) - HEATING

Performance in Heating								
T_OA	**SET**	**T_SA**	**x_SA**	**P_T**	**P_D**	**P_A**	**COP_C**	**COP_S**
-20 / -21 *	MC	19,7	0,2	19,1	-	5,62	3,4	2,8
	CS	18		18,3	-	4,82	3,8	3,0
-15 / -16 *	MC	24,4	0,5	18,6	**1,92**	6,01	3,1	2,5
	CS	22		17,5	**0,87**	4,90	3,6	2,8
		20		16,5	-	4,09	4,0	3,1
		18		15,5	-	3,36	4,6	3,3
-12 / -13 *	MC	27,2	0,8	18,3	**3,13**	6,24	2,9	2,4
	CS	22		15,8	**0,87**	4,03	3,9	3,0
		20		14,9	-	3,31	4,5	3,2
		18		13,9	-	2,67	5,2	3,5
-7 / -8	MC	23,6	1,5	14,8	**1,57**	3,70	4,0	3,8
	CS	22		14,0	**0,87**	3,27	4,3	4,0
		20		13,0	-	2,73	4,8	4,4
		18		12,1	-	2,31	5,2	4,7
-5 / -6	MC	25,7	1,9	14,7	**2,48**	3,81	3,9	3,6
	CS	22		13,0	**0,87**	2,79	4,7	4,3
		20		12,0	-	2,36	5,1	4,6
		18		11,1	-	1,94	5,7	5,1
0 / -1	MC	30	3,1	14,1	**4,35**	3,84	3,7	3,5
	CS	22		10,3	**0,87**	1,85	5,6	4,9
		20		9,41	-	1,53	6,2	5,3
		18		8,46	-	1,21	7,0	5,8
2 / 1	MC	30	3,7	13,1	**4,35**	3,29	4,0	3,7
	CS	22		9,33	**0,87**	1,58	5,9	5,1
		20		8,40	-	1,25	6,7	5,6
		18		7,45	-	0,93	8,0	6,4
7 / 6	MC	30	5,4	10,5	**4,35**	2,28	4,6	4,2
	CS	22		6,85	**0,87**	0,94	7,3	5,8
		20		5,93	-	0,71	8,4	6,3
12 / 11	MC	30	7,8	8,05	**4,35**	1,50	5,4	4,6

Seasonal energy performances				
T_SA	**E_T**	**E_A**	**SE_C**	**SE_S**
STOCKHOLM				
-	81.480	19.967	**4,1**	2,8
22	53.296	9.702	**5,5**	3,2
20	48.242	7.873	**6,1**	3,2
18	35.004	5.347	**6,5**	3,4
LONDON				
-	64.802	14.377	**4,5**	4,1
22	32.268	5.024	**6,4**	5,4
20	28.553	3.932	**7,3**	5,8
18	12.211	1.658	**7,4**	6,0
ROME				
-	33.512	7.094	**4,7**	4,2
22	13.566	2.013	**6,7**	5,6
20	11.907	1.551	**7,7**	6,0
18	3.459	450	**7,7**	6,2
VALENCIA				
-	25.445	5.247	**4,8**	4,3
22	8.592	1.249	**6,9**	5,6
20	7.515	956	**7,9**	6,1
18	1.662	213	**7,8**	6,3
TUNIS				
-	19.590	3.862	**5,1**	2,9
22	4.440	610	**7,3**	3,0
20	3.846	460	**8,4**	2,9
18	45	6	**8,0**	3,3

Notes
* System with "Hydronic recovery device for extended operating range" option
T_OA = Dry bulb/wet bulb outdoor air temperature [°C]
SET = mode: MP = Maximum Capaciy,PF = Fixed Point, HA = High Flow Rate
T_SA = Dry bulb supply air temperature [°C]
X_SA = Supply air humidity ratio [g/kg]
P_F = Overall cooling capacity of the system (kW)
P_T = Heating capacity of the system [kW]
P_R = Post-heating capacity [kW]
P_D = Additional capacity available to the space [kW]
P_A = Electricity absorbed by the thermodynamic circuit [kW]
EER_C = Thermodynamic efficiency of the system in cooling mode
EER_S = Overall efficiency of the system in cooling mode (thermodynamic circuit and fans)
COP_C = Thermodynamic efficiency of the system in heating mode
COP_S = Overall efficiency of the system in heating mode (thermodynamic circuit and fans)
E_T = Seasonal thermal/cooling energy supplied [kWh]
E_A = Overall seasonal electricity absorbed [kWh]
SE_C = Thermodynamic seasonal efficiency of the system
SE_S = Overall seasonal efficiency of the system (thermodynamic circuit and fans)

In heating mode, the performances are considered with maximum air temperature supply T_SA equal to 30°C
The performance refers to a standard ZEPHIR³ unit (not fitted with a 'Steam-powered humidification module' option)
Return air in cooling mode = 26°C DB
Return air in heating mode = 20°C / 12°C
Available static pressure: supply 150 Pa, return 100 Pa
Performance values do not include the effect of fan motor heat
Source: ASHRAE weather data (International weather for energy calculation)

SIZE 1 - AIR FLOW 1.900 m^3/h (MAXIMUM) - COOLING

SUPPLY HUMIDITY RATIO = 11g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
35 / 24	MC	18,1	15,3	-	**5,03**	4,61	3,3	3,0
	CS	20		1,21	**3,82**	4,45	3,7	3,4
		22		2,48	**2,54**	4,28	4,2	3,8
		24		3,75	**1,27**	4,11	4,6	4,2
32 / 23	MC	18,1	13,1	-	**5,03**	3,51	3,7	3,3
	CS	20		1,21	**3,82**	3,37	4,2	3,8
		22		2,48	**2,54**	3,22	4,8	4,3
		24		3,75	**1,27**	3,07	5,5	4,8
30 / 22	MC	17,7	11,2	-	**5,28**	2,61	4,3	3,7
	CS	20		1,46	**3,82**	2,47	5,1	4,4
		22		2,74	**2,54**	2,35	5,9	5,0
		24		4,01	**1,27**	2,23	6,8	5,7
28 / 21	MC	18	9,19	-	**5,34**	1,80	5,1	4,1
	CS	20		1,53	**3,82**	1,67	6,4	5,1
		22		2,80	**2,54**	1,56	7,7	6,1
		24		4,07	**1,27**	1,45	9,1	7,1
25 / 19	MC	18	5,24	-	**5,34**	0,69	7,6	4,7
	CS	20		1,53	**3,82**	0,63	10,7	6,5

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	836	116	**7,2**	4,1
20	1.068	106	**10,1**	5,5
22	120	16	**7,7**	5,6
24	133	15	**9,1**	6,5
LONDON				
-	1.362	199	**6,9**	4,6
20	1.724	183	**9,4**	6,1
22	345	48	**7,2**	5,8
24	381	45	**8,5**	6,8
ROME				
-	11.751	1.910	**6,2**	4,4
20	14.510	1.764	**8,2**	5,8
22	6.429	891	**7,2**	5,8
24	7.091	833	**8,5**	6,8
VALENCIA				
-	15.120	2.715	**5,6**	4,2
20	18.287	2.526	**7,2**	5,4
22	10.883	1.639	**6,6**	5,5
24	11.958	1.540	**7,8**	6,3

SUPPLY HUMIDITY RATIO = 12 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
40 / 25	MC	21	14,3	-	**3,18**	3,94	3,6	3,3
	CS	22		0,64	**2,54**	3,81	3,9	3,5
		24		1,91	**1,27**	3,56	4,6	4,1
35 / 24	MC	20	12,8	-	**3,94**	3,25	3,9	3,5
	CS	20,0		0,13	**3,82**	3,24	4,0	3,5
		22		1,40	**2,54**	3,07	4,6	4,1
		24		2,67	**1,27**	2,90	5,3	4,7
32 / 23	MC	20	10,7	-	**4,07**	2,25	4,8	4,0
	CS	20,0		0,25	**3,82**	2,22	4,9	4,2
		22		1,53	**2,54**	2,10	5,8	4,9
		24		2,80	**1,27**	1,97	6,9	5,7
30 / 22	MC	19	8,76	-	**4,26**	1,54	5,7	4,5
	CS	20,0		0,45	**3,82**	1,50	6,1	4,8
		22		1,72	**2,54**	1,41	7,4	5,7
		24		2,99	**1,27**	1,31	9,0	6,8
28 / 21	MC	19	6,76	-	**4,39**	0,98	6,9	4,8
	CS	20,0		0,57	**3,82**	0,95	7,7	5,4
		22		1,84	**2,54**	0,87	9,9	6,7

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	68	10	**6,9**	4,3
20	73	10	**7,7**	4,8
22	86	9	**9,9**	6,0
24	-	-	-	-
LONDON				
-	199	30	**6,6**	4,7
20	215	30	**7,3**	5,2
22	250	27	**9,2**	6,4
24	49	6	**8,3**	6,4
ROME				
-	3.717	567	**6,6**	4,7
20	4.001	551	**7,3**	5,2
22	4.663	508	**9,2**	6,4
24	1.127	128	**8,8**	6,7
VALENCIA				
-	6.500	1.064	**6,1**	4,6
20	6.929	1.037	**6,7**	5,0
22	8.004	963	**8,3**	6,1
24	3.874	471	**8,2**	6,4

SUPPLY HUMIDITY RATIO = 13 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
45 / 28 *	MC	21	20,6	-	**3,44**	6,05	3,4	3,1
	CS	22		0,89	**2,54**	5,86	3,7	3,3
		24		2,16	**1,27**	5,58	4,1	3,7
45 / 26	MC	24	13,3	-	**1,15**	3,27	4,1	3,6
40 / 25	MC	24	10,9	-	**1,15**	2,11	5,2	4,3
35 / 24	MC	21	10,3	-	**2,93**	2,02	5,1	4,2
	CS	22		0,38	**2,54**	1,97	5,4	4,5
		24		1,65	**1,27**	1,80	6,6	5,4
32 / 23	MC	21	8,40	-	**3,24**	1,32	6,4	4,8
	CS	22		0,70	**2,54**	1,26	7,2	5,4
		24		1,97	**1,27**	1,15	9,0	6,6
30 / 22	MC	21	6,18	-	**3,12**	0,80	7,7	5,1
	CS	22		0,57	**2,54**	0,76	8,9	5,7
		24		1,84	**1,27**	0,68	11,8	7,3

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
LONDON				
-	27	4	**7,2**	5,0
22	29	4	**8,3**	5,6
24	34	3	**10,8**	7,1
ROME				
-	600	79	**7,6**	5,1
22	656	75	**8,7**	5,7
24	776	67	**11,5**	7,3
VALENCIA				
-	2.132	297	**7,2**	5,0
22	2.319	283	**8,2**	5,6
24	2.723	255	**10,7**	7,0
TUNIS				
-	6.475	1.050	**6,2**	4,3
22	6.804	982	**6,9**	4,7
24	7.822	894	**8,7**	5,8

SIZE 1 - AIR FLOW 1.900 m³/h (MAXIMUM) - COOLING

SUPPLY HUMIDITY RATIO = not controlled

Performance in cooling and in dehumidification								
T_OA	**SET**	**T_SA**	**x_SA**	**P_F**	**P_D**	**P_A**	**EER_C**	**EER_S**
45 / 28 *	HA	26	15,8	9,46	**-**	0,97	9,8	6,1
45 / 26	HA	26	13,5	11,5	**-**	2,29	5,0	4,2
40 / 25	HA	24	13,0	11,0	**1,27**	2,16	5,1	4,3
35 / 24	HA	22	13,5	9,20	**2,54**	1,56	5,9	4,7
32 / 23	HA	21	12,5	5,01	**3,18**	0,65	7,7	4,7
30 / 22	HA	20	11,8	4,88	**3,82**	0,66	7,5	4,6
28 / 21	HA	19	11,1	4,73	**4,45**	0,66	7,2	4,4
25 / 19	HA	18	9,74	4,47	**5,09**	0,67	6,7	4,1

Seasonal energy performances				
T_SA	**E_T**	**E_A**	**SE_C**	**SE_S**
STOCKHOLM				
-	682	102	**6,7**	3,6
LONDON				
-	1.067	158	**6,7**	4,1
ROME				
-	8.250	1.208	**6,8**	4,2
VALENCIA				
-	9.704	1.406	**6,9**	4,3
TUNIS				
-	13.424	1.959	**6,9**	3,8

SIZE 1 - AIR FLOW 1.900 m³/h (MAXIMUM) - HEATING

Performance in Heating								
T_OA	**SET**	**T_SA**	**x_SA**	**P_T**	**P_D**	**P_A**	**COP_C**	**COP_S**
-15 / -16 *	MC	16,5	0,50	21,7	**-**	5,32	4,1	3,7
	HA	16		21,4	**-**	5,07	4,2	3,8
-12 / -13 *	MC	19,0	0,80	21,2	**-**	5,57	3,8	3,4
	CS	18		20,5	**-**	5,03	4,1	3,7
	HA	16		19,1	**-**	3,97	4,8	4,2
-7 / -8	MC	16,2	1,50	16,4	**-**	3,23	5,1	4,5
	HA	16		16,3	**-**	3,16	5,2	4,6
-5 / -6	MC	18,4	1,90	16,4	**-**	3,36	4,9	4,3
	CS	18		16,1		3,23	5,0	4,4
	HA	16		14,7	**-**	2,61	5,6	4,9
0 / -1	MC	23,6	3,10	16,2	**2,29**	3,66	4,4	4,0
	CS	22		15,1	**1,27**	3,10	4,9	4,3
		20		13,7	**-**	2,46	5,6	4,8
		18		12,4	**-**	1,93	6,4	5,3
	HA	16		11,0	**-**	1,45	7,6	5,9
2 / 1	MC	25,9	3,70	16,3	**3,75**	3,80	4,3	3,9
	CS	22		13,6	**1,27**	2,55	5,3	4,6
		20		12,3	**-**	2,01	6,1	5,1
		18		10,9	**-**	1,52	7,2	5,6
	HA	16		9,54	**-**	1,14	8,4	6,1
7 / 6	MC	30	5,40	15,3	**6,36**	3,76	4,1	3,7
	CS	22		10,0	**1,27**	1,48	6,8	5,3
		20		8,68	**-**	1,08	8,0	5,8
		18		7,34	**-**	0,78	9,4	6,1
	HA	16		6,00	**-**	0,54	11,1	6,3
12 / 11	MC	30	7,80	11,8	**6,36**	2,35	5,0	4,3
	CS	22		6,53	**1,27**	0,73	9,0	5,7

Seasonal energy performances				
T_SA	**E_T**	**E_A**	**SE_C**	**SE_S**
STOCKHOLM				
-	103.312	23.341	**4,4**	3,8
22	63.670	11.036	**5,8**	4,5
20	49.578	7.857	**6,3**	4,8
18	57.294	8.832	**6,5**	4,9
16	55.525	7.751	**7,2**	5,1
LONDON				
-	89.353	20.322	**4,4**	3,9
22	59.519	9.191	**6,5**	5,1
20	39.848	5.767	**6,9**	5,4
18	36.307	4.654	**7,8**	5,7
16	30.847	3.399	**9,1**	6,1
ROME				
-	47.549	10.668	**4,5**	3,9
22	30.413	4.364	**7,0**	5,2
20	17.231	2.376	**7,3**	5,5
18	14.991	1.788	**8,4**	5,9
16	12.565	1.282	**9,8**	6,2
VALENCIA				
-	36.524	8.069	**4,5**	4,0
22	22.709	3.114	**7,3**	5,3
20	10.980	1.480	**7,4**	5,6
18	9.420	1.090	**8,6**	6,0
16	7.847	775	**10,1**	6,2
TUNIS				
-	28.640	6.163	**4,6**	3,8
22	16.858	2.116	**8,0**	5,0
20	5.629	703	**8,0**	5,2
18	4.763	508	**9,4**	5,4
16	3.897	352	**11,1**	5,4

Notes
* System with "Hydronic recovery device for extended operating range" option
T_OA = Dry bulb/wet bulb outdoor air temperature [°C]
SET = mode: MP = Maximum Capaciy,PF = Fixed Point, HA = High Flow Rate
T_SA = Dry bulb supply air temperature [°C]
X_SA = Supply air humidity ratio [g/kg]
P_F = Overall cooling capacity of the system (kW)
P_T = Heating capacity of the system [kW]
P_R = Post-heating capacity [kW]
P_D = Additional capacity available to the space [kW]
P_A = Electricity absorbed by the thermodynamic circuit [kW]
EER_C = Thermodynamic efficiency of the system in cooling mode
EER_S = Overall efficiency of the system in cooling mode (thermodynamic circuit and fans)
COP_C = Thermodynamic efficiency of the system in heating mode
COP_S = Overall efficiency of the system in heating mode (thermodynamic circuit and fans)
E_T = Seasonal thermal/cooling energy supplied [kWh]
E_A = Overall seasonal electricity absorbed [kWh]
SE_C = Thermodynamic seasonal efficiency of the system
SE_S = Overall seasonal efficiency of the system (thermodynamic circuit and fans)

In heating mode, the performances are considered with maximum air temperature supply T_SA equal to 30°C
The performance refers to a standard ZEPHIR³ unit (not fitted with a 'Steam-powered humidification module' option)
Return air in cooling mode = 26°C DB
Return air in heating mode = 20°C / 12°C
Available static pressure: supply 150 Pa, return 100 Pa
Performance values do not include the effect of fan motor heat
Source: ASHRAE weather data (International weather for energy calculation)

CLIVET

SIZE 2 - AIR FLOW 1.600 m^3/h (MINIMUM) - COOLING

SUPPLY HUMIDITY RATIO = 9 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
35 / 24	MC	15,2	16,8	-	**5,79**	6,93	2,4	2,3
	CS	20		2,6	**3,21**	6,52	3,0	2,9
		22		3,6	**2,14**	6,35	3,2	3,1
		24		4,7	**1,07**	6,18	3,5	3,3
32 / 23	MC	14,6	15,3	-	**6,11**	5,37	2,8	2,7
	CS	20		2,9	**3,21**	4,99	3,6	3,5
		22		4,0	**2,14**	4,85	4,0	3,8
		24		5,0	**1,07**	4,71	4,3	4,1
30 / 22	MC	14,1	13,8	-	**6,38**	4,43	3,1	3,0
	CS	20		3,2	**3,21**	4,05	4,2	3,9
		22		4,2	**2,14**	3,92	4,6	4,3
		24		5,3	**1,07**	3,79	5,0	4,7
28 / 21	MC	13,7	12,3	-	**6,59**	3,61	3,4	3,2
	CS	20		3,4	**3,21**	3,19	4,9	4,6
		22		4,4	**2,14**	3,05	5,5	5,1
		24		5,5	**1,07**	2,92	6,1	5,6
25 / 19	MC	14,9	8,39	-	**5,95**	1,86	4,5	4,0
	CS	20		2,7	**3,21**	1,62	6,9	6,0
		22		3,8	**2,14**	1,53	8,0	6,9

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	1.314	300	**4,4**	3,8
20	1.736	262	**6,6**	5,6
22	1.899	248	**7,7**	6,4
24	178	29	**6,1**	5,5
LONDON				
-	2.105	494	**4,3**	3,8
20	2.770	432	**6,4**	5,6
22	3.024	410	**7,4**	6,5
24	505	86	**5,9**	5,4
ROME				
-	17.387	4.364	**4,0**	3,6
20	22.651	3.839	**5,9**	5,3
22	24.592	3.651	**6,7**	6,0
24	9.395	1.607	**5,8**	5,4
VALENCIA				
-	21.499	5.722	**3,8**	3,4
20	27.685	5.078	**5,5**	4,9
22	29.933	4.849	**6,2**	5,6
24	15.559	2.822	**5,5**	5,1

SUPPLY HUMIDITY RATIO = 10 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
45 / 28 *	MC	16,9	23,0	-	**4,88**	9,98	2,3	2,2
	CS	20		1,7	**3,21**	9,62	2,6	2,5
		22		2,7	**2,14**	9,38	2,7	2,7
		24		3,8	**1,07**	9,15	2,9	2,8
40 / 25	MC	18,2	15,9	-	**4,18**	5,41	2,9	2,8
	CS	20		1,0	**3,21**	5,25	3,2	3,1
		22		2,0	**2,14**	5,07	3,5	3,4
		24		3,1	**1,07**	4,90	3,9	3,7
35 / 24	MC	16,8	14,8	-	**4,93**	4,73	3,1	3,0
	CS	20		1,7	**3,21**	4,50	3,7	3,5
		22		2,8	**2,14**	4,36	4,0	3,8
		24		3,9	**1,07**	4,21	4,4	4,2
32 / 23	MC	16,7	13,0	-	**4,98**	3,69	3,5	3,3
	CS	20		1,8	**3,21**	3,48	4,2	4,0
		22		2,8	**2,14**	3,36	4,7	4,4
		24		3,9	**1,07**	3,23	5,2	4,9
30 / 22	MC	16,3	11,4	-	**5,20**	2,96	3,9	3,6
	CS	20		2,0	**3,21**	2,76	4,8	4,5
		22		3,1	**2,14**	2,65	5,5	5,0
		24		4,1	**1,07**	2,53	6,1	5,6
28 / 21	MC	16,3	9,70	-	**5,20**	2,21	4,4	3,9
	CS	20		2,0	**3,21**	2,01	5,8	5,2
		22		3,1	**2,14**	1,90	6,7	5,9
		24		4,1	**1,07**	1,79	7,7	6,8
25 / 19	MC	16	6,48	-	**5,36**	1,21	5,4	4,4
	CS	20		2,1	**3,21**	1,07	8,1	6,5
		22		3,2	**2,14**	1,00	9,7	7,8

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	1.017	194	**5,2**	4,2
20	1.341	172	**7,8**	6,1
22	1.504	161	**9,3**	7,2
24	138	18	**7,7**	6,6
LONDON				
-	1.634	319	**5,1**	4,3
20	2.137	284	**7,5**	6,2
22	2.391	266	**9,0**	7,4
24	395	54	**7,4**	6,5
ROME				
-	13.587	2.788	**4,9**	4,2
20	17.385	2.503	**6,9**	5,9
22	19.327	2.356	**8,2**	6,9
24	7.359	1.005	**7,3**	6,5
VALENCIA				
-	16.982	3.682	**4,6**	4,0
20	21.328	3.337	**6,4**	5,5
22	23.576	3.155	**7,5**	6,4
24	12.334	1.805	**6,8**	6,1
TUNIS				
-	24.387	5.790	**4,2**	3,7
20	29.894	5.322	**5,6**	4,8
22	32.812	5.069	**6,5**	5,5
24	20.539	3.497	**5,9**	5,2

SUPPLY HUMIDITY RATIO = 11g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
45 / 28 *	MC	17,9	21,2	-	**4,34**	8,08	2,6	2,5
	CS	20		1,1	**3,21**	7,85	2,8	2,7
		22		2,2	**2,14**	7,63	3,1	2,9
		24		3,3	**1,07**	7,41	3,3	3,2
45 / 26	MC	20,5	15,5	-	**2,95**	4,91	3,2	3,0
	CS	22		0,8	**2,14**	4,74	3,4	3,3
		24		1,9	**1,07**	4,51	3,9	3,7
40 / 25	MC	19,1	14,2	-	**3,70**	4,14	3,4	3,2
	CS	20		0,5	**3,21**	4,07	3,6	3,4
		22		1,6	**2,14**	3,91	4,0	3,8
		24		2,6	**1,07**	3,75	4,5	4,2
35 / 24	MC	18,8	12,5	-	**3,86**	3,31	3,8	3,5
	CS	20		0,6	**3,21**	3,23	4,1	3,8
		22		1,7	**2,14**	3,09	4,6	4,3
		24		2,8	**1,07**	2,95	5,2	4,8
32 / 23	MC	18,7	10,7	-	**3,91**	2,44	4,4	4,0
	CS	20		0,7	**3,21**	2,37	4,8	4,4
		22		1,8	**2,14**	2,25	5,5	5,0
		24		2,8	**1,07**	2,14	6,3	5,7
30 / 22	MC	18	9,3	-	**4,29**	2,02	4,6	4,1
	CS	20		1,1	**3,21**	1,93	5,4	4,8
		22		2,1	**2,14**	1,83	6,3	5,5
		24		3,2	**1,07**	1,73	7,2	6,3
28 / 21	MC	17,6	7,74	-	**4,50**	1,53	5,1	4,4
	CS	20		1,3	**3,21**	1,42	6,4	5,4
		22		2,4	**2,14**	1,33	7,6	6,4
		24		3,4	**1,07**	1,24	9,0	7,5

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	77	15	**5,1**	4,2
20	90	14	**6,4**	5,2
22	101	13	**7,6**	6,1
24	112	12	**9,0**	7,2
LONDON				
-	224	45	**5,0**	4,3
20	259	42	**6,1**	5,3
22	289	40	**7,3**	6,2
24	319	37	**8,6**	7,3
ROME				
-	4.182	845	**5,0**	4,3
20	4.828	789	**6,1**	5,3
22	5.385	742	**7,3**	6,2
24	5.943	694	**8,6**	7,2
VALENCIA				
-	7.152	1.486	**4,8**	4,2
20	8.145	1.401	**5,8**	5,1
22	9.050	1.320	**6,9**	5,9
24	9.956	1.240	**8,0**	6,9
TUNIS				
-	12.484	2.806	**4,4**	3,9
20	13.820	2.684	**5,1**	4,5
22	15.226	2.544	**6,0**	5,1
24	16.632	2.407	**6,9**	5,9

SIZE 2 - AIR FLOW 1.600 m³/h (MINIMUM) - HEATING

Performance in Heating

T_OA	SET	T_SA	x_SA	P_T	P_D	P_A	COP_C	COP_S
-20 / -21 *	MC	24,1	0,20	26,1	**2,20**	8,24	3,2	3,0
	CS	22		24,9	**1,07**	7,03	3,5	3,4
		20		23,7	-	5,93	4,0	3,8
		18		23,3	-	5,58	4,2	3,9
-15 / -16 *	MC	28,7	0,50	25,4	**4,66**	8,93	2,8	2,7
	CS	22		22,4	**1,07**	5,93	3,8	3,6
		20		21,9	-	5,51	4,0	3,8
		18		21,4	-	5,10	4,2	3,9
-12 / -13 *	MC	30	0,80	24,1	**5,36**	8,41	2,9	2,8
	CS	22		20,9	**1,07**	5,35	3,9	3,7
		20		20,3	-	4,82	4,2	3,9
		18		19,6	-	4,25	4,6	4,3
-7 / -8	MC	27,6	1,50	20,6	**4,07**	5,42	3,8	3,6
	CS	22		17,3	**1,07**	3,53	4,9	4,6
		20		16,1	-	3,00	5,4	5,0
		18		14,9	-	2,47	6,0	5,5
-5 / -6	MC	30	1,90	20,7	**5,36**	5,60	3,7	3,5
	CS	22		15,9	**1,07**	3,11	5,1	4,7
		20		14,8	-	2,56	5,8	5,3
		18		13,6	-	2,20	6,2	5,6
0 / -1	MC	30	3,10	17,3	**5,36**	4,14	4,2	3,9
	CS	22		12,7	**1,07**	2,14	5,9	5,3
		20		11,6	-	1,76	6,6	5,8
		18		10,4	-	1,45	7,2	6,1
2 / 1	MC	30	3,70	16,1	**5,36**	3,64	4,4	4,1
	CS	22		11,5	**1,07**	1,78	6,5	5,7
		20		10,3	-	1,49	6,9	5,9
		18		9,18	-	1,29	7,1	6,0
7 / 6	MC	30	5,40	12,9	**5,36**	2,54	5,1	4,6
	CS	22		8,43	**1,07**	1,25	6,7	5,6
		20		7,31	-	1,03	7,1	5,7
12 / 11	MC	30	7,80	9,89	**5,36**	1,70	5,8	5,1

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	102.830	23.595	**4,4**	4,0
22	65.828	11.372	**5,8**	5,0
20	59.690	9.494	**6,3**	5,3
18	43.442	6.646	**6,5**	5,5
LONDON				
-	79.896	16.139	**5,0**	4,5
22	39.728	6.165	**6,4**	5,5
20	35.147	5.100	**6,9**	5,8
18	15.027	2.138	**7,0**	6,0
ROME				
-	41.201	7.946	**5,2**	4,7
22	16.702	2.532	**6,6**	5,6
20	14.658	2.094	**7,0**	5,8
18	4.259	601	**7,1**	6,0
VALENCIA				
-	31.264	5.883	**5,3**	4,8
22	10.578	1.592	**6,6**	5,6
20	9.253	1.316	**7,0**	5,8
18	2.047	288	**7,1**	6,0
TUNIS				
-	24.068	4.349	**5,5**	4,8
22	5.464	811	**6,7**	5,4
20	4.740	668	**7,1**	5,4
18	55	8	**7,1**	5,7

Notes
* System with "Hydronic recovery device for extended operating range" option
T_OA = Dry bulb/wet bulb outdoor air temperature [°C]
SET = mode: MP = Maximum Capaciy,PF = Fixed Point, HA = High Flow Rate
T_SA = Dry bulb supply air temperature [°C]
X_SA = Supply air humidity ratio [g/kg]
P_F = Overall cooling capacity of the system (kW)
P_T = Heating capacity of the system [kW]
P_R = Post-heating capacity [kW]
P_D = Additional capacity available to the space [kW]
P_A = Electricity absorbed by the thermodynamic circuit [kW]
EER_C = Thermodynamic efficiency of the system in cooling mode
EER_S = Overall efficiency of the system in cooling mode (thermodynamic circuit and fans)
COP_C = Thermodynamic efficiency of the system in heating mode
COP_S = Overall efficiency of the system in heating mode (thermodynamic circuit and fans)
E_T = Seasonal thermal/cooling energy supplied [kWh]
E_A = Overall seasonal electricity absorbed [kWh]
SE_C = Thermodynamic seasonal efficiency of the system
SE_S = Overall seasonal efficiency of the system (thermodynamic circuit and fans)
In heating mode, the performances are considered with maximum air temperature supply T_SA equal to 30°C
The performance refers to a standard ZEPHIR³ unit (not fitted with a 'Steam-powered humidification module' option)
Return air in cooling mode = 26°C DB
Return air in heating mode = 20°C / 12°C
Available static pressure: supply 150 Pa, return 100 Pa
Performance values do not include the effect of fan motor heat
Source: ASHRAE weather data (International weather for energy calculation)

SIZE 2 - AIR FLOW 2.200 m³/h (STANDARD) - COOLING

SUPPLY HUMIDITY RATIO = 10 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
35 / 24	MC	17,3	20,0	-	**6,41**	7,93	2,5	2,4
	CS	20		2,0	**4,42**	7,58	2,9	2,8
		22		3,5	**2,95**	7,33	3,2	3,0
		24		4,9	**1,47**	7,07	3,5	3,4
32 / 23	MC	16,6	17,9	-	**6,92**	5,95	3,0	2,8
	CS	20		2,5	**4,42**	5,61	3,6	3,4
		22		4,0	**2,95**	5,42	4,0	3,8
		24		5,5	**1,47**	5,22	4,5	4,2
30 / 22	MC	16,3	15,7	-	**7,15**	4,62	3,4	3,1
	CS	20		2,7	**4,42**	4,30	4,3	3,9
		22		4,2	**2,95**	4,12	4,8	4,4
		24		5,7	**1,47**	3,95	5,4	4,9
28 / 21	MC	16	13,5	-	**7,37**	3,38	4,0	3,6
	CS	20		2,9	**4,42**	3,05	5,4	4,8
		22		4,4	**2,95**	2,89	6,2	5,5
		24		5,9	**1,47**	2,72	7,1	6,3
25 / 19	MC	16	8,94	-	**7,37**	1,64	5,5	4,4
	CS	20		2,9	**4,42**	1,46	8,1	6,5
		22		4,4	**2,95**	1,36	9,8	7,7

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	1.404	267	**5,3**	4,1
20	1.852	238	**7,8**	6,0
22	2.076	222	**9,4**	7,0
24	194	27	**7,1**	6,1
LONDON				
-	2.257	444	**5,1**	4,2
20	2.955	397	**7,4**	6,1
22	3.304	371	**8,9**	7,2
24	553	82	**6,7**	6,0
ROME				
-	18.793	4.002	**4,7**	4,0
20	24.109	3.599	**6,7**	5,6
22	26.779	3.385	**7,9**	6,6
24	10.284	1.539	**6,7**	5,9
VALENCIA				
-	23.477	5.416	**4,3**	3,8
20	29.568	4.913	**6,0**	5,2
22	32.659	4.645	**7,0**	6,0
24	17.164	2.794	**6,1**	5,5

SUPPLY HUMIDITY RATIO = 11g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
40 / 25	MC	19,8	19,0	-	**4,57**	6,55	2,9	2,7
	CS	20		0,1	**4,42**	6,51	2,9	2,8
		22		1,6	**2,95**	6,22	3,3	3,1
		24		3,1	**1,47**	5,92	3,7	3,5
35 / 24	MC	18,3	17,5	-	**5,67**	5,52	3,2	3,0
	CS	20		1,3	**4,42**	5,34	3,5	3,3
		22		2,7	**2,95**	5,13	3,9	3,7
		24		4,2	**1,47**	4,92	4,4	4,1
32 / 23	MC	17,9	15,3	-	**5,97**	4,11	3,7	3,4
	CS	20		1,5	**4,42**	3,94	4,3	3,9
		22		3,0	**2,95**	3,77	4,9	4,4
		24		4,5	**1,47**	3,60	5,5	5,0
30 / 22	MC	17,8	13,0	-	**6,04**	2,88	4,5	4,0
	CS	20		1,6	**4,42**	2,73	5,4	4,7
		22		3,1	**2,95**	2,60	6,2	5,4
		24		4,6	**1,47**	2,46	7,1	6,2
28 / 21	MC	17,7	10,6	-	**6,11**	1,96	5,4	4,5
	CS	20		1,7	**4,42**	1,82	6,8	5,6
		22		3,2	**2,95**	1,70	8,1	6,6
		24		4,6	**1,47**	1,58	9,6	7,8
25 / 19	MC	17,5	6,38	-	**6,26**	0,98	6,5	4,7
	CS	20		1,8	**4,42**	0,89	9,2	6,5

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	1.012	159	**6,4**	4,4
20	1.290	145	**8,9**	5,9
22	138	17	**8,1**	6,3
24	152	16	**9,6**	7,4
LONDON				
-	1.642	265	**6,2**	4,7
20	2.074	243	**8,5**	6,3
22	397	52	**7,6**	6,3
24	438	49	**9,0**	7,4
ROME				
-	13.997	2.380	**5,9**	4,6
20	17.250	2.195	**7,9**	6,0
22	7.393	977	**7,6**	6,3
24	8.160	912	**8,9**	7,4
VALENCIA				
-	17.890	3.274	**5,5**	4,4
20	21.598	3.043	**7,1**	5,7
22	12.541	1.815	**6,9**	5,9
24	13.786	1.705	**8,1**	6,8

SUPPLY HUMIDITY RATIO = 12 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
45 / 28*	MC	20	25,7	-	**4,42**	9,35	2,7	2,6
	CS	20		0,0	**4,42**	9,35	2,7	2,6
		22		1,5	**2,95**	8,97	3,0	2,9
		24		2,9	**1,47**	8,59	3,3	3,2
45 / 26	MC	22,6	18,2	-	**2,50**	5,49	3,3	3,1
	CS	24		1,0	**1,47**	5,04	3,8	3,6
40 / 25	MC	21,8	15,9	-	**3,09**	4,09	3,9	3,6
		22		0,1	**2,95**	4,06	4,0	3,6
		24		1,6	**1,47**	3,70	4,7	4,3
35 / 24	MC	20	14,7	-	**4,42**	3,57	4,1	3,7
	CS	20		0,0	**4,42**	3,57	4,1	3,7
		22		1,5	**2,95**	3,37	4,8	4,3
		24		2,9	**1,47**	3,18	5,5	5,0
32 / 23	MC	19,4	12,5	-	**4,86**	2,44	5,1	4,4
	CS	20		0,4	**4,42**	2,41	5,4	4,7
		22		1,9	**2,95**	2,27	6,4	5,5
		24		3,4	**1,47**	2,14	7,4	6,3
30 / 22	MC	19,3	10,2	-	**4,94**	1,80	5,7	4,7
	CS	20		0,5	**4,42**	1,76	6,1	5,0
		22		2,0	**2,95**	1,65	7,4	6,0
		24		3,5	**1,47**	1,54	8,9	7,1
28 / 21	MC	19,3	7,65	-	**4,94**	1,21	6,3	4,8
	CS	20		0,5	**4,42**	1,17	7,0	5,3
		22		2,0	**2,95**	1,07	9,0	6,7
		24		3,5	**1,47**	0,98	11,4	8,3

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	77	12	**6,3**	4,5
20	82	12	**7,0**	4,9
22	96	11	**9,0**	6,2
24	111	10	**11,4**	7,6
LONDON				
-	227	37	**6,1**	4,8
20	241	36	**6,7**	5,2
22	282	33	**8,6**	6,5
24	324	30	**10,7**	8,0
ROME				
-	4.234	689	**6,1**	4,8
20	4.502	668	**6,7**	5,2
22	5.268	615	**8,6**	6,5
24	6.034	564	**10,7**	8,0
VALENCIA				
-	7.451	1.265	**5,9**	4,7
20	7.877	1.232	**6,4**	5,1
22	9.122	1.142	**8,0**	6,3
24	10.366	1.055	**9,8**	7,6
TUNIS				
-	13.663	2.619	**5,2**	4,2
20	14.025	2.523	**5,6**	4,5
22	16.147	2.413	**6,7**	5,3
24	18.080	2.253	**8,0**	6,3

SIZE 2 - AIR FLOW 2.200 m³/h (STANDARD) - HEATING

Performance in Heating

T_OA	SET	T_SA	x_SA	P_T	P_D	P_A	COP_C	COP_S
-20 / -21 *	MC	10,3	0,20	30,7	**-**	7,54	4,1	3,8
-15 / -16 *	MC	17,1	0,50	29,7	**-**	8,16	3,6	3,4
-12 / -13 *	MC	23,1	0,80	29,2	**2,28**	8,55	3,4	3,2
	CS	22		27,3	**1,47**	7,07	3,9	3,6
		20		25,2	**-**	5,47	4,6	4,2
		18		23,6	**-**	4,39	5,4	4,8
-7 / -8	MC	21,1	1,50	23,0	**0,81**	4,92	4,7	4,3
	CS	20		22,1	**-**	4,52	4,9	4,5
		18		20,5	**-**	3,80	5,4	4,9
-5 / -6	MC	23,2	1,90	22,9	**2,36**	5,09	4,5	4,2
	CS	22		21,9	**1,47**	4,65	4,7	4,4
		20		20,3	**-**	3,91	5,2	4,7
		18		18,7	**-**	3,26	5,7	5,2
0 / -1	MC	28,8	3,10	22,9	**6,48**	5,59	4,1	3,8
		22		17,5	**1,47**	3,14	5,6	5,0
	CS	20		15,9	**-**	2,50	6,4	5,5
		18		14,3	**-**	2,10	6,8	5,8
2 / 1	MC	30	3,70	22,1	**7,37**	5,40	4,1	3,8
	CS	22		15,8	**1,47**	2,56	6,2	5,4
		20		14,2	**-**	2,15	6,6	5,6
		18		12,6	**-**	1,73	7,3	6,0
7 / 6	MC	30	5,40	17,8	**7,37**	3,77	4,7	4,3
	CS	22		11,6	**1,47**	1,57	7,4	6,0
		20		10,0	**-**	1,35	7,4	5,8
		18		8,5	**-**	1,13	7,5	5,7
12 / 11	MC	30	7,80	13,6	**7,37**	2,44	5,6	4,8
	CS	22		7,6	**1,47**	1,01	7,5	5,5

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	134.295	30.428	**4,4**	4,0
22	92.243	15.694	**5,9**	4,9
20	80.969	13.262	**6,1**	5,1
18	72.403	10.985	**6,6**	5,1
LONDON				
-	108.952	23.151	**4,7**	4,3
22	71.434	10.582	**6,8**	5,5
20	48.204	7.021	**6,9**	5,7
18	42.001	5.814	**7,2**	5,7
ROME				
-	56.592	11.575	**4,9**	4,4
22	35.520	5.014	**7,1**	5,6
20	20.095	2.837	**7,1**	5,7
18	17.348	2.350	**7,4**	5,7
VALENCIA				
-	43.007	8.579	**5,0**	4,5
22	26.361	3.650	**7,2**	5,7
20	12.680	1.768	**7,2**	5,8
18	10.903	1.467	**7,4**	5,7
TUNIS				
-	33.135	6.322	**5,2**	4,5
22	19.548	2.625	**7,4**	5,3
20	6.485	877	**7,4**	5,5
18	5.516	734	**7,5**	5,3

Notes
* System with "Hydronic recovery device for extended operating range" option
T_OA = Dry bulb/wet bulb outdoor air temperature [°C]
SET = mode: MP = Maximum Capaciy,PF = Fixed Point, HA = High Flow Rate
T_SA = Dry bulb supply air temperature [°C]
X_SA = Supply air humidity ratio [g/kg]
P_F = Overall cooling capacity of the system (kW)
P_T = Heating capacity of the system [kW]
P_R = Post-heating capacity [kW]
P_D = Additional capacity available to the space [kW]
P_A = Electricity absorbed by the thermodynamic circuit [kW]
EER_C = Thermodynamic efficiency of the system in cooling mode
EER_S = Overall efficiency of the system in cooling mode (thermodynamic circuit and fans)
COP_C = Thermodynamic efficiency of the system in heating mode
COP_S = Overall efficiency of the system in heating mode (thermodynamic circuit and fans)
E_T = Seasonal thermal/cooling energy supplied [kWh]
E_A = Overall seasonal electricity absorbed [kWh]
SE_C = Thermodynamic seasonal efficiency of the system
SE_S = Overall seasonal efficiency of the system (thermodynamic circuit and fans)
In heating mode, the performances are considered with maximum air temperature supply T_SA equal to 30°C
The performance refers to a standard ZEPHIR³ unit (not fitted with a 'Steam-powered humidification module' option)
Return air in cooling mode = 26°C DB
Return air in heating mode = 20°C / 12°C
Available static pressure: supply 150 Pa, return 100 Pa
Performance values do not include the effect of fan motor heat
Source: ASHRAE weather data (International weather for energy calculation)
Performance values do not include the effect of fan motor heat
Source: ASHRAE weather data (International weather for energy calculation)

SIZE 2 - AIR FLOW 3.500 m³/h (MAXIMUM) - COOLING

SUPPLY HUMIDITY RATIO = 11g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
32 / 23	MC	18,5	23,6	-	**8,79**	7,71	3,1	2,7
	CS	20		1,8	**7,03**	7,45	3,4	3,0
		22		4,1	**4,69**	7,11	3,9	3,5
		24		6,4	**2,34**	6,76	4,4	3,9
30 / 22	MC	18,3	20,0	-	**9,02**	4,98	4,0	3,4
	CS	20		2,0	**7,03**	4,77	4,6	3,9
		22		4,3	**4,69**	4,51	5,4	4,5
		24		6,7	**2,34**	4,26	6,3	5,2
28 / 21	MC	17,9	16,5	-	**9,49**	3,20	5,2	4,0
	CS	20		2,5	**7,03**	2,99	6,3	4,9
		22		4,8	**4,69**	2,79	7,6	5,8
		24		7,1	**2,34**	2,58	9,2	6,8
25 / 19	MC	18,2	8,90	-	**9,14**	1,26	7,1	4,2
	CS	20		2,1	**7,03**	1,17	9,4	5,4

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	1.429	211	**6,8**	3,8
20	1.753	196	**8,9**	4,9
22	213	28	**7,6**	5,5
24	236	26	**9,2**	6,5
LONDON				
-	2.340	363	**6,4**	4,1
20	2.847	338	**8,4**	5,2
22	612	88	**7,0**	5,5
24	678	81	**8,3**	6,4
ROME				
-	20.433	3.477	**5,9**	4,0
20	24.392	3.252	**7,5**	5,0
22	11.387	1.630	**7,0**	5,5
24	12.605	1.516	**8,3**	6,4
VALENCIA				
-	26.158	4.934	**5,3**	3,9
20	30.695	4.643	**6,6**	4,7
22	18.853	2.988	**6,3**	5,1
24	20.805	2.796	**7,4**	5,9

SUPPLY HUMIDITY RATIO = 12 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
40 / 25	MC	22,3	24,6	-	**4,34**	7,94	3,1	2,8
	CS	24		2,0	**2,34**	7,19	3,7	3,3
35 / 24	MC	20,5	22,8	-	**6,45**	6,58	3,5	3,1
	CS	22		1,8	**4,69**	6,28	3,9	3,4
		24		4,1	**2,34**	5,86	4,6	4,0
32 / 23	MC	19,9	19,3	-	**7,15**	4,33	4,5	3,7
	CS	20		0,1	**7,03**	4,31	4,5	3,7
		22		2,5	**4,69**	4,05	5,4	4,4
		24		4,8	**2,34**	3,79	6,4	5,2
30 / 22	MC	19,6	15,8	-	**7,50**	2,79	5,7	4,3
	CS	20		0,5	**7,03**	2,76	5,9	4,5
		22		2,8	**4,69**	2,57	7,2	5,4
		24		5,2	**2,34**	2,39	8,8	6,4
28 / 21	MC	19,6	11,8	-	**7,50**	1,68	7,0	4,6
	CS	20		0,5	**7,03**	1,66	7,4	4,8
		22		2,8	**4,69**	1,51	9,7	6,1

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	118	17	**7,0**	4,3
20	123	17	**7,4**	4,5
22	146	15	**9,7**	5,7
LONDON				
-	350	53	**6,6**	4,5
20	363	52	**6,9**	4,7
22	428	48	**8,9**	5,9
24	87	11	**7,9**	6,0
ROME				
-	6.537	988	**6,6**	4,5
20	6.779	977	**6,9**	4,7
22	7.997	895	**8,9**	5,9
24	2.010	235	**8,5**	6,3
VALENCIA				
-	11.513	1.900	**6,1**	4,4
20	11.611	1.802	**6,4**	4,6
22	13.858	1.736	**8,0**	5,6
24	6.902	876	**7,9**	6,0

SUPPLY HUMIDITY RATIO = 13 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
45 / 26	MC	25	23,6	-	**1,17**	6,62	3,6	3,1
40 / 25	MC	25,2	19,0	-	**0,94**	3,39	5,6	4,5
35 / 24	MC	21,9	18,5	-	**4,80**	3,48	5,3	4,2
	CS	22		0,1	**4,69**	3,47	5,4	4,3
		24		2,5	**2,34**	3,10	6,8	5,3
32 / 23	MC	21,3	15,0	-	**5,51**	2,37	6,3	4,6
	CS	22		0,8	**4,69**	2,30	6,9	5,0
		24		3,2	**2,34**	2,08	8,7	6,1
30 / 22	MC	21,6	10,8	-	**5,16**	1,44	7,5	4,7
		22		0,5	**4,69**	1,40	8,0	4,9
	CS	24		2,8	**2,34**	1,23	11,1	6,5
28 / 21	MC	21,2	7,88	-	**5,63**	0,98	8,0	4,2
	CS	22		0,9	**4,69**	0,92	9,5	4,9

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	79	10	**8,0**	3,8
22	88	9	**9,5**	4,4
LONDON				
-	237	30	**7,8**	4,3
22	261	29	**9,1**	4,9
24	59	6	**10,2**	6,4
ROME				
-	4.400	559	**7,9**	4,3
22	4.845	531	**9,1**	4,9
24	1.321	122	**10,8**	6,4
VALENCIA				
-	7.902	1.048	**7,5**	4,4
24	4.658	459	**10,2**	6,3

SIZE 2 - AIR FLOW 3.500 m³/h (MAXIMUM) - COOLING

SUPPLY HUMIDITY RATIO = not controlled

Performance in cooling and in dehumidification

T_OA	SET	T_SA	x_SA	P_F	P_D	P_A	EER_C	EER_S
45 / 28 *	HA	26	16,00	24,0	-	3,46	6,9	5,3
45 / 26	HA	26	13,30	21,8	-	5,04	4,3	3,7
40 / 25	HA	24	12,80	20,8	**2,34**	4,57	4,6	3,8
35 / 24	HA	22	13,10	18,2	**4,69**	3,38	5,4	4,3
32 / 23	HA	21	12,70	16,3	**5,86**	2,86	5,7	4,4
30 / 22	HA	20	12,30	14,5	**7,03**	2,31	6,3	4,5
28 / 21	HA	19	11,80	13,0	**8,20**	1,89	6,9	4,7
25 / 19	HA	18	10,90	9,4	**9,38**	1,36	6,9	4,2

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	1.470	212	**6,9**	3,9
LONDON				
-	2.345	339	**6,9**	4,3
ROME				
-	19.110	2.783	**6,9**	4,4
VALENCIA				
-	23.430	3.477	**6,7**	4,4
TUNIS				
-	32.831	5.094	**6,4**	4,1

SIZE 2 - AIR FLOW 3.500 m³/h (MAXIMUM) - HEATING

Performance in Heating

T_OA	SET	T_SA	x_SA	P_T	P_D	P_A	COP_C	COP_S
-15 / -16 *	MC	13,7	0,50	36,4	-	7,20	5,1	4,4
	HA	13,7		36,4	-	7,20	5,1	4,4
-12 / -13 *	MC	16,1	0,80	35,4	-	7,50	4,7	4,1
	HA	16		35,3	-	7,41	4,8	4,2
-7 / -8	MC	13	1,50	26,0	-	4,33	6,0	5,0
	HA	13		26,0	-	4,33	6,0	5,0
-5 / -6	MC	15,1	1,90	26,0	-	4,48	5,8	4,9
	HA	15,1		26,0	-	4,48	5,8	4,9
0 / -1	MC	20,4	3,10	25,8	**0,47**	4,88	5,3	4,5
	CS	20		25,3	-	4,69	5,4	4,5
		18		22,8	-	3,76	6,1	4,9
	HA	16		20,3	-	2,98	6,8	5,3
2 / 1	MC	22,4	3,70	25,6	**2,81**	5,01	5,1	4,3
	CS	22		25,1	**2,34**	4,82	5,2	4,4
		20		22,6	-	3,85	5,9	4,8
		18		20,1	-	3,04	6,6	5,1
	HA	16		17,6	-	2,30	7,7	5,5
7 / 6	MC	27,7	5,40	25,5	**9,02**	5,50	4,6	4,0
	CS	22		18,4	**2,34**	2,75	6,7	5,1
		20		16,0	-	2,16	7,4	5,3
		18		13,5	-	1,67	8,1	5,3
	HA	16		11,1	-	1,31	8,5	5,1
12 / 11	MC	30	7,80	21,7	**11,72**	4,36	5,0	4,1
	CS	22		12,0	**2,34**	1,47	8,2	5,1
		20		9,6	-	1,18	8,1	4,7

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	169.709	33.402	**5,1**	4,2
22	79.313	12.908	**6,1**	4,5
20	103.519	16.661	**6,2**	4,6
18	80.475	11.996	**6,7**	4,8
16	100.485	14.792	**6,8**	4,9
LONDON				
-	151.245	30.984	**4,9**	4,1
22	96.300	14.675	**6,6**	4,8
20	94.703	13.880	**6,8**	4,9
18	63.595	8.833	**7,2**	4,4
16	56.867	7.352	**7,7**	4,4
ROME				
-	81.948	16.894	**4,9**	4,1
22	53.740	7.877	**6,8**	4,9
20	47.664	6.627	**7,2**	4,9
18	27.265	3.646	**7,5**	4,1
16	23.212	2.881	**8,1**	3,9
VALENCIA				
-	63.716	13.125	**4,9**	4,1
22	40.830	5.793	**7,0**	5,0
20	35.220	4.761	**7,4**	4,9
18	17.306	2.274	**7,6**	3,7
16	14.504	1.774	**8,2**	3,5
TUNIS				
-	50.955	10.478	**4,9**	4,0
22	30.995	4.125	**7,5**	4,8
20	25.646	3.281	**7,8**	4,5
18	8.761	1.087	**8,1**	4,9
16	7.210	852	**8,5**	4,7

Notes
* System with "Hydronic recovery device for extended operating range" option
T_OA = Dry bulb/wet bulb outdoor air temperature [°C]
SET = mode: MP = Maximum Capaciy,PF = Fixed Point, HA = High Flow Rate
T_SA = Dry bulb supply air temperature [°C]
X_SA = Supply air humidity ratio [g/kg]
P_F = Overall cooling capacity of the system (kW)
P_T = Heating capacity of the system [kW]
P_R = Post-heating capacity [kW]
P_D = Additional capacity available to the space [kW]
P_A = Electricity absorbed by the thermodynamic circuit [kW]
EER_C = Thermodynamic efficiency of the system in cooling mode
EER_S = Overall efficiency of the system in cooling mode (thermodynamic circuit and fans)
COP_C = Thermodynamic efficiency of the system in heating mode
COP_S = Overall efficiency of the system in heating mode (thermodynamic circuit and fans)
E_T = Seasonal thermal/cooling energy supplied [kWh]
E_A = Overall seasonal electricity absorbed [kWh]
SE_C = Thermodynamic seasonal efficiency of the system
SE_S = Overall seasonal efficiency of the system (thermodynamic circuit and fans)

In heating mode, the performances are considered with maximum air temperature supply T_SA equal to 30°C
The performance refers to a standard ZEPHIR³ unit (not fitted with a 'Steam-powered humidification module' option)
Return air in cooling mode = 26°C DB
Return air in heating mode = 20°C / 12°C
Available static pressure: supply 150 Pa, return 100 Pa
Performance values do not include the effect of fan motor heat
Source: ASHRAE weather data (International weather for energy calculation)

SIZE 3 - AIR FLOW 3.300 m³/h (MINIMUM) - COOLING

SUPPLY HUMIDITY RATIO = 9 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
35 / 24	MC	14,3	35,6	-	**12,9**	14,5	2,5	2,4
	CS	20		6,3	**6,63**	13,5	3,1	3,0
		22		8,5	**4,42**	13,2	3,3	3,2
		24		10,7	**2,21**	12,9	3,6	3,4
32 / 23	MC	13,8	32,4	-	**13,4**	12,3	2,6	2,5
	CS	20		6,9	**6,63**	11,4	3,4	3,3
		22		9,1	**4,42**	11,1	3,7	3,6
		24		11,3	**2,21**	10,8	4,0	3,8
30 / 22	MC	13,6	29,1	-	**13,7**	9,58	3,0	2,9
	CS	20		7,1	**6,63**	8,73	4,1	3,9
		22		9,3	**4,42**	8,46	4,5	4,3
		24		11,5	**2,21**	8,19	5,0	4,6
28 / 21	MC	13,7	25,3	-	**13,5**	6,63	3,8	3,5
	CS	20		7,0	**6,63**	5,85	5,5	5,0
		22		9,2	**4,42**	5,60	6,2	5,6
		24		11,4	**2,21**	5,35	6,9	6,2
25 / 19	MC	13,6	18,6	-	**13,7**	3,60	5,2	4,5
	CS	20		7,1	**6,63**	3,09	8,3	7,0
		22		9,3	**4,42**	2,94	9,5	8,0

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	2.894	578	**5,0**	4,3
20	3.968	497	**8,0**	6,7
22	4.304	473	**9,1**	7,5
24	367	54	**6,9**	6,1
LONDON				
-	4.614	953	**4,8**	4,3
20	6.287	824	**7,6**	6,6
22	6.811	785	**8,7**	7,4
24	1.046	164	**6,4**	5,8
ROME				
-	37.568	8.395	**4,5**	4,0
20	50.334	7.324	**6,9**	6,0
22	54.338	6.998	**7,8**	6,8
24	19.464	3.067	**6,3**	5,8
VALENCIA				
-	46.146	11.254	**4,1**	3,7
20	60.903	9.930	**6,1**	5,5
22	65.539	9.522	**6,9**	6,1
24	32.471	5.619	**5,8**	5,3

SUPPLY HUMIDITY RATIO = 10 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
40 / 25	MC	17,1	33,8	-	**9,83**	12,5	2,7	2,6
	CS	20		3,2	**6,63**	12,0	3,1	2,9
		22		5,4	**4,42**	11,6	3,4	3,2
		24		7,6	**2,21**	11,3	3,7	3,5
35 / 24	MC	15,7	31,6	-	**11,3**	11,0	2,9	2,7
	CS	20		4,8	**6,63**	10,4	3,5	3,3
		22		7,0	**4,42**	10,1	3,8	3,6
		24		9,2	**2,21**	9,84	4,1	3,9
32 / 23	MC	15,3	28,3	-	**11,8**	8,23	3,4	3,2
	CS	20		5,2	**6,63**	7,68	4,4	4,1
		22		7,4	**4,42**	7,45	4,8	4,5
		24		9,6	**2,21**	7,22	5,3	4,9
30 / 22	MC	14,9	25,1	-	**12,2**	6,32	4,0	3,6
	CS	20		5,6	**6,63**	5,81	5,3	4,8
		22		7,8	**4,42**	5,60	5,9	5,3
		24		10,1	**2,21**	5,40	6,5	5,9
28 / 21	MC	15,1	21,3	-	**12,0**	4,34	4,9	4,3
	CS	20		5,4	**6,63**	3,88	6,9	6,0
		22		7,6	**4,42**	3,69	7,8	6,8
		24		9,8	**2,21**	3,50	8,9	7,7
25 / 19	MC	18	11,2	-	**8,84**	2,07	5,4	4,3
	CS	20		2,2	**6,63**	1,91	7,0	5,4
		22		4,4	**4,42**	1,75	8,9	6,8

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	1.803	337	**5,3**	4,1
20	2.171	310	**7,0**	5,3
22	2.507	285	**8,8**	6,6
24	311	35	**8,9**	7,5
LONDON				
-	2.956	564	**5,2**	4,2
20	3.570	517	**6,9**	5,5
22	4.093	479	**8,6**	6,7
24	891	107	**8,3**	7,2
ROME				
-	25.927	5.131	**5,1**	4,2
20	31.616	4.680	**6,8**	5,6
22	35.620	4.372	**8,1**	6,6
24	16588	20.11	**8**	7
VALENCIA				
-	33.488	7.048	**4,8**	4,1
20	40.868	6.440	**6,3**	5,4
22	45.505	6.070	**7,5**	6,3
24	27.801	3.711	**7,5**	6,6
TUNIS				
-	48.530	11.458	**4,2**	3,7
20	58.583	10.569	**5,5**	4,8
22	64.576	10.059	**6,4**	5,5
24	45.412	7.316	**6,2**	5,6

SUPPLY HUMIDITY RATIO = 11g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
45 / 28 *	MC	15,8	46,9	-	**11,2**	19,8	2,4	2,3
	CS	20		4,6	**6,63**	19,0	2,7	2,6
		22		6,9	**4,42**	18,6	2,9	2,8
		24		9,1	**2,21**	18,2	3,1	3,0
45 / 26	MC	18,8	33,7	-	**7,96**	11,9	2,8	2,7
	CS	20		1,3	**6,63**	11,7	3,0	2,9
		22		3,5	**4,42**	11,3	3,3	3,1
		24		5,7	**2,21**	10,9	3,6	3,4
40 / 25	MC	17,9	30,5	-	**8,95**	9,34	3,3	3,1
	CS	20		2,3	**6,63**	9,03	3,6	3,4
		22		4,5	**4,42**	8,74	4,0	3,8
		24		6,7	**2,21**	8,45	4,4	4,1
35 / 24	MC	16,5	28,2	-	**10,5**	7,71	3,7	3,4
	CS	20		3,9	**6,63**	7,32	4,4	4,1
		22		6,1	**4,42**	7,10	4,8	4,5
		24		8,3	**2,21**	6,87	5,3	4,9
32 / 23	MC	16,6	24,3	-	**10,3**	5,55	4,4	4,0
	CS	20		3,8	**6,63**	5,24	5,4	4,8
		22		6,0	**4,42**	5,05	6,0	5,4
		24		8,2	**2,21**	4,87	6,7	6,0
30 / 22	MC	16,2	21,1	-	**10,8**	4,05	5,2	4,6
	CS	20		4,2	**6,63**	3,76	6,7	5,9
		22		6,4	**4,42**	3,61	7,6	6,6
		24		8,6	**2,21**	3,46	8,6	7,4
28 / 21	MC	18,6	14,8	-	**8,18**	2,71	5,5	4,5
	CS	20		1,5	**6,63**	2,57	6,4	5,2
		22		3,8	**4,42**	2,38	7,8	6,3
		24		6,0	**2,21**	2,18	9,5	7,6

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	148	27	**5,5**	4,4
20	163	26	**6,4**	5,1
22	186	24	**7,8**	6,1
24	208	22	**9,5**	7,4
LONDON				
-	443	83	**5,4**	4,5
20	496	78	**6,3**	5,3
22	558	73	**7,6**	6,3
24	620	68	**9,2**	7,5
ROME				
-	8.314	1.546	**5,4**	4,5
20	9.367	1.458	**6,4**	5,4
22	10.517	1.363	**7,7**	6,4
24	11.666	1.264	**9,2**	7,5
VALENCIA				
-	14.764	2.839	**5,2**	4,5
20	16.887	2.671	**6,3**	5,4
22	18.755	2.520	**7,4**	6,3
24	20.622	2.365	**8,7**	7,3
TUNIS				
-	26.887	5.845	**4,6**	4,0
20	30.879	5.513	**5,6**	4,9
22	33.778	5.270	**6,4**	5,5
24	36.677	5.024	**7,3**	6,3

SIZE 3 - AIR FLOW 3.300 m³/h (MINIMUM) - HEATING

Performance in Heating

T_OA	SET	T_SA	x_SA	P_T	P_D	P_A	COP_C	COP_S
-20 / -21 *	MC	25,2	0,20	55,8	**5,75**	16,8	3,3	3,2
	CS	22		51,7	**2,21**	13,1	3,9	3,8
		20		49,2	-	11,1	4,4	4,2
		18		46,7	-	9,41	5,0	4,6
-15 / -16 *	MC	30	0,50	54,3	**11,0**	18,2	3,0	2,9
	CS	22		44,5	**2,21**	9,74	4,6	4,3
		20		42,1	-	7,96	5,3	4,9
		18		39,6	-	6,63	6,0	5,4
-12 / -13 *	MC	30	0,80	49,9	**11,0**	15,5	3,2	3,1
	CS	22		40,3	**2,21**	7,73	5,2	4,8
		20		37,9	-	6,59	5,8	5,2
		18		35,5	-	5,50	6,5	5,8
-7 / -8	MC	30	1,50	45,4	**11,0**	11,3	4,0	3,8
	CS	22		35,6	**2,21**	6,52	5,5	5,0
		20		33,1	-	5,56	6,0	5,4
		18		30,7	-	4,61	6,7	5,9
-5 / -6	MC	30	1,90	42,6	**11,0**	10,1	4,2	4,0
	CS	22		32,9	**2,21**	5,66	5,8	5,3
		20		30,5	-	4,7	6,5	5,8
		18		28,0	-	4,02	7,0	6,1
0 / -1	MC	30	3,10	35,8	**11,0**	7,69	4,7	4,3
		22		26,3	**2,21**	3,98	6,6	5,8
	CS	20		23,9	-	3,38	7,1	6,1
		18		21,5	-	2,78	7,7	6,4
2 / 1	MC	30	3,70	33,2	**11,0**	6,80	4,9	4,5
	CS	22		23,7	**2,21**	3,44	6,9	5,9
		20		21,3	-	2,80	7,6	6,3
		18		18,9	-	2,43	7,8	6,3
7 / 6	MC	30	5,40	26,7	**11,0**	4,70	5,7	5,1
	CS	22		17,4	**2,21**	2,33	7,5	6,0
		20		15,1	-	2,00	7,6	5,9
		18		12,8	-	1,68	7,6	5,7
12 / 11	MC	30	7,80	20,4	**11,0**	3,07	6,6	5,6
	CS	22		11,4	**2,21**	1,63	7,0	5,2
		20		9,3	-	1,30	7,2	5,0

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	213.271	43.923	**4,9**	4,4
22	149.955	22.962	**6,5**	5,5
20	134.290	19.196	**7,0**	5,7
18	109.472	14.791	**7,4**	6,0
LONDON				
-	165.066	29.741	**5,6**	5,0
22	107.279	15.199	**7,1**	5,7
20	93.195	12.649	**7,4**	5,8
18	63.145	8.258	**7,6**	6,0
ROME				
-	85.113	14.600	**5,8**	5,1
22	53.359	7.462	**7,2**	5,7
20	45.692	6.182	**7,4**	5,6
18	26.094	3.407	**7,7**	5,9
VALENCIA				
-	64.578	10.780	**6,0**	5,2
22	39.613	5.531	**7,2**	5,6
20	33.624	4.564	**7,4**	5,5
18	16.403	2.143	**7,7**	5,9
TUNIS				
-	49.703	7.927	**6,3**	5,3
22	29.393	4.102	**7,2**	5,3
20	24.570	3.363	**7,3**	5,1
18	8.305	1.090	**7,6**	5,5

Notes
* System with "Hydronic recovery device for extended operating range" option
T_OA = Dry bulb/wet bulb outdoor air temperature [°C]
SET = mode: MP = Maximum Capaciy,PF = Fixed Point, HA = High Flow Rate
T_SA = Dry bulb supply air temperature [°C]
X_SA = Supply air humidity ratio [g/kg]
P_F = Overall cooling capacity of the system (kW)
P_T = Heating capacity of the system [kW]
P_R = Post-heating capacity [kW]
P_D = Additional capacity available to the space [kW]
P_A = Electricity absorbed by the thermodynamic circuit [kW]
EER_C = Thermodynamic efficiency of the system in cooling mode
EER_S = Overall efficiency of the system in cooling mode (thermodynamic circuit and fans)
COP_C = Thermodynamic efficiency of the system in heating mode
COP_S = Overall efficiency of the system in heating mode (thermodynamic circuit and fans)
E_T = Seasonal thermal/cooling energy supplied [kWh]
E_A = Overall seasonal electricity absorbed [kWh]
SE_C = Thermodynamic seasonal efficiency of the system
SE_S = Overall seasonal efficiency of the system (thermodynamic circuit and fans)
In heating mode, the performances are considered with maximum air temperature supply T_SA equal to 30°C
The performance refers to a standard ZEPHIR³ unit (not fitted with a 'Steam-powered humidification module' option)
Return air in cooling mode = 26°C DB   Return air in heating mode = 20°C / 12°C
Available static pressure: supply 150 Pa, return 100 Pa
Performance values do not include the effect of fan motor heat
Source: ASHRAE weather data (International weather for energy calculation)

SIZE 3 - AIR FLOW 4.600 m³/h (STANDARD) - COOLING

SUPPLY HUMIDITY RATIO = 10 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
35 / 24	MC	16,2	42,6	-	**15,0**	16,3	2,6	2,5
	CS	20		5,9	**9,24**	15,4	3,1	3,0
		22		8,9	**6,16**	15,0	3,4	3,2
		24		12,0	**3,08**	14,5	3,8	3,5
32 / 23	MC	15,1	39,6	-	**16,7**	14,2	2,8	2,6
	CS	20		7,5	**9,24**	13,2	3,6	3,3
		22		10,6	**6,16**	12,8	3,9	3,7
		24		13,7	**3,08**	12,4	4,3	4,0
30 / 22	MC	14,98	34,8	-	**16,9**	10,2	3,4	3,1
	CS	20		7,7	**9,24**	9,38	4,5	4,1
		22		10,8	**6,16**	9,06	5,0	4,6
		24		13,9	**3,08**	8,73	5,6	5,0
28 / 21	MC	15,2	29,4	-	**16,6**	6,29	4,7	4,1
	CS	20		7,4	**9,24**	5,63	6,5	5,6
		22		10,5	**6,16**	5,36	7,4	6,3
		24		13,6	**3,08**	5,08	8,5	7,1
25 / 19	MC	15,8	19,0	-	**15,7**	3,03	6,3	4,8
	CS	20		6,5	**9,24**	2,67	9,5	7,1

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	2.992	493	**6,1**	4,4
20	3.985	435	**9,2**	6,4
22	399	54	**7,4**	6,1
24	430	51	**8,5**	6,8
LONDON				
-	4.821	829	**5,8**	4,6
20	6.381	734	**8,7**	6,7
22	1.144	169	**6,8**	5,9
24	1.230	161	**7,7**	6,6
ROME				
-	40.378	7.581	**5,3**	4,3
20	52.611	6.756	**7,8**	6,2
22	21.307	3.161	**6,7**	5,8
24	22.909	3.010	**7,6**	6,5
VALENCIA				
-	50.715	10.640	**4,8**	4,0
20	65.143	9.570	**6,8**	5,6
22	35.834	5.975	**6,0**	5,3
24	38.437	5.717	**6,7**	5,9

SUPPLY HUMIDITY RATIO = 11g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
40 / 25	MC	18,3	41,9	-	**11,8**	14,9	2,8	2,6
	CS	20		2,6	**9,24**	14,5	3,1	2,9
		22		5,7	**6,16**	14,0	3,4	3,2
		24		8,8	**3,08**	13,5	3,8	3,5
35 / 24	MC	16,9	38,7	-	**14,0**	12,5	3,1	2,9
	CS	20		4,8	**9,24**	11,9	3,7	3,4
		22		7,9	**6,16**	11,5	4,0	3,7
		24		10,9	**3,08**	11,1	4,5	4,1
32 / 23	MC	16,5	34,0	-	**14,6**	9,01	3,8	3,4
	CS	20		5,4	**9,24**	8,50	4,6	4,2
		22		8,5	**6,16**	8,20	5,2	4,6
		24		11,6	**3,08**	7,91	5,8	5,1
30 / 22	MC	16,4	29,1	-	**14,7**	5,97	4,9	4,2
	CS	20		5,5	**9,24**	5,56	6,2	5,3
		22		8,6	**6,16**	5,33	7,1	6,0
		24		11,7	**3,08**	5,10	8,0	6,8
28 / 21	MC	16,6	23,6	-	**14,4**	3,94	6,0	4,8
	CS	20		5,2	**9,24**	3,59	8,0	6,4
		22		8,3	**6,16**	3,39	9,4	7,4
		24		11,4	**3,08**	3,18	11,0	8,5
25 / 19	MC	20,5	8,1	-	**8,47**	1,18	6,9	3,8
	CS	22		2,3	**6,16**	1,06	9,9	5,2

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	1.392	207	**6,7**	3,6
20	288	36	**8,0**	6,0
22	1.803	184	**9,8**	4,9
24	350	32	**11,0**	8,0
LONDON				
-	2.389	368	**6,5**	4,0
20	835	111	**7,5**	6,1
22	3.106	327	**9,5**	5,7
24	1.008	100	**10,1**	8,0
ROME				
-	23.341	3.784	**6,2**	4,3
20	15.575	2.072	**7,5**	6,1
22	30.679	3.334	**9,2**	6,1
24	18.779	1.853	**10,1**	8,0
VALENCIA				
-	32.265	5.693	**5,7**	4,2
20	26.572	3.892	**6,8**	5,7
22	42.269	5.036	**8,4**	6,0
24	31778	3519	**9**	7
TUNIS				
-	49.555	10.348	**4,8**	3,6
20	44.937	8.123	**5,5**	4,6
22	63.690	9.287	**6,9**	5,1
24	52.952	7.457	**7,1**	5,9

SUPPLY HUMIDITY RATIO = 12 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
45 / 26	MC	19,9	41,8	-	**9,40**	14,2	2,9	2,8
	CS	20		0,2	**9,24**	14,2	3,0	2,8
		22		3,2	**6,16**	13,6	3,3	3,1
		24		6,3	**3,08**	13,0	3,7	3,5
40 / 25	MC	19,6	36,6	-	**9,86**	9,86	3,7	3,4
	CS	20		0,6	**9,24**	9,78	3,8	3,5
		22		3,7	**6,16**	9,35	4,3	3,9
		24		6,8	**3,08**	8,93	4,9	4,4
35 / 24	MC	18,5	32,9	-	**11,5**	7,33	4,5	4,0
	CS	20		2,3	**9,24**	7,11	5,0	4,4
		22		5,4	**6,16**	6,82	5,6	4,9
		24		8,5	**3,08**	6,53	6,3	5,5
32 / 23	MC	18	28,2	-	**12,3**	5,37	5,3	4,5
	CS	20		3,1	**9,24**	5,15	6,1	5,1
		22		6,2	**6,16**	4,93	7,0	5,9
		24		9,2	**3,08**	4,71	7,9	6,6
30 / 22	MC	18,4	22,5	-	**11,7**	3,37	6,7	5,2
	CS	20		2,5	**9,24**	3,23	7,7	6,0
		22		5,5	**6,16**	3,06	9,2	7,0
		24		8,6	**3,08**	2,88	10,8	8,2
28 / 21	MC	21,1	13,3	-	**7,55**	1,96	6,8	4,6
	CS	22		1,4	**6,16**	1,85	7,9	5,3
		24		4,5	**3,08**	1,58	11,2	7,1

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	133	20	**6,8**	4,2
22	147	19	**7,9**	4,8
24	178	16	**11,2**	6,4
LONDON				
-	415	63	**6,6**	4,7
20	106	15	**7,2**	5,7
22	471	59	**8,0**	5,6
24	557	51	**10,9**	7,2
ROME				
-	7.824	1.165	**6,7**	4,7
20	2.410	318	**7,6**	5,9
22	8.944	1.088	**8,2**	5,7
24	10.546	956	**11,0**	7,3
VALENCIA				
-	14.591	2.258	**6,5**	4,8
20	8.396	1.175	**7,1**	5,7
22	17.116	2.092	**8,2**	5,9
24	19.719	1.889	**10,4**	7,4

SIZE 3 - AIR FLOW 4.600 m³/h (STANDARD) - HEATING

Performance in Heating								
T_OA	**SET**	**T_SA**	**x_SA**	**P_T**	**P_D**	**P_A**	**COP_C**	**COP_S**
-20 / -21 *	MC	18,2	0,20	65,5	-	15,1	4,3	4,0
	CS	18		65,2	-	14,9	4,4	4,0
-15 / -16 *	MC	22,8	0,50	63,4	**4,31**	16,4	3,9	3,6
	CS	22		62,0	**3,08**	15,3	4,1	3,8
		20		58,6	-	12,8	4,6	4,2
		18		55,2	-	10,7	5,2	4,6
-12 / -13 *	MC	25,7	0,80	62,1	**8,78**	17,1	3,6	3,4
	CS	22		56,0	**3,08**	12,5	4,5	4,1
		20		52,7	-	10,5	5,0	4,5
		18		49,3	-	8,53	5,8	5,1
-7 / -8	MC	22,1	1,50	48,7	**3,23**	9,88	4,9	4,5
	CS	22		49,6	**3,08**	9,83	5,0	4,6
		20		46,2	-	8,48	5,4	4,9
		18		42,8	-	7,12	6,0	5,3
-5 / -6	MC	24,3	1,90	49,7	**6,62**	10,2	4,9	4,5
	CS	22		45,9	**3,08**	8,61	5,3	4,8
		20		42,4	-	7,19	5,9	5,2
		18		39,1	-	6,15	6,4	5,5
0 / -1	MC	29,8	3,10	49,5	**15,0**	11,3	4,4	4,0
		22		36,6	**3,08**	5,96	6,1	5,3
	CS	20		33,3	-	4,81	6,9	5,8
		18		30,0	-	3,97	7,6	6,1
2 / 1	MC	30	3,70	46,2	**15,4**	10,2	4,5	4,1
	CS	22		33,0	**3,08**	4,79	6,9	5,8
		20		29,7	-	4,01	7,4	6,0
		18		26,4	-	3,38	7,8	6,1
7 / 6	MC	30	5,40	37,1	**15,4**	7,13	5,2	4,6
	CS	22		24,2	**3,08**	3,14	7,7	5,9
		20		21,0	-	2,54	8,3	6,0
		18		17,8	-	2,15	8,3	5,8
12 / 11	MC	30	7,80	28,4	**15,40**	4,56	6,2	5,2
	CS	22		15,8	**3,08**	1,97	8,0	5,4
		20		12,6	-	1,55	8,1	5,1

Seasonal energy performances				
T_SA	**E_T**	**E_A**	**SE_C**	**SE_S**
STOCKHOLM				
-	284.316	59.157	**4,8**	4,2
22	208.685	32.984	**6,3**	4,9
20	186.567	27.168	**6,9**	5,1
18	152.667	21.148	**7,2**	5,2
LONDON				
-	228.393	44.062	**5,2**	4,6
22	149.144	20.516	**7,3**	5,7
20	128.970	16.645	**7,7**	5,7
18	87.987	11.127	**7,9**	5,9
ROME				
-	118.255	21.860	**5,4**	4,7
22	74.137	9.794	**7,6**	5,7
20	63.025	7.900	**8,0**	5,7
18	36.338	4.501	**8,1**	5,9
VALENCIA				
-	89.811	16.162	**5,6**	4,8
22	55.016	7.150	**7,7**	5,7
20	46.258	5.741	**8,1**	5,6
18	22.836	2.806	**8,1**	5,8
TUNIS				
-	69.149	11.870	**5,8**	4,7
22	40.792	5.169	**7,9**	5,2
20	33.640	4.113	**8,2**	4,9
18	11.550	1.396	**8,3**	5,3

Notes
* System with "Hydronic recovery device for extended operating range" option
T_OA = Dry bulb/wet bulb outdoor air temperature [°C]
SET = mode: MP = Maximum Capaciy,PF = Fixed Point, HA = High Flow Rate
T_SA = Dry bulb supply air temperature [°C]
X_SA = Supply air humidity ratio [g/kg]
P_F = Overall cooling capacity of the system (kW)
P_T = Heating capacity of the system [kW]
P_R = Post-heating capacity [kW]
P_D = Additional capacity available to the space [kW]
P_A = Electricity absorbed by the thermodynamic circuit [kW]
EER_C = Thermodynamic efficiency of the system in cooling mode
EER_S = Overall efficiency of the system in cooling mode (thermodynamic circuit and fans)
COP_C = Thermodynamic efficiency of the system in heating mode
COP_S = Overall efficiency of the system in heating mode (thermodynamic circuit and fans)

E_T = Seasonal thermal/cooling energy supplied [kWh]
E_A = Overall seasonal electricity absorbed [kWh]
SE_C = Thermodynamic seasonal efficiency of the system
SE_S = Overall seasonal efficiency of the system (thermodynamic circuit and fans)
In heating mode, the performances are considered with maximum air temperature supply T_SA equal to 30°C
The performance refers to a standard ZEPHIR³ unit (not fitted with a 'Steam-powered humidification module' option)
Return air in cooling mode = 26°C DB
Return air in heating mode = 20°C / 12°C
Available static pressure: supply 150 Pa, return 100 Pa
Performance values do not include the effect of fan motor heat
Source: ASHRAE weather data (International weather for energy calculation)

SIZE 3 - AIR FLOW 7.000 m³/h (MAXIMUM) - COOLING

SUPPLY HUMIDITY RATIO = 11g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
32 / 23	MC	17,6	49,4	-	**19,9**	14,0	3,4	3,0
	CS	20		5,6	**14,6**	13,0	4,0	3,5
		22		10,3	**9,38**	13,0	4,5	3,9
		24		15,0	**4,69**	12,0	5,1	4,4
30 / 22	MC	17,3	42,3	-	**20,9**	9,75	4,3	3,6
	CS	20		6,3	**14,6**	9,18	5,3	4,3
		22		11,0	**9,38**	8,76	6,1	4,9
		24		15,7	**4,69**	8,34	7,0	5,5
28 / 21	MC	17	35,1	-	**21,9**	6,29	5,6	4,2
	CS	20		7,0	**14,6**	5,77	7,3	5,3
		22		11,7	**9,38**	5,42	8,6	6,2
		24		16,4	**4,69**	5,07	10,2	7,2
25 / 19	MC	19,4	15,0	-	**15,7**	1,96	7,7	3,7
	CS	20		1,4	**14,6**	1,90	8,6	4,1

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	2.481	341	**7,3**	3,3
20	2.751	328	**8,4**	3,8
22	468	54	**8,6**	5,8
24	515	51	**10,2**	6,7
LONDON				
-	4.154	604	**6,9**	3,8
20	4.641	577	**8,0**	4,3
22	1.343	170	**7,9**	5,9
24	1.475	159	**9,3**	6,7
ROME				
-	38.359	6.160	**6,2**	3,8
20	43.761	5.806	**7,5**	4,5
22	25.002	3.162	**7,9**	5,9
24	27.439	2.973	**9,2**	6,7
VALENCIA				
-	50.613	9.001	**5,6**	3,8
20	57.980	8.470	**6,8**	4,5
22	41.327	5.772	**7,2**	5,5
24	45.232	5.450	**8,3**	6,3

SUPPLY HUMIDITY RATIO = 12 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
35 / 24	MC	18,9	49,1	-	**16,6**	13,6	3,6	3,1
	CS	20		2,6	**14,0**	13,3	3,9	3,4
		22		7,3	**9,38**	12,7	4,4	3,8
		24		12,0	**4,69**	12,2	5,0	4,3
32 / 23	MC	18,7	41,3	-	**17,1**	8,83	4,7	3,8
	CS	20		3,0	**14,0**	8,56	5,2	4,2
		22		7,7	**9,38**	8,15	6,0	4,8
		24		12,4	**4,69**	7,74	6,9	5,4
30 / 22	MC	18,7	33,6	-	**17,1**	5,39	6,2	4,5
	CS	20		3,0	**14,06**	5,20	7,0	5,0
		22		7,7	**9,38**	4,90	8,4	5,9
		24		12,4	**4,69**	4,61	10,0	6,8
28 / 21	MC	18,5	26,3	-	**17,5**	3,61	7,3	4,6
	CS	20		3,5	**14,0**	3,41	8,7	5,4
		22		8,2	**9,38**	3,16	10,9	6,5

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	263	36	**7,3**	4,2
20	298	34	**8,7**	4,9
22	345	32	**10,9**	5,9
LONDON				
-	773	112	**6,9**	4,5
20	870	106	**8,2**	5,3
22	1.001	99	**10,1**	6,3
24	192	22	**8,9**	6,4
ROME				
-	14.416	2.067	**7,0**	4,5
20	16.199	1.963	**8,3**	5,3
22	18.637	1.828	**10,2**	6,4
24	4418	457	**10**	7
VALENCIA				
-	25.139	3.897	**6,5**	4,4
20	27.955	3.726	**7,5**	5,1
22	31.916	3.489	**9,1**	6,0
24	15.224	1.723	**8,8**	6,3

SUPPLY HUMIDITY RATIO = 13 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
45 / 26	MC	22,2	53,0	-	**8,91**	15,4	3,4	3,0
	CS	24		4,2	**4,69**	14,1	4,1	3,5
40 / 25	MC	23	42,9	-	**7,03**	8,36	5,1	4,1
	CS	24		2,3	**4,69**	7,57	6,0	4,7
35 / 24	MC	20,3	40,6	-	**13,3**	7,97	5,1	4,0
	CS	22		4,0	**9,38**	7,57	5,9	4,6
		24		8,7	**4,69**	7,10	6,9	5,3
32 / 23	MC	20,5	31,9	-	**12,8**	4,69	6,8	4,7
	CS	22		3,5	**9,38**	4,44	8,0	5,4
		24		8,2	**4,69**	4,11	9,8	6,4
30 / 22	MC	20	25,2	-	**14,0**	3,08	8,2	4,8
	CS	20		0,0	**14,0**	3,08	8,2	4,8
		22		4,7	**9,38**	2,86	10,5	6,0
		24		9,4	**4,69**	2,64	13,1	7,3
28 / 21	MC	24,1	9,08	-	**4,45**	1,06	8,6	2,9

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
LONDON				
-	325	39	**8,3**	3,3
20	76	9	**8,2**	4,8
22	125	13	**9,6**	5,8
24	144	12	**12,0**	7,0
ROME				
-	6.293	753	**8,4**	3,4
20	2.243	274	**8,2**	4,8
22	2.872	281	**10,2**	5,9
24	3.318	260	**12,8**	7,2
VALENCIA				
-	13.339	1.682	**7,9**	3,8
20	6.376	779	**8,2**	4,8
22	9.974	1.050	**9,5**	5,8
24	11.464	971	**11,8**	7,0

SIZE 3 - AIR FLOW 7.000 m³/h (MAXIMUM) - COOLING

SUPPLY HUMIDITY RATIO = not controlled

Performance in cooling and in dehumidification

T_OA	SET	T_SA	x_SA	P_F	P_D	P_A	EER_C	EER_S
45 / 28 *	HA	26	16,6	44,8	-	4,83	9,3	6,0
45 / 26	HA	26	13,7	41,4	-	6,70	6,2	4,7
40 / 25	HA	24	13,2	39,2	**4,69**	6,10	6,4	4,8
35 / 24	HA	22	13,9	31,9	**9,38**	4,46	7,2	4,8
32 / 23	HA	21	13,2	30,2	**11,7**	4,20	7,2	4,8
30 / 22	HA	20	13,0	25,1	**14,0**	3,06	8,2	4,8
28 / 21	HA	19	12,3	23,1	**16,4**	2,91	7,9	4,6
25 / 19	HA	18	10,8	19,2	**18,7**	2,53	7,6	4,1

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	2.957	388	**7,6**	3,7
LONDON				
-	4.673	612	**7,6**	4,2
ROME				
-	37.039	4.803	**7,7**	4,3
VALENCIA				
-	44.565	5.754	**7,7**	4,4
TUNIS				
-	61.867	8.097	**7,6**	4,0

SIZE 3 - AIR FLOW 7.000 m³/h (MAXIMUM) - HEATING

Performance in Heating

T_OA	SET	T_SA	x_SA	P_T	P_D	P_A	COP_C	COP_S
-15 / -16 *	MC	14,8	0,50	75,7	-	14,6	5,2	4,4
	HA	14,8		75,7	-	14,6	5,2	4,4
-12 / -13 *	MC	17,2	0,80	73,9	-	15,2	4,9	4,1
	HA	16		68,5	-	13,5	5,1	4,2
-7 / -8	MC	14,2	1,50	55,2	-	8,73	6,3	5,1
	HA	14,2		55,2	-	8,73	6,3	5,1
-5 / -6	MC	16,3	1,90	55,0	-	8,98	6,1	5,0
	HA	16		54,3	-	8,76	6,2	5,0
0 / -1	MC	21,5	3,10	54,5	**3,52**	9,78	5,6	4,6
	CS	20		50,6	-	8,37	6,0	4,8
		18		45,5	-	6,66	6,8	5,2
	HA	16		40,5	-	5,40	7,5	5,4
2 / 1	MC	23,7	3,70	54,6	**8,67**	10,1	5,4	4,5
	CS	22		50,2	**4,69**	8,46	5,9	4,7
		20		45,2	-	6,77	6,7	5,1
		18		40,2	-	5,52	7,3	5,3
	HA	16		35,1	-	4,23	8,3	5,5
7 / 6	MC	29	5,40	54,0	**21,0**	11,1	4,9	4,1
	CS	22		36,9	**4,69**	4,97	7,4	5,2
		20		32,0	-	3,93	8,1	5,3
		18		27,0	-	3,17	8,5	5,1
	HA	16		22,1	-	2,48	8,9	4,8
12 / 11	MC	30	7,80	43,3	**23,4**	7,82	5,5	4,4
	CS	22		24,0	**4,69**	2,71	8,9	5,0
		20		19,3	-	2,18	8,9	4,5
		18		14,4	-	1,65	8,7	3,8

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	356.197	66.030	**5,4**	4,1
22	158.788	23.053	**6,9**	4,6
20	207.139	29.811	**6,9**	4,6
18	179.044	23.865	**7,5**	4,6
16	202.769	27.791	**7,3**	4,8
LONDON				
-	314.697	60.311	**5,2**	4,3
22	192.851	26.405	**7,3**	5,0
20	189.583	25.029	**7,6**	5,0
18	159.052	19.961	**8,0**	4,8
16	113.593	13.718	**8,3**	5,1
ROME				
-	169.267	32.463	**5,2**	4,3
22	107.615	14.235	**7,6**	5,0
20	95.461	12.016	**7,9**	4,9
18	78.383	9.527	**8,2**	4,7
16	46.269	5.394	**8,6**	5,0
VALENCIA				
-	130.856	24.956	**5,2**	4,3
22	81.755	10.507	**7,8**	5,0
20	70.564	8.666	**8,1**	4,9
18	57.072	6.828	**8,4**	4,5
16	28.894	3.327	**8,7**	5,0
TUNIS				
-	103.691	19.591	**5,3**	4,1
22	62.053	7.538	**8,2**	4,6
20	51.419	6.020	**8,5**	4,3
18	40.403	4.684	**8,6**	3,8
16	14.355	1.613	**8,9**	4,3

Notes

* System with "Hydronic recovery device for extended operating range" option
T_OA = Dry bulb/wet bulb outdoor air temperature [°C]
SET = mode: MP = Maximum Capaciy,PF = Fixed Point, HA = High Flow Rate
T_SA = Dry bulb supply air temperature [°C]
X_SA = Supply air humidity ratio [g/kg]
P_F = Overall cooling capacity of the system (kW)
P_T = Heating capacity of the system [kW]
P_R = Post-heating capacity [kW]
P_D = Additional capacity available to the space [kW]
P_A = Electricity absorbed by the thermodynamic circuit [kW]
EER_C = Thermodynamic efficiency of the system in cooling mode
EER_S = Overall efficiency of the system in cooling mode (thermodynamic circuit and fans)
COP_C = Thermodynamic efficiency of the system in heating mode
COP_S = Overall efficiency of the system in heating mode (thermodynamic circuit and fans)
E_T = Seasonal thermal/cooling energy supplied [kWh]
E_A = Overall seasonal electricity absorbed [kWh]
SE_C = Thermodynamic seasonal efficiency of the system
SE_S = Overall seasonal efficiency of the system (thermodynamic circuit and fans)
In heating mode, the performances are considered with maximum air temperature supply T_SA equal to 30°C
The performance refers to a standard ZEPHIR³ unit (not fitted with a 'Steam-powered humidification module' option)
Return air in cooling mode = 26°C DB
Return air in heating mode = 20°C / 12°C
Available static pressure: supply 150 Pa, return 100 Pa
Performance values do not include the effect of fan motor heat
Source: ASHRAE weather data (International weather for energy calculation)

SIZE 4 - AIR FLOW 5.200 m³/h (MINIMUM) - COOLING

SUPPLY HUMIDITY RATIO = 9 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
35 / 24	MC	14,7	55,3	-	**19,6**	20,2	2,7	2,6
	CS	20		9,2	**10,4**	19,0	3,4	3,3
		22		12,7	**6,96**	18,5	3,7	3,5
		24		16,2	**3,48**	18,0	4,0	3,8
32 / 23	MC	13,7	51,4	-	**21,4**	17,8	2,9	2,8
	CS	20		11,0	**10,4**	16,5	3,8	3,6
		22		14,5	**6,96**	16,1	4,1	3,9
		24		17,9	**3,48**	15,6	4,4	4,2
30 / 22	MC	14,3	44,6	-	**20,3**	12,9	3,5	3,2
	CS	20		9,9	**10,4**	11,8	4,6	4,3
		22		13,4	**6,96**	11,4	5,1	4,7
		24		16,9	**3,48**	11,0	5,6	5,2
28 / 21	MC	13,7	40,0	-	**21,4**	10,6	3,8	3,5
	CS	20		11,0	**10,4**	9,34	5,5	5,0
		22		14,5	**6,96**	8,94	6,1	5,6
		24		17,9	**3,48**	8,55	6,8	6,2
25 / 19	MC	15	27,1	-	**19,1**	6,21	4,4	3,8
	CS	20		8,7	**10,4**	5,42	6,6	5,7
		22		12,2	**6,96**	5,10	7,7	6,6

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	4.248	988	**4,3**	3,7
20	5.594	863	**6,5**	5,4
22	6.123	814	**7,5**	6,2
24	579	86	**6,8**	6,0
LONDON				
-	6.809	1.609	**4,2**	3,8
20	8.933	1.409	**6,3**	5,5
22	9.758	1.331	**7,3**	6,4
24	1.644	254	**6,5**	5,9
ROME				
-	56.291	13.783	**4,1**	3,7
20	73.150	12.121	**6,0**	5,4
22	79.460	11.500	**6,9**	6,1
24	30.510	4.706	**6,5**	5,9
VALENCIA				
-	69.708	17.817	**3,9**	3,6
20	89.600	15.801	**5,7**	5,1
22	96.906	15.061	**6,4**	5,8
24	50.620	8.332	**6,1**	5,6

SUPPLY HUMIDITY RATIO = 10 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
45 / 28 *	MC	15,2	77,2	-	**18,8**	38,8	2,0	1,9
	CS	20		8,4	**10,4**	37,0	2,3	2,2
		22		11,8	**6,96**	36,3	2,5	2,4
		24		15,3	**3,48**	35,6	2,6	2,5
40 / 25	MC	16,8	54,1	-	**16,0**	18,6	2,9	2,8
	CS	20		5,6	**10,4**	17,8	3,4	3,2
		22		9,1	**6,96**	17,3	3,7	3,5
		24		12,5	**3,48**	16,8	4,0	3,8
35 / 24	MC	15,2	50,5	-	**18,8**	16,4	3,1	2,9
	CS	20		8,4	**10,4**	15,4	3,8	3,6
		22		11,8	**6,96**	15,0	4,2	3,9
		24		15,3	**3,48**	14,6	4,5	4,3
32 / 23	MC	15,2	44,8	-	**18,8**	12,8	3,5	3,3
	CS	20		8,4	**10,4**	11,9	4,5	4,2
		22		11,8	**6,96**	11,6	4,9	4,5
		24		15,3	**3,48**	11,2	5,4	5,0
30 / 22	MC	15,7	38,2	-	**17,9**	8,84	4,3	3,9
	CS	20		7,5	**10,4**	8,17	5,6	5,1
		22		11,0	**6,96**	7,86	6,3	5,6
		24		14,5	**3,48**	7,55	7,0	6,3
28 / 21	MC	16,7	30,8	-	**16,1**	6,92	4,5	4,0
	CS	20		5,7	**10,4**	6,31	5,8	5,1
		22		9,2	**6,96**	5,95	6,7	5,9
		24		12,7	**3,48**	5,59	7,8	6,8
25 / 19	MC	18,7	16,5	-	**12,7**	3,48	4,7	3,8
	CS	20		2,3	**10,4**	3,29	5,7	4,5
		22		5,7	**6,96**	2,99	7,4	5,8

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	2.651	563	**4,7**	3,6
20	3.030	530	**5,7**	4,3
22	3.559	484	**7,4**	5,4
24	435	56	**7,8**	6,5
LONDON				
-	4.347	933	**4,7**	3,8
20	4.989	875	**5,7**	4,6
22	5814	803	**7,2**	5,8
24	1.262	168	**7,5**	6,6
ROME				
-	38.077	8.301	**4,6**	3,9
20	44.159	7.731	**5,7**	4,8
22	50.469	7.161	**7,0**	5,8
24	23.539	3.115	**7,6**	6,6
VALENCIA				
-	49.551	11.119	**4,5**	3,8
20	57.853	10.330	**5,6**	4,8
22	65.158	9.666	**6,7**	5,7
24	40.227	5.625	**7,2**	6,3
TUNIS				
-	74.008	18.232	**4,1**	3,5
20	86.516	16.987	**5,1**	4,3
22	95.998	16.115	**6,0**	5,0
24	69.178	11.419	**6,1**	5,4

SUPPLY HUMIDITY RATIO = 11g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
45 / 28 *	MC	16,7	71,4	-	**16,1**	27,9	2,6	2,5
	CS	20		5,7	**10,4**	26,9	2,9	2,8
		22		9,2	**6,96**	26,2	3,1	2,9
		24		12,7	**3,48**	25,6	3,3	3,1
45 / 26	MC	19,1	52,7	-	**12,0**	16,6	3,2	3,0
	CS	20		1,6	**10,4**	16,3	3,3	3,2
		22		5,0	**6,96**	15,8	3,7	3,5
		24		8,5	**3,48**	15,2	4,0	3,8
40 / 25	MC	17,9	48,5	-	**14,1**	14,3	3,4	3,2
	CS	20		3,7	**10,4**	13,8	3,8	3,6
		22		7,1	**6,96**	13,4	4,2	3,9
		24		10,6	**3,48**	12,9	4,6	4,3
35 / 24	MC	16,7	44,1	-	**16,1**	12,0	3,7	3,4
	CS	20		5,7	**10,4**	11,4	4,4	4,1
		22		9,2	**6,96**	11,0	4,8	4,5
		24		12,7	**3,48**	10,7	5,3	4,9
32 / 23	MC	17,2	37,5	-	**15,3**	8,35	4,5	4,1
	CS	20		4,9	**10,4**	7,92	5,4	4,8
		22		8,4	**6,96**	7,62	6,0	5,4
		24		11,8	**3,48**	7,32	6,7	6,0
30 / 22	MC	19,2	28,1	-	**11,8**	6,15	4,6	4,0
	CS	20		1,4	**10,4**	6,00	4,9	4,3
		22		4,9	**6,96**	5,63	5,9	5,1
		24		8,4	**3,48**	5,26	6,9	6,0
28 / 21	MC	20	20,8	-	**10,4**	4,43	4,7	3,9
	CS	20		0,0	**10,4**	4,43	4,7	3,9
		22		3,5	**6,96**	4,02	6,0	5,0
		24		7,0	**3,48**	3,58	7,8	6,3

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	208	44	**4,7**	3,7
20	208	44	**4,7**	3,7
22	243	40	**6,0**	4,7
24	278	36	**7,8**	5,9
LONDON				
-	621	133	**4,7**	4,0
20	630	132	**4,8**	4,0
22	728	121	**6,0**	5,0
24	825	109	**7,6**	6,2
ROME				
-	11.566	2.480	**4,7**	4,0
20	11.719	2.464	**4,8**	4,0
22	13.530	2.255	**6,0**	5,0
24	15.341	2.034	**7,5**	6,2
VALENCIA				
-	20.588	4.477	**4,6**	4,0
20	21.267	4.409	**4,8**	4,1
22	24.210	4.079	**5,9**	5,0
24	27.152	3.734	**7,3**	6,1
TUNIS				
-	38.968	9.030	**4,3**	3,7
20	41.804	8.749	**4,8**	4,1
22	46.372	8.255	**5,6**	4,7
24	50.941	7.760	**6,6**	5,5

SIZE 4 - AIR FLOW 5.200 m³/h (MINIMUM) - HEATING

Performance in Heating

T_OA	SET	T_SA	x_SA	P_T	P_D	P_A	COP_C	COP_S
-20 / -21 *	MC	20,8	0,20	110,0	**1,93**	32,9	3,3	3,2
	CS	20		107,0	-	30,4	3,5	3,3
		18		102,0	-	24,5	4,2	3,8
-15 / -16 *	MC	25,8	0,50	107,0	**13,9**	36,4	2,9	2,8
	CS	22		96,8	**4,82**	24,8	3,9	3,6
		20		91,6	-	20,6	4,4	4,1
		18		86,3	-	16,4	5,3	4,7
-12 / -13 *	MC	28,9	0,80	106,0	**21,4**	38,5	2,8	2,6
	CS	22		87,6	**4,82**	20,2	4,3	3,9
		20		82,4	-	16,0	5,2	4,6
		18		77,3	-	12,8	6,0	5,2
-7 / -8	MC	25,6	1,50	87,4	**13,5**	22,6	3,9	3,6
	CS	22		77,7	**4,82**	16,0	4,9	4,4
		20		72,3	-	13,4	5,4	4,8
		18		66,9	-	11,1	6,0	5,3
-5 / -6	MC	28,1	1,90	87,9	**19,5**	23,6	3,7	3,5
	CS	22		71,7	**4,82**	14,0	5,1	4,6
		20		66,5	-	11,6	5,7	5,1
		18		61,1	-	9,18	6,7	5,7
0 / -1	MC	30	3,10	78,1	**24,1**	19,5	4,0	3,7
		22		57,3	**4,82**	9,02	6,4	5,4
	CS	20		52,1	-	7,33	7,1	5,9
		18		46,9	-	5,65	8,3	6,5
2 / 1	MC	30	3,70	72,2	**24,1**	16,8	4,3	3,9
	CS	22		51,7	**4,82**	7,67	6,7	5,6
		20		46,5	-	5,90	7,9	6,2
		18		41,3	-	4,73	8,7	6,6
7 / 6	MC	30	5,40	58,2	**24,1**	11,2	5,2	4,6
	CS	22		37,9	**4,82**	4,93	7,7	5,8
		20		32,9	-	4,22	7,8	5,7
		18		27,8	-	3,49	8,0	5,5
12 / 11	MC	30	7,80	44,6	**24,1**	7,10	6,3	5,2
	CS	22		24,8	**4,82**	3,51	7,1	4,9
		20		19,8	-	2,70	7,3	4,7

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	457.548	105.298	**4,3**	3,8
22	326.756	52.645	**6,2**	4,9
20	292.225	42.693	**6,8**	5,2
18	238.675	31.372	**7,6**	5,6
LONDON				
-	359.432	71.461	**5,0**	4,4
22	233.686	33.167	**7,0**	5,4
20	202.132	26.865	**7,5**	5,5
18	137.508	16.889	**8,1**	5,9
ROME				
-	185.637	34.736	**5,3**	4,6
22	116.202	16.100	**7,2**	5,4
20	98.822	13.004	**7,6**	5,4
18	56.782	6.964	**8,2**	5,8
VALENCIA				
-	140.938	25.499	**5,5**	4,7
22	86.250	11.893	**7,3**	5,3
20	72.556	9.570	**7,6**	5,2
18	35.679	4.389	**8,1**	5,7
TUNIS				
-	108.551	18.551	**5,9**	4,7
22	63.973	8.779	**7,3**	4,8
20	52.797	7.027	**7,5**	4,6
18	18.040	2.262	**8,0**	5,1

Notes
* System with "Hydronic recovery device for extended operating range" option
T_OA = Dry bulb/wet bulb outdoor air temperature [°C]
SET = mode: MP = Maximum Capaciy,PF = Fixed Point, HA = High Flow Rate
T_SA = Dry bulb supply air temperature [°C]
X_SA = Supply air humidity ratio [g/kg]
P_F = Overall cooling capacity of the system (kW)
P_T = Heating capacity of the system [kW]
P_R = Post-heating capacity [kW]
P_D = Additional capacity available to the space [kW]
P_A = Electricity absorbed by the thermodynamic circuit [kW]
EER_C = Thermodynamic efficiency of the system in cooling mode
EER_S = Overall efficiency of the system in cooling mode (thermodynamic circuit and fans)
COP_C = Thermodynamic efficiency of the system in heating mode
COP_S = Overall efficiency of the system in heating mode (thermodynamic circuit and fans)
E_T = Seasonal thermal/cooling energy supplied [kWh]
E_A = Overall seasonal electricity absorbed [kWh]
SE_C = Thermodynamic seasonal efficiency of the system
SE_S = Overall seasonal efficiency of the system (thermodynamic circuit and fans)
In heating mode, the performances are considered with maximum air temperature supply T_SA equal to 30°C
The performance refers to a standard ZEPHIR³ unit (not fitted with a 'Steam-powered humidification module' option)
Return air in cooling mode = 26°C DB
Return air in heating mode = 20°C / 12°C
Available static pressure: supply 150 Pa, return 100 Pa
Performance values do not include the effect of fan motor heat
Source: ASHRAE weather data (International weather for energy calculation)

SIZE 4 - AIR FLOW 7.200 m³/h (STANDARD) - COOLING

SUPPLY HUMIDITY RATIO = 10 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
35 / 24	MC	16,9	65,4	-	**21,9**	24,6	2,7	2,5
	CS	20		7,5	**14,4**	23,5	3,1	2,9
		22		12,3	**9,64**	22,7	3,4	3,2
		24		17,1	**4,82**	21,9	3,8	3,5
32 / 23	MC	16,2	59,8	-	**23,6**	24,0	2,5	2,3
	CS	20		9,2	**14,4**	19,0	3,6	3,4
		22		14,0	**9,64**	18,3	4,0	3,7
		24		18,8	**4,82**	17,7	4,4	4,1
30 / 22	MC	15,5	53,1	-	**25,3**	14,3	3,7	3,3
	CS	20		10,8	**14,4**	13,2	4,8	4,3
		22		15,7	**9,64**	12,7	5,4	4,8
		24		20,5	**4,82**	12,2	6,0	5,3
28 / 21	MC	15,5	45,3	-	**25,3**	10,1	4,5	3,9
	CS	20		10,8	**14,4**	9,09	6,2	5,3
		22		15,7	**9,64**	8,63	7,1	6,0
		24		20,5	**4,82**	8,17	8,1	6,8
25 / 19	MC	18,2	24,1	-	**18,8**	4,39	5,5	4,1
	CS	20		4,3	**14,4**	4,08	7,0	5,0
		22		9,2	**9,64**	3,73	8,9	6,3

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	3.875	724	**5,3**	3,8
20	4.600	670	**6,9**	4,7
22	5.333	616	**8,7**	5,8
24	658	82	**8,1**	6,5
LONDON				
-	6.343	1.227	**5,2**	4,0
20	7.552	1.129	**6,7**	5,0
22	8.695	1.043	**8,3**	6,2
24	1.878	250	**7,5**	6,4
ROME				
-	55.474	11.381	**4,9**	3,9
20	66.712	10.423	**6,4**	5,0
22	75.449	9.727	**7,8**	6,0
24	34.983	4.664	**7,5**	6,4
VALENCIA				
-	71.459	16.008	**4,5**	3,7
20	85.933	14.531	**5,9**	4,8
22	96.049	13.677	**7,0**	5,7
24	58.447	8.593	**6,8**	5,9

SUPPLY HUMIDITY RATIO = 11g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
40 / 25	MC	19,2	64,2	-	**16,3**	22,8	2,8	2,6
	CS	20		1,9	**14,4**	22,4	3,0	2,8
		22		6,8	**9,64**	21,5	3,3	3,1
		24		11,6	**4,82**	20,6	3,7	3,4
35 / 24	MC	17,8	58,4	-	**19,7**	17,7	3,3	3,0
	CS	20		5,3	**14,4**	17,0	3,7	3,4
		22		10,1	**9,64**	16,4	4,2	3,8
		24		14,9	**4,82**	15,7	4,7	4,3
32 / 23	MC	17,4	51,3	-	**20,7**	12,6	4,1	3,6
	CS	20		6,3	**14,4**	12,0	4,8	4,2
		22		11,1	**9,64**	11,5	5,4	4,8
		24		15,9	**4,82**	11,1	6,1	5,3
30 / 22	MC	17,4	43,0	-	**20,7**	8,19	5,3	4,4
	CS	20		6,3	**14,4**	7,72	6,4	5,3
		22		11,1	**9,64**	7,36	7,3	6,1
		24		15,9	**4,82**	7,00	8,4	6,9
28 / 21	MC	18,8	31,9	-	**17,3**	5,77	5,5	4,4
	CS	20		2,9	**14,4**	5,52	6,3	4,9
		22		7,7	**9,64**	5,09	7,8	6,0
		24		12,5	**4,82**	4,66	9,5	7,1
25 / 19	MC	20,2	15,5	-	**13,9**	2,45	6,3	3,9
	CS	22		4,3	**9,64**	2,19	9,1	5,3

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	2.520	406	**6,2**	3,6
20	348	55	**6,3**	4,6
22	3.213	362	**8,9**	4,8
24	444	47	**9,5**	6,7
LONDON				
-	4.185	688	**6,1**	4,0
20	1.040	168	**6,2**	4,9
22	5322	613	**9,7**	5,4
24	1.310	144	**9,1**	7,0
ROME				
-	37.718	6.422	**5,9**	4,1
20	19.517	3.105	**6,3**	5,0
22	47.657	5.717	**8,3**	5,6
24	24.532	2.670	**9,2**	7,0
VALENCIA				
-	50.532	9.063	**5,6**	4,1
20	34.616	5.702	**6,1**	4,9
22	63.549	8.095	**7,9**	5,6
24	42.765	5.004	**8,5**	6,8

SUPPLY HUMIDITY RATIO = 12 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
45 / 28*	MC	19,9	82,9	-	**14,7**	28,9	2,9	2,7
	CS	20		0,2	**14,4**	28,8	2,9	2,7
		22		5,1	**9,64**	27,7	3,2	3,0
		24		9,9	**4,82**	26,6	3,5	3,2
45 / 26	MC	21,5	62,3	-	**10,8**	19,4	3,2	3,0
	CS	22		1,2	**9,64**	19,1	3,3	3,1
		24		6,0	**4,82**	17,9	3,8	3,5
40 / 25	MC	20,5	55,7	-	**13,2**	14,0	4,0	3,6
	CS	22		3,6	**9,64**	13,5	4,4	3,9
		24		8,4	**4,82**	12,7	5,1	4,5
35 / 24	MC	19,2	49,8	-	**16,3**	11,2	4,4	3,9
	CS	20		1,9	**14,4**	11,0	4,7	4,1
		22		6,8	**9,64**	10,5	5,4	4,7
		24		11,6	**4,82**	9,98	6,1	5,3
32 / 23	MC	19,2	41,4	-	**16,3**	7,48	5,5	4,6
	CS	20		1,9	**14,4**	7,34	5,9	4,9
		22		6,8	**9,64**	6,95	6,9	5,7
		24		11,6	**4,82**	6,56	8,1	6,5
30 / 22	MC	21,8	27,1	-	**10,1**	4,74	5,7	4,3
	CS	22		0,5	**9,64**	4,68	5,9	4,4
		24		5,3	**4,82**	4,05	8,0	5,8
28 / 21	MC	22,6	17,3	-	**8,20**	2,73	6,3	4,0
	CS	24		3,4	**4,82**	2,23	9,3	5,5

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	173	27	**6,3**	3,7
24	207	22	**9,3**	4,9
LONDON				
-	538	87	**6,2**	4,1
20	43	7	**5,9**	4,9
22	131	21	**6,2**	4,8
24	646	72	**8,9**	5,6
ROME				
-	10.013	1.627	**6,2**	4,1
20	260	44	**5,9**	4,9
22	2.744	458	**6,0**	4,5
24	11.989	1.348	**8,9**	5,6
VALENCIA				
-	18.765	3.169	**5,9**	4,2
20	2.917	521	**5,6**	4,7
22	10.209	1.678	**6,1**	4,7
24	22.638	2.667	**8,5**	5,7
TUNIS				
-	39.024	7.319	**5,3**	3,9
20	20.799	4.007	**5,2**	4,3
22	33.575	5.662	**5,9**	4,6
24	37.495	6.340	**5,9**	4,7

SIZE 4 - AIR FLOW 7.200 m³/h (STANDARD) - HEATING

Performance in Heating								
T_OA	SET	T_SA	x_SA	P_T	P_D	P_A	COP_C	COP_S
-20 / -21 *	MC	20,8	0,20	110,0	**1,93**	32,9	3,3	3,2
	CS	20		107,0	-	30,4	3,5	3,3
		18		102,0	-	24,5	4,2	3,8
-15 / -16 *	MC	25,8	0,50	107,0	**13,9**	36,4	2,9	2,8
	CS	22		96,8	**4,82**	24,8	3,9	3,6
		20		91,6	-	20,6	4,4	4,1
		18		86,3	-	16,4	5,3	4,7
-12 / -13 *	MC	28,9	0,80	106,0	**21,4**	38,5	2,8	2,6
	CS	22		87,6	**4,82**	20,2	4,3	3,9
		20		82,4	-	16,0	5,2	4,6
		18		77,3	-	12,8	6,0	5,2
-7 / -8	MC	25,6	1,50	87,4	**13,5**	22,6	3,9	3,6
	CS	22		77,7	**4,82**	16,0	4,9	4,4
		20		72,3	-	13,4	5,4	4,8
		18		66,9	-	11,1	6,0	5,3
-5 / -6	MC	28,1	1,90	87,9	**19,5**	23,6	3,7	3,5
	CS	22		71,7	**4,82**	14,0	5,1	4,6
		20		66,5	-	11,6	5,7	5,1
		18		61,1	-	9,18	6,7	5,7
0 / -1	MC	30	3,10	78,1	**24,1**	19,5	4,0	3,7
		22		57,3	**4,82**	9,02	6,4	5,4
	CS	20		52,1	-	7,33	7,1	5,9
		18		46,9	-	5,65	8,3	6,5
2 / 1	MC	30	3,70	72,2	**24,1**	16,8	4,3	3,9
	CS	22		51,7	**4,82**	7,67	6,7	5,6
		20		46,5	-	5,90	7,9	6,2
		18		41,3	-	4,73	8,7	6,6
7 / 6	MC	30	5,40	58,2	**24,1**	11,2	5,2	4,6
	CS	22		37,9	**4,82**	4,93	7,7	5,8
		20		32,9	-	4,22	7,8	5,7
		18		27,8	-	3,49	8,0	5,5
12 / 11	MC	30	7,80	44,6	**24,1**	7,10	6,3	5,2
	CS	22		24,8	**4,82**	3,51	7,1	4,9
		20		19,8	-	2,70	7,3	4,7

Seasonal energy performances				
T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	457.548	105.298	**4,3**	3,8
22	326.756	52.645	**6,2**	4,9
20	292.225	42.693	**6,8**	5,2
18	238.675	31.372	**7,6**	5,6
LONDON				
-	359.432	71.461	**5,0**	4,4
22	233.686	33.167	**7,0**	5,4
20	202.132	26.865	**7,5**	5,5
18	137.508	16.889	**8,1**	5,9
ROME				
-	185.637	34.736	**5,3**	4,6
22	116.202	16.100	**7,2**	5,4
20	98.822	13.004	**7,6**	5,4
18	56.782	6.964	**8,2**	5,8
VALENCIA				
-	140.938	25.499	**5,5**	4,7
22	86.250	11.893	**7,3**	5,3
20	72.556	9.570	**7,6**	5,2
18	35.679	4.389	**8,1**	5,7
TUNIS				
-	108.551	18.551	**5,9**	4,7
22	63.973	8.779	**7,3**	4,8
20	52.797	7.027	**7,5**	4,6
18	18.040	2.262	**8,0**	5,1

Notes
* System with "Hydronic recovery device for extended operating range" option
T_OA = Dry bulb/wet bulb outdoor air temperature [°C]
SET = mode: MP = Maximum Capaciy,PF = Fixed Point, HA = High Flow Rate
T_SA = Dry bulb supply air temperature [°C]
X_SA = Supply air humidity ratio [g/kg]
P_F = Overall cooling capacity of the system (kW)
P_T = Heating capacity of the system [kW]
P_R = Post-heating capacity [kW]
P_D = Additional capacity available to the space [kW]
P_A = Electricity absorbed by the thermodynamic circuit [kW]
EER_C = Thermodynamic efficiency of the system in cooling mode
EER_S = Overall efficiency of the system in cooling mode (thermodynamic circuit and fans)
COP_C = Thermodynamic efficiency of the system in heating mode
COP_S = Overall efficiency of the system in heating mode (thermodynamic circuit and fans)
E_T = Seasonal thermal/cooling energy supplied [kWh]
E_A = Overall seasonal electricity absorbed [kWh]
SE_C = Thermodynamic seasonal efficiency of the system
SE_S = Overall seasonal efficiency of the system (thermodynamic circuit and fans)
In heating mode, the performances are considered with maximum air temperature supply T_SA equal to 30°C
The performance refers to a standard ZEPHIR³ unit (not fitted with a 'Steam-powered humidification module' option)
Return air in cooling mode = 26°C DB
Return air in heating mode = 20°C / 12°C
Available static pressure: supply 150 Pa, return 100 Pa
Performance values do not include the effect of fan motor heat
Source: ASHRAE weather data (International weather for energy calculation)

SIZE 4 - AIR FLOW 9.200 m³/h (MAXIMUM) - COOLING

SUPPLY HUMIDITY RATIO = 11g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
35 / 24	MC	18,3	73,3	-	**23,7**	24,8	3,0	2,7
	CS	20		5,2	**18,4**	24,0	3,3	3,0
		22		11,4	**12,3**	23,1	3,7	3,3
		24		17,6	**6,16**	22,1	4,1	3,7
32 / 23	MC	17,6	65,0	-	**25,8**	18,3	3,6	3,1
	CS	20		7,4	**18,4**	17,5	4,1	3,6
		22		13,6	**12,3**	16,8	4,7	4,1
		24		19,7	**6,16**	16,1	5,3	4,6
30 / 22	MC	17,5	54,6	-	**26,1**	11,6	4,7	3,9
	CS	20		7,7	**18,4**	10,9	5,7	4,7
		22		13,9	**12,3**	10,4	6,6	5,3
		24		20,0	**6,16**	9,89	7,5	6,1
28 / 21	MC	17,3	45,3	-	**26,8**	7,71	5,9	4,5
	CS	20		8,3	**18,4**	7,11	7,5	5,6
		22		14,5	**12,3**	6,67	9,0	6,6
		24		20,6	**6,16**	6,22	10,6	7,6
25 / 19	MC	20,8	16,4	-	**16,0**	2,32	7,1	3,5
	CS	22		3,7	**12,3**	2,12	9,5	4,4

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	2.782	407	**6,8**	3,2
20	536	71	**7,5**	5,3
22	3.451	368	**9,4**	4,1
24	659	62	**10,6**	7,1
LONDON				
-	4.744	723	**6,6**	3,7
20	1.546	221	**7,0**	5,4
22	5.919	651	**9,1**	4,8
24	1.891	195	**9,7**	7,2
ROME				
-	45.691	7.416	**6,2**	3,9
20	28.766	4.097	**7,0**	5,4
22	57.935	6.600	**8,8**	5,3
24	35.174	3.620	**9,7**	7,2
VALENCIA				
-	62.561	11.172	**5,6**	3,8
20	48.798	7.720	**6,3**	5,0
22	79.185	9.970	**7,9**	5,3
24	59.210	6.899	**8,6**	6,6

SUPPLY HUMIDITY RATIO = 12 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
40 / 25	MC	20,7	70,8	-	**16,3**	21,5	3,3	3,0
	CS	22		4,0	**12,3**	20,7	3,6	3,2
		24		10,2	**6,16**	19,5	4,2	3,7
35 / 24	MC	19,2	63,5	-	**20,9**	16,0	4,0	3,4
	CS	20		2,5	**18,4**	15,7	4,2	3,6
		22		8,6	**12,3**	15,0	4,8	4,1
		24		14,8	**6,16**	14,3	5,5	4,7
32 / 23	MC	19,1	53,3	-	**21,2**	10,5	5,1	4,1
	CS	20		2,8	**18,4**	10,2	5,5	4,4
		22		8,9	**12,3**	9,71	6,4	5,1
		24		15,1	**6,16**	9,18	7,5	5,9
30 / 22	MC	20,2	39,6	-	**17,8**	6,26	6,3	4,6
	CS	22		5,5	**12,3**	5,82	7,8	5,5
		24		11,7	**6,16**	5,35	9,6	6,6
28 / 21	MC	22,3	23,1	-	**11,4**	3,51	6,6	3,9
	CS	24		5,2	**6,16**	2,83	10,0	5,4

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	231	35	**6,6**	3,5
24	283	28	**10,0**	4,8
LONDON				
-	727	114	**6,4**	4,0
20	56	10	**5,5**	4,4
22	198	27	**7**	5
24	902	93	**9,7**	5,6
ROME				
-	13.662	2.112	**6,5**	4,0
20	336	61	**5,5**	4,4
22	4.391	576	**7,6**	5,4
24	17.020	1.734	**9,8**	5,7
VALENCIA				
-	25.779	4.182	**6,2**	4,1
20	3.763	729	**5,2**	4,2
22	15.586	2.167	**7,2**	5,3
24	32.478	3.503	**9,3**	5,8

SUPPLY HUMIDITY RATIO = 13 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
45 / 28 *	MC	20,4	101,0	-	**17,2**	35,5	2,8	2,6
	CS	22		4,9	**12,3**	34,3	3,1	2,8
		24		11,1	**6,16**	32,7	3,4	3,1
45 / 26	MC	24	65,6	-	**6,16**	15,2	4,3	3,7
	CS	24		0,0	**6,16**	13,9	4,7	4,0
40 / 25	MC	23,8	54,5	-	**6,78**	9,64	5,7	4,5
	CS	24		0,6	**6,16**	8,73	6,3	4,9
35 / 24	MC	20,8	51,5	-	**16,0**	9,23	5,6	4,4
	CS	22		3,7	**12,3**	8,86	6,2	4,9
		24		9,9	**6,16**	8,22	7,5	5,8
32 / 23	MC	22,6	36,0	-	**10,4**	5,54	6,5	4,5
	CS	24		4,3	**6,16**	4,86	8,3	5,5
30 / 22	MC	24,8	18,70	-	**3,70**	2,60	7,2	3,7
28 / 21	MC	23,3	17,10	-	**8,32**	2,33	7,3	3,6

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	171	23	**7,3**	3,2
LONDON				
-	503	69	**7,3**	3,7
24	40	5	**8,3**	5,5
ROME				
-	9.148	1.255	**7,3**	3,6
24	242	29	**8,3**	5,5
VALENCIA				
-	16.269	2.290	**7,1**	3,7
22	662	106	**6,2**	4,9
24	2.873	356	**8,1**	5,6
TUNIS				
-	34.795	5.528	**6,3**	3,6
22	9.114	1.653	**5,5**	4,3
24	22.355	3.052	**7,3**	4,0

SIZE 4 - AIR FLOW 9.200 m³/h (MAXIMUM) - COOLING

SUPPLY HUMIDITY RATIO = not controlled

Performance in cooling and in dehumidification

T_OA	SET	T_SA	x_SA	P_F	P_D	P_A	EER_C	EER_S
45 / 28 *	HA	26	16,2	62,7	-	8,17	7,7	5,6
45 / 26	HA	26	13,4	56,9	-	10,1	5,6	4,5
40 / 25	HA	24	13,1	53,6	**6,16**	9,19	5,8	4,6
35 / 24	HA	22	13,4	45,1	**12,3**	6,97	6,5	4,8
32 / 23	HA	21	12,7	43,2	**15,4**	6,77	6,4	4,7
30 / 22	HA	20	12,0	40,3	**18,4**	6,37	6,3	4,6
28 / 21	HA	19	11,4	36,6	**21,5**	5,88	6,2	4,4
25 / 19	HA	18	10,2	30,0	**24,6**	4,95	6,1	4,1

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	4.626	762	**6,1**	3,8
LONDON				
-	7.313	1.202	**6,1**	4,1
ROME				
-	58.161	9.502	**6,1**	4,2
VALENCIA				
-	69.905	11.355	**6,2**	4,2
TUNIS				
-	95.300	15.355	**6,2**	4,0

SIZE 4 - AIR FLOW 9.200 m³/h (MAXIMUM) - HEATING

Performance in Heating

T_OA	SET	T_SA	x_SA	P_T	P_D	P_A	COP_C	COP_S
-15 / -16 *	MC	19,9	0,50	117,0	-	32,5	3,6	3,3
	CS	18		110,0	-	26,0	4,2	3,8
	HA	16		103,0	-	20,2	5,1	4,4
-12 / -13 *	MC	22,5	0,80	115,0	**7,70**	34,5	3,3	3,1
	CS	22		113,0	**6,16**	32,8	3,4	3,1
		20		106,0	-	25,6	4,1	3,7
		18		97,5	-	20,4	4,8	4,2
	HA	16		87,8	-	15,8	5,6	4,7
-7 / -8	MC	20,2	1,50	93,0	**0,62**	20,4	4,6	4,1
	CS	20		92,4	-	20,0	4,6	4,1
		18		85,6	-	16,2	5,3	4,6
	HA	16		78,8	-	12,8	6,2	5,2
-5 / -6	MC	22,3	1,90	92,8	**7,09**	21,2	4,4	3,9
	CS	22		91,6	**6,16**	20,5	4,5	4,0
		20		84,8	-	16,5	5,1	4,5
		18		78,1	-	13,2	5,9	5,0
	HA	16		71,3	-	10,6	6,7	5,5
0 / -1	MC	27,8	3,10	92,5	**24,0**	23,5	3,9	3,6
	CS	22		73,2	**6,16**	13,0	5,6	4,7
		20		66,6	-	10,2	6,5	5,3
		18		59,9	-	7,80	7,7	5,9
	HA	16		53,2	-	5,94	9,0	6,4
2 / 1	MC	29,8	3,70	91,8	**30,1**	24,3	3,8	3,4
	CS	22		66,0	**6,16**	10,6	6,2	5,1
		20		59,5	-	8,20	7,3	5,6
		18		52,8	-	6,24	8,5	6,1
	HA	16		46,2	-	4,66	9,9	6,5
7 / 6	MC	30	5,40	74,4	**30,8**	16,2	4,6	4,0
	CS	22		48,5	**6,16**	5,88	8,2	5,8
		20		42,1	-	4,71	8,9	5,9
		18		35,5	-	3,90	9,1	5,6
	HA	16		29,1	-	3,11	9,4	5,3
12 / 11	MC	30	7,80	56,9	**30,8**	9,84	5,8	4,6
	CS	22		31,6	**6,16**	3,98	7,9	4,9
		20		25,3	-	3,07	8,2	4,6
		18		19,0	-	2,09	9,1	4,2

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	552.203	129.689	**4,3**	3,7
22	385.426	65.049	**5,9**	4,5
20	371.418	57.222	**6,5**	4,8
18	328.858	45.141	**7,3**	5,0
16	268.219	33.008	**8,1**	5,4
LONDON				
-	453.128	98.757	**4,6**	4,0
22	298.517	41.943	**7,1**	5,2
20	258.506	32.970	**7,8**	5,4
18	217.769	25.426	**8,6**	5,4
16	149.473	16.161	**9,2**	5,8
ROME				
-	236.140	49.012	**4,8**	4,1
22	148.407	19.600	**7,6**	5,3
20	126.386	15.385	**8,2**	5,3
18	104.015	11.737	**8,9**	5,2
16	60.906	6.463	**9,4**	5,6
VALENCIA				
-	179.630	36.040	**5,0**	4,2
22	110.126	14.209	**7,8**	5,3
20	92.785	11.137	**8,3**	5,2
18	75.213	8.394	**9,0**	5,0
16	38.038	4.026	**9,4**	5,5
TUNIS				
-	138.581	26.150	**5,3**	4,2
22	81.648	10.151	**8,0**	4,8
20	67.503	7.942	**8,5**	4,6
18	53.228	5.854	**9,1**	4,2
16	18.901	2.018	**9,4**	4,7

NNotes
* System with "Hydronic recovery device for extended operating range" option
T_OA = Dry bulb/wet bulb outdoor air temperature [°C]
SET = mode: MP = Maximum Capaciy,PF = Fixed Point, HA = High Flow Rate
T_SA = Dry bulb supply air temperature [°C]
X_SA = Supply air humidity ratio [g/kg]
P_F = Overall cooling capacity of the system (kW)
P_T = Heating capacity of the system [kW]
P_R = Post-heating capacity [kW]
P_D = Additional capacity available to the space [kW]
P_A = Electricity absorbed by the thermodynamic circuit [kW]
EER_C = Thermodynamic efficiency of the system in cooling mode
EER_S = Overall efficiency of the system in cooling mode (thermodynamic circuit and fans)
COP_C = Thermodynamic efficiency of the system in heating mode
COP_S = Overall efficiency of the system in heating mode (thermodynamic circuit and fans)
E_T = Seasonal thermal/cooling energy supplied [kWh]
E_A = Overall seasonal electricity absorbed [kWh]
SE_C = Thermodynamic seasonal efficiency of the system
SE_S = Overall seasonal efficiency of the system (thermodynamic circuit and fans)
In heating mode, the performances are considered with maximum air temperature supply T_SA equal to 30°C
The performance refers to a standard ZEPHIR³ unit (not fitted with a 'Steam-powered humidification module' option)
Return air in cooling mode = 26°C DB
Return air in heating mode = 20°C / 12°C
Available static pressure: supply 150 Pa, return 100 Pa
Performance values do not include the effect of fan motor heat
Source: ASHRAE weather data (International weather for energy calculation)

SIZE 5 - AIR FLOW 7.500 m^3/h (MINIMUM) - COOLING

SUPPLY HUMIDITY RATIO = 9 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
35 / 24	MC	13,6	83,2	-	**31,1**	34,2	2,4	2,3
	CS	20		16,1	**15,0**	31,9	3,1	3,0
		22		21,1	**10,0**	31,2	3,3	3,2
		24		26,1	**5,02**	30,5	3,6	3,4
32 / 23	MC	13,2	75,7	-	**32,1**	28,4	2,7	2,5
	CS	20		17,1	**15,0**	26,2	3,5	3,3
		22		22,1	**10,0**	25,6	3,8	3,6
		24		27,1	**5,02**	24,9	4,1	3,9
30 / 22	MC	12,8	68,6	-	**33,1**	23,2	3,0	2,8
	CS	20		18,1	**15,0**	21,0	4,1	3,9
		22		23,1	**10,0**	20,4	4,5	4,2
		24		28,1	**5,02**	19,8	4,9	4,5
28 / 21	MC	13,1	59,5	-	**32,4**	18,1	3,3	3,0
	CS	20		17,3	**15,0**	15,8	4,9	4,4
		22		22,4	**10,0**	15,2	5,4	4,9
		24		27,4	**5,02**	14,6	6,0	5,4
25 / 19	MC	15,5	37,8	-	**26,3**	10,1	3,7	3,3
	CS	20		11,3	**15,0**	8,89	5,5	4,7
		22		16,3	**10,0**	8,34	6,5	5,5

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	5.963	1.615	**3,7**	3,1
20	7.741	1.420	**5,4**	4,5
22	8.504	1.336	**6,4**	5,3
24	869	146	**6,0**	5,3
LONDON				
-	9.610	2.643	**3,6**	3,2
20	12.459	2.326	**5,4**	4,6
22	13.649	2.195	**6,2**	5,3
24	2.478	435	**5,7**	5,2
ROME				
-	80.685	22.977	**3,5**	3,1
20	104.361	20.227	**5,2**	4,5
22	113.462	19.204	**5,9**	5,2
24	46.146	8.117	**5,7**	5,2
VALENCIA				
-	101.086	29.979	**3,4**	3,1
20	130.050	26.550	**4,9**	4,4
22	140.587	25.353	**5,5**	4,9
24	77.015	14.389	**5,4**	4,9

SUPPLY HUMIDITY RATIO = 10 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
40 / 25	MC	15,7	80,9	-	**25,8**	30,7	2,6	2,5
	CS	20		10,8	**15,0**	29,2	3,1	3,0
		22		15,8	**10,0**	28,5	3,4	3,2
		24		20,8	**5,02**	27,8	3,7	3,5
35 / 24	MC	15,3	73,2	-	**26,8**	24,8	3,0	2,8
	CS	20		11,8	**15,0**	23,3	3,6	3,4
		22		16,8	**10,0**	22,7	4,0	3,7
		24		21,8	**5,02**	22,1	4,3	4,0
32 / 23	MC	15,3	64,8	-	**26,8**	19,4	3,3	3,1
	CS	20		11,8	**15,0**	18,1	4,2	3,9
		22		16,8	**10,0**	17,6	4,6	4,3
		24		21,8	**5,02**	17,0	5,1	4,7
30 / 22	MC	15,7	55,3	-	**25,8**	16,2	3,4	3,1
	CS	20		10,8	**15,0**	14,9	4,4	4,0
		22		15,8	**10,0**	14,4	4,9	4,5
		24		20,8	**5,02**	13,8	5,5	5,0
28 / 21	MC	16,6	45,0	-	**23,6**	12,5	3,6	3,2
	CS	20		8,5	**15,0**	11,3	4,7	4,2
		22		13,6	**10,0**	10,7	5,5	4,8
		24		18,6	**5,02**	10,0	6,4	5,5
25 / 19	MC	17,1	28,0	-	**22,3**	5,62	5,0	3,9
	CS	20		7,3	**15,0**	5,08	6,9	5,4
		22		12,3	**10,0**	4,71	8,6	6,5

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	4.426	923	**4,8**	3,7
20	5.546	834	**6,6**	5,0
22	6.309	776	**8,1**	6,0
24	636	100	**6,4**	5,4
LONDON				
-	7.163	1.543	**4,6**	3,8
20	8.934	1.396	**6,4**	5,1
22	10.124	1.302	**7,8**	6,1
24	1.841	298	**6,2**	5,4
ROME				
-	60.612	14.132	**4,3**	3,6
20	74.681	12.801	**5,8**	4,8
22	83.782	12.020	**7,0**	5,7
24	34320	5580	**6,2**	5,4
VALENCIA				
-	77.103	19.054	**4,0**	3,5
20	94.227	17.329	**5,4**	4,6
22	104.764	16.389	**6,4**	5,4
24	58.506	9.928	**5,9**	5,2

Notes
* System with "Hydronic recovery device for extended operating range" option
T_OA = Dry bulb/wet bulb outdoor air temperature [°C]
SET = mode: MP = Maximum Capaciy,PF = Fixed Point, HA = High Flow Rate
T_SA = Dry bulb supply air temperature [°C]
X_SA = Supply air humidity ratio [g/kg]
P_F = Overall cooling capacity of the system (kW)
P_T = Heating capacity of the system [kW]
P_R = Post-heating capacity [kW]
P_D = Additional capacity available to the space [kW]
P_A = Electricity absorbed by the thermodynamic circuit [kW]
EER_C = Thermodynamic efficiency of the system in cooling mode
EER_S = Overall efficiency of the system in cooling mode (thermodynamic circuit and fans)
COP_C = Thermodynamic efficiency of the system in heating mode
COP_S = Overall efficiency of the system in heating mode (thermodynamic circuit and fans)
E_T = Seasonal thermal/cooling energy supplied [kWh]
E_A = Overall seasonal electricity absorbed [kWh]
SE_C = Thermodynamic seasonal efficiency of the system
SE_S = Overall seasonal efficiency of the system (thermodynamic circuit and fans)
In heating mode, the performances are considered with maximum air temperature supply T_SA equal to 30°C
The performance refers to a standard ZEPHIR^3 unit (not fitted with a 'Steam-powered humidification module' option)
Return air in cooling mode = 26°C DB
Return air in heating mode = 20°C / 12°C
Available static pressure: supply 150 Pa, return 100 Pa
Performance values do not include the effect of fan motor heat
Source: ASHRAE weather data (International weather for energy calculation)

SUPPLY HUMIDITY RATIO = 11g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
45 / 28 *	MC	16,2	104,0	-	**24,6**	38,3	2,7	2,6
	CS	20		9,5	**15,0**	36,7	3,1	2,9
		22		14,6	**10,0**	35,9	3,3	3,1
		24		19,6	**5,02**	35,1	3,5	3,3
45 / 26	MC	18,1	78,6	-	**19,8**	27,2	2,9	2,7
	CS	20		4,8	**15,0**	26,5	3,1	3,0
		22		9,8	**10,0**	25,8	3,4	3,2
		24		14,8	**5,02**	25,0	3,7	3,5
40 / 25	MC	17,5	70,7	-	**21,3**	21,4	3,3	3,1
	CS	20		6,3	**15,0**	20,6	3,7	3,5
		22		11,3	**10,0**	20,0	4,1	3,8
		24		16,3	**5,02**	19,4	4,5	4,2
35 / 24	MC	17,9	61,3	-	**20,3**	17,8	3,4	3,2
	CS	20		5,3	**15,0**	17,1	3,9	3,6
		22		10,3	**10,0**	16,5	4,3	4,0
		24		15,3	**5,02**	15,9	4,8	4,4
32 / 23	MC	18,5	51,0	-	**18,8**	14,2	3,6	3,2
	CS	20		3,8	**15,0**	13,7	4,0	3,6
		22		8,8	**10,0**	13,1	4,6	4,1
		24		13,8	**5,02**	12,5	5,2	4,6
30 / 22	MC	19,1	41,1	-	**17,3**	10,7	3,8	3,4
	CS	20		2,3	**15,0**	10,4	4,2	3,6
		22		7,3	**10,0**	9,81	4,9	4,3
		24		12,3	**5,02**	9,17	5,8	5,0
28 / 21	MC	19,1	32,9	-	**17,3**	6,74	4,9	4,0
	CS	20		2,3	**15,0**	6,50	5,4	4,4
		22		7,3	**10,0**	5,97	6,7	5,4
		24		12,3	**5,02**	5,44	8,3	6,5

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	329	67	**4,9**	3,8
20	352	65	**5,4**	4,2
22	402	60	**6,7**	5,1
24	452	54	**8,3**	6,2
LONDON				
-	964	208	**4,6**	3,9
20	1.029	201	**5,1**	4,2
22	1.169	186	**6,3**	5,1
24	1.310	171	**7,7**	6,2
ROME				
-	17.946	3.902	**4,6**	3,8
20	19.131	3.770	**5,1**	4,2
22	21.742	3.489	**6,2**	5,1
24	24.354	3.203	**7,6**	6,1
VALENCIA				
-	31.175	7.225	**4,3**	3,7
20	33.201	6.988	**4,8**	4,0
22	37.445	6.520	**5,7**	4,8
24	41.689	6.040	**6,9**	5,7
TUNIS				
-	56.658	14.532	**3,9**	3,3
20	60.622	14.033	**4,3**	3,7
22	67.212	13.282	**5,1**	4,3
24	73.801	12.513	**5,9**	4,9

SIZE 5 - AIR FLOW 7.500 m³/h (MINIMUM) - HEATING

Performance in Heating

T_OA	SET	T_SA	x_SA	P_T	P_D	P_A	COP_C	COP_S
-20 / -21 *	MC	26,3	0,20	129,0	**15,8**	43,0	3,0	2,9
	CS	22		117,0	**5,02**	29,2	4,0	3,8
		20		112,0	-	24,5	4,6	4,3
		18		106,0	-	19,7	5,4	4,9
-15 / -16 *	MC	30	0,50	123,0	**25,1**	42,7	2,9	2,8
	CS	22		101,0	**5,02**	20,6	4,9	4,5
		20		95,6	-	18,2	5,3	4,8
		18		90,0	-	15,8	5,7	5,1
-12 / -13 *	MC	30	0,80	113,0	**25,1**	35,0	3,2	3,1
	CS	22		91,5	**5,02**	18,5	4,9	4,5
		20		86,0	-	16,1	5,3	4,8
		18		80,5	-	13,6	5,9	5,2
-7 / -8	MC	30	1,50	103,0	**25,1**	27,2	3,8	3,6
	CS	22		80,9	**5,02**	14,2	5,7	5,2
		20		75,3	-	11,9	6,3	5,6
		18		69,8	-	10,6	6,6	5,8
-5 / -6	MC	30	1,90	96,9	**25,1**	23,2	4,2	3,9
	CS	22		74,8	**5,02**	12,4	6,0	5,4
		20		69,2	-	11,1	6,2	5,5
		18		63,6	-	9,76	6,5	5,6
0 / -1	MC	30	3,10	81,3	**25,1**	17,3	4,7	4,3
		22		59,6	**5,02**	10,1	5,9	5,1
	CS	20		54,3	-	8,71	6,2	5,3
		18		48,8	-	7,29	6,7	5,5
2 / 1	MC	30	3,70	75,3	**25,1**	14,8	5,1	4,6
	CS	22		53,8	**5,02**	9,06	5,9	5,1
		20		48,4	-	7,61	6,4	5,3
		18		43,0	-	6,11	7,0	5,6
7 / 6	MC	30	5,40	60,6	**25,1**	12,3	4,9	4,4
	CS	22		39,6	**5,02**	5,92	6,7	5,3
		20		34,2	-	4,42	7,7	5,8
		18		28,9	-	3,25	8,9	6,1
12 / 11	MC	30	7,80	46,4	**25,1**	9,18	5,1	4,3
	CS	22		25,7	**5,02**	3,06	8,4	5,6
		20		20,6	-	1,82	11,3	6,2

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	484.254	104.701	**4,6**	4,1
22	340.306	55.133	**6,2**	5,0
20	304.220	45.317	**6,7**	5,2
18	248.426	35.450	**7,0**	5,5
LONDON				
-	374.858	75.872	**4,9**	4,4
22	243.351	36.298	**6,7**	5,3
20	210.292	27.621	**7,6**	5,7
18	143.041	18.421	**7,8**	5,8
ROME				
-	193.329	38.776	**5,0**	4,4
22	120.961	17.259	**7,0**	5,4
20	102.791	12.532	**8,2**	5,8
18	59.056	7.269	**8,1**	5,9
VALENCIA				
-	146.716	29.350	**5,0**	4,4
22	89.738	12.423	**7,2**	5,4
20	75.467	8.747	**8,6**	5,9
18	37.105	4.470	**8,3**	6,0
TUNIS				
-	112.965	22.548	**5,0**	4,2
22	66.504	8.706	**7,6**	5,2
20	54.912	5.766	**9,5**	5,5
18	18.754	2.117	**8,9**	5,7

SIZE 5 - AIR FLOW 9.500 m³/h (STANDARD) - COOLING

SUPPLY HUMIDITY RATIO = 10 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
35 / 24	MC	15,6	91,3	-	**33,0**	33,2	2,8	2,6
	CS	20		14,0	**19,0**	31,3	3,4	3,1
		22		20,4	**12,7**	30,4	3,7	3,4
		24		26,7	**6,36**	29,5	4,0	3,7
32 / 23	MC	15,2	81,6	-	**34,3**	26,1	3,1	2,9
	CS	20		15,3	**19,0**	24,4	4,0	3,6
		22		21,6	**12,7**	23,6	4,4	4,0
		24		28,0	**6,36**	22,9	4,8	4,3
30 / 22	MC	15,4	70,9	-	**33,7**	19,0	3,7	3,3
	CS	20		14,6	**19,0**	17,5	4,9	4,3
		22		21,0	**12,7**	16,9	5,4	4,8
		24		27,4	**6,3**	16,2	6,1	5,3
28 / 21	MC	16,3	57,6	-	**30,8**	14,7	3,9	3,4
	CS	20		11,8	**19,0**	13,3	5,2	4,4
		22		18,1	**12,7**	12,6	6,0	5,1
		24		24,5	**6,36**	11,9	6,9	5,8
25 / 19	MC	17,3	34,4	-	**27,6**	6,57	5,2	3,9
	CS	20		8,6	**19,0**	5,96	7,2	5,2
		22		15,0	**12,7**	5,51	9,0	6,3

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	5.461	1.080	**5,1**	3,6
20	6.798	979	**6,9**	4,8
22	7.765	908	**8,5**	5,8
24	821	119	**6,9**	5,6
LONDON				
-	8.866	1.809	**4,9**	3,7
20	11.003	1.642	**6,7**	5,0
22	12.511	1.528	**8,2**	6,0
24	2.375	357	**6,6**	5,6
ROME				
-	75.725	16.584	**4,6**	3,6
20	93.217	15.057	**6,2**	4,8
22	104.744	14.120	**7,4**	5,7
24	44.292	6.637	**6,7**	5,6
VALENCIA				
-	96.817	22.568	**4,3**	3,5
20	118.459	20.573	**5,8**	4,6
22	131.807	19.436	**6,8**	5,4
24	75.346	11.938	**6,3**	5,4

SUPPLY HUMIDITY RATIO = 11g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
40 / 25	MC	18,2	86,9	-	**24,8**	27,9	3,1	2,9
	CS	20		5,7	**19,0**	27,1	3,4	3,1
		22		12,1	**12,7**	26,2	3,8	3,5
		24		18,4	**6,36**	25,3	4,2	3,8
35 / 24	MC	17,3	79,0	-	**27,6**	22,9	3,4	3,1
	CS	20		8,6	**19,0**	21,9	4,0	3,6
		22		15,0	**12,7**	21,1	4,5	4,0
		24		21,3	**6,36**	20,4	4,9	4,4
32 / 23	MC	17,6	66,9	-	**26,7**	17,3	3,9	3,4
	CS	20		7,6	**19,0**	16,5	4,5	4,0
		22		14,0	**12,7**	15,9	5,1	4,4
		24		20,4	**6,36**	15,2	5,7	5,0
30 / 22	MC	18,2	54,5	-	**24,8**	13,4	4,1	3,5
	CS	20		5,7	**19,0**	12,8	4,7	4,0
		22		12,1	**12,7**	12,1	5,5	4,6
		24		18,4	**6,36**	11,5	6,3	5,3
28 / 21	MC	19,1	41,3	-	**21,9**	8,96	4,6	3,6
	CS	20		2,9	**19,0**	8,64	5,1	4,0
		22		9,2	**12,7**	7,93	6,4	4,9
		24		15,6	**6,36**	7,23	7,9	5,9
25 / 19	MC	16,6	22,5	-	**29,9**	3,32	6,8	4,0
	CS	20		10,8	**19,0**	3,13	10,6	6,1

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	3.608	561	**6,4**	3,7
20	5.172	531	**9,7**	5,4
22	505	79	**6,4**	4,7
24	569	72	**7,9**	5,7
LONDON				
-	5.924	966	**6,1**	3,9
20	8.278	916	**9,0**	5,6
22	1.493	243	**6,2**	4,8
24	1.671	223	**7,5**	5,8
ROME				
-	51.874	9.394	**5,5**	3,8
20	67.620	8.954	**7,6**	5,1
22	27.885	4.543	**6,1**	4,8
24	31193	4187	**7**	6
VALENCIA				
-	68.240	13.464	**5,1**	3,7
20	85.256	12.851	**6,6**	4,8
22	48.888	8.336	**5,9**	4,7
24	54.264	7.770	**7,0**	5,6

SUPPLY HUMIDITY RATIO = 12 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
45 / 28*	MC	18,4	117,0	-	**24,1**	42,8	2,7	2,6
	CS	20		5,1	**19,0**	41,8	2,9	2,7
		22		11,5	**12,7**	40,6	3,2	3,0
		24		17,8	**6,36**	39,4	3,4	3,2
45 / 26	MC	20,4	85,1	-	**17,8**	25,4	3,4	3,1
	CS	22		5,1	**12,7**	24,5	3,7	3,4
		24		11,5	**6,36**	23,3	4,1	3,8
40 / 25	MC	20,8	71,9	-	**16,5**	18,3	3,9	3,5
	CS	22		3,8	**12,7**	17,7	4,3	3,8
		24		10,2	**6,36**	16,6	4,9	4,3
35 / 24	MC	20,2	62,8	-	**18,4**	15,6	4,0	3,5
	CS	22		5,7	**12,7**	14,8	4,6	4,0
		24		12,1	**6,36**	13,9	5,4	4,6
32 / 23	MC	20,5	50,7	-	**17,5**	11,8	4,3	3,6
	CS	22		4,8	**12,7**	11,2	5,0	4,1
		24		11,1	**6,36**	10,4	5,9	4,8
30 / 22	MC	20,7	39,5	-	**16,8**	7,88	5,0	3,9
	CS	22		4,1	**12,7**	7,44	5,9	4,5
		24		10,5	**6,36**	6,74	7,4	5,5
28 / 21	MC	20,4	29,5	-	**17,8**	4,87	6,1	4,1
	CS	22		5,1	**12,7**	4,46	7,8	5,1
		24		11,5	**6,36**	3,93	10,4	6,5

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	295	49	**6,1**	3,8
22	346	45	**7,8**	4,8
24	410	39	**10,4**	6,1
LONDON				
-	877	152	**5,8**	4,0
22	1.017	141	**7,2**	4,9
24	1.195	125	**9,6**	6,3
ROME				
-	16.357	2.842	**5,8**	4,0
22	18.917	2.625	**7,2**	4,9
24	22.225	2.333	**9,5**	6,2
VALENCIA				
-	28.981	5.373	**5,4**	3,9
22	33.031	5.004	**6,6**	4,7
24	38.406	4.494	**8,5**	5,9
TUNIS				
-	54.677	11.593	**4,7**	3,6
20	1.343	460	**2,9**	2,7
22	61.067	10.911	**5,6**	4,2
24	69.414	10.010	**6,9**	5,1

SIZE 5 - AIR FLOW 9.500 m³/h (STANDARD) - HEATING

Performance in Heating

T_OA	SET	T_SA	x_SA	P_T	P_D	P_A	COP_C	COP_S
-20 / -21 *	MC	20,3	0,20	143,0	**0,95**	38,9	3,7	3,4
	CS	18		134,0	**-**	30,0	4,5	4,1
-15 / -16 *	MC	25,2	0,50	139,0	**16,5**	42,8	3,2	3,0
	CS	22		128,0	**6,36**	30,7	4,2	3,8
		20		121,0	**-**	25,5	4,7	4,3
		18		114,0	**-**	20,3	5,6	4,9
-12 / -13 *	MC	28,1	0,80	137,0	**25,7**	45,3	3,0	2,8
	CS	22		116,0	**6,36**	25,1	4,6	4,2
		20		109,0	**-**	19,9	5,5	4,8
		18		102,0	**-**	17,2	5,9	5,1
-7 / -8	MC	25,2	1,50	114,0	**16,5**	26,7	4,3	3,9
	CS	22		103,0	**6,36**	19,3	5,3	4,8
		20		95,4	**-**	16,4	5,8	5,1
		18		88,3	**-**	13,6	6,5	5,5
-5 / -6	MC	27,3	1,90	113,0	**23,2**	27,7	4,1	3,8
	CS	22		94,7	**6,36**	17,1	5,5	4,9
		20		87,6	**-**	14,2	6,2	5,3
		18		80,6	**-**	11,4	7,1	5,9
0 / -1	MC	30	3,10	103,0	**31,8**	23,6	4,4	4,0
		22		75,6	**6,36**	11,8	6,4	5,3
	CS	20		68,7	**-**	10,3	6,7	5,4
		18		61,8	**-**	8,78	7,0	5,5
2 / 1	MC	30	3,70	95,4	**31,8**	20,6	4,6	4,2
	CS	22		68,2	**6,36**	10,8	6,3	5,2
		20		61,4	**-**	9,22	6,7	5,3
		18		54,5	**-**	7,64	7,1	5,4
7 / 6	MC	30	5,40	76,8	**31,8**	14,4	5,3	4,6
	CS	22		50,1	**6,36**	7,57	6,6	5,0
		20		43,4	**-**	5,75	7,5	5,4
		18		36,7	**-**	4,08	9,0	5,7
12 / 11	MC	30	7,80	58,7	**31,8**	11,1	5,3	4,4
	CS	22		32,6	**6,36**	3,97	8,2	5,1
		20		26,2	**-**	2,63	10,0	5,2

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	600.841	131.370	4,6	4,0
22	431.378	69.428	6,2	4,9
20	385.607	56.949	6,8	5,1
18	314.848	43.505	7,2	5,4
LONDON				
-	473.725	94.322	5,0	4,3
22	308.293	45.411	6,8	5,1
20	266.851	35.359	7,5	5,3
18	181.449	22.827	7,9	5,6
ROME				
-	244.717	47.423	5,2	4,4
22	153.241	21.808	7,0	5,1
20	130.513	16.409	8,0	5,3
18	74.942	9.076	8,3	5,6
VALENCIA				
-	185.759	35.625	5,2	4,4
22	113.697	15.795	7,2	5,1
20	95.848	11.628	8,2	5,3
18	47.094	5.592	8,4	5,6
TUNIS				
-	142.999	26.978	5,3	4,3
22	84.275	11.218	7,5	4,8
20	69.776	7.914	8,8	4,9
18	23.815	2.657	9,0	5,3

Notes
* System with "Hydronic recovery device for extended operating range" option
T_OA = Dry bulb/wet bulb outdoor air temperature [°C]
SET = mode: MP = Maximum Capaciy,PF = Fixed Point, HA = High Flow Rate
T_SA = Dry bulb supply air temperature [°C]
X_SA = Supply air humidity ratio [g/kg]
P_F = Overall cooling capacity of the system (kW)
P_T = Heating capacity of the system [kW]
P_R = Post-heating capacity [kW]
P_D = Additional capacity available to the space [kW]
P_A = Electricity absorbed by the thermodynamic circuit [kW]
EER_C = Thermodynamic efficiency of the system in cooling mode
EER_S = Overall efficiency of the system in cooling mode (thermodynamic circuit and fans)
COP_C = Thermodynamic efficiency of the system in heating mode
COP_S = Overall efficiency of the system in heating mode (thermodynamic circuit and fans)
E_T = Seasonal thermal/cooling energy supplied [kWh]
E_A = Overall seasonal electricity absorbed [kWh]
SE_C = Thermodynamic seasonal efficiency of the system
SE_S = Overall seasonal efficiency of the system (thermodynamic circuit and fans)

In heating mode, the performances are considered with maximum air temperature supply T_SA equal to 30°C
The performance refers to a standard ZEPHIR³ unit (not fitted with a 'Steam-powered humidification module' option)
Return air in cooling mode = 26°C DB
Return air in heating mode = 20°C / 12°C
Available static pressure: supply 150 Pa, return 100 Pa
Performance values do not include the effect of fan motor heat
Source: ASHRAE weather data (International weather for energy calculation)

SIZE 5 - AIR FLOW 11.500 m³/h (MAXIMUM) - COOLING

SUPPLY HUMIDITY RATIO = 11g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
35 / 24	MC	17,4	95,0	-	**33,1**	32,1	3,0	2,7
	CS	20		10,0	**23,1**	30,7	3,4	3,1
		22		17,7	**15,4**	29,6	3,8	3,4
		24		25,4	**7,70**	28,6	4,2	3,8
32 / 23	MC	17,4	81,7	-	**33,1**	22,6	3,6	3,1
	CS	20		10,0	**23,1**	21,5	4,3	3,7
		22		17,7	**15,4**	20,7	4,8	4,1
		24		25,4	**7,70**	19,9	5,4	4,6
30 / 22	MC	17,7	68,0	-	**31,9**	16,4	4,1	3,4
	CS	20		8,9	**23,1**	15,5	5,0	4,1
		22		16,6	**15,4**	14,8	5,7	4,6
		24		24,3	**7,70**	14,0	6,6	5,3
28 / 21	MC	18,5	52,0	-	**28,8**	11,4	4,6	3,5
	CS	20		5,8	**23,1**	10,8	5,3	4,0
		22		13,5	**15,4**	10,0	6,5	4,9
		24		21,2	**7,70**	9,21	7,9	5,8
25 / 19	MC	19,4	24,5	-	**25,4**	3,46	7,1	3,5
	CS	20		2,3	**23,1**	3,36	8,0	3,9
		22		10,0	**15,4**	3,01	11,5	5,3

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	3.999	605	**6,6**	3,3
20	4.385	585	**7,5**	3,6
22	5.555	527	**10,5**	4,8
24	732	92	**7,9**	5,5
LONDON				
-	6.654	1.069	**6,2**	3,5
20	7.312	1.029	**7,1**	4,0
22	9.137	934	**9,8**	5,2
24	2.140	283	**7,6**	5,6
ROME				
-	60.296	10.911	**5,5**	3,5
20	66.584	10.440	**6,4**	4,0
22	80.539	9.580	**8,4**	5,1
24	39.954	5.280	**7,6**	5,6
VALENCIA				
-	80.777	16.075	**5,0**	3,5
20	89.607	15.331	**5,8**	4,0
22	105.764	14.238	**7,4**	4,9
24	69.028	9.794	**7,0**	5,4

SUPPLY HUMIDITY RATIO = 12 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
40 / 25	MC	20,5	88,2	-	**21,1**	25,3	3,5	3,1
	CS	22		5,8	**15,4**	24,2	3,9	3,4
		24		13,5	**7,70**	22,9	4,4	3,9
35 / 24	MC	19,3	79,3	-	**25,8**	19,6	4,0	3,4
	CS	20		2,7	**23,1**	19,2	4,3	3,6
		22		10,4	**15,4**	18,3	4,9	4,1
		24		18,1	**7,70**	17,4	5,6	4,7
32 / 23	MC	20	63,1	-	**23,1**	14,5	4,4	3,5
	CS	22		7,7	**15,4**	13,6	5,2	4,1
		24		15,4	**7,70**	12,7	6,2	4,9
30 / 22	MC	20,9	47,1	-	**19,6**	9,44	5,0	3,6
	CS	22		4,2	**15,4**	8,94	5,7	4,1
		24		11,9	**7,70**	7,81	7,6	5,2
28 / 21	MC	20,8	34,5	-	**20,0**	5,47	6,3	3,9
	CS	22		4,6	**15,4**	5,07	7,7	4,6
		24		12,3	**7,70**	4,41	10,6	5,9

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	345	55	**6,3**	3,6
22	391	51	**7,7**	4,3
24	468	44	**10,6**	5,5
LONDON				
-	1.032	174	**5,9**	3,8
22	1.164	162	**7,2**	4,5
24	1.379	142	**9,7**	5,8
ROME				
-	19.233	3.252	**5,9**	3,8
22	21.620	3.032	**7,1**	4,5
24	25625	2646	**9,7**	5,8
VALENCIA				
-	34.394	6.275	**5,5**	3,7
20	984	230	**4,3**	3,6
22	38.433	5.874	**6,5**	4,4
24	44.941	5.182	**8,7**	5,5

SUPPLY HUMIDITY RATIO = 13 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
45 / 28 *	MC	20,1	127,0	-	**22,7**	43,0	3,0	2,7
	CS	22		7,3	**15,4**	41,4	3,2	3,0
		24		15,0	**7,70**	39,7	3,6	3,2
45 / 26	MC	23,2	84,2	-	**10,8**	20,7	4,1	3,5
	CS	24		3,1	**7,70**	19,1	4,6	3,9
40 / 25	MC	26	59,4	-	**-**	12,4	4,8	3,7
35 / 24	MC	22,8	57,6	-	**12,3**	12,3	4,7	3,7
	CS	24		4,6	**7,70**	11,0	5,7	4,3
32 / 23	MC	22,8	43,9	-	**12,3**	7,97	5,5	3,8
	CS	24		4,6	**7,70**	6,99	6,9	4,6
30 / 22	MC	23,1	30,0	-	**11,2**	4,25	7,1	3,9
	CS	24		3,5	**7,70**	3,63	9,2	4,7
28 / 21	MC	22,6	20,1	-	**13,1**	2,16	9,3	3,6

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	201	22	**9,3**	3,2
LONDON				
-	616	73	**8,5**	3,6
24	149	18	**8,3**	4,7
ROME				
-	11.476	1.344	**8,5**	3,6
24	3.270	365	**9,0**	4,7
VALENCIA				
-	21.201	2.784	**7,6**	3,7
24	11.785	1.421	**8,3**	4,7
TUNIS				
-	43.833	7.292	**6,0**	3,5
22	1.477	455	**3,2**	3,0
24	36.428	5.326	**6,8**	4,2

SIZE 5 - AIR FLOW 11.500 m³/h (MAXIMUM) - COOLING

SUPPLY HUMIDITY RATIO = not controlled

Performance in cooling and in dehumidification

T_OA	SET	T_SA	x_SA	P_F	P_D	P_A	EER_C	EER_S
45 / 28 *	HA	26	15,7	82,0	-	14,7	5,6	4,4
45 / 26	HA	26	13,3	72,0	-	16,3	4,4	3,6
40 / 25	HA	24	12,7	69,0	**7,70**	15,6	4,4	3,6
35 / 24	HA	22	12,8	62,0	**15,4**	13,8	4,5	3,6
32 / 23	HA	21	12,3	57,5	**19,2**	12,6	4,6	3,6
30 / 22	HA	20	11,7	52,8	**23,1**	11,4	4,6	3,6
28 / 21	HA	19	11,2	47,8	**26,9**	9,95	4,8	3,6
25/19	HA	18	10,3	36,6	**30,8**	6,46	5,7	3,7

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	5.675	1.017	5,6	3,5
LONDON				
-	9.013	1.636	5,5	3,7
ROME				
-	72.646	13.665	5,3	3,6
VALENCIA				
-	88.200	17.056	5,2	3,6
TUNIS				
-	121.627	24.129	5,0	3,4

SIZE 5 - AIR FLOW 11.500 m³/h (MAXIMUM) - HEATING

Performance in Heating

T_OA	SET	T_SA	x_SA	P_T	P_D	P_A	COP_C	COP_S
-15 / -16 *	MC	19,4	0,50	149,0	-	39,5	3,8	3,4
	CS	18		138,0	-	29,0	4,8	4,2
	HA	16		129,0	-	23,4	5,5	4,7
-12 / -13 *	MC	22,1	0,80	146,0	**8,09**	42,0	3,5	3,2
	CS	22		145,0	**7,70**	41,2	3,5	3,2
		20		133,0	-	29,2	4,6	4,0
		18		124,0	-	23,6	5,3	4,5
	HA	16		116,0	-	18,1	6,4	5,2
-7 / -8	MC	19,7	1,50	120,0	-	24,8	4,8	4,2
	CS	18		107,0	-	17,5	6,1	5,1
	HA	16		98,4	-	14,5	6,8	5,5
-5 / -6	MC	21,7	1,90	119,0	**6,55**	25,7	4,6	4,1
	CS	20		106,0	-	18,2	5,8	4,9
		18		97,6	-	15,1	6,5	5,3
	HA	16		89,1	-	12,0	7,4	5,8
0 / -1	MC	27	3,10	118,0	**26,9**	28,2	4,2	3,7
		22		91,5	**7,70**	14,7	6,2	5,0
	CS	20		83,2	-	11,7	7,1	5,5
		18		74,9	-	10,1	7,4	5,5
	HA	16		66,6	-	8,45	7,9	5,6
2 / 1	MC	29,2	3,70	118,0	**35,4**	29,4	4,0	3,6
	CS	22		82,5	**7,70**	12,3	6,7	5,2
		20		74,2	-	10,6	7,0	5,3
		18		65,9	-	8,86	7,4	5,3
	HA	16		57,8	-	7,18	8,1	5,4
7 / 6	MC	30	5,40	92,8	**38,5**	18,2	5,1	4,3
	CS	22		60,6	**7,70**	8,87	6,8	4,9
		20		52,5	-	7,03	7,5	5,0
		18		44,5	-	5,06	8,8	5,2
	HA	16		36,3	-	3,40	10,7	5,3
12 / 11	MC	30	7,80	71,3	**38,5**	12,9	5,5	4,4
	CS	22		39,5	**7,70**	4,67	8,5	4,9
		20		31,7	-	3,22	9,8	4,7

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	701.329	155.698	**4,5**	3,8
22	406.594	63.054	**6,4**	4,7
20	429.279	62.135	**6,9**	4,9
18	381.401	53.259	**7,2**	5,0
16	336.210	42.180	**8,0**	5,2
LONDON				
-	570.794	118.065	**4,8**	4,1
22	360.603	51.151	**7,0**	5,0
20	322.797	42.278	**7,6**	5,0
18	219.811	27.463	**8,0**	5,3
16	186.745	20.596	**9,1**	5,4
ROME				
-	296.578	59.034	**5,0**	4,2
22	184.216	25.306	**7,3**	4,9
20	157.871	19.768	**8,0**	5,0
18	90.800	10.983	**8,3**	5,3
16	76.057	7.971	**9,5**	5,4
VALENCIA				
-	225.299	43.815	**5,1**	4,2
22	137.520	18.480	**7,4**	4,9
20	115.945	14.072	**8,2**	4,9
18	57.068	6.797	**8,4**	5,3
16	47.489	4.850	**9,8**	5,3
TUNIS				
-	173.396	32.323	**5,4**	4,2
22	102.045	13.171	**7,7**	4,6
20	84.417	9.679	**8,7**	4,5
18	28.875	3.292	**8,8**	4,9
16	23.579	2.219	**10,6**	4,8

Notes
* System with "Hydronic recovery device for extended operating range" option
T_OA = Dry bulb/wet bulb outdoor air temperature [°C]
SET = mode: MP = Maximum Capaciy,PF = Fixed Point, HA = High Flow Rate
T_SA = Dry bulb supply air temperature [°C]
X_SA = Supply air humidity ratio [g/kg]
P_F = Overall cooling capacity of the system (kW)
P_T = Heating capacity of the system [kW]
P_R = Post-heating capacity [kW]
P_D = Additional capacity available to the space [kW]
P_A = Electricity absorbed by the thermodynamic circuit [kW]
EER_C = Thermodynamic efficiency of the system in cooling mode
EER_S = Overall efficiency of the system in cooling mode (thermodynamic circuit and fans)
COP_C = Thermodynamic efficiency of the system in heating mode
COP_S = Overall efficiency of the system in heating mode (thermodynamic circuit and fans)
E_T = Seasonal thermal/cooling energy supplied [kWh]
E_A = Overall seasonal electricity absorbed [kWh]
SE_C = Thermodynamic seasonal efficiency of the system
SE_S = Overall seasonal efficiency of the system (thermodynamic circuit and fans)

In heating mode, the performances are considered with maximum air temperature supply T_SA equal to 30°C
The performance refers to a standard ZEPHIR³ unit (not fitted with a 'Steam-powered humidification module' option)
Return air in cooling mode = 26°C DB
Return air in heating mode = 20°C / 12°C
Available static pressure: supply 150 Pa, return 100 Pa
Performance values do not include the effect of fan motor heat
Source: ASHRAE weather data (International weather for energy calculation)

SIZE 6 - AIR FLOW 9.500 m³/h (MINIMUM) - COOLING

SUPPLY HUMIDITY RATIO = 9 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
35 / 24	MC	14,6	102,0	-	**36,3**	36,9	2,8	2,6
	CS	20		17,2	**19,1**	34,6	3,4	3,3
		22		23,5	**12,7**	33,7	3,7	3,5
		24		29,9	**6,36**	32,9	4,0	3,8
32 / 23	MC	14,1	92,5	-	**37,9**	30,7	3,0	2,8
	CS	20		18,8	**19,1**	28,5	3,9	3,6
		22		25,1	**12,7**	27,7	4,2	4,0
		24		31,5	**6,36**	27,0	4,6	4,3
30 / 22	MC	13,9	82,8	-	**38,5**	24,4	3,4	3,1
	CS	20		19,4	**19,1**	22,2	4,6	4,2
		22		25,8	**12,7**	21,5	5,0	4,6
		24		32,1	**6,36**	20,8	5,5	5,0
28 / 21	MC	14,9	69,4	-	**35,3**	19,3	3,6	3,3
	CS	20		16,2	**19,1**	17,2	5,0	4,5
		22		22,6	**12,7**	16,4	5,6	5,0
		24		28,9	**6,36**	15,6	6,3	5,6
25 / 19	MC	15,5	48,0	-	**33,7**	13,2	3,6	3,2
	CS	20		14,6	**19,1**	11,6	5,4	4,6
		22		21,0	**12,7**	10,9	6,3	5,3

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	7.510	2.067	**3,6**	3,1
20	9.750	1.819	**5,4**	4,4
22	10.717	1.712	**6,3**	5,1
24	983	156	**6,3**	5,4
LONDON				
-	12.039	3.326	**3,6**	3,2
20	15.563	2.932	**5,3**	4,6
22	17.071	2.764	**6,2**	5,3
24	2.829	464	**6,1**	5,4
ROME				
-	99.435	27.613	**3,6**	3,2
20	127.074	24.444	**5,2**	4,5
22	138.602	23.133	**6,0**	5,2
24	52.770	8.643	**6,1**	5,4
VALENCIA				
-	123.793	34.954	**3,5**	3,2
20	156.786	31.142	**5,0**	4,4
22	170.133	29.613	**5,7**	5,0
24	89.059	15.309	**5,8**	5,2

SUPPLY HUMIDITY RATIO = 10 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
45 / 28 *	MC	17,6	135,0	-	**29,6**	56,2	2,4	2,3
	CS	20		10,5	**19,1**	54,1	2,7	2,6
		22		16,9	**12,7**	52,8	2,9	2,7
		24		23,2	**6,36**	51,5	3,1	2,9
40 / 25	MC	17,7	95,5	-	**26,4**	30,4	3,1	2,9
	CS	20		7,3	**19,1**	29,4	3,5	3,3
		22		13,7	**12,7**	28,5	3,8	3,6
		24		20,0	**6,36**	27,6	4,2	3,9
35 / 24	MC	16,6	89,4	-	**31,2**	27,1	3,3	3,1
	CS	20		12,1	**19,1**	25,7	3,9	3,7
		22		18,4	**12,7**	24,9	4,3	4,0
		24		24,8	**6,36**	24,1	4,7	4,4
32 / 23	MC	16,3	78,4	-	**30,9**	21,6	3,6	3,3
	CS	20		11,8	**19,1**	20,3	4,4	4,0
		22		18,1	**12,7**	19,6	4,9	4,5
		24		24,5	**6,36**	18,9	5,4	4,9
30 / 22	MC	17	66,0	-	**28,6**	18,1	3,6	3,3
	CS	20		9,5	**19,1**	16,9	4,5	4,0
		22		15,9	**12,7**	16,2	5,1	4,5
		24		22,3	**6,36**	15,4	5,7	5,1
28 / 21	MC	18,1	52,1	-	**25,1**	14,0	3,7	3,3
	CS	20		6,0	**19,1**	13,1	4,4	3,8
		22		12,4	**12,7**	12,2	5,3	4,5
		24		18,8	**6,36**	11,3	6,3	5,3
25 / 19	MC	18,7	30,2	-	**23,2**	6,22	4,9	3,7
	CS	20		4,1	**19,1**	5,87	5,8	4,3
		22		10,5	**12,7**	5,33	7,6	5,5

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	4.809	1023	**4,7**	3,4
20	5.457	965	**5,7**	4,1
22	6.424	879	**7,3**	5,1
24	709	113	**6,3**	5,1
LONDON				
-	7.839	1.712	**4,6**	3,6
20	8.888	1.612	**5,5**	4,2
22	10.396	1475	**7,0**	5,3
24	2.069	336	**6,2**	5,3
ROME				
-	6.7505	15.727	**4,3**	3,5
20	76.336	14.777	**5,2**	4,1
22	87.864	13.631	**6,4**	5,1
24	38.592	6.287	**6,1**	5,3
VALENCIA				
-	87.223	21.221	**4,1**	3,4
20	98.773	19.919	**5,0**	4,1
22	112.120	18.544	**6,0**	4,9
24	66.502	11.142	**6,0**	5,2
TUNIS				
-	130.339	33.357	**3,9**	3,3
20	147.935	31.374	**4,7**	3,9
22	165.258	29.570	**5,6**	4,6
24	116.181	20.972	**5,5**	4,8

SUPPLY HUMIDITY RATIO = 11g/kg														
Performance in cooling and in dehumidification										Seasonal energy performances				
T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S		T_SA	E_T	E_A	SE_C	SE_S
45 / 28 *	MC	17,6	127,0	-	**26,7**	42,9	3,0	2,8		STOCKHOLM				
	CS	20		7,63	**19,1**	41,6	3,2	3,1		-	360	85	**4,2**	3,3
		22		14,0	**12,7**	40,5	3,5	3,3		22	398	79	**5,0**	3,8
		24		20,4	**6,36**	39,3	3,7	3,5		24	462	69	**6,7**	4,9
45 / 26	MC	20,4	92,1	-	**17,8**	26,5	3,5	3,2		LONDON				
	CS	22		5,09	**12,7**	25,5	3,8	3,5		-	1.070	258	**4,1**	3,4
		24		11,5	**6,36**	24,3	4,3	3,9		20	62	16	**3,9**	3,4
40 / 25	MC	19,8	82,2	-	**19,7**	22,3	3,7	3,4		22	1.185	240	**4,9**	4,0
	CS	20		0,64	**19,1**	22,1	3,7	3,4		24	1.363	211	**6,4**	5,1
		22		7,00	**12,7**	21,1	4,2	3,9		ROME				
		24		13,4	**6,36**	20,1	4,8	4,3		-	19.964	4.835	**4,1**	3,4
35 / 24	MC	19,2	73,0	-	**21,6**	19,7	3,7	3,4		20	372	96	**3,9**	3,4
	CS	20		2,54	**19,1**	19,4	3,9	3,5		22	22.113	4.498	**4,9**	4,0
		22		8,91	**12,7**	18,5	4,4	4,0		24	25.421	3.966	**6,4**	5,1
		24		15,3	**6,36**	17,6	5,0	4,5		VALENCIA				
32 / 23	MC	19,6	60,8	-	**20,4**	16,2	3,8	3,3		-	35.290	8.768	**4,0**	3,4
	CS	20		1,27	**19,1**	16,0	3,9	3,4		20	4.196	1.081	**3,9**	3,5
		22		7,63	**12,7**	15,1	4,5	4,0		22	39.182	8171	**4,8**	4,0
		24		14,0	**6,36**	14,2	5,3	4,6		24	44.557	7.317	**6,1**	4,9
30 / 22	MC	20,3	48,3	-	**18,1**	12,6	3,8	3,3		TUNIS				
	CS	22		5,41	**12,7**	11,8	4,6	3,9		-	65.683	17.005	**3,9**	3,2
		24		11,8	**6,36**	10,8	5,6	4,7		20	31.251	8.131	**3,8**	3,4
28 / 21	MC	20,8	36,0	-	**16,5**	8,51	4,2	3,4		22	73.242	15884	**4,6**	3,8
	CS	22		3,82	**12,7**	7,90	5,0	4,0		24	81.588	14.598	**5,6**	4,6
		24		10,2	**6,36**	6,87	6,7	5,2						

SIZE 6 - AIR FLOW 9.500 m³/h (MINIMUM) - HEATING

Performance in Heating										Seasonal energy performances				
T_OA	SET	T_SA	x_SA	P_T	P_D	P_A	COP_C	COP_S		T_SA	E_T	E_A	SE_C	SE_S
-20 / -21 *	MC	25,3	0,2	159,0	**16,9**	50,3	3,2	3,0		STOCKHOLM				
	CS	22		148,0	**6,36**	36,9	4,0	3,8		-	612.940	138.686	**4,4**	3,9
		20		141,0	-	31,4	4,5	4,2		22	431.216	77.050	**5,6**	4,6
		18		134,0	-	25,7	5,2	4,8		20	385.374	65.264	**5,9**	4,7
-15 / -16 *	MC	30	0,5	155,0	**31,8**	54,7	2,8	2,7		18	340.431	53.524	**6,4**	4,8
	CS	22		128,0	**6,36**	27,1	4,7	4,3		LONDON				
		20		121,0	-	23,4	5,2	4,7		-	475.036	102.017	**4,7**	4,1
		18		114,0	-	20,7	5,5	4,9		22	308.042	53.855	**5,7**	4,6
-12 / -13 *	MC	30	0,8	143,0	**31,8**	44,5	3,2	3,0		20	266.517	43.442	**6,1**	4,8
	CS	22		116,0	**6,36**	24,0	4,8	4,4		18	226.038	32.047	**7,1**	5,1
		20		109,0	-	21,3	5,1	4,6		ROME				
		18		102,0	-	18,5	5,5	4,9		-	244.993	52.520	**4,7**	4,1
-7 / -8	MC	29,2	1,5	128,0	**29,3**	33,9	3,8	3,6		22	153.105	26.243	**5,8**	4,6
	CS	22		103,0	**6,36**	18,9	5,4	4,9		20	130.343	20.492	**6,4**	4,7
		20		95,4	-	15,7	6,1	5,4		18	108.256	14.232	**7,6**	5,1
		18		88,3	-	14,0	6,3	5,5		VALENCIA				
-5 / -6	MC	30	1,9	123,0	**31,8**	31,0	4,0	3,7		-	185.925	39.973	**4,7**	4,1
	CS	22		94,7	**6,36**	16,2	5,8	5,2		22	113.602	19.116	**5,9**	4,6
		20		87,7	-	14,5	6,0	5,3		20	95.735	14.595	**6,6**	4,8
		18		80,6	-	13,1	6,2	5,3		18	78.453	9.751	**8,0**	5,1
0 / -1	MC	30	3,1	103,0	**31,8**	22,7	4,5	4,2		TUNIS				
	CS	22		75,6	**6,36**	13,6	5,6	4,8		-	143.158	30.985	**4,6**	3,9
		20		68,7	-	12,0	5,7	4,9		22	84.211	13.692	**6,2**	4,4
		18		61,9	-	10,5	5,9	4,9		20	69.712	10.014	**7,0**	4,5
2 / 1	MC	30	3,7	95,4	**31,8**	19,8	4,8	4,4		18	55.754	6.171	**9,0**	4,8
	CS	22		68,2	**6,36**	12,5	5,5	4,7						
		20		61,3	-	10,9	5,6	4,7						
		18		54,5	-	9,2	5,9	4,8						
7 / 6	MC	30	5,4	76,8	**31,8**	16,2	4,7	4,2						
	CS	22		50,0	**6,36**	9,2	5,4	4,4						
		20		43,3	-	7,5	5,8	4,6						
		18		36,7	-	5,2	7,0	5,1						
12 / 11	MC	30	7,8	58,8	**31,8**	12,9	4,6	3,9						
	CS	22		32,6	**6,36**	4,86	6,7	4,7						
		20		26,2	-	3,26	8,0	5,0						
		18		20,1	-	1,75	11,5	5,3						

Notes
* System with "Hydronic recovery device for extended operating range" option
T_OA = Dry bulb/wet bulb outdoor air temperature [°C]
SET = mode: MP = Maximum Capaciy,PF = Fixed Point, HA = High Flow Rate
T_SA = Dry bulb supply air temperature [°C]
X_SA = Supply air humidity ratio [g/kg]
P_F = Overall cooling capacity of the system (kW)
P_T = Heating capacity of the system [kW]
P_R = Post-heating capacity [kW]
P_D = Additional capacity available to the space [kW]
P_A = Electricity absorbed by the thermodynamic circuit [kW]
EER_C = Thermodynamic efficiency of the system in cooling mode
EER_S = Overall efficiency of the system in cooling mode (thermodynamic circuit and fans)
COP_C = Thermodynamic efficiency of the system in heating mode
COP_S = Overall efficiency of the system in heating mode (thermodynamic circuit and fans)
E_T = Seasonal thermal/cooling energy supplied [kWh]
E_A = Overall seasonal electricity absorbed [kWh]
SE_C = Thermodynamic seasonal efficiency of the system
SE_S = Overall seasonal efficiency of the system (thermodynamic circuit and fans)
In heating mode, the performances are considered with maximum air temperature supply T_SA equal to 30°C
The performance refers to a standard ZEPHIR³ unit (not fitted with a 'Steam-powered humidification module' option)
Return air in cooling mode = 26°C DB
Return air in heating mode = 20°C / 12°C
Available static pressure: supply 150 Pa, return 100 Pa
Performance values do not include the effect of fan motor heat
Source: ASHRAE weather data (International weather for energy calculation)

SIZE 6 - AIR FLOW 12.000 m³/h (STANDARD) - COOLING

SUPPLY HUMIDITY RATIO = 10 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
35 / 24	MC	16,6	112,0	-	**37,7**	38,4	2,9	2,7
	CS	20		13,7	**24,1**	36,5	3,4	3,2
		22		21,7	**16,0**	35,4	3,8	3,5
		24		29,7	**8,04**	34,3	4,1	3,8
32 / 23	MC	16,1	99,8	-	**39,7**	30,5	3,3	3,0
	CS	20		15,7	**24,1**	28,7	4,0	3,6
		22		23,7	**16,0**	27,7	4,5	4,0
		24		31,7	**8,04**	26,8	4,9	4,4
30 / 22	MC	15,8	87,6	-	**40,9**	22,6	3,9	3,4
	CS	20		16,9	**24,1**	21,0	5,0	4,3
		22		24,9	**16,0**	20,2	5,6	4,8
		24		32,9	**8,04**	19,4	6,2	5,3
28 / 21	MC	17	69,7	-	**36,1**	17,4	4,0	3,4
	CS	20		12,1	**24,1**	15,9	5,1	4,3
		22		20,1	**16,0**	15,0	6,0	4,9
		24		28,1	**8,04**	14,0	7,0	5,7
25 / 19	MC	18,8	37,9	-	**28,9**	8,10	4,7	3,4
	CS	20		4,8	**24,1**	7,66	5,6	3,9
		22		12,9	**16,0**	6,96	7,3	5,0

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	6.079	1.324	**4,6**	3,2
20	6.884	1.247	**5,5**	3,8
22	8.105	1.138	**7,1**	4,7
24	978	140	**7,0**	5,5
LONDON				
-	9.957	2.209	**4,5**	3,4
20	11.320	2.074	**5,5**	4,0
22	13.224	1.903	**6,9**	5,0
24	2.841	421	**6,7**	5,6
ROME				
-	86.985	20.055	**4,3**	3,4
20	99.933	18.695	**5,3**	4,1
22	114.494	17.331	**6,6**	5,0
24	53.094	7.837	**6,8**	5,6
VALENCIA				
-	113.017	27.114	**4,2**	3,3
20	130.675	25.249	**5,2**	4,1
22	147.534	23.629	**6,2**	4,9
24	90.725	14.118	**6,4**	5,4

SUPPLY HUMIDITY RATIO = 11g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
40 / 25	MC	19,7	104,0	-	**25,3**	30,9	3,4	3,1
	CS	20		1,2	**24,1**	30,7	3,4	3,1
		22		9,2	**16,0**	29,3	3,9	3,5
		24		17,3	**8,04**	27,9	4,3	3,9
35 / 24	MC	18,3	95,9	-	**30,9**	26,1	3,7	3,3
	CS	20		6,8	**24,1**	25,2	4,1	3,6
		22		14,9	**16,0**	24,2	4,6	4,0
		24		22,9	**8,04**	23,2	5,1	4,5
32 / 23	MC	18,5	81,0	-	**30,1**	20,1	4,0	3,5
	CS	20		6,0	**24,1**	19,4	4,5	3,9
		22		14,1	**16,0**	18,5	5,1	4,4
		24		22,1	**8,04**	17,6	5,9	5,0
30 / 22	MC	19,5	64,1	-	**26,1**	15,4	4,2	3,5
	CS	20		2,0	**24,1**	15,2	4,3	3,6
		22		10,0	**16,07**	14,2	5,2	4,3
		24		18,1	**8,04**	13,2	6,2	5,0
28 / 21	MC	20,2	47,9	-	**23,3**	10,9	4,4	3,4
	CS	22		7,2	**16,0**	9,91	5,6	4,2
		24		15,3	**8,04**	8,81	7,2	5,3
25 / 19	MC	20,4	21,7	-	**22,5**	3,04	7,1	3,5
	CS	22		6,4	**16,0**	2,74	10,3	4,8

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	3.560	541	**6,6**	3,2
22	4.546	488	**9,3**	4,2
24	632	88	**7,2**	5,0
LONDON				
-	5.958	963	**6,2**	3,5
20	285	65	**4,4**	3,7
22	7.520	872	**8,6**	4,6
24	1.866	269	**6,9**	5,2
ROME				
-	54.585	10.051	**5,4**	3,5
20	6.406	1.469	**4,4**	3,6
22	66.943	9.127	**7,3**	4,5
24	34.779	5.025	**6,9**	5,2
VALENCIA				
-	74.095	14.828	**5,0**	3,4
20	22.571	5.176	**4,4**	3,6
22	89.426	13.519	**6,6**	4,4
24	60.971	9.194	**6,6**	5,1

SUPPLY HUMIDITY RATIO = 12 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
45 / 28*	MC	19,3	145,0	-	**26,9**	50,3	2,9	2,7
	CS	20		2,8	**24,1**	49,7	3,0	2,8
		22		10,8	**16,0**	48,0	3,2	3,0
		24		18,9	**8,04**	46,3	3,5	3,3
45 / 26	MC	22,3	100,0	-	**14,8**	26,5	3,8	3,4
	CS	24		6,8	**8,04**	24,4	4,4	3,9
40 / 25	MC	22,6	84,2	-	**13,6**	20,4	4,1	3,6
	CS	24		5,6	**8,04**	18,4	4,9	4,2
35 / 24	MC	21,8	73,1	-	**16,8**	17,5	4,2	3,5
	CS	24		8,8	**8,04**	15,6	5,3	4,4
32 / 23	MC	22,3	57,2	-	**14,8**	13,2	4,3	3,5
	CS	24		6,8	**8,04**	11,6	5,5	4,3
30 / 22	MC	22,9	41,3	-	**12,4**	8,57	4,8	3,5
	CS	24		4,4	**8,04**	7,32	6,2	4,4
28 / 21	MC	22,2	30,4	-	**15,2**	5,01	6,1	3,7
	CS	24		7,2	**8,04**	4,04	9,3	5,2

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	304	50	**6,1**	3,4
24	376	40	**9,3**	4,8
LONDON				
-	911	159	**5,7**	3,7
24	1.104	131	**8,5**	5,0
ROME				
-	16.939	2.971	**5,7**	3,7
24	20.447	2.438	**8,4**	5,0
VALENCIA				
-	30.379	5.718	**5,3**	3,6
24	35.776	4.783	**7,5**	4,8
TUNIS				
-	59.587	12.695	**4,7**	3,4
20	1.626	547	**3,0**	2,8
22	1.714	528	**3,2**	3,0
24	68.293	10.961	**6,2**	4,3

SIZE 6 - AIR FLOW 12.000 m³/h (STANDARD) - HEATING

Performance in Heating

T_OA	SET	T_SA	x_SA	P_T	P_D	P_A	COP_C	COP_S
-20 / -21 *	MC	19,3	0,20	175,0	-	45,4	3,9	3,6
	CS	18		169,0	-	38,8	4,4	4,0
-15 / -16 *	MC	24	0,50	170,0	**16,07**	49,9	3,4	3,2
	CS	22		161,0	**8,04**	39,3	4,1	3,7
		20		152,0	-	33,1	4,6	4,1
		18		144,0	-	27,1	5,3	4,7
-12 / -13 *	MC	26,7	0,80	167,0	**26,9**	52,5	3,2	3,0
	CS	22		146,0	**8,04**	33,0	4,4	4,0
		20		138,0	-	26,8	5,1	4,5
		18		129,0	-	22,5	5,7	4,9
-7 / -8	MC	23,8	1,50	138,0	**15,2**	31,0	4,5	4,0
	CS	22		130,0	**8,04**	25,8	5,0	4,5
		20		121,0	-	21,4	5,7	4,9
		18		112,0	-	18,0	6,2	5,3
-5 / -6	MC	26	1,90	137,0	**24,1**	32,2	4,3	3,9
	CS	22		119,0	**8,04**	22,0	5,4	4,7
		20		111,0	-	18,5	6,0	5,1
		18		102,0	-	14,9	6,8	5,6
0 / -1	MC	30	3,10	130,0	**40,1**	31,1	4,2	3,8
	CS	22		95,4	**8,04**	15,3	6,2	5,2
		20		86,7	-	13,6	6,4	5,2
		18		78,0	-	11,9	6,6	5,2
2 / 1	MC	30	3,70	121,0	**40,1**	26,5	4,6	4,1
	CS	22		86,1	**8,04**	14,1	6,1	5,0
		20		77,4	-	12,3	6,3	5,0
		18		68,9	-	10,6	6,5	5,0
7 / 6	MC	30	5,40	96,9	**40,18**	18,3	5,3	4,5
	CS	22		63,2	**8,04**	10,7	5,9	4,6
		20		54,9	-	8,77	6,3	4,6
		18		46,3	-	6,80	6,8	4,6
12 / 11	MC	30	7,80	74,3	**40,1**	14,9	5,0	4,1
	CS	22		41,2	**8,04**	6,27	6,6	4,4
		20		33,0	-	4,12	8,0	4,5
		18		24,7	-	2,38	10,4	4,4

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
		STOCKHOLM		
-	752.942	166.233	**4,5**	3,9
22	544.064	93.178	**5,8**	4,6
20	487.173	77.913	**6,3**	4,7
18	429.159	63.749	**6,7**	4,7
		LONDON		
-	598.237	122.128	**4,9**	4,2
22	389.101	63.663	**6,1**	4,7
20	336.916	51.173	**6,6**	4,7
18	283.833	39.574	**7,2**	4,8
		ROME		
-	309.325	61.752	**5,0**	4,3
22	193.457	31.366	**6,2**	4,6
20	164.750	24.375	**6,8**	4,7
18	135.531	18.044	**7,5**	4,7
		VALENCIA		
-	234.857	46.605	**5,0**	4,2
22	143.557	23.090	**6,2**	4,5
20	120.968	17.508	**6,9**	4,6
18	97.972	12.546	**7,8**	4,6
		TUNIS		
-	180.805	35.547	**5,1**	4,1
22	106.431	16.896	**6,3**	4,2
20	88.037	12.233	**7,2**	4,2
18	69.294	8.197	**8,5**	4,1

Notes
* System with "Hydronic recovery device for extended operating range" option
T_OA = Dry bulb/wet bulb outdoor air temperature [°C]
SET = mode: MP = Maximum Capaciy,PF = Fixed Point, HA = High Flow Rate
T_SA = Dry bulb supply air temperature [°C]
X_SA = Supply air humidity ratio [g/kg]
P_F = Overall cooling capacity of the system (kW)
P_T = Heating capacity of the system [kW]
P_R = Post-heating capacity [kW]
P_D = Additional capacity available to the space [kW]
P_A = Electricity absorbed by the thermodynamic circuit [kW]
EER_C = Thermodynamic efficiency of the system in cooling mode
EER_S = Overall efficiency of the system in cooling mode (thermodynamic circuit and fans)
COP_C = Thermodynamic efficiency of the system in heating mode
COP_S = Overall efficiency of the system in heating mode (thermodynamic circuit and fans)
E_T = Seasonal thermal/cooling energy supplied [kWh]
E_A = Overall seasonal electricity absorbed [kWh]
SE_C = Thermodynamic seasonal efficiency of the system
SE_S = Overall seasonal efficiency of the system (thermodynamic circuit and fans)

In heating mode, the performances are considered with maximum air temperature supply T_SA equal to 30°C
The performance refers to a standard ZEPHIR³ unit (not fitted with a 'Steam-powered humidification module' option)
Return air in cooling mode = 26°C DB
Return air in heating mode = 20°C / 12°C
Available static pressure: supply 150 Pa, return 100 Pa
Performance values do not include the effect of fan motor heat
Source: ASHRAE weather data (International weather for energy calculation)

SIZE 6 - AIR FLOW 14.000 m³/h (MAXIMUM) - COOLING

SUPPLY HUMIDITY RATIO = 11g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
35 / 24	MC	18,5	111,0	-	**35,2**	31,9	3,5	3,1
	CS	20		7,03	**28,1**	31,0	3,8	3,3
		22		16,4	**18,8**	29,7	4,3	3,7
		24		25,8	**9,38**	28,5	4,8	4,2
32 / 23	MC	18	96,8	-	**37,5**	23,5	4,1	3,5
	CS	20		9,38	**28,1**	22,6	4,7	3,9
		22		18,8	**18,8**	21,6	5,3	4,4
		24		28,1	**9,38**	20,6	6,1	5,0
30 / 22	MC	18,8	77,8	-	**33,8**	17,7	4,4	3,5
	CS	20		5,63	**28,1**	17,1	4,9	3,9
		22		15,0	**18,8**	16,1	5,8	4,5
		24		24,4	**9,38**	15,1	6,8	5,2
28 / 21	MC	19,6	58,6	-	**30,0**	12,8	4,6	3,4
	CS	20		1,88	**28,1**	12,5	4,8	3,6
		22		11,3	**18,8**	11,4	6,1	4,4
		24		20,6	**9,38**	10,3	7,7	5,4
25 / 19	MC	20,6	24,6	-	**25,3**	3,46	7,1	3,1
	CS	22		6,56	**18,8**	3,13	10,0	4,1

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	4.079	619	**6,6**	2,8
20	605	125	**4,8**	3,4
22	5.124	558	**9,2**	3,7
24	792	103	**7,7**	5,0
LONDON				
-	6.878	1.107	**6,2**	3,2
20	1.808	374	**4,8**	3,6
22	8.583	998	**8,6**	4,
24	2.333	313	**7,5**	5,4
ROME				
-	64.193	11.627	**5,5**	3,3
20	33.764	6.970	**4,8**	3,6
22	78.901	10.451	**7,5**	4,3
24	43.514	5.845	**7,4**	5,4
VALENCIA				
-	87.852	17.187	**5,1**	3,3
20	60.021	12.484	**4,8**	3,7
22	106.990	15.504	**6,9**	4,3
24	75.865	106.82	**7,1**	5,3

SUPPLY HUMIDITY RATIO = 12 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
40 / 25	MC	21,9	101,0	-	**19,2**	23,5	4,3	3,6
	CS	22		0,47	**18,8**	23,4	4,3	3,7
		24		9,84	**9,38**	21,3	5,2	4,3
35 / 24	MC	20,5	91,3	-	**25,8**	20,7	4,4	3,6
	CS	22		7,03	**18,8**	19,7	5,0	4,1
		24		16,4	**9,38**	18,5	5,8	4,7
32 / 23	MC	21,6	69,9	-	**20,6**	15,3	4,6	3,6
	CS	22		1,88	**18,8**	14,9	4,8	3,7
		24		11,3	**9,38**	13,4	6,1	4,6
30 / 22	MC	22,6	49,5	-	**15,9**	10,0	5,0	3,5
	CS	24		6,56	**9,38**	8,52	6,6	4,3
28 / 21	MC	22,5	34,0	-	**16,4**	5,28	6,4	3,5
	CS	24		7,03	**9,38**	4,26	9,6	4,7

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	340	53	**6,4**	3,2
24	410	43	**9,6**	4,2
LONDON				
-	1.034	172	**6,0**	3,5
22	72	15	**4,8**	3,7
24	1.234	141	**8,7**	4,7
ROME				
-	19.275	3.222	**6,0**	3,5
22	431	89	**4,8**	3,7
24	22.915	2.649	**8,6**	4,6
VALENCIA				
-	35.242	6.362	**5,5**	3,5
22	4.984	1.026	**4,9**	3,8
24	414.01	5.333	**7,8**	4,6

SUPPLY HUMIDITY RATIO = 13 g/kg

Performance in cooling and in dehumidification

T_OA	SET	T_SA	P_F	P_R	P_D	P_A	EER_C	EER_S
45 / 28 *	MC	20,8	151,0	-	**24,4**	46,5	3,2	2,9
	CS	22		5,63	**18,8**	45,2	3,5	3,1
		24		15,0	**9,38**	42,9	3,9	3,4
45 / 26	MC	28,2	80,9	-	**-**	17,2	4,7	3,7
40 / 25	MC	28,2	62,6	-	**-**	12,7	4,9	3,7
35 / 24	MC	25	60,6	-	**4,69**	12,5	4,8	3,6
32 / 23	MC	25,1	43,0	-	**4,22**	7,71	5,6	3,6
30 / 22	MC	25	28,8	-	**6,09**	3,98	7,2	3,4
28 / 21	MC	23,7	19,7	-	**10,8**	2,09	9,4	3,0

Seasonal energy performances

T_SA	E_T	E_A	SE_C	SE_S
STOCKHOLM				
-	197	21	**9,4**	2,6
LONDON				
-	602	70	**8,6**	8,6
ROME				
-	11.194	1.289	**8,7**	8,7
VALENCIA				
-	20.675	2.667	**7,8**	7,6
TUNIS				
-	43.683	7.157	**6,1**	3,1
22	1.723	497	**3,5**	3,1
24	1.826	472	**3,9**	3,4

SIZE 6 - AIR FLOW 14.000 m³/h (MAXIMUM) - COOLING

SUPPLY HUMIDITY RATIO = not controlled

Performance in cooling and in dehumidification								
T_OA	**SET**	**T_SA**	**x_SA**	**P_F**	**P_D**	**P_A**	**EER_C**	**EER_S**
45 / 28 *	HA	26	15,2	105,0	-	19,3	5,4	4,3
45 / 26	HA	26	12,8	92,7	-	20,3	4,6	3,8
40 / 25	HA	24	12,4	87,8	**9,38**	19,4	4,5	3,7
35 / 24	HA	22	12,3	80,6	**18,8**	17,8	4,5	3,6
32 / 23	HA	21	11,8	75,2	**23,4**	16,7	4,5	3,6
30 / 22	HA	20	11,3	69,0	**28,1**	15,3	4,5	3,5
28 / 21	HA	19	10,9	61,9	**32,8**	13,7	4,5	3,4
25 / 19	HA	18	9,71	51,2	**37,5**	11,1	4,6	3,3

Seasonal energy performances				
T_SA	**E_T**	**E_A**	**SE_C**	**SE_S**
STOCKHOLM				
-	7.889	1.713	**4,6**	3,1
LONDON				
-	12.469	2.711	**4,6**	3,3
ROME				
-	99.050	21.626	**4,6**	3,3
VALENCIA				
-	119.185	26.098	**4,6**	3,4
TUNIS				
-	163.319	35.796	**4,6**	3,2

SIZE 6 - AIR FLOW 14.000 m³/h (MAXIMUM) - HEATING

Performance in Heating								
T_OA	**SET**	**T_SA**	**x_SA**	**P_T**	**P_D**	**P_A**	**COP_C**	**COP_S**
-15 / -16 *	MC	20,2	0,5	179,0	**0,94**	46,9	3,8	3,4
	CS	20		178,0	-	45,8	3,9	3,5
		18		168,0	-	35,3	4,8	4,1
	HA	16		158,0	-	29,1	5,4	4,6
-12 / -13 *	MC	22,8	0,8	176,0	**13,1**	49,5	3,6	3,2
	CS	22		172,0	**9,38**	44,8	3,8	3,4
		20		162,0	-	35,6	4,6	4,0
		18		151,0	-	29,0	5,2	4,4
	HA	16		141,0	-	22,6	6,2	5,0
-7 / -8	MC	20,6	1,5	144,0	**2,81**	29,3	4,9	4,3
	CS	20		141,0	-	27,5	5,1	4,4
		18		130,0	-	21,7	6,0	5,0
	HA	16		120,0	-	18,0	6,7	5,4
-5 / -6	MC	22,7	1,9	143,0	**12,7**	30,4	4,7	4,1
	CS	22		140,0	**9,38**	28,3	4,9	4,3
		20		129,0	-	22,5	5,7	4,8
		18		119,0	-	18,6	6,4	5,2
	HA	16		108,0	-	14,9	7,2	5,6
0 / -1	MC	28	3,1	142,0	**37,5**	33,4	4,3	3,8
	CS	22		111,0	**9,38**	18,3	6,1	4,9
		20		101,0	-	14,7	6,9	5,3
		18		91,1	-	12,9	7,1	5,3
	HA	16		81,1	-	11,1	7,3	5,2
2 / 1	MC	30	3,7	141,0	**46,9**	34,1	4,1	3,7
	CS	22		101,0	**9,38**	15,3	6,6	5,1
		20		90,4	-	13,4	6,7	5,1
		18		80,30	-	11,6	6,9	5,0
	HA	16		70,30	-	9,70	7,2	5,0
7 / 6	MC	30	5,4	113,0	**46,9**	22,7	5,0	4,2
	CS	22		73,8	**9,38**	11,8	6,3	4,6
		20		64,0	-	9,78	6,5	4,5
		18		54,2	-	7,76	7,0	4,5
	HA	16		44,2	-	5,44	8,1	4,5
12 / 11	MC	30	7,8	86,7	**46,9**	16,2	5,4	4,2
	CS	22		48,1	**9,38**	7,39	6,5	4,1
		20		38,5	-	4,69	8,2	4,2
		18		28,9	-	2,83	10,2	4,0

Seasonal energy performances				
T_SA	**E_T**	**E_A**	**SE_C**	**SE_S**
STOCKHOLM				
-	845.662	186354	**4,5**	3,8
22	587.176	99478	**5,9**	4,4
20	567.995	89249	**6,4**	4,
18	500.981	73246	**6,8**	4,6
16	408.993	56265	**7,3**	4,8
LONDON				
-	691.252	144.073	**4,8**	4,0
22	454.691	72.149	**6,3**	4,6
20	392.910	56.964	**6,9**	4,7
18	331.753	44.799	**7,4**	4,6
16	227.262	29.659	**7,7**	4,8
ROME				
-	359.821	72.737	**4,9**	4,1
22	226.030	35.448	**6,4**	4,5
20	192.158	27.211	**7,1**	4,5
18	158.484	20.566	**7,7**	4,4
16	9.2576	11.875	**7,8**	4,7
VALENCIA				
-	273.602	54.289	**5,0**	4,1
22	167.691	26.212	**6,4**	4,4
20	141.094	19.601	**7,2**	4,5
18	114.594	14.382	**8,0**	4,3
16	57809	7.346	**7,9**	4,6
TUNIS				
-	210.932	40.474	**5,2**	4,0
22	124.269	19.387	**6,4**	4,0
20	102.679	13.792	**7,4**	4,0
18	81.092	9.533	**8,5**	3,8
16	28.710	3.540	**8,1**	4,1

Notes
* System with "Hydronic recovery device for extended operating range" option
T_OA = Dry bulb/wet bulb outdoor air temperature [°C]
SET = mode: MP = Maximum Capaciy,PF = Fixed Point, HA = High Flow Rate
T_SA = Dry bulb supply air temperature [°C]
X_SA = Supply air humidity ratio [g/kg]
P_F = Overall cooling capacity of the system (kW)
P_T = Heating capacity of the system [kW]
P_R = Post-heating capacity [kW]
P_D = Additional capacity available to the space [kW]
P_A = Electricity absorbed by the thermodynamic circuit [kW]
EER_C = Thermodynamic efficiency of the system in cooling mode
EER_S = Overall efficiency of the system in cooling mode (thermodynamic circuit and fans)
COP_C = Thermodynamic efficiency of the system in heating mode
COP_S = Overall efficiency of the system in heating mode (thermodynamic circuit and fans)
E_T = Seasonal thermal/cooling energy supplied [kWh]
E_A = Overall seasonal electricity absorbed [kWh]
SE_C = Thermodynamic seasonal efficiency of the system
SE_S = Overall seasonal efficiency of the system (thermodynamic circuit and fans)
In heating mode, the performances are considered with maximum air temperature supply T_SA equal to 30°C
The performance refers to a standard ZEPHIR³ unit (not fitted with a 'Steam-powered humidification module' option)
Return air in cooling mode = 26°C DB
Return air in heating mode = 20°C / 12°C
Available static pressure: supply 150 Pa, return 100 Pa
Performance values do not include the effect of fan motor heat
Source: ASHRAE weather data (International weather for energy calculation)

Accessories

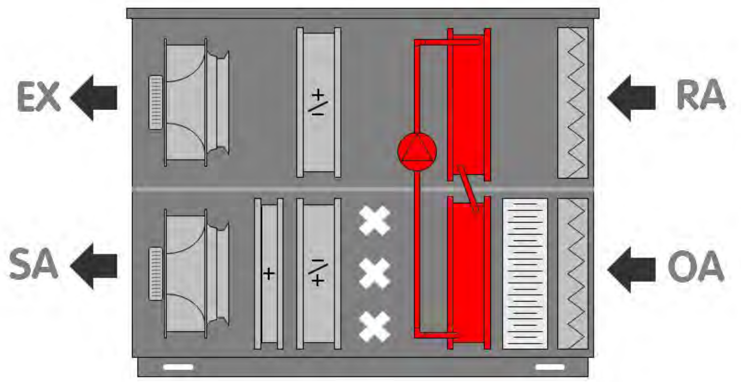
RECH - Hydronic recovery device for extended operating range

Opzione suitable for application in cold climate and in hot humid climate.

It is a compact device within the System, thus keeping unchanged the unit dimensions and consequently its compactness.

It is automatically activated only when requested by actual ambient conditions: they transfer heat from return air to outdoor air and keep optimal operation on the reverse cycle thermodynamic circuit.

It includes two additional heat exchangers, connected by a water circuit complete of high efficiency pump with pressure switch, safety valve, manometer, expansion tank, water and glycol charge (35% in weight).



The innovative predictive control keeps comfortable supply conditions even during defrost cycles, if any. They run without reverting the thermodynamic cycle: stop the device, increase the heat pump capacity, temporary reduce the airflow even by 40% to control evaporation, activate heat integration.

All reported performance is net because it includes those effects and does not need any further correction.
This option reduces the available static pressure (supply air side).

This operation involves variation of the main electrical data of the unit.

For the correct unit operation the temperature within the unit must be under 50 °C. Temperature of installed or stored units must not exceed 50°C.
With the unit installed and connected to the air distribution system, protections and safeties work only with active electrical power supply and not severed sectionized unit.

Attention!
In the case of very cold climates it is necessary to use appropriate measures to prevent snow and ice aceaccumulation in front of outdoor air inlet and exhaust air extraction.

II - Internal installation

This option is required for installation inside the building.

Also suitable for outside installation, to distance from the unit both the outdoor air intake and exhaust air discharge. Includes rectangular flanges connecting to ducts for the outdoor and exhaust air ductwork.

As in the standard version, it also includes the rectangular flanges connecting to ducts for the supply and extracted air.

PVARC - Variable flow for supply and exhaust air with CO2 probe

This option is recommended where population differs greatly at any given time, it automatically adjusts the air flow to the actual conditions and increases saving for ventilation.

Complete with probe and integrated logic control. When CO_2 concentration is lower than the set-point, the air flow is reduced according to the distance from the set-point.

The probe is installed and wired built-in the unit and is located in the return air duct of the unit.

The range of variation is from the selected supply air flow value to the minimum air flow value available on that size.

PVARCV - Variable flow for supply and exhaust air with CO2+VOC probe

Option shown in environments characterized by tobacco smoke, formaldehyde (coming for example from solvents, deodorants, glues, paints, detergents), cooking, etc.

Automatically adjusts the air flow to the actual conditions of use and increases saving in ventilation. Complete with probe and integrated logic control.

When CO_2 and VOC (volatile organic compounds) concentration is lower than the set-point, the air flow is reduced according to the distance from the set-point.

The probe is installed and wired built-in the unit and is located in the return air duct of the unit.

The range of variation is from the selected supply air flow value to the minimum air flow value available on that size.

DESM - Smoke detector

Option that detects smoke in the space and intervenes on the operation of the unit.

Complete with sensor, electronic control unit and relative integrated logic control. When alarm or sensor failure occurs, ventilation stops.

The ON-OFF remote control and the start-up/shut-down keyboard control are disabled. The unit is reactivated manually.

Smoke detection in the space is done through the analysis of the return air. The Tyndall effect smoke detector's increased sensitivity can detect the presence of smoke in high speed air flows, by means of a photo-optical system with a labyrinth detection chamber.

The device is installed inside the unit.

NCRC - Remote control with user interface: not required

This option is recommended in the presence of a centralized supervision system or other remote management equipment.

The unit will maintain their functions unchanged, but is supplied without a user interface.

During ordinary maintenance, the authorized service technician must be equipped with properly configured personal computer or a compatible service interface.

MOB - RS485 Serial port with Modbus protocol.

It allows the serial connection to supervision systems, using Modbus as the communication protocol. It allows the access to the complete list of operating variables, controls and alarms.

The device is installed and wired built-in the unit.

The total length of each serial line do not exceed 1000 meters and the line must be connected in bus typology (in/out)

LON - RS485 Serial port with LonWorks protocol

It allows the serial connection to supervision systems, using LonWorks as the communication protocol.

It allows access to a list of operating variables, control and alarms compliant with the Echelon standard.

The device is installed and wired built-in the unit.

The configuration and management activities for the LonWorks networks are the responsibility of the client.

LonWorks technology uses the LonTalk® protocol for communicating between the network nodes. Contact the service supplier for further information.

The total length of each serial line do not exceed 1000 meters and the line must be connected in bus typology (in/out)

BACIP - BACnet-IP serial communication module

It allows the serial connection to supervision systems, using BACnet as the communication protocol.

It allows the access to the complete list of operating variables, controls and alarms.

The device is installed and wired built-in the unit.

The configuration and management activities for the BACnet networks are the responsibility of the client.

The total length of each serial line do not exceed 1000 meters and the line must be connected in bus typology (in/out)

CEA - Copper/aluminium exchanger on outdoor air with acrylic lining

Coils with copper pipes and aluminium fins with acrylic lining. Resist bi-metallic corrosion and allow for application in coastal areas.

CCA - Copper/aluminium exchanger on exhaust air with acrylic lining

Coils with copper pipes and aluminium fins with acrylic lining. Resist bi-metallic corrosion and allow for application in coastal areas.

CPHGMA - Hot gas re-heating Cu/Al coil with capacity modulation and acrylic lining

Coils with copper pipes and aluminium fins with acrylic lining.

Resist bi-metallic corrosion and allow for application in coastal areas.

Accessories separately supplied

MHSE - Immersed electrode and steam humidification module

This device is suitable for winter operation when humidity is required for the ambient without cooling the air flow.

The automatic modulating control allows you to adjust the steam production and its relative management costs to the actual requirements.

Sized in accordance with the various capacities, the device is suitable for use with un-softened water of medium conductivity and is complete with: solenoid valve feed, disposable cylinder, solenoid valve water discharge, steam distribution tube, electronic control panel with water level monitor, conductivity monitor, defoamer, manual drain force. To ensure maximum hygiene, the cylinder is automatically emptied after a preset period of stand-by. The device is equipped with an automatically activated anti-freeze function and with heating cable for the supply water duct automatic drainage.

The option is installed in a separate module external to the unit and with its own electrical board.

The control of the device, regulated by the unit, is realized through a 0-10V signal.

A return probe already assembled and wired built-in the unit is used to control the humidity level.

The option is also suitable for remote installation, on the air supply duct. Maximum distance 30 m.

Matching with immersed electrode and steam humidification

SIZE	SIZE 1	SIZE 2	SIZE 3	SIZE 4	SIZE 5	SIZE 6
Size immersed electrode steam humidifier	HSE8 (8kg/h)	HSE9 (15kg/h)	HSE25 (25kg/h)	HSE35 (35kg/h)	HSE45 (45kg/h)	HSE45 (45kg/h)

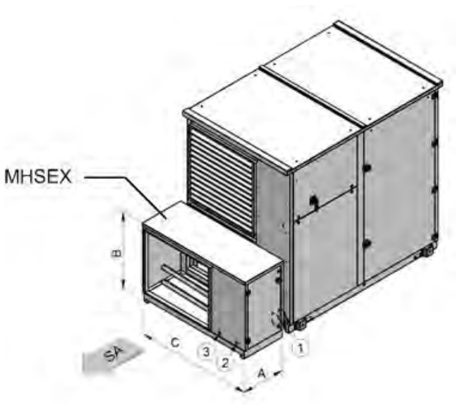
Electrical input

Size			SIZE 1	SIZE 2	SIZE 3	SIZE 4	SIZE 5	SIZE 6
F.L.A. - Full load current at max admissible conditions								
F.L.A. MHSEX - Immersed electrode and steam humidification module		A	8,7	16,2	27,0	38,0	48,8	48,8
F.L.I. - Full load power input at max admissible conditions								
F.L.I. MHSEX - Immersed electrode and steam humidification module		kW	6,0	11,3	18,8	26,3	33,8	33,8

The modulating capacity control depends on return air conditions.

This option involves variation of the main electrical data of the unit.

This accessory requires connection to a water supply network and discharge water circuit with adeguate frost protection. Requires its own power supply and have to be connected to the unit. Installation and wiring to customer care.



1. Power input
2. Steam inlet
3. Condensate discharge

Sizes of immersed electrode and steam humidification module

Size			SIZE 1	SIZE 2	SIZE 3	SIZE 4	SIZE 5	SIZE 6
A		mm	640	640	900	900	900	900
B		mm	800	800	960	1060	1060	1060
C		mm	905	905	1700	1700	1920	2225

MCHSX - Centralised steam humidification module

This device allows to supply the humidity to the space by withdrawing mains steam at an appropriate pressure.

Useful in applications where mains steam supply is available and where a significant amount of moisture is required in the winter season such as in hospitals or manufacturing.

It includes the following stainless steel components: distribution steam tube, modulating solenoid valve, condensation drain device, steam filter, hydraulic connections. It also includes the necessary control and functions. The operating pressure is 1 bar.

The device allows for an accurate delivery of moisture to the space and simplifies unit installation and management. The option is installed in a separate external module outside the unit and is connected to the electrical panel of the unit. The control of the device, which is set by the unit, is via a 0-10 V output signal from the electrical panel, which is used to control the regulating valve.

The option is also suitable for remote installation, on the air supply duct. Maximum distance 30 m.

Matching with centralised steam humidification module

Size		SIZE 1	SIZE 2	SIZE 3	SIZE 4	SIZE 5	SIZE 6
Centralized steam humidification size	1	CHS 10kg/h	CHS 15kg/h	CHS 25kg/h	CHS 35kg/h	CHS 45kg/h	CHS 50kg/h

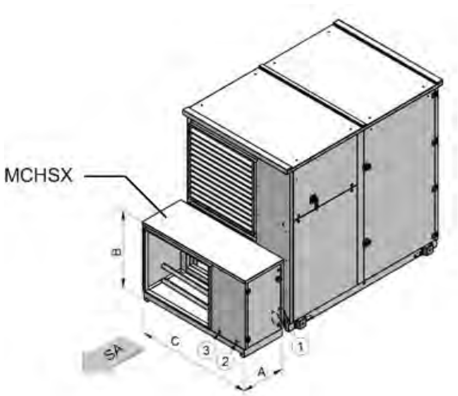
1. Maximum steam flow, refers to the pressure of 1 bar

The modulating capacity control depends on return air conditions.

This option involves variation of the main electrical data of the unit.

A shut-off valve in the unit's steam input line is to be provided (responsibility of the customer). Install the steam line in a position higher to the unit.

If the available steam supply exceeds the pressure operating range indicated, the required de-pressurization must take place outside the unit (responsibility of the customer).



1. Power input
2. Steam inlet
3. Condensate discharge

Sizes of centralised steam humidification module

Size			SIZE 1	SIZE 2	SIZE 3	SIZE 4	SIZE 5	SIZE 6
A		mm	640	640	900	900	900	900
B		mm	800	800	960	1060	1060	1060
C		mm	905	905	1700	1700	1920	2225

RSSX - Remote supply air sensor

This option detects the actual conditions in the air supply duct, to be used by the automatic control in lieu of the on-board sensor. Complete with duct probe for internal temperature and humidity sensing, surface mount plastic case, 10 m long cable, plug for quick connection to the System.

The device is designed to be installed outside the unit (to be carried out by the Customer)

Use only the supplied cable. For proper operation, do not cut the cable.

AMRX - Rubber antivibration mounts

The rubber anti-vibrating dampers are to be mounted on designated areas on the support brackets. Their function is to dampen the vibrations produced by the unit by reducing the noise transmitted to the support structures. They are elastic bodies that can dampen axial and tangential stress and their physical and mechanical properties remain constant over time thanks to the highly resistant materials they are made of. Alternatively, rubberized neoprene anti-vibration strips may be used on the unit longitudinal support members (not supplied by Clivet)

Summary table of main options and accessories

CPAN-XHE3 SERIES OPTIONS		
Option	**Description**	
Version		
RTA	Active thermodynamic recovery	Standard
RECH	Hydronic recovery device for extended operating range	Standard
Refrigeration circuit		
RCM	Cooling circuit with capacity modulation	Standard
EVE	Electronic expansion valves	Standard
CPHGM	hot gas re-heating coil with capacity modulation	Standard
CEA	Copper/aluminium exchanger on outdoor air with acrylic lining	Option
CCA	Copper/aluminium exchanger on exhaust air with acrylic lining	Option
CPHGMA	Hot gas re-heating Cu/Al coil with capacity modulation and acrylic lining	Option
Air side features		
FG4EE	G4 class air filters on outdoor and exhaust air	Standard
FEL	Electronic filters	Standard
PSTAF	Clogged filter differtial pressure switch on extract and delivery	Standard
PCOSME	Air flow constant in delivery and expulsion	Standard
PVARC	Variable air flow on supply and exhaust with CO2 probe	Option
PVARCV	Variable air flow on supply and exhaust with CO2+VOC probe	Option
MHSEX	Immersed electrodes steam humidifying module	■ .
MCHSX	Steam-powered humidifying module	■ .
RSSX	Remote supply air sensor	■ .
Electric Circuit		
CTU	Temperature and humidity control	Standard
PM	Phase monitor	Standard
REX	Integration electric heaters	Standard
MODB	RS485 Serial port with Modbus protocol	Option
LONW	Serial port with LONWORKS protocol	Option
BACIP	BACnet-IP serial communication module	Option
DESM	Smoke detector	Option
CRC	Remote control with user interface	Standard
NCRC	Remote control with user interface: not required	Option
Installation		
IO	Outdoor installation	Standard
II	Indoor installation	Option
AMRX	Rubber antivibration mounts	■ .

■ Accessory separately supplied

Unit technical features

Compressor

SIZE 1

Inverter controlled rotary-type hermetic compressor equipped with a motor protection device for overheating, overcurrents and excessive temperatures of the supply gas. It is installed on anti-vibration mounts and it is equipped with oil charge. The compressor is wrapped in a sound-absorbing hood, that reduces its sound emissions.

An oil heater, which starts automatically, keeps the oil from being diluted by the refrigerant when the compressor stops.

A single compressor is installed on a single refrigerant circuit.

SIZE 2-3-4

Inverter controlled scroll-type hermetic compressor equipped with a motor protection device for overheating, overcurrents and excessive temperatures of the supply gas. Mounted on rubber vibration dampers complete with oil charge. An oil heater is automatically activated to prevent the oil from being diluted by the refrigerant when the compressor stops.

A single compressor is installed on a single refrigerant circuit (SIZE 2) or a single compressor for each of the two refrigerant circuits (SIZE 3-4)

SIZE 5-6

Inverter controlled scroll-type hermetic compressor equipped with a motor protection device for overheating, overcurrents and excessive temperatures of the supply gas. Mounted on rubber vibration dampers complete with oil charge. An oil heater is automatically activated to prevent the oil from being diluted by the refrigerant when the compressor stops.

Two controller compressors with inverter are installed on the main cooling circuit, complete with oil level equalizer, and a single compressor with ON/OFF regulation on the secondary cooling circuit.

Structure

The base is assembled with a painted and galvanized steel frame. The internal structure is made of a load-bearing frame, in corrugated steel sheet of the type "ALUZINC" while in SIZE 1 and SIZE 2 the cowling serves as the frame.

Aluzinc has high anti-corrosion features due to the galvanic protection typical of the aluminium-zinc combination.

Panelling

The inside of the compressor panels in sheet steel is painted with polyester powder colour RAL 9001 and lined with heat-insulating and sound-proof self-extinguishing material (20mm thickness, density 9.5kg/m^3, flame resistant class 1 - DIN 53438).

Panels in the air treatment zone and the cover panels, in SIZE 3, SIZE 4, SIZE 5 and SIZE 6, sandwich-type double walled in sheet steel with polyurethane insulation (40 kg /m3), 6/10mm thick external sheet galvanised and painted with polyester powder colour RAL 9001, polyurethane thickness 40mm with thermal conductivity of 0.022W/mK, hot-dip galvanized internal sheet 5/10mm thickness. The panel also has a PVC profile for thermal insulation with a rubber gasket in EPDM which provides an air-tight seal, colour RAL 9001.

In SIZE 1, SIZE 2, the same type of panels are installed as those in the compressor space.

All panelling can easily be removed to allow complete accessibility to internal components.

Internal exchanger

- exchanger for the outdoor air handling
- exchanger for energy recovery of extracted air

Direct expansion finned coil exchanger made with copper pipes placed on staggered rows mechanically expanded to better adhere to the fin collar. The fins are made from aluminium with a corrugated surface and adequately distanced to ensure the maximum heat exchange efficiency.

Fan

- Supply fan
- Extraction fan

Fans (plug-fan type) without reversed blade screw, driven by directly coupled brushless DC motors with electronic control. The fan blades are designed to optimise aerodynamics and reduce running noise, and are made in a high performance plastic. No drive sizing is required.

Refrigeration circuit

Refrigeration circuit with:

- refrigerant charge
- sight glass with moisture and liquid indicator
- high pressure safety pressure switch
- filter dryer
- high pressure safety valve
- electronic expansion valve
- non-return valve
- 4-way reverse cycle valve
- liquid receiver
- Reheating by hot gas recovery to modulation capacity

Filtration

- outdoor air intake side
- extraction ambient side

Pleated filter for greater filtering surface, made of a galvanized sheet frame with a galvanized and electric-welded protective mesh, and regenerable filtering media made from polyester fibre sized with synthetic resins. G4 efficiency according to CEN-EN 779 standard (Eurovent classification EU4/5 - separation average 90.1% ASHRAE 52-76 Atm). Self-extinguishing type (flame resistant class 1 - DIN 53438).

- outdoor air intake side

On the outdoor air intake side, a highly efficient second filtration stage is installed, by means of an aluminium alloy electronic filter complete with metal pre-filter, realized by active electrostatic filtering cells. The electronic control circuit is integrated with a watertight seal which allows it to be washed.

The filtration efficiency is higher than 95% for particles with a diameter greater than 0,5 μm, and is equivalent to the H10 classification used in traditional filters.

Tray

Condense collection tray made of 1050 H24 aluminium alloy with anti-condensation insulation, welded and equipped with siphon drain tube.

Electrical panel

The electrical panel is positioned inside the units, with access through a swing door that is opened by a special key.

The capacity section includes:

- main door lock isolator switch
- compressor circuit breaker
- compressor power supply remote control switch
- fan motor thermal protections of internal and external section
- circuit breaker to protect auxiliary circuit
- inverter for compressor control
- heating elements

The microprocessor control section includes:

- treated air temperature control
- daily, weekly programmer of temperature set-point and unit on/off
- compressor overload protection and timer
- self-diagnosis system with immediate display of the error code
- clean contacts for ON-OFF remote, fan mode, compressor mode, summer/winter mode

Control keypad, including:

- display to indicate operating status and mode
- display of the set values and the error codes
- PRG key for unit configuration and parameters display
- ALARM button to access the alarm management functions
- operating mode key
- On/Off and manual reset button for overload device activation
- UP and DOWN keys for the navigation of the menu and the sub-menu

Accessories

- Active thermodynamic recovery
- Hydronic recovery device for extended operating range
- Indoor installation
- Copper/aluminium exchanger on outdoor air with acrylic lining
- Copper/aluminium exchanger on exhaust air with acrylic lining
- Hot gas re-heating Cu/Al coil with capacity modulation and acrylic lining
- Variable air flow on supply and exhaust with CO2 probe
- Variable air flow on supply and exhaust with CO2+VOC probe
- RS485 Serial port with Modbus protocol
- RS485 Serial port with LonWorks protocol
- Serial port RS485 with BACnet protocol
- Smoke detector
- Remote control with user interface: not required

Accessories separately supplied

- Immersed electrodes steam humidifying module
- Steam-powered humidifying module
- Remote supply air sensor
- Rubber antivibration mounts

Test

Unit manufactured to ISO 9001 standard and commissioned upon production completion.

General technical data

General technical data - Performance

Size			Size 1	Size 2	SIZE 3	Size 4	Size 5	Size 6
Operation with constant supply temperature								
Standard air flow								
Nominal air flow		l/s	361	611	1278	2000	2638	3333
Nominal air flow		m^3/h	1300	2200	4600	7200	9500	12000
Max external static pressure (supply)		Pa	630	630	630	600	420	630
Max external static pressure (extraction)		Pa	630	630	630	630	540	630
Cooling								
Total cooling capacity	1	kW	10,60	17,50	38,7	58,4	79,0	95,9
Re-heating capacity	1	kW	2,70	4,20	10,9	14,9	21,3	22,9
Compressor power input	1	kW	2,91	4,92	11,10	15,70	20,40	23,20
EER_C	1	-	4,57	4,41	4,47	4,67	4,91	5,12
Heating								
Heating capacity	2	kW	5,93	10,00	21,0	32,9	43,4	54,9
Compressor power input	2	kW	0,71	1,35	2,54	4,22	5,75	8,77
COP_C	2	-	8,38	7,45	8,28	7,80	7,55	6,26

Operation at the maximum available capacity								
Standard air flow								
Nominal air flow		l/s	361	611	1278	2000	2638	3333
Nominal air flow		m^3/h	1300	2200	4600	7200	9500	12000
Max external static pressure (supply)		Pa	630	630	630	600	420	630
Max external static pressure (extraction)		Pa	630	630	630	630	540	630
Cooling								
Total cooling capacity	3	kW	10,60	17,50	38,7	58,4	79.0	95.9
Compressor power input	3	kW	3,26	5,52	12,5	17,7	22,9	26.1
Additional available capacity to space	3	kW	3,57	5,67	14,0	19.8	27.7	30.9
EER_C	3	-	3,25	3,18	3,10	3,31	3.45	3.68
Heating								
Heating capacity	4	kW	10,50	17,80	37,1	58,2	76,8	96,9
Compressor power input	4	kW	2,28	3,77	7,13	11,2	14,4	18,3
COP_C	4	-	4,61	4,72	5,21	5,20	5,33	5,29

Operation with high airflow								
Maximum air flow								
Nominal air flow		l/s	528	972	1944	2556	3194	3889
Nominal air flow		m^3/h	1900	3500	7000	9200	11500	14000
Max external static pressure (supply)		Pa	630	470	630	450	345	630
Max external static pressure (extraction)		Pa	630	630	630	530	400	630
Cooling								
Total cooling capacity	5	kW	9,20	18,20	31,9	45,1	62,0	80,6
Compressor power input	5	kW	1,56	3,38	4,46	6,97	13,8	17,8
EER_C	5	-	5,89	5,38	7,15	6,48	4,50	4,51
Heating								
Heating capacity	6	kW	6,00	11,10	22,10	29,10	36,30	44,20
Compressor power input	6	kW	0,54	1,31	2,48	3,11	3,40	5,44
COP_C	6	-	11,10	8,46	8,91	9,36	10,7	8,14

DB = dry bulb

WB = wet bulb

EER_C = Thermodynamic efficiency of the system in cooling mode

COP_C = Thermodynamic efficiency of the system in heating mode

1. Outdoor air temperature: 35°C D.B./ 24°C W.B.. Extracted air temperature 26°C D.B.. Supply air humidity ratio: 11g/kg. Supply air temperature 24°C D.B.
2. Outdoor air temperature 7°C D.B./ 6.0°C W.B.. External air temperature 20°C D.B. / 12°C W.B.. Supply air temperature 20°C D.B.
3. Outdoor air temperature 35°C D.B./ 24°C W.B.. Extracted air temperature: 26°C D.B.. Supply air humidity ratio: 11g/kg
4. Outdoor air: 7°C D.B./ 6.0°C W.B.. Extracted air temperature: 20°C D.B. / 12°C W.B.. Supply air temperature: 30°C D.B.
5. Outdoor air temperature 35°C D.B./ 24°C W.B.. Extracted air temperature 26°C D.B.. Supply air temperature 22°C D.B.
6. Outdoor air temperature: 7°C D.B./ 6.0°C W.B.. Extracted air temperature: 20°C D.B. / 12°C W.B.. Supply air temperature: 16°C D.B.

General technical data - Construction

Size			Size 1	Size 2	SIZE 3	Size 4	Size 5	Size 6
Compressor								
Type of compressors			ROT	Scroll	Scroll	Scroll	Scroll	Scroll
No. of compressors		No	1	1	2	2	3	3
Std Capacity control steps		No	20-100%	20-100%	10-100%	10-100%	8-100%	8-100%
Refrigeration circuits		No	1	1	2	2	2	2
Air Handling Section Fans (Supply)								
Type of supply fan			RAD	RAD	RAD	RAD	RAD	RAD
Number of supply fans		No	1	1	1	1	1	2
Fan diameter		mm	310	355	500	630	630	500
Minimum air flow		l/s	278	444	917	1444	2083	2639
Minimum air flow		m^3/h	1000	1600	3300	5200	7500	9500
Maximum air flow		l/s	528	972	1944	2556	3194	3889
Maximum air flow		m^3/h	1900	3500	7000	9200	11500	14000
Installed unit power		kW	0,80	0,90	2,70	2,80	2,80	2,70
Max. static pressure supply fan		Pa	630	630	630	600	420	630
Fans (Exhaust)								
Type of exhaust fan			RAD	RAD	RAD	RAD	RAD	RAD
Number of exhaust fans		No	1	1	1	1	1	2
Fan diameter		mm	310	355	500	630	630	500
Exhaust air flow		l/s	361	611	1278	2000	2638	3333
Installed unit power		kW	0,80	0,90	2,70	2,80	2,80	2,70
Max. exhaust static pressure		Pa	630	630	630	600	540	630
Connections								
Condensate discharge			1" GAS	1" GAS	1" GAS	1" GAS	1" GAS	1" GAS
Power supply								
Standard power supply		V	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50
Dimensions								
A - Length		mm	1895	1895	2465	2465	2465	2465
B - Width		mm	950	950	1735	1735	2025	2330
C - Height		mm	1025	1625	1810	2260	2260	2260
Standard unit weights								
Shipping weight		kg	320	450	1070	1285	1450	1670
Operating weight		kg	320	450	1070	1285	1450	1670

ROT = rotary compressor

SCROLL = scroll compressor

RAD = radial fan

Electrical data

Size			Size 1	Size 2	SIZE 3	Size 4	Size 5	Size 6
F.L.A. - Full load current at max admissible conditions								
F.L.A. - Compressor 1		A	15.1	17.4	17.4	34.5	34.5	34.5
F.L.A. - Compressor 2		A	-	-	17.4	34.5	34.5	34.5
F.L.A. - Compressor 3		A	-	-	-	-	14.6	30.9
F.L.A. - Single supply fan		A	1.6	1.7	4.4	4.3	4.3	6.0
F.L.A. - Single exhaust air fan		A	1.6	1.7	4.4	4.3	4.3	6.0
F.L.A. - Heating elements		A	5	6	13	17	26	35
F.L.A. - Total		A	23.5	27.8	57.1	95.4	119	147
L.R.A. - Locked rotor amperes								
L.R.A. - Compressor 1		A	15.1	17.4	17.4	34.5	34.5	34.5
L.R.A. - Compressor 2		A	-	-	17.4	34.5	34.5	34.5
L.R.A. - Compressor 3		A	-	-	-	-	101	174
L.R.A. - Single supply fan		A	1.6	1.7	4.4	4.3	4.3	6.0
L.R.A. - Single exhaust air fan		A	1.6	1.7	4.4	4.3	4.3	6.0
L.R.A. - Heating elements		A	5	7	14	19	29	38
F.L.I. - Full load power input at max admissible conditions								
F.L.I. - Compressor 1		kW	5.60	10.3	10.3	20.0	20.0	20.0
F.L.I. - Compressor 2		kW	-	-	10.3	20.0	20.0	20.0
F.L.I. - Compressor 3		kW	-	-	-	-	5.30	17.2
F.L.I. - Single supply fan		kW	0.8	0.9	2.8	2.8	2.8	2.7
F.L.I. – Single exhaust air fan		kW	0.8	0.9	2.8	2.8	2.8	2.7
F.L.I. - Heating elements		kW	3	4	9	12	18	24
F.L.I. - Total		kW	10.5	17.0	35.5	57.8	72.4	89.3
M.I.C. Maximum inrush current								
M.I.C. - Value		A	23.5	27.8	57.1	95.4	185	286

Data refer to standard units.
Power supply: 400/3/50 Hz +/- 10%
Voltage unbalance: max 2 %
Values not including accessories

Sound levels

The sound pressure level refers to a distance of 1 meter from the outer surface of the unit operating in open field.

Static pressure 50 Pa (UNI EN ISO 9614-2)

For the standard air supply the total sound power levels for the diverse values of available static pressure are shown.

Please note that when the unit is installed in conditions different from nominal test conditions (e.g. near walls or obstacles in general), the sound levels may undergo substantial variations.

AIR SUPPLY MINIMUM (50 Pa)

Size	Sound power level (dB)								Sound pressure level	Sound power level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
Size 1	54	52	56	59	68	69	62	70	58	74
Size 2	55	53	57	60	69	70	63	71	59	75
SIZE 3	60	58	61	64	72	73	66	74	61	79
Size 4	66	68	66	66	71	72	66	73	59	79
Size 5	67	69	67	67	72	73	67	74	60	80
Size 6	69	68	70	73	75	74	69	74	62	81

AIR SUPPLY STANDARD (50 Pa)

Size	Sound power level (dB)								Sound pressure level	Sound power level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
Size 1	59	60	65	69	72	72	63	69	60	77
Size 2	60	61	66	70	73	73	65	70	61	78
SIZE 3	66	65	67	70	73	74	67	74	61	80
Size 4	67	69	67	67	72	73	67	74	60	80
Size 5	74	75	75	74	75	74	69	74	62	83
Size 6	74	75	77	79	78	76	71	73	64	85

AIR SUPPLY STANDARD (100,200,300 Pa)

Size	Sound power level (dB)		
	Available head (Pa)		
	100	200	300
Size 1	77	77	78
Size 2	78	78	79
SIZE 3	80	80	81
Size 4	80	80	81
Size 5	83	84	84
Size 6	85	85	86

MAXIMUM AIR SUPPLY (50 Pa)

Size	Sound power level (dB)								Sound pressure level	Sound power level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
Size 1	65	69	75	77	77	73	65	68	64	82
Size 2	66	70	76	78	78	74	66	69	65	83
SIZE 3	74	75	77	79	78	77	72	74	66	85
Size 4	77	78	77	76	77	77	71	75	64	85
Size 5	78	80	79	78	77	76	71	74	64	86
Size 6	77	78	80	82	81	79	74	75	67	88

Operation with constant supply temperature
T_OA = 35/24°C
T_RA = 26°C
T_SA = 24°C
X_SA = 11g/kg
T_OA = Outdoor air temperature at Dry/Wet bulb [°C]
T_OA = Exhaust air temperature at Dry bulb [°C]
T_SA = Dry bulb supply air temperature [°C]
X_SA = Supply air humidity ratio [g/kg]

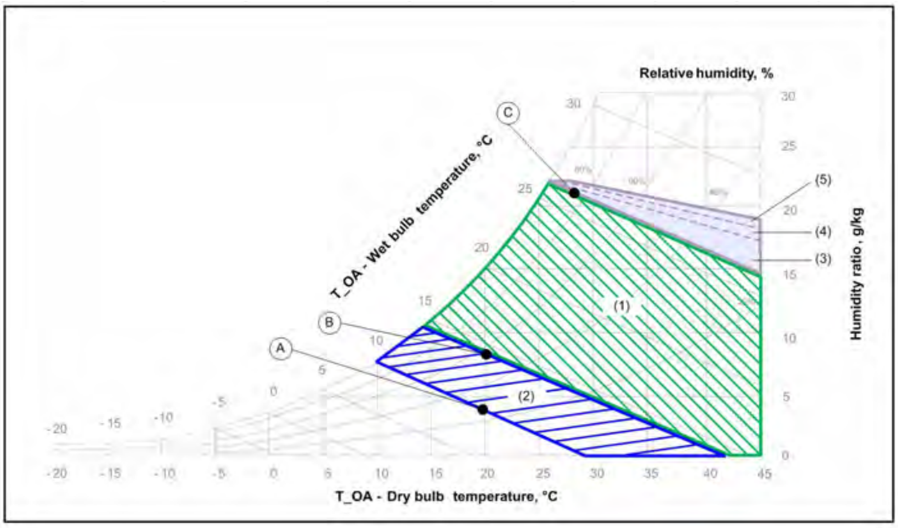
Operating ranges

Operating range (Cooling)

The limits are indicative and take into consideration:

- general and non specific sizes
- unit correctly installed and serviced

Outdoor air



1 = Normal operating range
2 = Operating range with capacity modulation
3 = With option RECH - "Hydronic recovery device", with T_RA = 26° D.B.
4 = With option RECH - "Hydronic recovery device", with T_RA = 24° D.B.
5 = With option RECH - "Hydronic recovery device", with T_RA = 22° D.B.

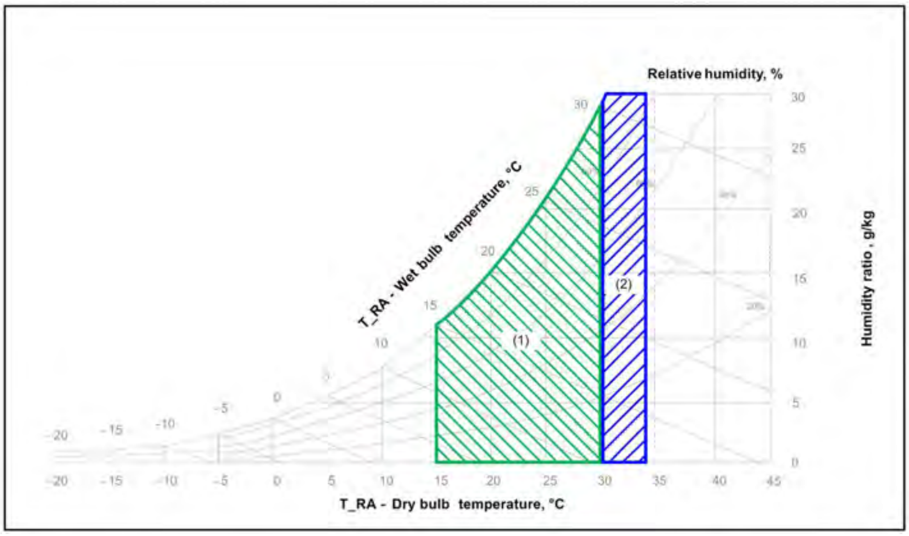
T_OA = outdoor air temperature
T_RA = extracted air temperature
DB = dry bulb
WB = wet bulb

Outdoor air temperature limit at wet bulb

			T_OA (W.B)
A		°C	10
B		°C	14
C		°C	26

T_RA = extracted air temperature

Extracted air



1 = Normal operating range
2 = Operating range with capacity modulation

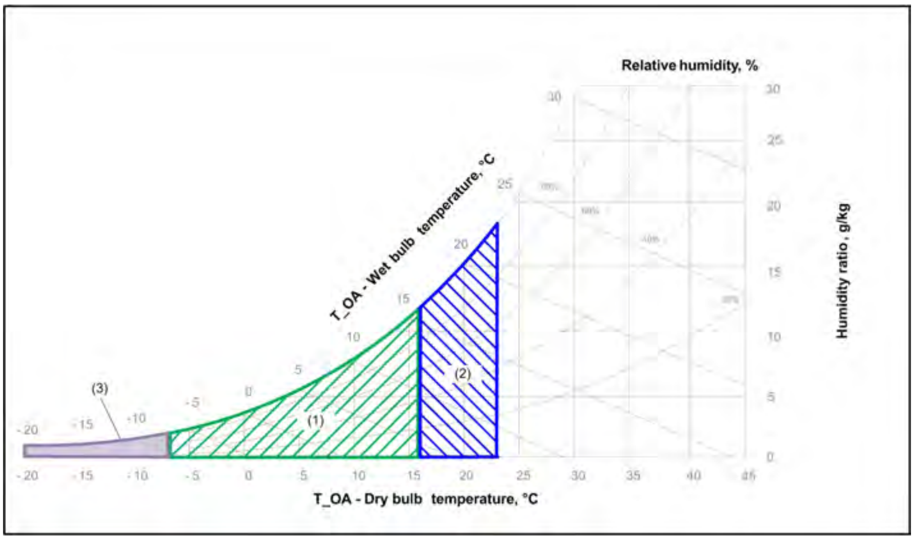
T_RA = extracted air temperature
DB = dry bulb
WB = wet bulb

Operating range (Heating)

The limits are indicative and take into consideration:

- general and non specific sizes
- unit correctly installed and serviced

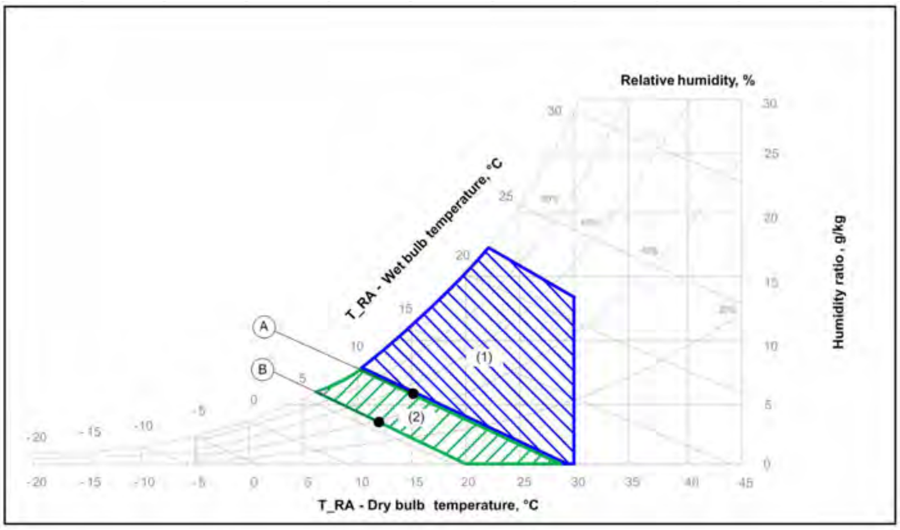
Outdoor air



1 = Normal operating range
2 = Operating range with capacity modulation
3 = With "RECH - Hydronic recovery device"

T_OA = outdoor air temperature
DB = dry bulb
WB = wet bulb

Extracted air



1 = Normal operating range
2 = Operation in which they could be defrost cycles

T_RA = extracted air temperature
DB = dry bulb
WB = wet bulb

Extracted air temperature limit at wet bulb

			T_RA (W.B)
A		°C	10,2
B		°C	6,0

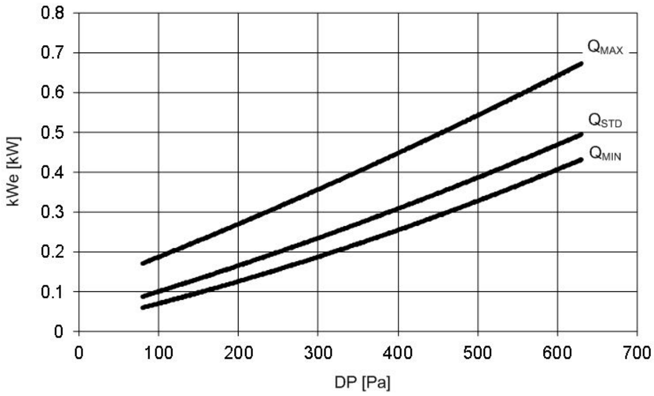
T_RA = extracted air temperature
WB = wet bulb

WARNING: failure to comply with the lower limit of wet bulb temperature can cause the unit to stop.

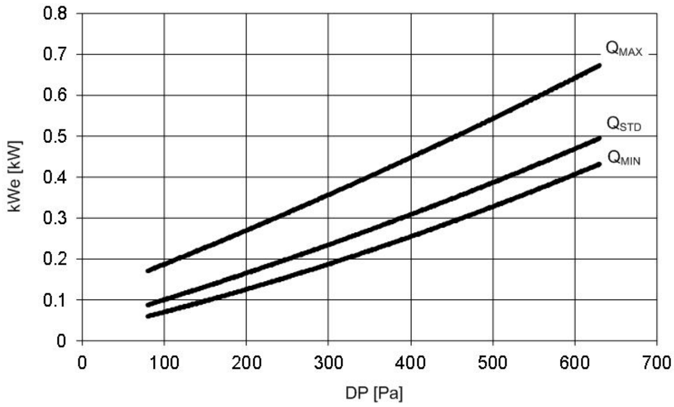
Fan performance

SIZE 1

Supply fans



Exhaust fans



kWe = total power input(kW)
DP = static pressure in Pa

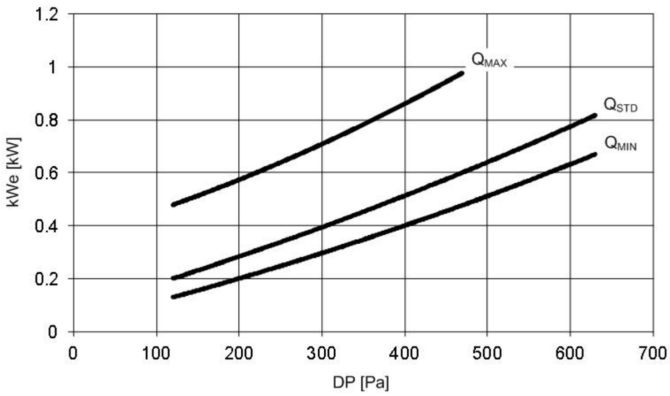
Qmin = 1.000 m3/h
Qstd = 1.300 m3/h
Qmax = 1.900 m3/h

Pressure drop of optional components

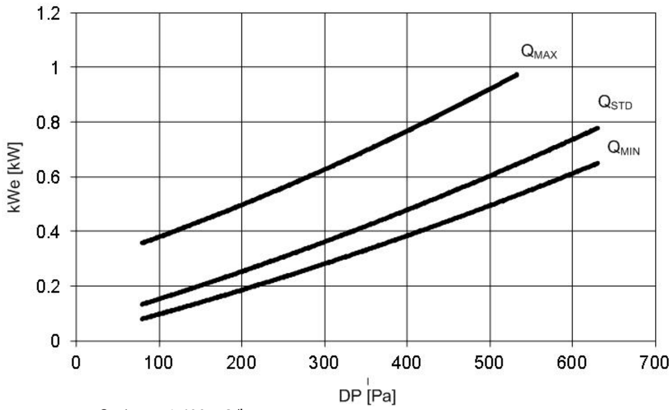
		Qmin	Qstd	Qmax
RECH - Hydronic recovery device for extended operating range	Pa	33	48	83

SIZE 2

Supply fans



Exhaust fans



kWe = total power input(kW)
DP = static pressure in Pa

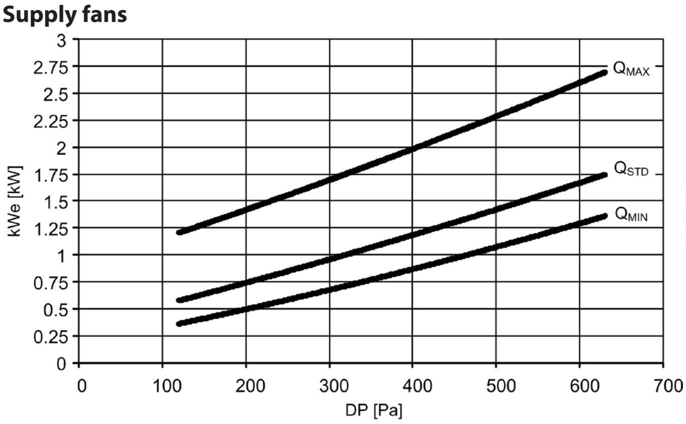
Qmin = 1.600 m3/h
Qstd = 2.200 m3/h
Qmax = 3.500 m3/h

Pressure drop of optional components

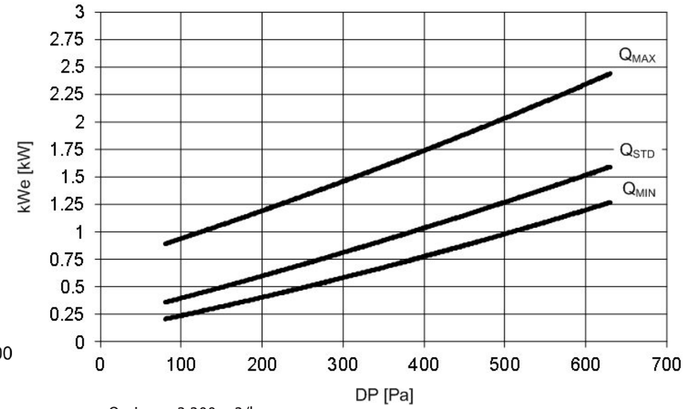
		Qmin	Qstd	Qmax
RECH - Hydronic recovery device for extended operating range	Pa	29	45	89

SIZE 3

Supply fans



Exhaust fans



kWe = total power input(kW)
DP = static pressure in Pa

Qmin = 3.300 m3/h
Qstd = 4.600 m3/h
Qmax = 7.000 m3/h

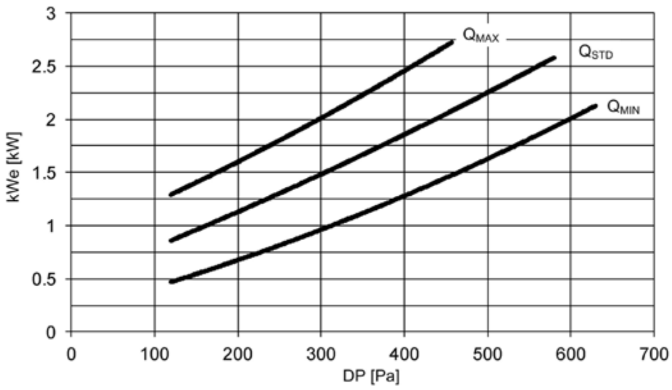
Pressure drop of optional components

		Qmin	Qstd	Qmax
RECH - Hydronic recovery device for extended operating range	Pa	30	48	88

The performance takes into account the pressure drops in the unit (pressure drops in treatment coil, standard filters, etc.).
To determine the performance required of the fans, you must add to the usable static pressure desired the pressure drops of any accessories.

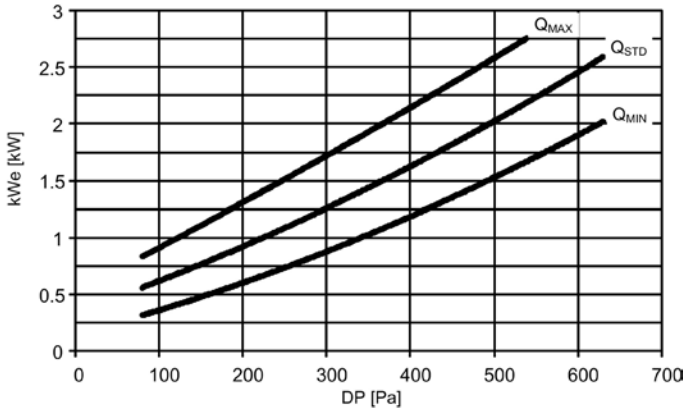
Size 4

Supply fans



kWe = total power input(kW)
DP = static pressure in Pa

Exhaust fans



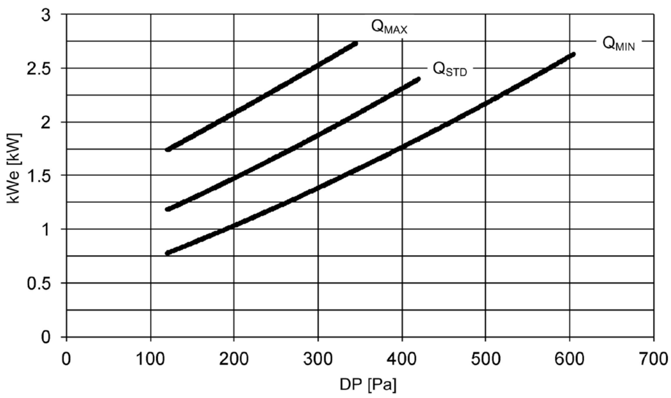
Qmin = 5.200 m3/h
Qstd = 7.200 m3/h
Qmax = 9.200 m3/h

Pressure drop of optional components

		Qmin	Qstd	Qmax
RECH - Hydronic recovery device for extended operating range	Pa	40	64	92

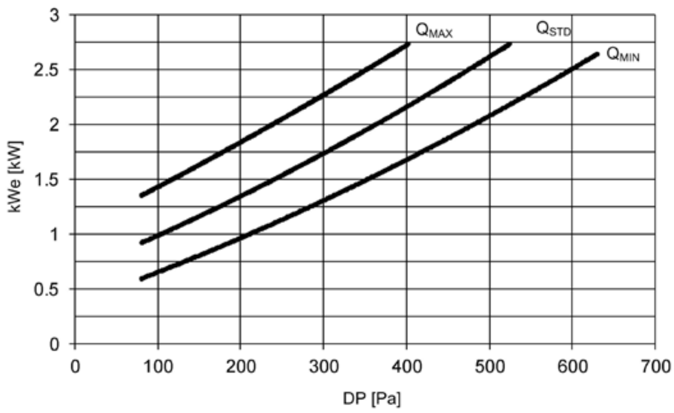
SIZE 5

Supply fans



kWe = total power input(kW)
DP = static pressure in Pa

Exhaust fans



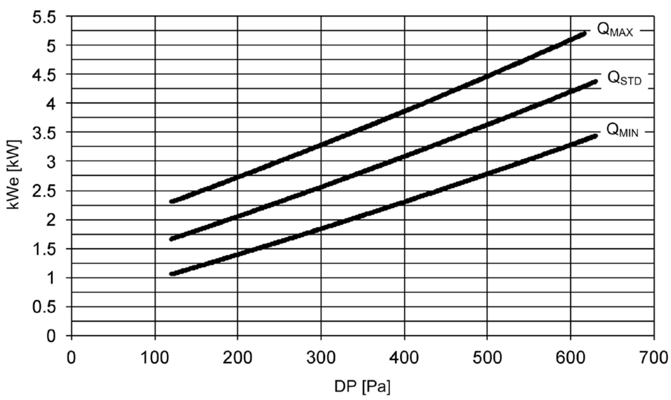
Qmin = 7.500 m3/h
Qstd = 9.500 m3/h
Qmax = 11.500 m3/h

Pressure drop of optional components

		Qmin	**Qstd**	**Qmax**
RECH - Hydronic recovery device for extended operating range	Pa	47	67	88

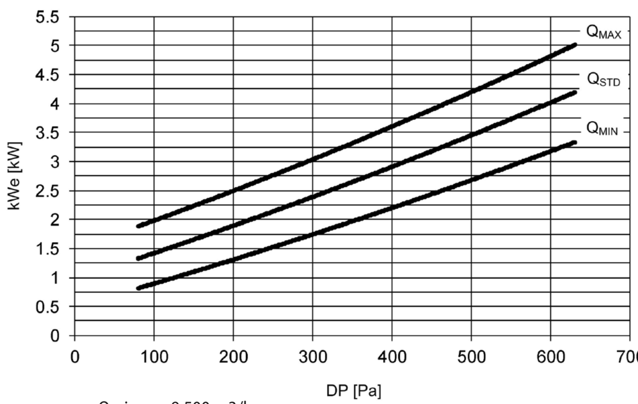
SIZE 6

Supply fans



kWe = total power input(kW)
DP = static pressure in Pa

Exhaust fans



Qmin = 9.500 m3/h
Qstd = 12.000 m3/h
Qmax = 14.000 m3/h

Pressure drop of optional components

		Qmin	Qstd	Qmax
RECH - Hydronic recovery device for extended operating range	Pa	50	70	88

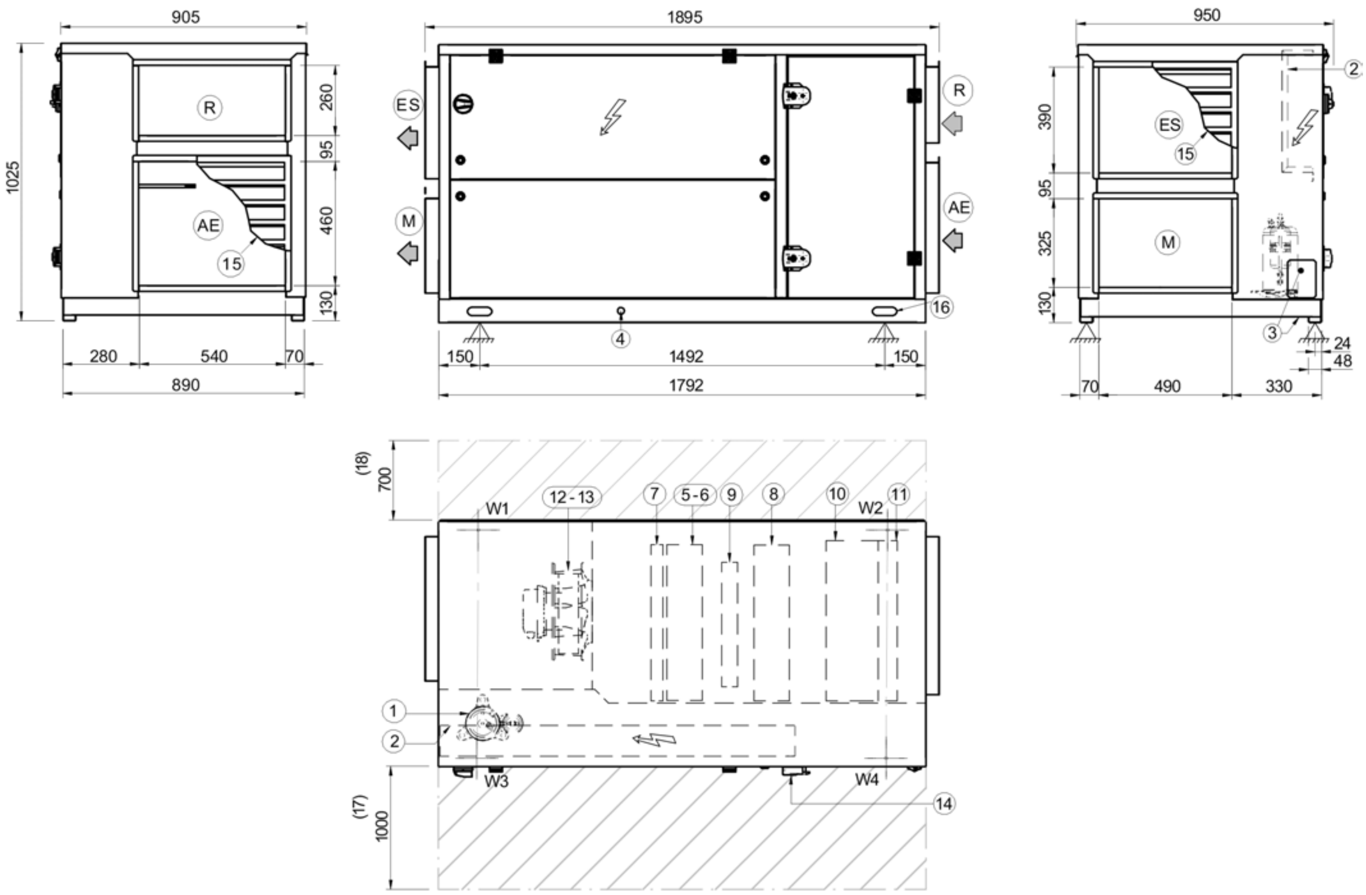
The performance takes into account the pressure drops in the unit (pressure drops in treatment coil, standard filters, etc.).
To determine the performance required of the fans, you must add to the usable static pressure desired the pressure drops of any accessories.

Dimensional drawings

SIZE 1

DAA5Gsize1_0

Date: 21/09/2012



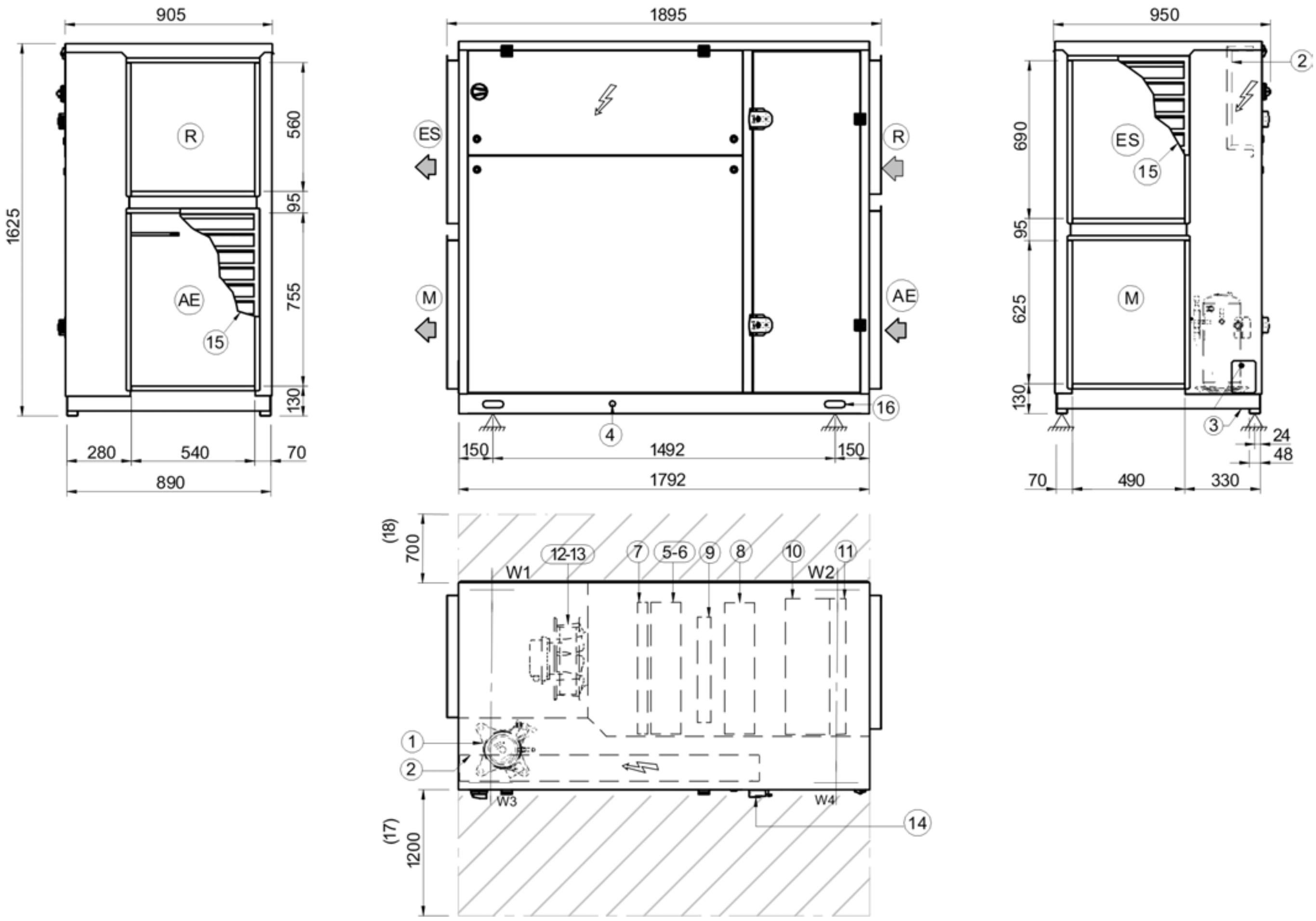
(1) Capacity modulating compressor
(2) Electrical panel
(3) Power input
(4) Condensation drain pipe Ø 20 mm
(5) Standard outdoor air exchanger (below)
(6) Exhaust air standard exchanger (above)
(7) Capacity modulating post-heating with hot gas recovery
(8) Hydronic recovery device for extended operating range (Optional)
(9) Electrical heaters
(10) Electronic filters
(11) Class G4 air filters on outdoor and exhaust air
(12) Supply fan (below)
(13) Exhaust fan (above)
(14) Air filters access
(15) Grid for indoor installation (Optional)
(16) Lifting holes
(17) Functional spaces
(18) If the unit is placed against the wall provide the space for the replacement of the roof electric fan
(R) Return Air
(M) Supply Air
(AE) Outdoor air intake
(ES) Exhaust air

WEIGHT DISTRIBUTION			
Size			Size 1
W1 Supporting Point		kg	78
W2 Supporting Point		kg	82
W3 Supporting Point		kg	82
W4 Supporting Point		kg	78
Shipping weight		kg	320

SIZE 2

DAA5Gsize2_0

Date: 21/09/2012



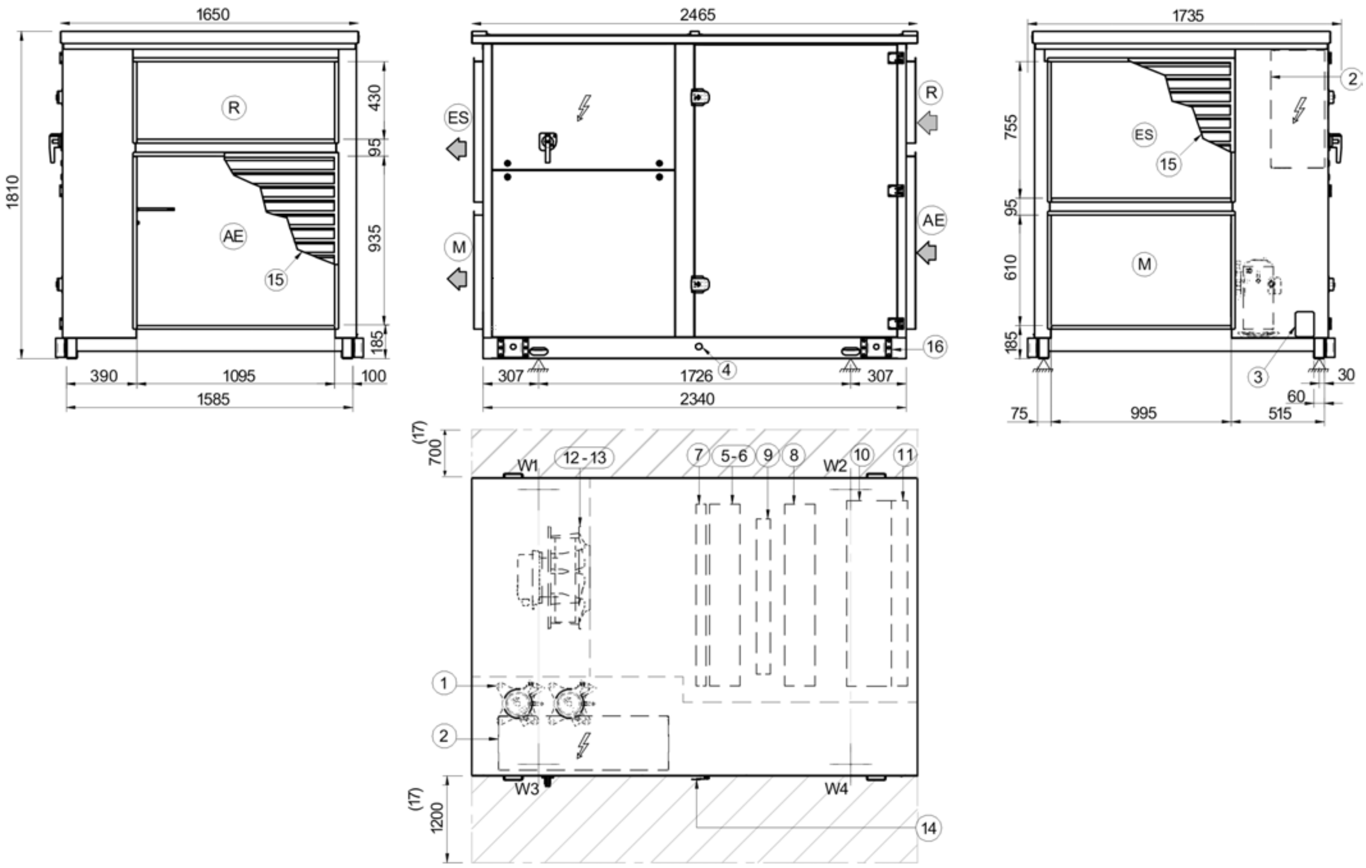
(1) Capacity modulating compressor
(2) Electrical panel
(3) Power input
(4) Condensation drain pipe Ø 20 mm
(5) Standard outdoor air exchanger (below)
(6) Exhaust air standard exchanger (above)
(7) Capacity modulating post-heating with hot gas recovery
(8) Hydronic recovery device for extended operating range (Optional)
(9) Electrical heaters
(10) Electronic filters
(11) Class G4 air filters on outdoor and exhaust air
(12) Supply fan (below)
(13) Exhaust fan (above)
(14) Air filters access
(15) Grid for indoor installation (Optional)
(16) Lifting holes
(17) Functional spaces
(18) If the unit is placed against the wall provide the space for the replacement of the roof electric fan
(R) Return Air
(M) Supply Air
(AE) Outdoor air intake
(ES) Exhaust air

WEIGHT DISTRIBUTION			
Size			Size 2
W1 Supporting Point		kg	110
W2 Supporting Point		kg	115
W3 Supporting Point		kg	116
W4 Supporting Point		kg	109
Shipping weight		kg	450

SIZE 3

DAA5Gsize3_0

Date: 21/09/2012



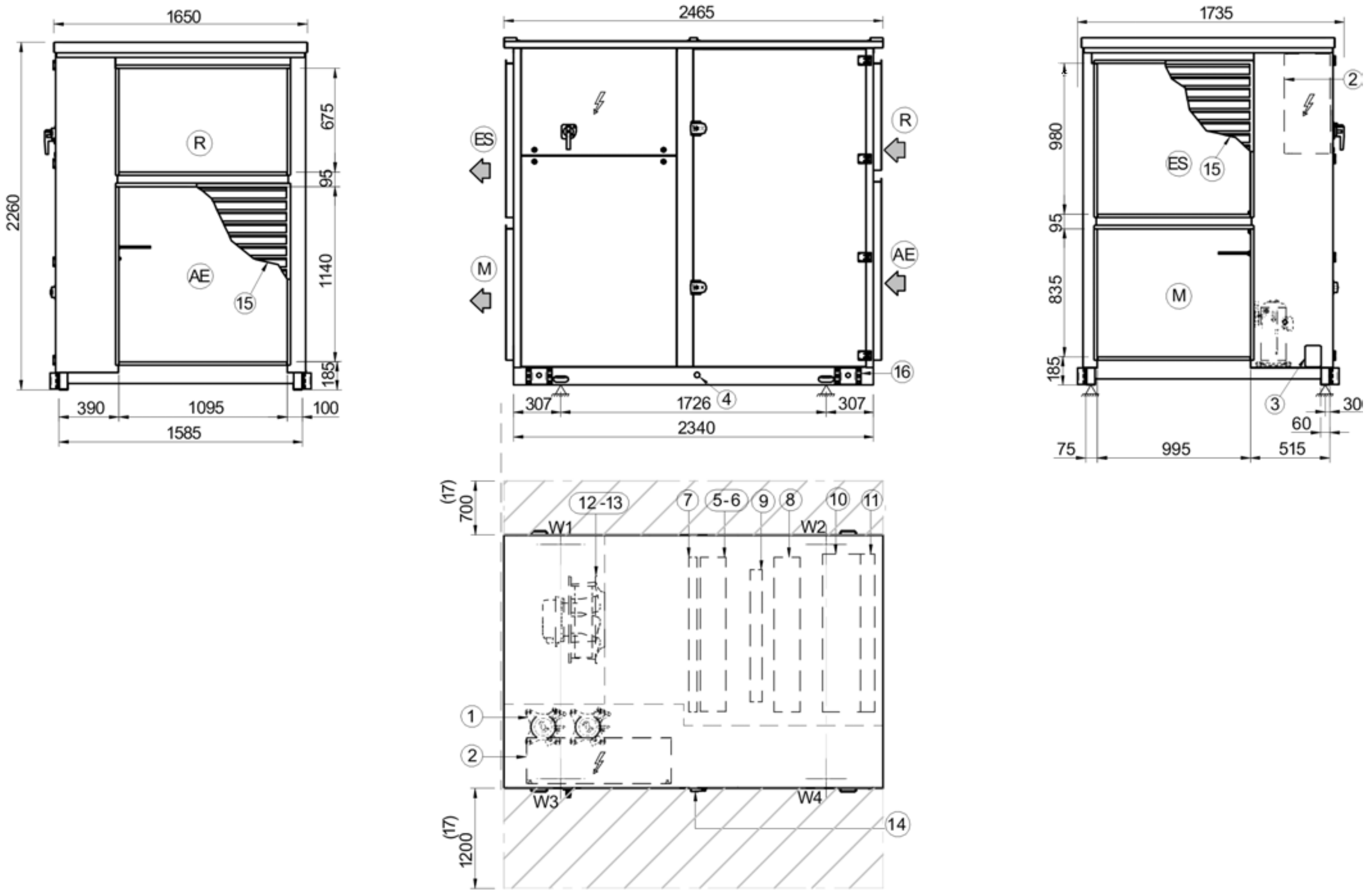
(1) Capacity modulating compressor
(2) Electrical panel
(3) Power input
(4) Condensation drain pipe Ø 20 mm
(5) Standard outdoor air exchanger (below)
(6) Exhaust air standard exchanger (above)
(7) Capacity modulating post-heating with hot gas recovery
(8) Hydronic recovery device for extended operating range (Optional)
(9) Electrical heaters
(10) Electronic filters
(11) Class G4 air filters on outdoor and exhaust air
(12) Supply fan (below)
(13) Exhaust fan (above)
(14) Air filters access
(15) Grid for indoor installation (Optional)
(16) Support brackets (can be removed after the unit is positioned)
(17) Functional spaces
(18) If the unit is placed against the wall provide the space for the replacement of the roof electric fan
(R) Return Air
(M) Supply Air
(AE) Outdoor air intake
(ES) Exhaust air

WEIGHT DISTRIBUTION			
Size			SIZE 3
W1 Supporting Point		kg	259
W2 Supporting Point		kg	273
W3 Supporting Point		kg	289
W4 Supporting Point		kg	249
Shipping weight		kg	1070

Size 4

DAA5Gsize4_0

Date: 21/09/2012



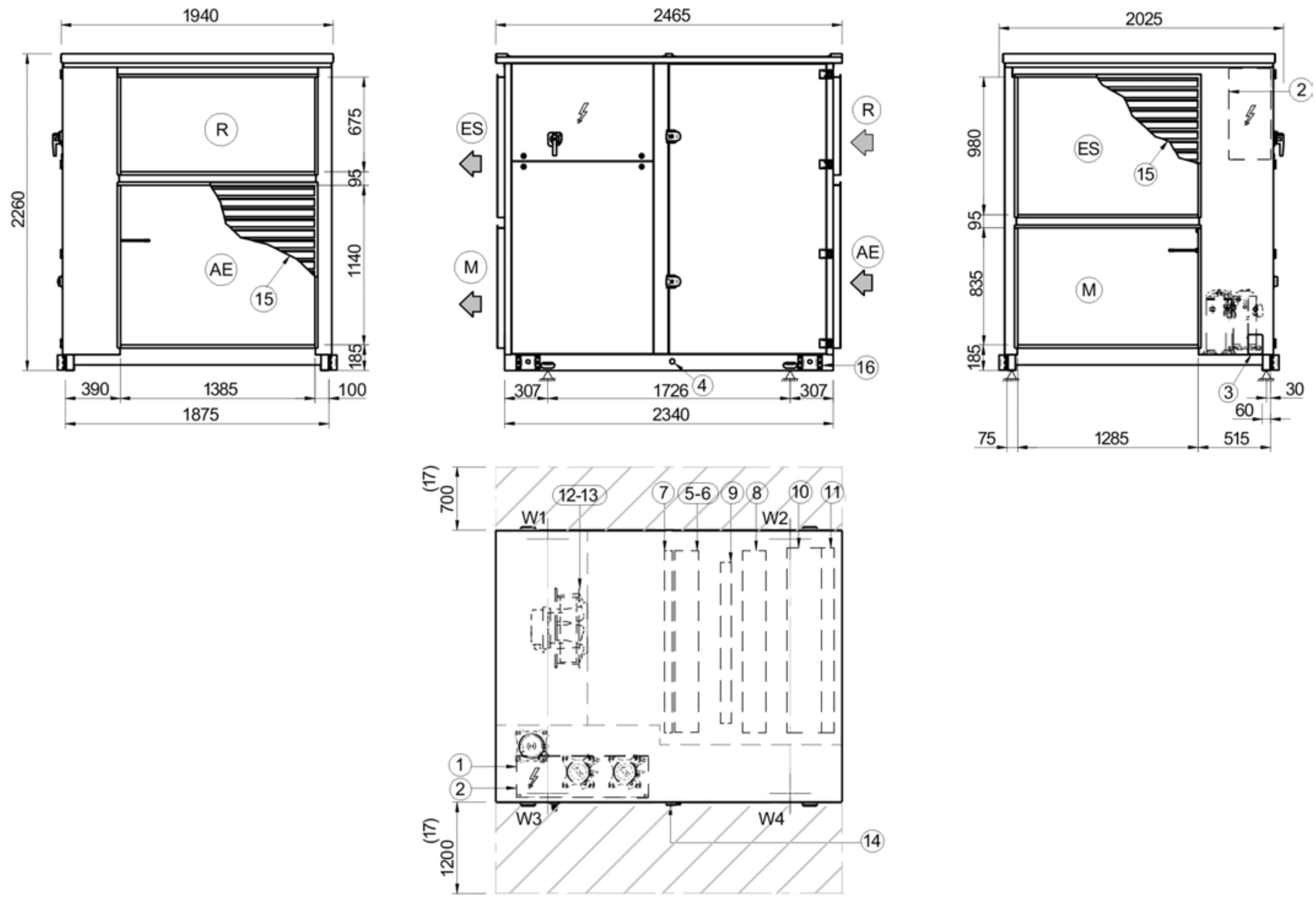
(1) Capacity modulating compressor
(2) Electrical panel
(3) Power input
(4) Condensation drain pipe Ø 20 mm
(5) Standard outdoor air exchanger (below)
(6) Exhaust air standard exchanger (above)
(7) Capacity modulating post-heating with hot gas recovery
(8) Hydronic recovery device for extended operating range (Optional)
(9) Electrical heaters
(10) Electronic filters
(11) Class G4 air filters on outdoor and exhaust air
(12) Supply fan (below)
(13) Exhaust fan (above)
(14) Air filters access
(15) Grid for indoor installation (Optional)
(16) Support brackets (can be removed after the unit is positioned)
(17) Functional spaces
(18) If the unit is placed against the wall provide the space for the replacement of the roof electric fan
(R) Return Air
(M) Supply Air
(AE) Outdoor air intake
(ES) Exhaust air

WEIGHT DISTRIBUTION			
Size			Size 4
W1 Supporting Point		kg	312
W2 Supporting Point		kg	328
W3 Supporting Point		kg	347
W4 Supporting Point		kg	299
Shipping weight		kg	1285

SIZE 5

DAA5Gsize5_0

Date: 21/09/2012



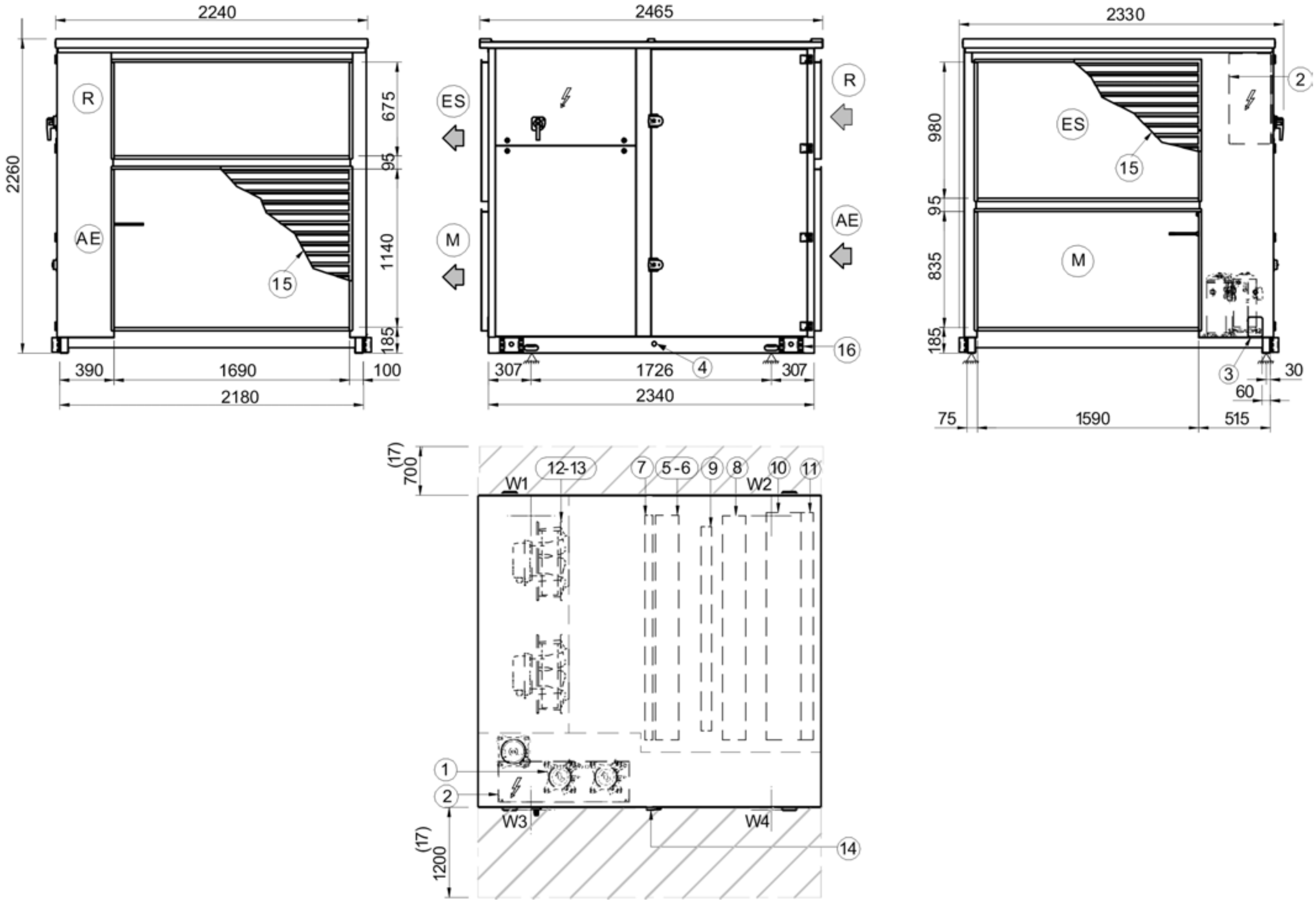
(1) Capacity modulating compressor
(2) Electrical panel
(3) Power input
(4) Condensation drain pipe Ø 20 mm
(5) Standard outdoor air exchanger (below)
(6) Exhaust air standard exchanger (above)
(7) Capacity modulating post-heating with hot gas recovery
(8) Hydronic recovery device for extended operating range (Optional)
(9) Electrical heaters
(10) Electronic filters
(11) Class G4 air filters on outdoor and exhaust air
(12) Supply fan (below)
(13) Exhaust fan (above)
(14) Air filters access
(15) Grid for indoor installation (Optional)
(16) Support brackets (can be removed after the unit is positioned)
(17) Functional spaces
(18) If the unit is placed against the wall provide the space for the replacement of the roof electric fan
(R) Return Air
(M) Supply Air
(AE) Outdoor air intake
(ES) Exhaust air

WEIGHT DISTRIBUTION			
Size			Size 5
W1 Supporting Point		kg	348
W2 Supporting Point		kg	370
W3 Supporting Point		kg	399
W4 Supporting Point		kg	334
Shipping weight		kg	1450

SIZE 6

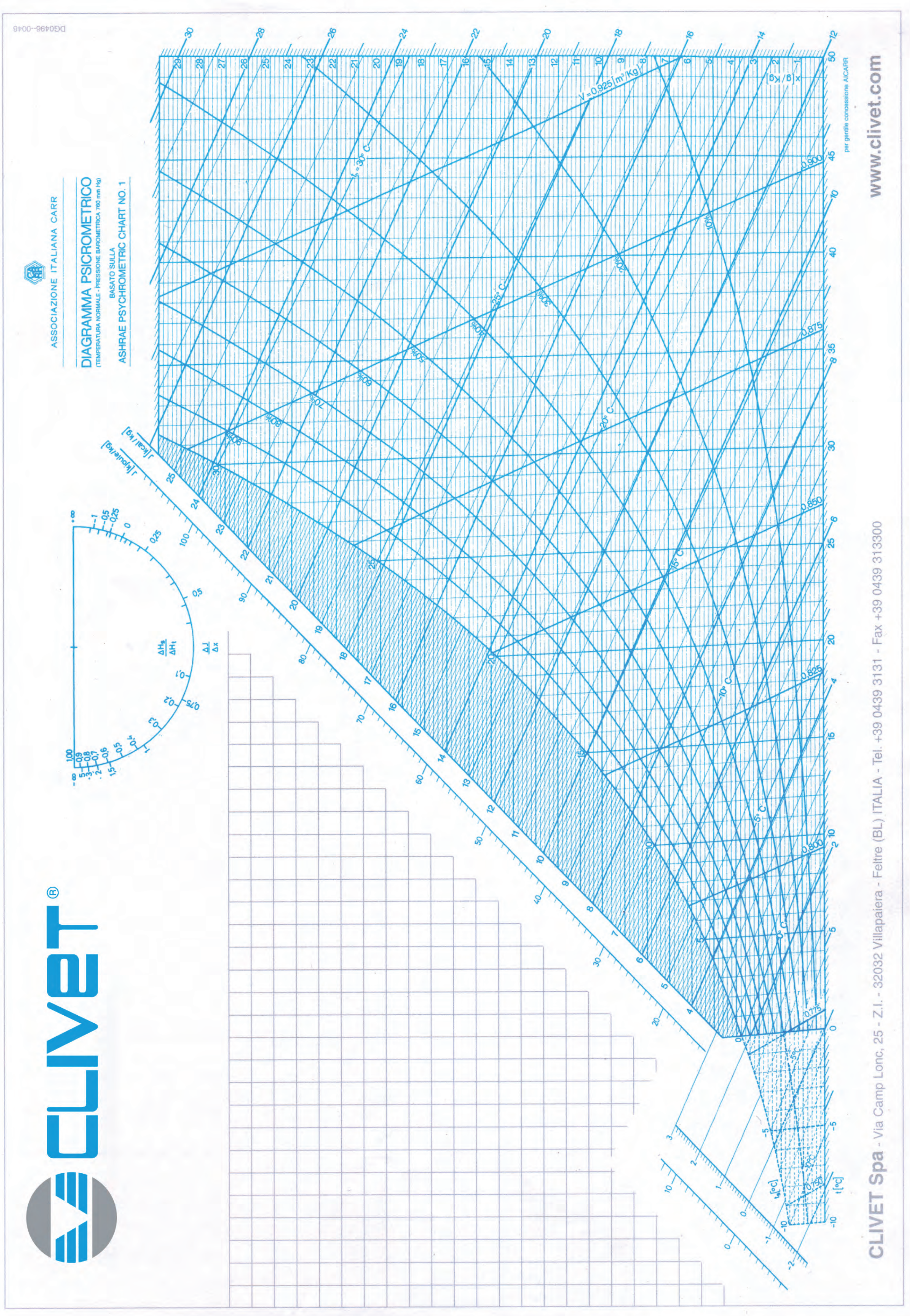
DAA5Gsize6_0

Date: 21/09/2012



(1) Capacity modulating compressor
(2) Electrical panel
(3) Power input
(4) Condensation drain pipe Ø 20 mm
(5) Standard outdoor air exchanger (below)
(6) Exhaust air standard exchanger (above)
(7) Capacity modulating post-heating with hot gas recovery
(8) Hydronic recovery device for extended operating range (Optional)
(9) Electrical heaters
(10) Electronic filters
(11) Class G4 air filters on outdoor and exhaust air
(12) Supply fan (below)
(13) Exhaust fan (above)
(14) Air filters access
(15) Grid for indoor installation (Optional)
(16) Support brackets (can be removed after the unit is positioned)
(17) Functional spaces
(18) If the unit is placed against the wall provide the space for the replacement of the roof electric fan
(R) Return Air
(M) Supply Air
(AE) Outdoor air intake
(ES) Exhaust air

WEIGHT DISTRIBUTION			
Size			Size 6
W1 Supporting Point		kg	401
W2 Supporting Point		kg	426
W3 Supporting Point		kg	459
W4 Supporting Point		kg	384
Shipping weight		kg	1670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