

An integrated solution

The integration of all these peculiarities in a packaged product, complete in power supply and regulation, ready to use and industrially produced, allows:

- A reduction of the planning times (it is not necessary to select and to plan the different components, to make designs, schemes, etc.);
- Simpler supply than traditional one;
- Less work on the jobsite;
- High total solution quality;
- Integration with Clivet management system basically present in the unit electronic control.



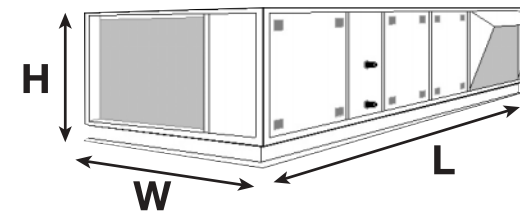
The reduction of the logistic chain and the high quality of the result make this system more competitive than any other solution.

TECHNICAL SPECIFICATIONS

ZEPHIR		38	60	102	154
air flow-rate min./max	m ³ /h	2900/4500	4500/7000	7000/11000	11000/17000
	l/s	805/1250	1250/1945	1945/3055	3055/4722
cooling capacity min./max	kW	45 / 66	71 / 96	112 / 158	145 / 250
heating capacity min./max	kW	40 / 62	62 / 96	99 / 150	150 / 230
length L	mm	4460	4800	5180	5690
depth W	mm	1230	1570	1910	1910
height H	mm	1040	1040	1210	1720

Summer specifications/Specifications referred to summer: external air 35°C with 50% R.H.
water 7/12°C
outlet air temperature 13°C with 95% R.H.

Winter specifications/Specifications referred to winter: external air -8°C with 80% R.H.
water 45/40°C
outlet air temperature 32°C



DFP460106-00

ZEPHIR

Integrated primary air handling unit
Rates from 800 to 4700 l/s.

The air change rate in the occupied spaces is the basic hygienic factor that guarantees an high comfort level. The external air handling management is the most important element for an air-conditioning system.

Air quality

The external air (primary air) is necessary to guarantee in the occupied spaces the air change for an ideal comfort, eliminating from the ambient all the polluting substances produced by man and his activity.

External air heating in winter operation

It is available with an exclusive system, able to recover heat from the exhaust air. The hot water pre-heating coil is used only with extreme climatic conditions.

External air cooling in summer operation

It is available with an exclusive system, able to transfer heat to the exhaust air. The pre-heating coil supplied by chilled water is used only with extreme climatic conditions.

External air humidification in winter operation

Necessary to ensure right relative humidity in spaces. It is obtained through an exclusive humidification system with low water consumption and high hygienic conditions.

External air dehumidification in summer operation

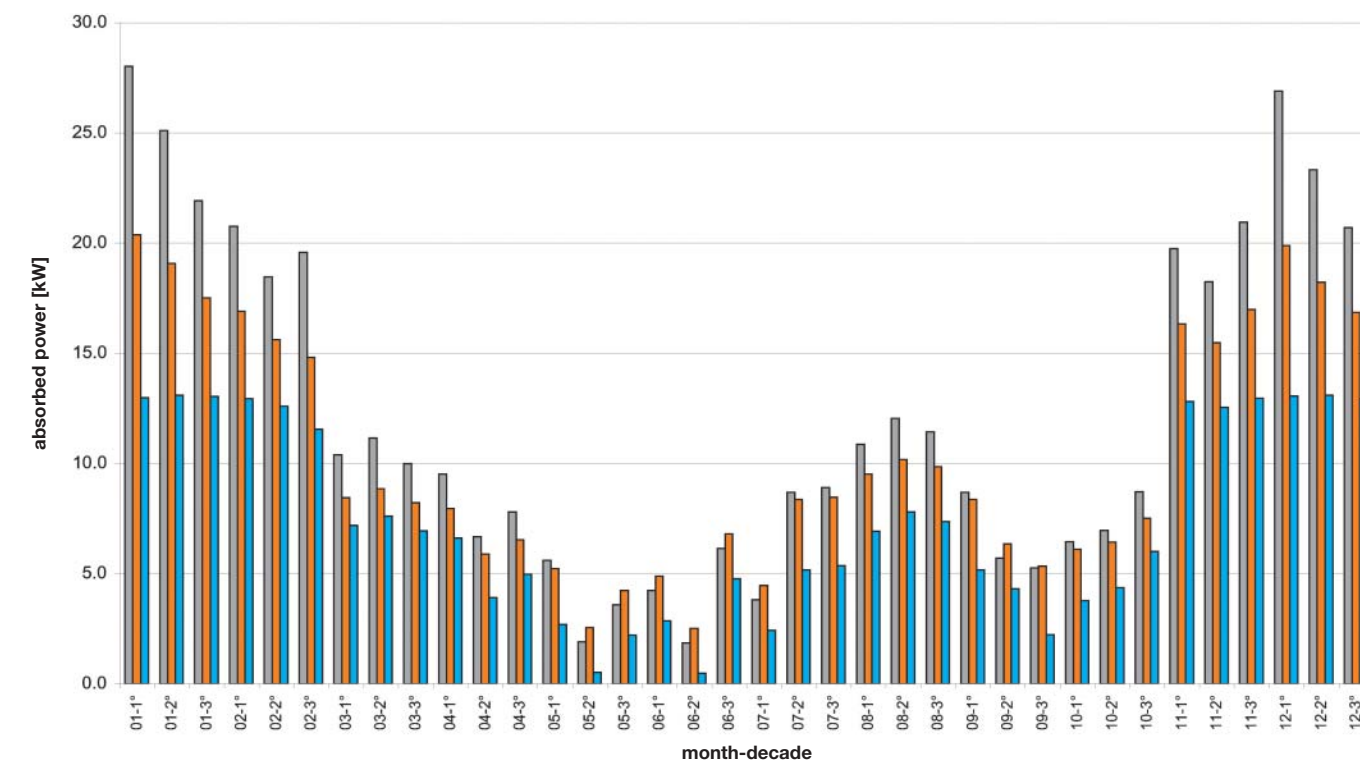
It is necessary in summer operation when external air relative humidity is very high. This function is free because obtained through the regenerator active in cooling.

External air filtering

It is the most important element for this handling. The ambient air quality depends on it. Since the external air pollution values are very high (powder, dust, etc.), a system with very high and constant efficiency, obtained with electronic control, and with simple maintenance has been adopted.



for primary air handling



Data refer to daily operation for five days/week in Milan
Power is used to:

- overcome pressure drops of unit and system
- heat or cool treated air quantity
- humidify or dehumidify treated air quantity

Integration of absorbed power during the year for:

- Air-conditioning unit without recovery 28100kW/h
- Air-conditioning unit with static recovery 23700 kW/h
- ZEPHIR (with dynamic recovery) 17000 kW/h

For more information send an e-mail to: zephir@clivet.it



CLIVET SPA
Feltre (BL) ITALY
Tel. + 39 0439 3131
Fax + 39 0439 313300
info@clivet.it

CLIVET ESPAÑA S.A.
Madrid SPAIN
Tel. + 34 91 6852344
Fax + 34 91 6852353
info@clivet.es

CLIVET UK LTD
Sevenoaks (Kent) U.K.
Tel. + 44 (0) 1732 464141
Fax + 44 (0) 1732 741575
info@clivet-uk.co.uk

Fareham (Hampshire) U.K.
Tel. + 44 (0) 1489 572238
Fax + 44 (0) 1489 573033

CLIVET NEDERLAND B.V.
Amersfoort - Netherlands
Tel. + 31 (0) 33 7503420
Fax + 31 (0) 33 7503424
info@clivet.nl

CLIVET TUNISIE S.a.r.l.
Sidi Rezig - TUNISIE
Tel. + 216 71 426 285
Fax + 216 71 429 285
clivet.tunisie@planet.tn

www.clivet.com



Zephir is an advanced product, planned to offer an integrated solution that guarantees an high ambient air quality ensuring great energy savings compared to traditional systems.

The integrated solution

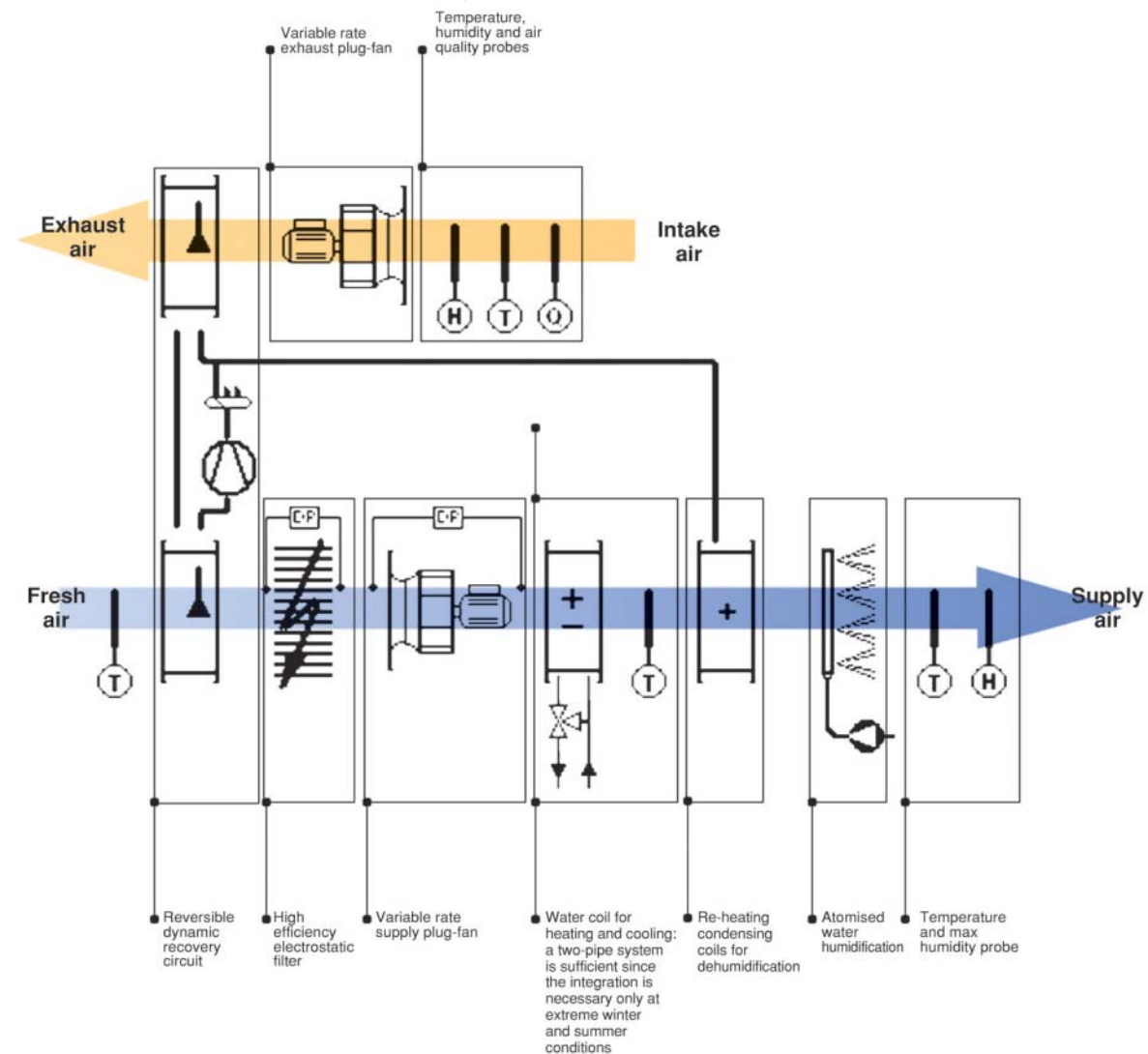
Energy saving

External air handling is an energetically expensive process. All the expedients has been adopted to reduce the use of energy necessary to this process as much as possible.

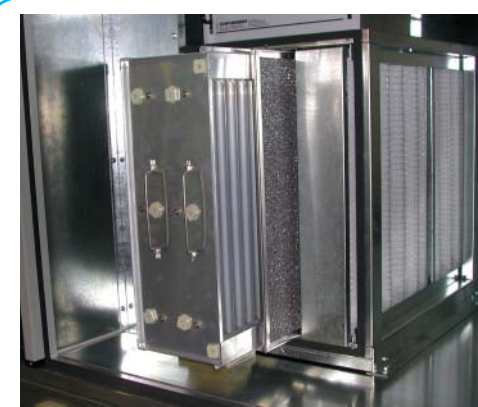
- The dynamic heat regenerator allows heating and cooling with energy efficiencies higher than traditional systems. In spring and autumn the possibility to support thermal loads, where only ZEPHIR unit is installed, happens through terminal unit stand-by.
- Control system uses fully free-cooling. Therefore thermal energy is used only if closely necessary.
- Energy for fans, continuously used, is reduced at minimum through:
 - the use of high performance fans;
 - the pressure drops reduction inside the unit thanks to the adopted solutions (low drops on filters, humidification, regenerator compared to traditional solutions).
- Annual energy consumption, thanks to these expedients, is drastically reduced.
- The air change flow-rate regulation is controlled by air quality probe that puts in the necessary quantity instead of a constant volume.
- The unit cover, with high thermal and acoustic insulation characteristics, allows the highest energy saving.
- An advanced control system regulates all the functions always choosing the most energetically advantageous one.



The system



The air quality



FILTERING

ZEPHIR allows the use of electrostatic filters completely automatic with efficiency up to H13, able to neutralize also virus and bacteria, with absolutely low pressure drops, caused by the metallic G2 pre-filter. The filtering efficiency control is ensured by an electronic controller. A suitable sensor gives a signal for the electrostatic filter dirtiness and regulates its periodical maintenance, easy to be done by the user (simple cleaning).

HUMIDIFICATION

ZEPHIR adopts a compressed water humidification system that includes all the advantages of a water system (low consumptions, local availability) the great efficiency and it ensures no pollution substances formation. It is equipped with a water pan – non-stop drainage type -. Therefore when the humidity demand stops, all the section remains perfectly dry.

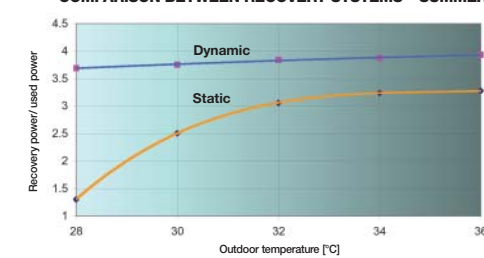


HEATING AND COOLING

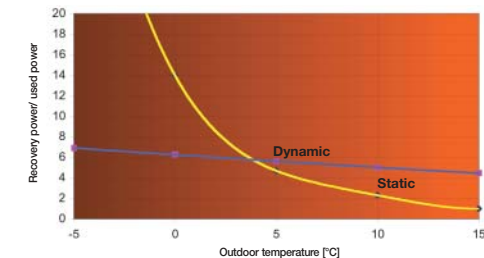
In extreme summer and winter conditions the water coil supplying the active regenerator, guarantees the desired temperature. The coil is equipped with a modulating three-way valve with regulation valve and connections for gauges and thermometers, bleed and drainage valve.

Energy saving

COMPARISON BETWEEN RECOVERY SYSTEMS – SUMMER



COMPARISON BETWEEN RECOVERY SYSTEMS – WINTER



Traditional heat recovery systems, usually static, they do not allow to adapt the system efficiency at the different climatic conditions and to the differential between external and ambient temperatures. Clivet new active recovery system allows an efficient energy saving during the whole year without pollution of external and exhaust air flow-rates.

In spring and autumn it is frequently possible to support ambient thermal loads only through ZEPHIR unit, with terminal unit stand-by.

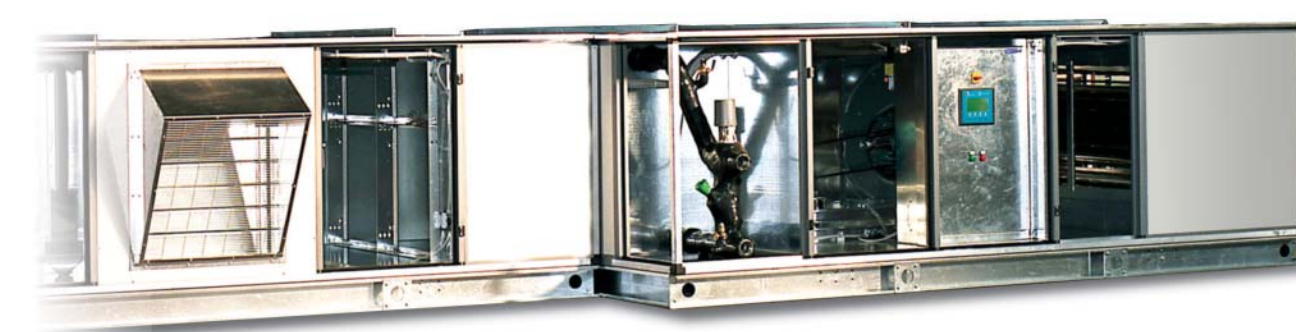
In summer operation the recovery system condensing coil is used to obtain a completely free summer re-heating handling.

The static recovery system apparent superiority in winter conditions can be seen in very short periods of unit effective operation, while dynamic recovery is more efficient during the most part of the year. Moreover the lowest pressure drops of dynamic recovery allow energy saving during the whole year.

DYNAMIC RECOVERY



ZEPHIR integrated unit

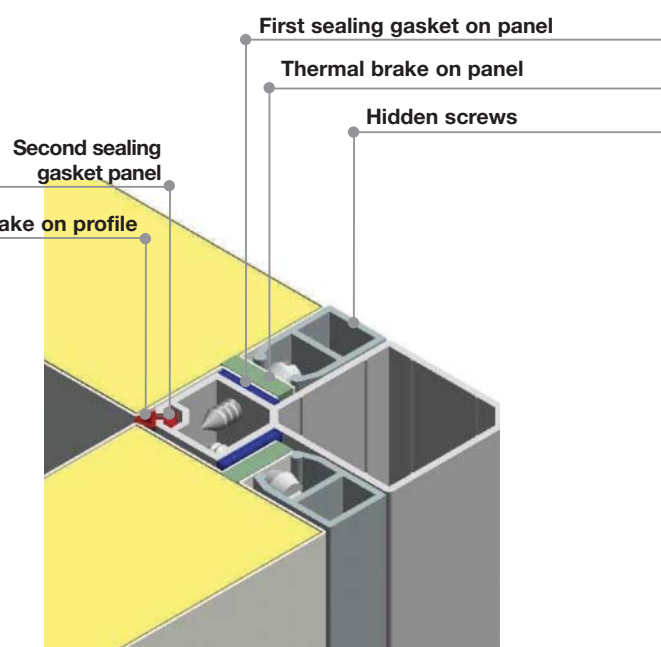
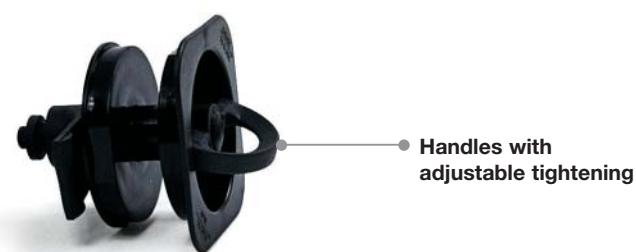


ZEPHIR units are completely integrated in CLIVET TALK system and are able to talk to the other CLIVET components of the system, to optimise the operation modes and the energy consumptions.

Moreover they are basically arranged to be connected to Clivet Management system or to other management systems that use different communication protocols.

STRUCTURE

The unit cover made from load-bearing aluminium frame and 50 mm double-skin panels, with its high acoustic and thermal insulation characteristics, allows the highest energy saving and the best ambient comfort.

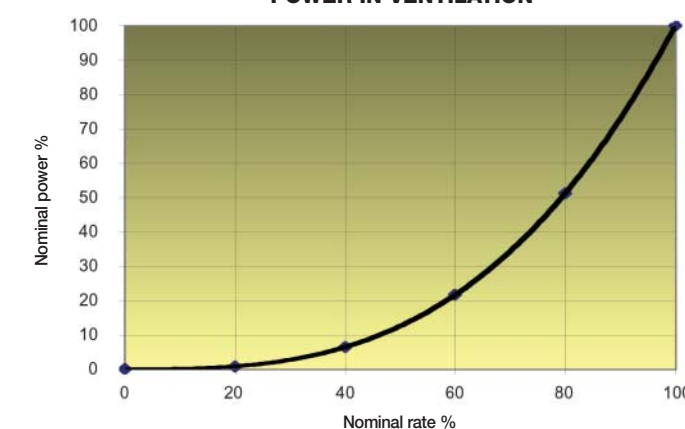


VENTILATION

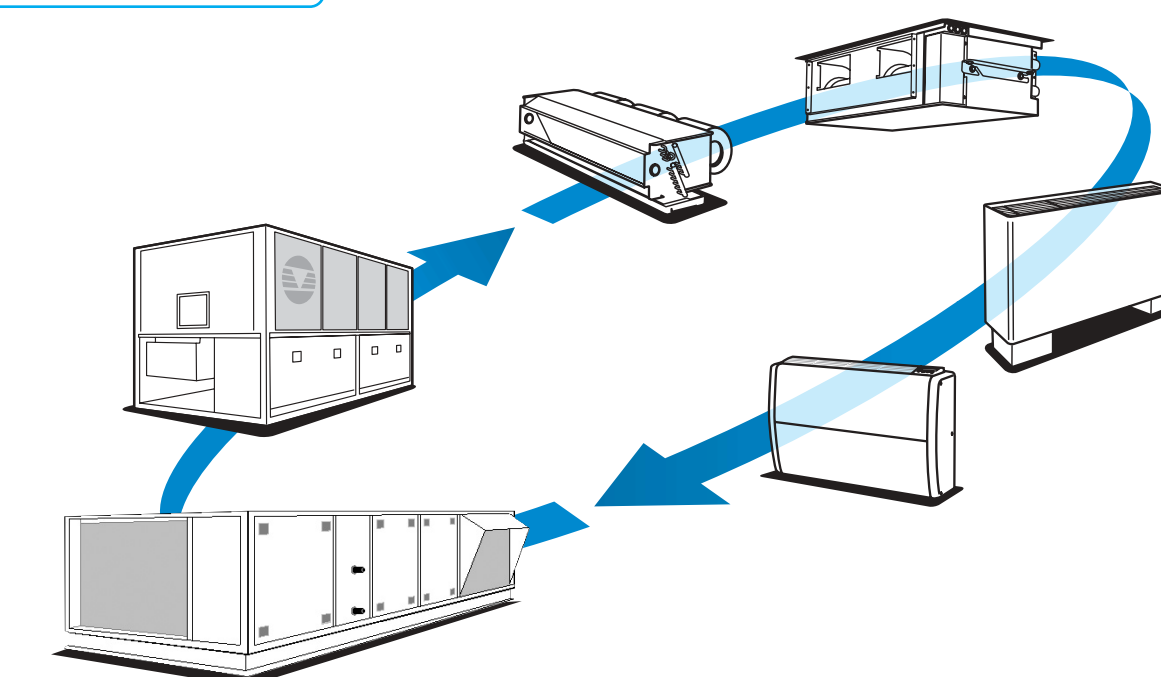
For the same system, the volume of the primary air (that must be handled) changes according to spaces occupation and consequent air pollution, daily or damped operation and valid free-cooling use. The handling of the right air flow in each moment means a sensible reduction of the energy consumption for air handling.



POWER IN VENTILATION



THE CONTROL



ZEPHIR air-conditioning units are equipped with wired and ready to operation controllers:

- electrical power and protection control panels for motor fitted for rate control inverter
- temperature, relative humidity and air quality probes
- modulating actuators for exchangers and for humidification
- control and safety devices

