



NEW  
GENERATION

## Product presentation **CLIVETPack2**

Packaged air conditioner cooling only/heat pump air to air – rooftop type



# CLIVETPack2: is the state of the art on rooftop

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## The advanced package

Almost all plant components are packed into the unit

Each CLIVETPACK is factory tested before shipment

On-site operation and first cost are dramatically reduced

## Specialised by application

From 0 to 100% fresh air to best serve different applications

Developers and consultants can industrialise HVAC design and realisation

## High efficiency and reliability

Low consumption solutions on both thermal energy production and ventilation

De-centralised design to operate only when and where needed

# CLIVETPack2: specialized on application

**Fresh air is the driver for different series**

## **MEDIUM ATTENDANCE**

**Air source**

**Water source**

## **HIGH ATTENDANCE**

## **FULL FRESH AIR**



# CLIVETPACK 2 at a glance

XHE packages:

Are designed for **outdoor** installation

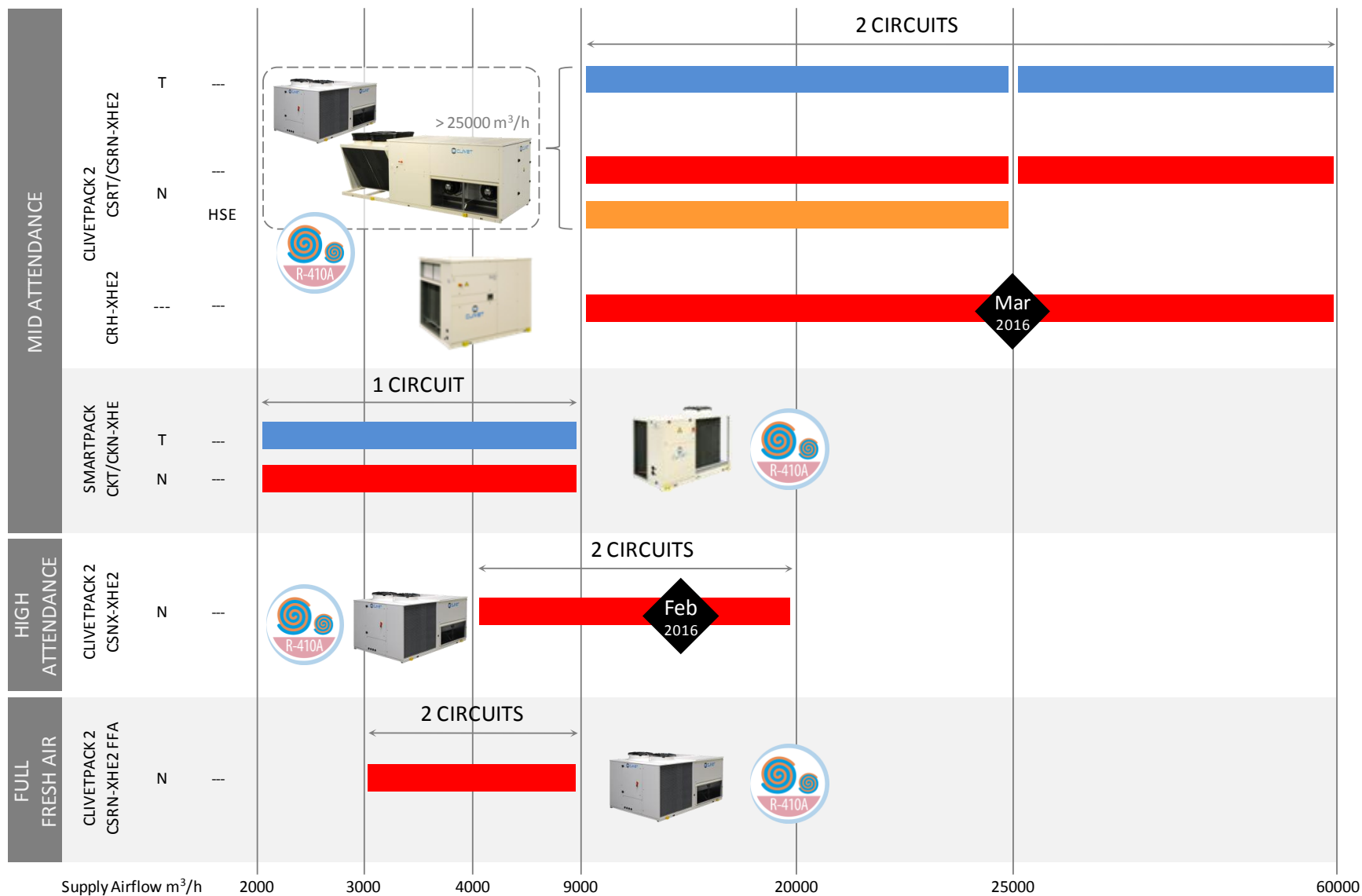
Perform **Ventilation**, **Filtration**, **Cooling** or **Heating**

Can do **Make-up air** and **Thermodynamic energy recovery**

Fully suit with **Commercial** and **Industrial** applications



# The complete series





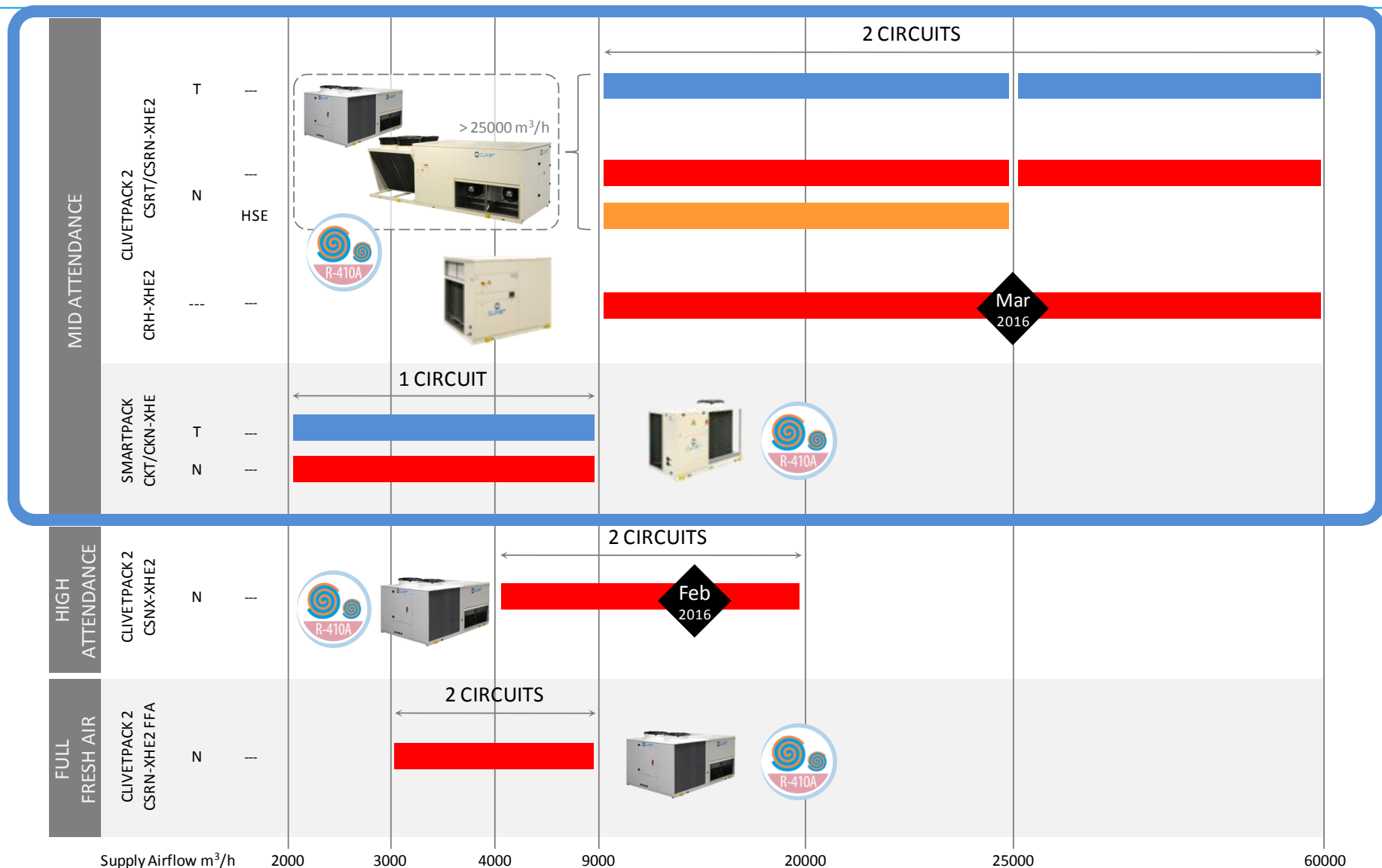
## CLIVETPack2

Medium Attendance application

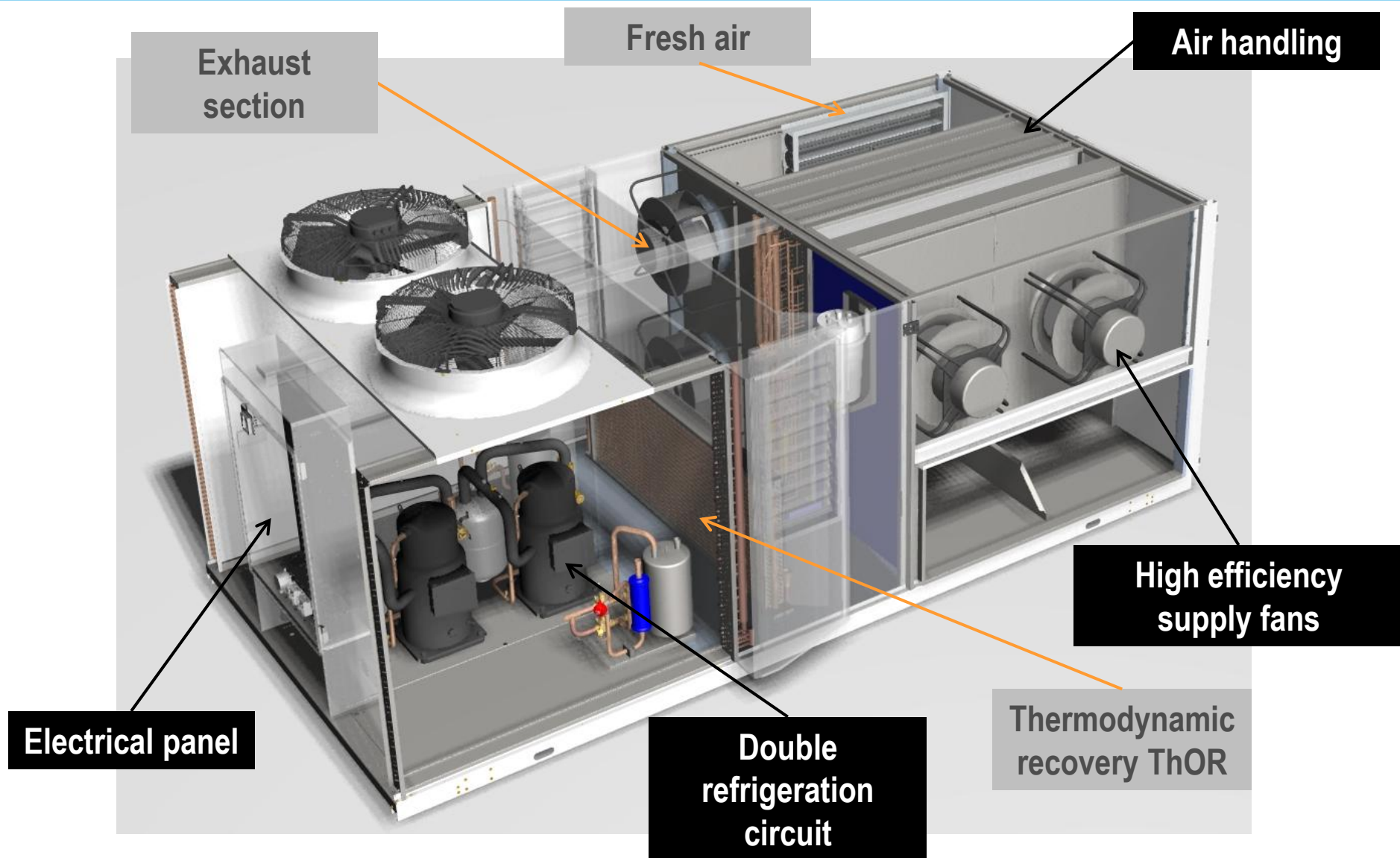




# The series for medium attendance

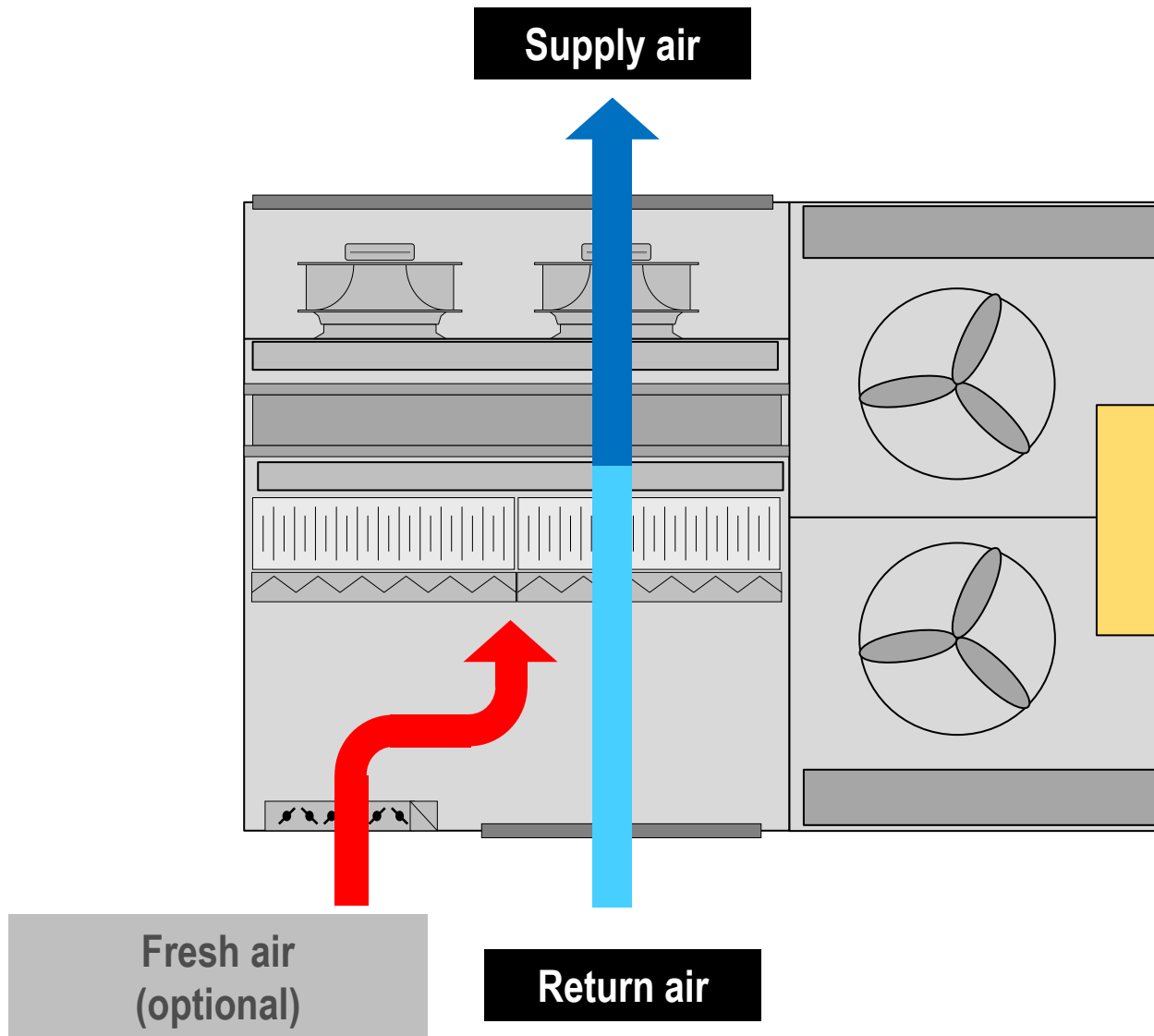


# Main features

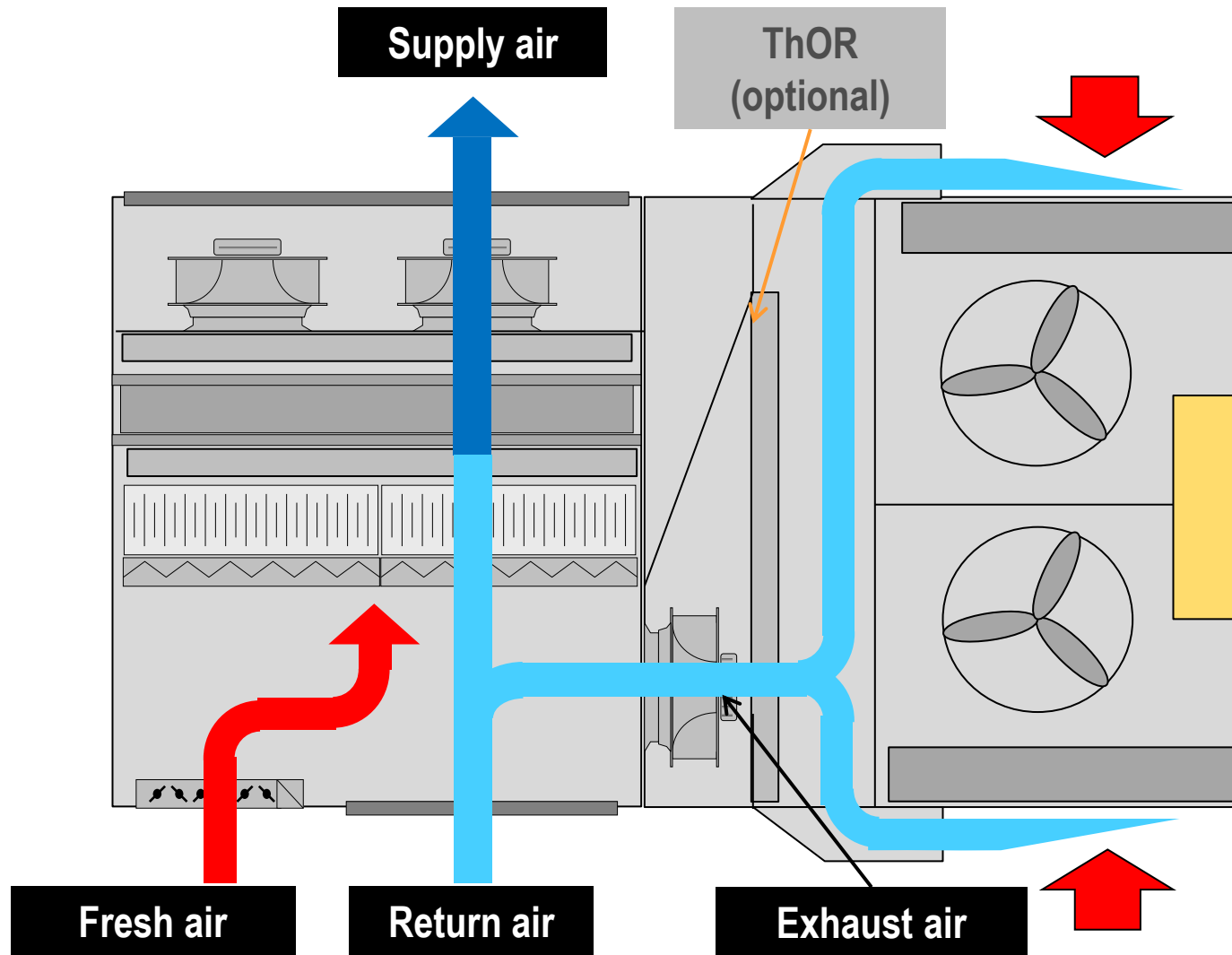




# Features: total recirculation, fresh air

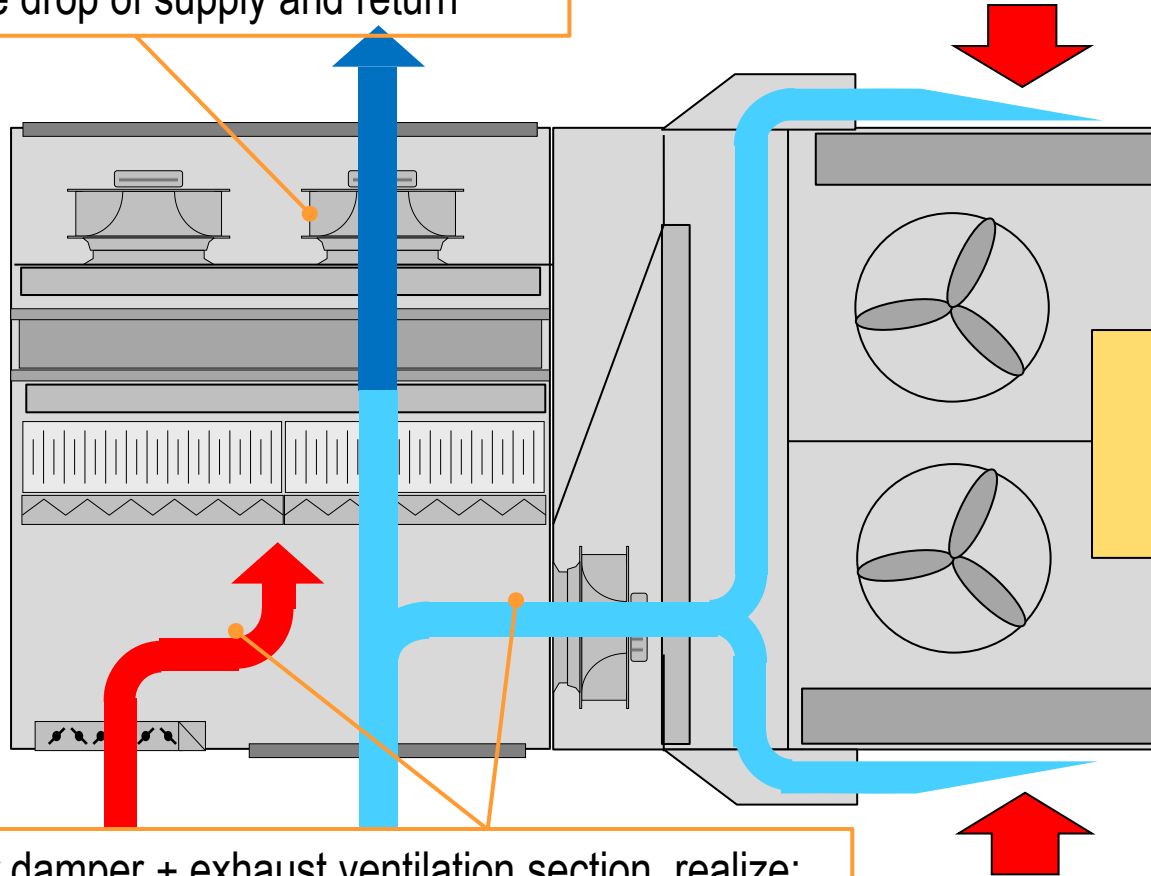


# Features: Freecooling and energy recovery



# Automatic air management

Main ventilation section  
win the pressure drop of supply and return



Fresh air damper + exhaust ventilation section, realize:

- renewal air
- thermal freecooling (enthalpy in option)

# ThOR Thermodynamic Overboost Recovery

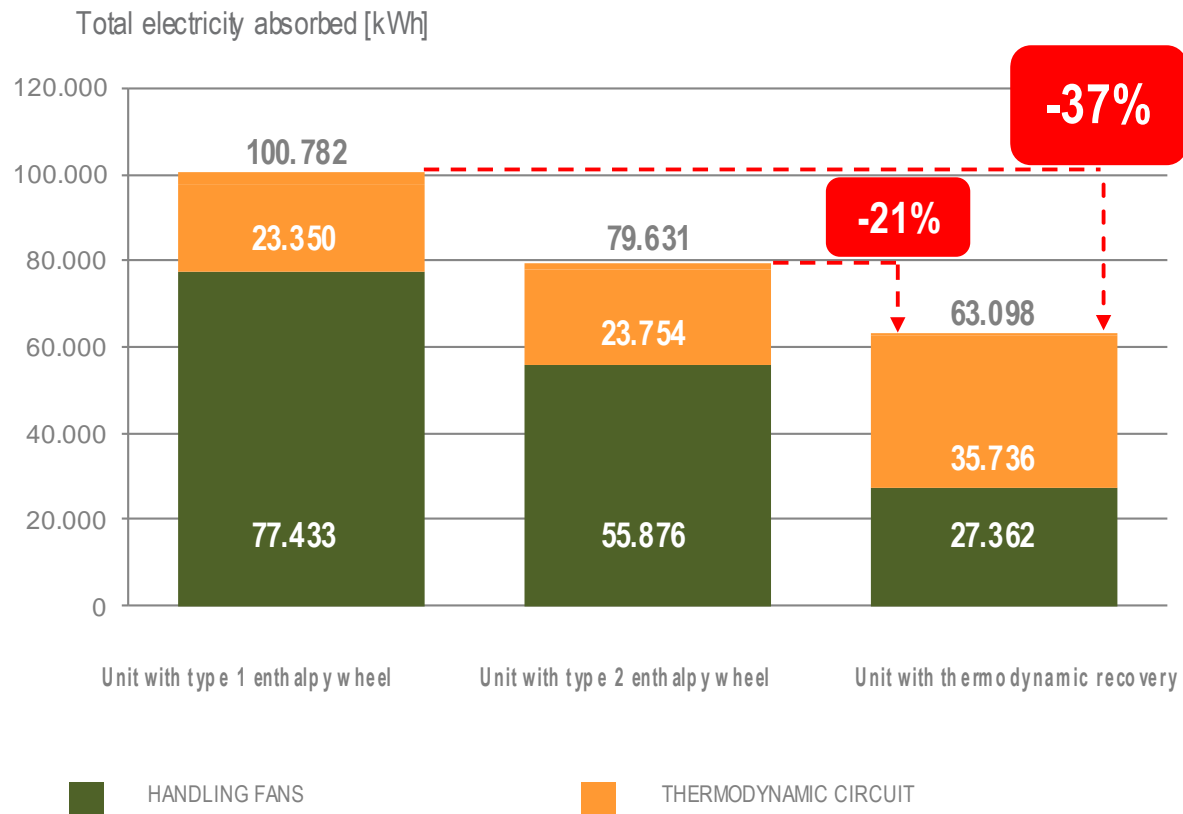
**Thermodynamic energy recovery** is based on reversible heat pump technology. The heating and cooling capacity production circuit employs exhaust air as a source of heat, which is favorable both in the winter and summer operating mode.

For this matter:

- the **seasonal efficiency** of capacity production is greater than a conventional refrigeration circuit, which employs outdoor air as a source of heat;
- the capacity output is **much more stable** compared with passive exchangers as the outdoor conditions vary,
- does not employ passive exchangers and therefore also **eliminates higher consumption** due to ventilation;
- it is integrated in the unit, which has an **extremely compact design**

# ThOR: benefits

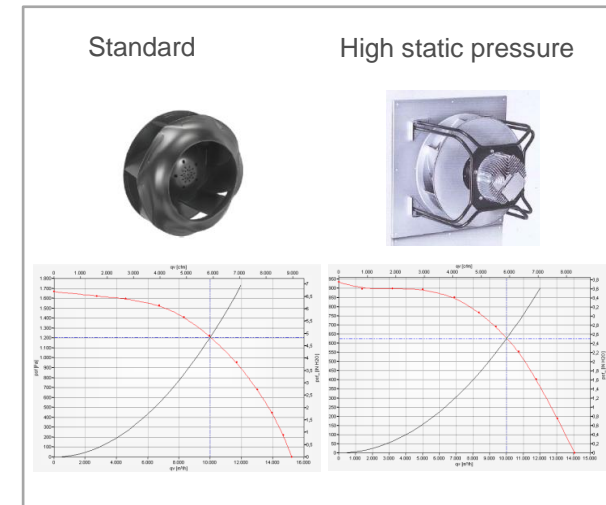
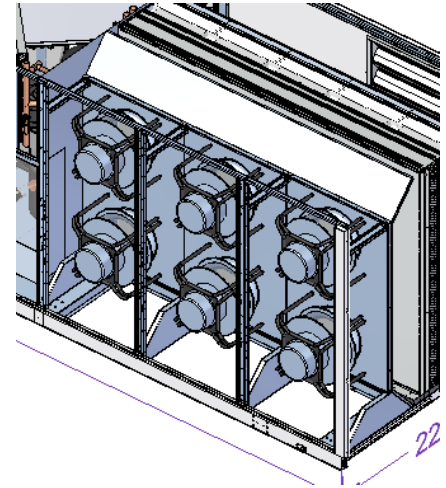
## Great energy saving



This means that during the annual operation cycle, the power absorbed by the thermodynamic recovery unit is less compared to the rooftop unit with the enthalpy wheel recovery unit based on both selection criteria adopted (type 1 compact enthalpy wheel and type 2 enthalpy wheel with low front speed).

# Ventilation full control

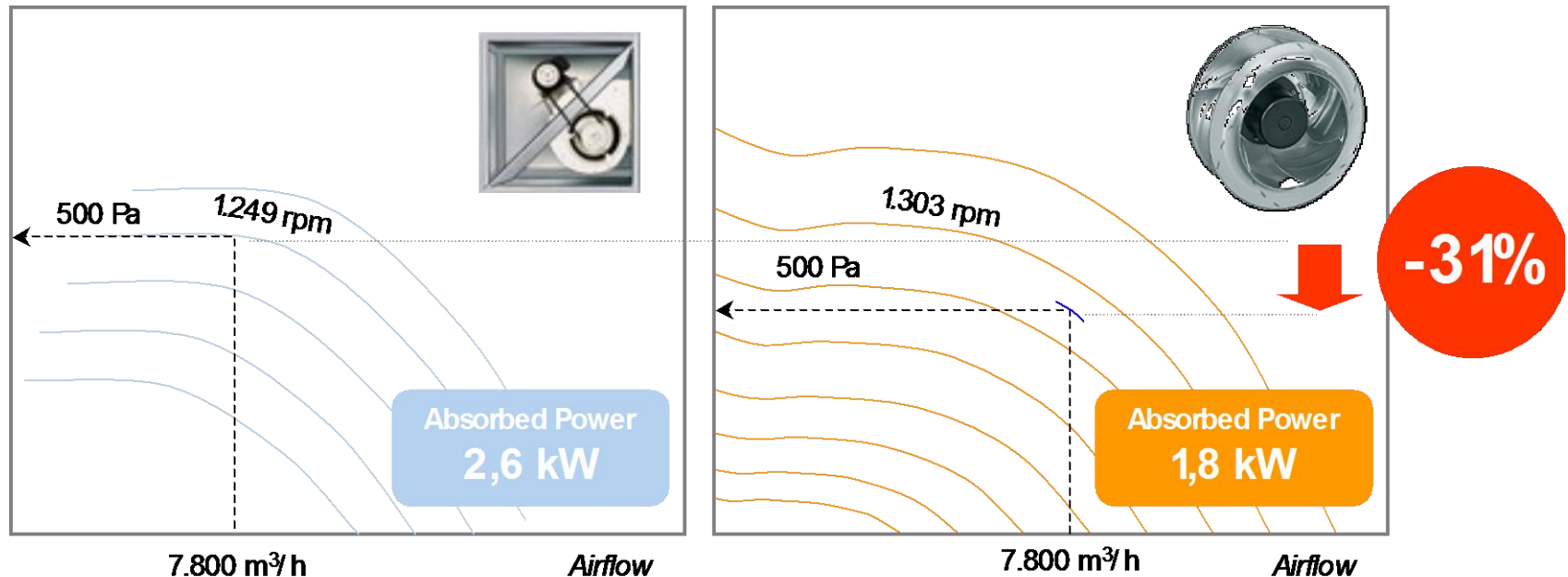
- Plug-fan with electronic control (EC)
- **Brushless** technology = max efficiency
- Single fan section for air supply and return
- Smaller fan, simplifies maintenance and doesn't stop ventilation
- Fan speed control = simple start-up on site
- Costant supply airflow or **variable airflow rate**
- High static pressure electric fans





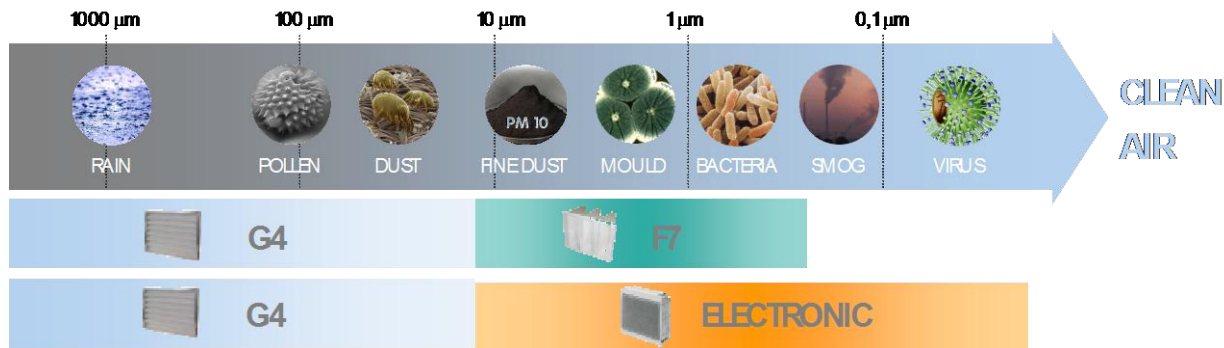
# High efficiency EC brushless plug-fan

Keeping the same airflow / pressure,  
the ventilation system **saves 30% energy** than traditional solutions

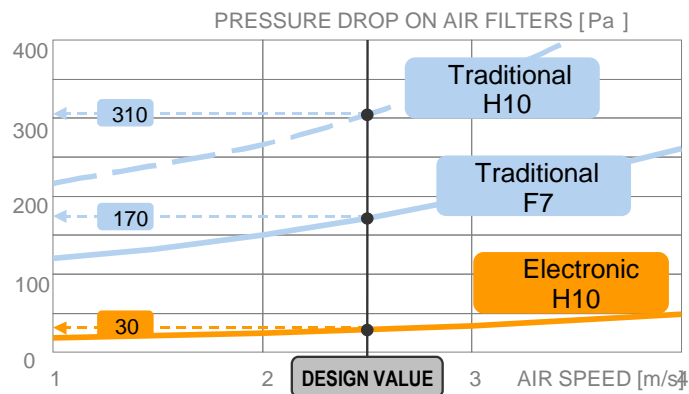


Electric motor absorbed capacity, manufacturer data  
Example referred to a flow of 7.800 m³/h with external static pressure of 500 Pa

# Very high efficiency filtrations



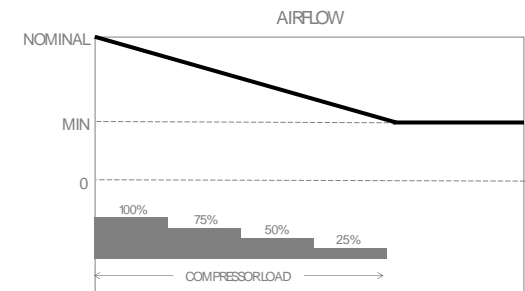
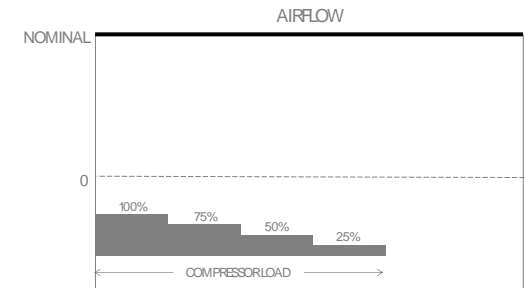
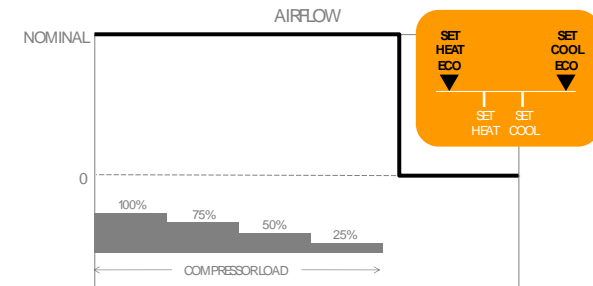
- G4 filters on first stage
- F7 filters or Electronic filters on second stage



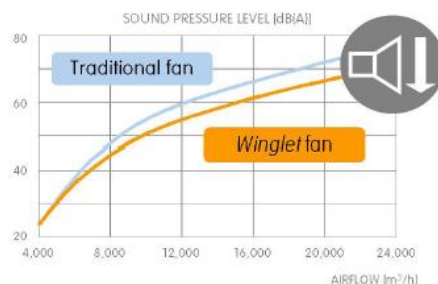
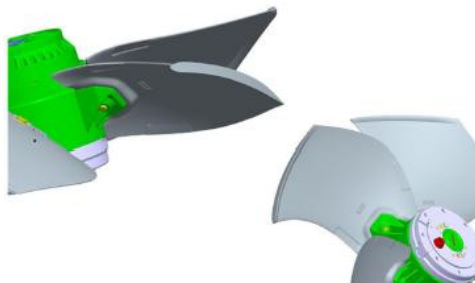
Electronic filters = **15%** of energy saving for lower drop pressure than traditional

# Effective air flow rate management

- ECO mode: airflow supply remains constant at varied thermal loads and is shutdown when the load is fulfilled
- Constant airflow rate: fan varies speed also with progressive filter clogging
- Variable airflow rate: supply airflow varies depending on the thermal load up to a minimum compatible value with distribution system. 40% of Airflow reduction → **70% energy savings**



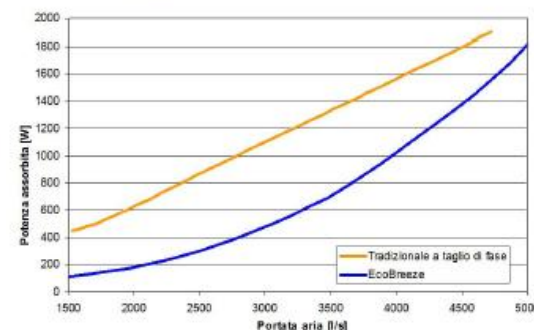
# High efficiency external axial fans



Innovative Winglet able to increase aerodynamic efficiency and reduce the sound emission than traditional fans.

ECOBREEZE brushless motor with electronic commutation. Managed with condensation pressure:

- Increase the efficiency
- Increase the working life
- Reduction in the electrical consumption by the system



# High efficiency on heating

**Heat pump** is the **main** solution for heating:

Suitable for cold climates, up to  $-12^{\circ}\text{C}$

Reduced defrosting, thanks to:

- Thermodynamic recovery, active where coils would start freezing

- Ice protection system / Predictive defrost logic

Optimal energy efficiency

- Primary energy consumption is much lower than for gas heaters

Optimal investment

- The Heat pump option has a minimum price impact

- Operation cost is as low as COP is higher than 1,9

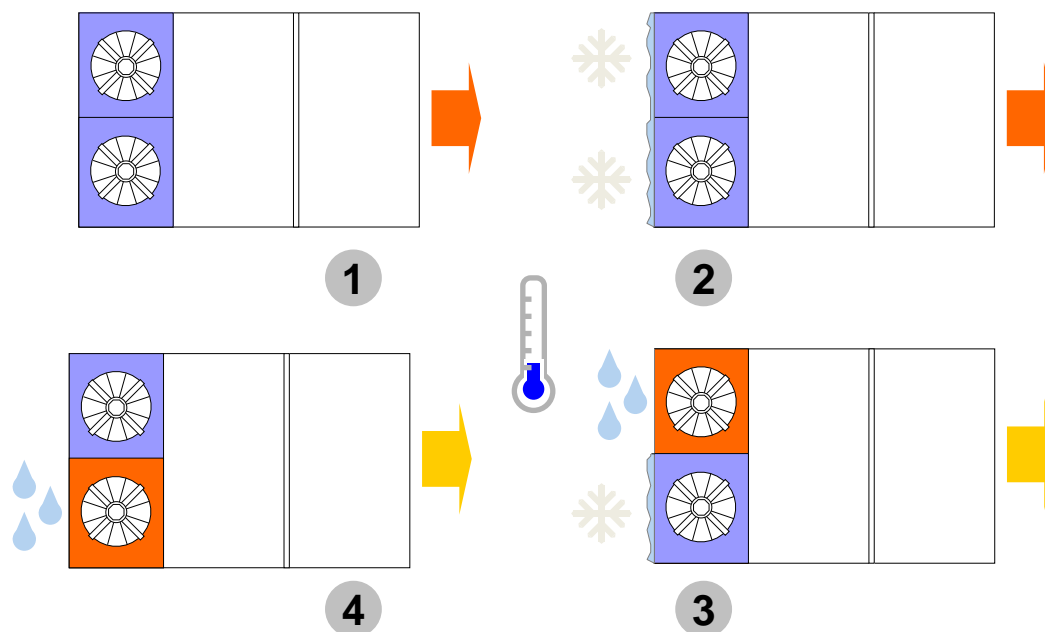
# High efficiency in defrosting

Heat Pump versions includes:

**Ice Protection System** and **Predictive** logic

Optimal defrost, only when needed

**Two** independent circuits for alternate Defrost





# High efficiency on heating

**Three** further options are available for heating

- 1) **Electric** heaters
- 2) **Hot water** coil with 3-way valve
- 3) Condensing **Gas** heater
- 4) Energy recovery from food refrigeration (water coil)



# High efficiency on heating

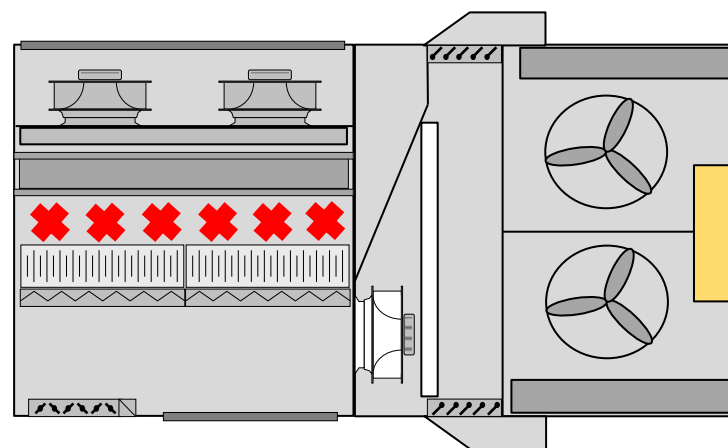
## Electric heaters

- 1) Keep the unit packaged (no gas, no water connections)
- 2) Integrate the HP capacity
- 3) Can work as pre-heating, before the HP coil

FULL ELECTRIC  
PACKAGE

NO GAS  
REQUIRED

-12°C  
OPERATION



# High efficiency on heating

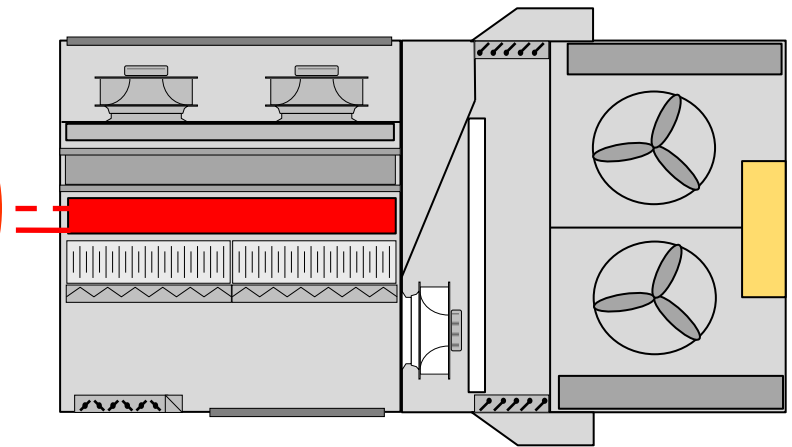
## Hot water coil

- 1) Provides Integration / Pre-heating
- 2) Can work as the sole heater below a set temperature
- 3) Replaces the HP in case of emergency
- 4) Includes the modulating 3-way valve

FOR VERY LOW  
AMBIENT  
TEMPERATURE

ON BOARD  
MODULATING  
VALVE

-20°C  
OPERATION



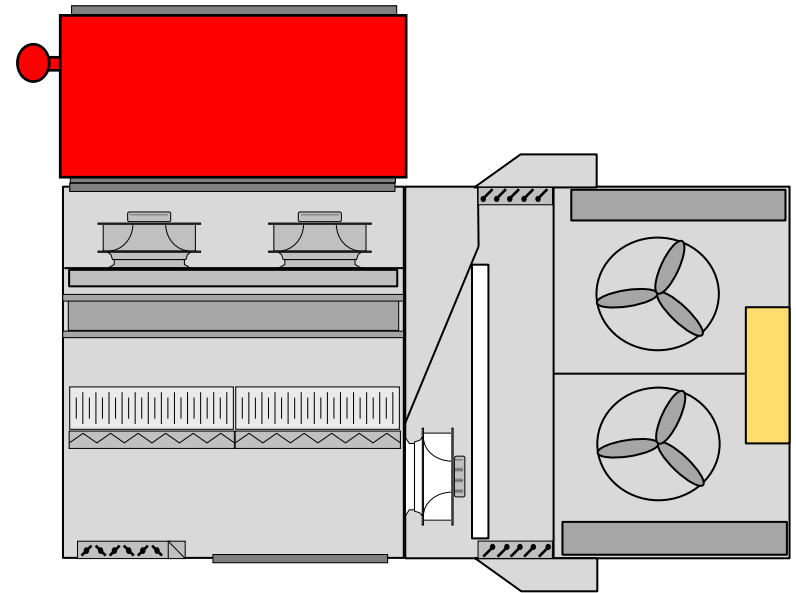
# High efficiency on heating

**Gas** heater, **condensing** type with **modulating** regulation

- 1) High efficiency, up to 105%
- 2) Full package, including valves and chimney
- 3) Provides Integration / Full heating / Emergency
- 4) No water → No pumps / No freezing

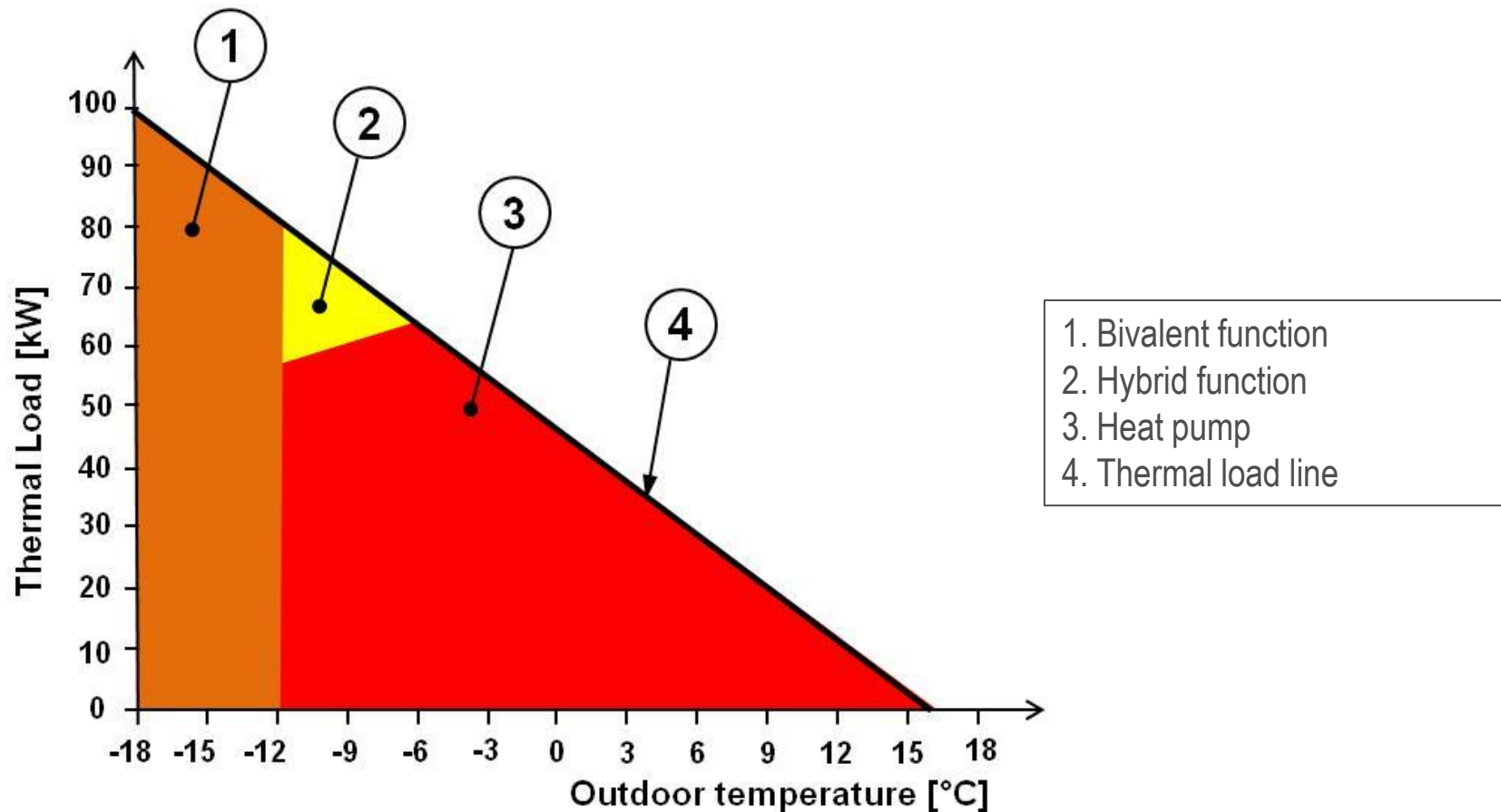
FOR VERY LOW  
AMBIENT  
TEMPERATURE

-30°C  
OPERATION



# Heat pump and gas burner module

Hibryd or bivalent operation, criteria to determine the capacity:



# New gas burner

## 1 Condensation technology with modulating control

High efficiency  $> 105\%$  Pci

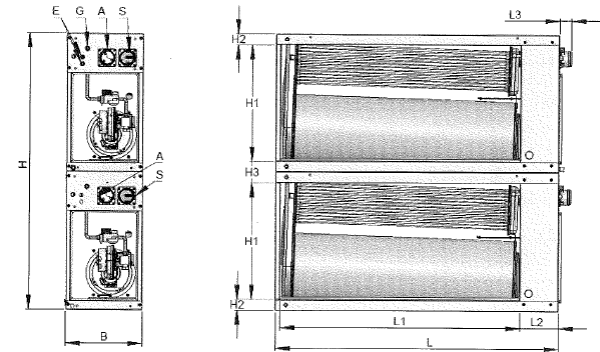
Accurate control capacity



## 2 Standard burner with 2-stage control

Robust and low capital cost

Efficiency  $< 93\%$  PCI



Both with vertical development



# Application for very cold climate



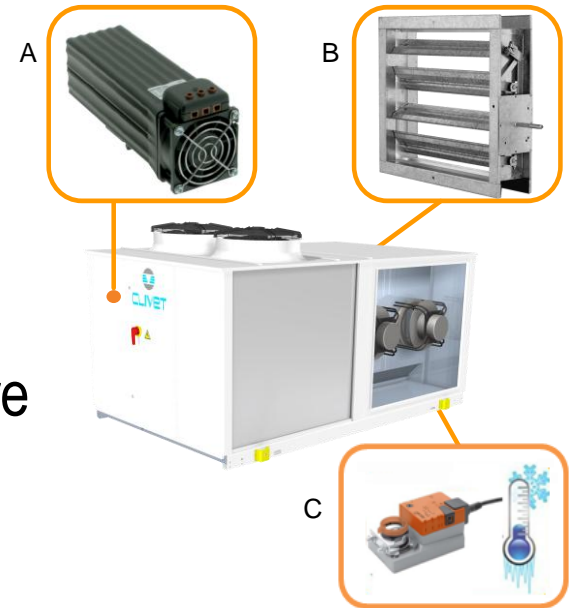
Out door temperature  
from  $-10^{\circ}\text{C}$  to  $-30^{\circ}\text{C}$

Besides auxiliary heating options:

A) Heater thermostatically controlled

B) Air damper in special execution

C) Motorised actuator suitable for low temperature



# Winter comfort with humidification

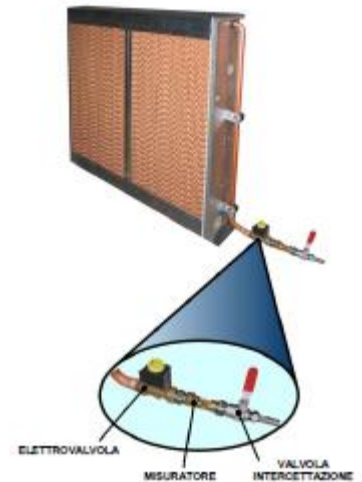
## Immersed electrodes steam humidifier

- Available in various sizes
- Automatic modulating control
- With automatic drain for inactivity

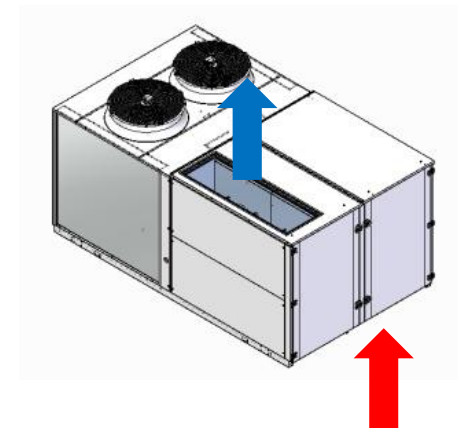
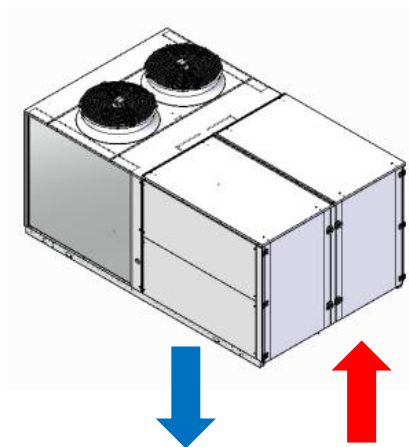
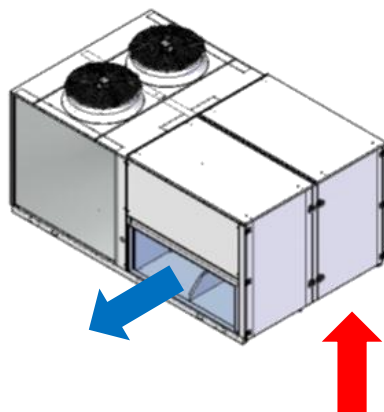
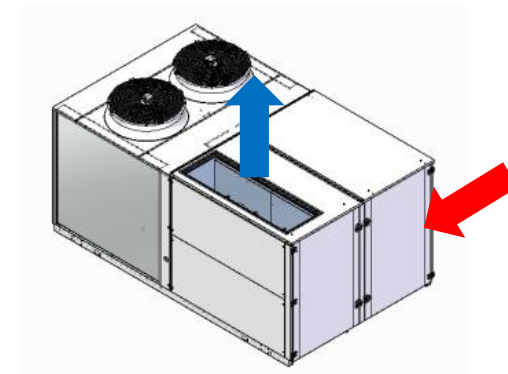
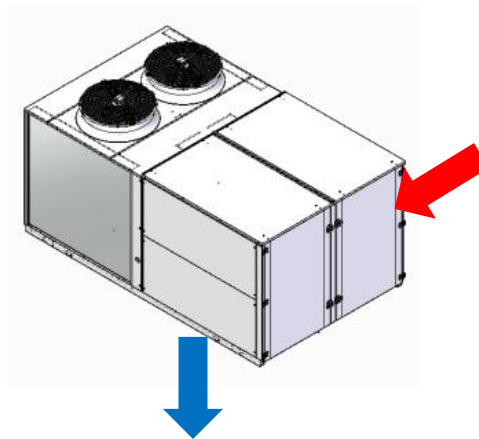
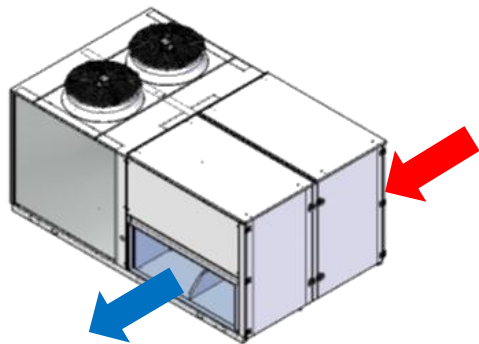


## Water to waste evaporating wet-deck humidifier

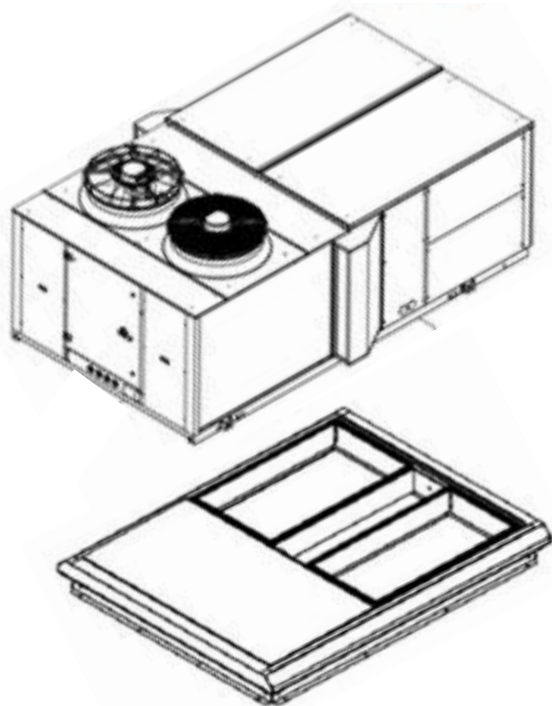
- Fast and effective humidification
- Continuous renewal of water
- Automatic washing cycle



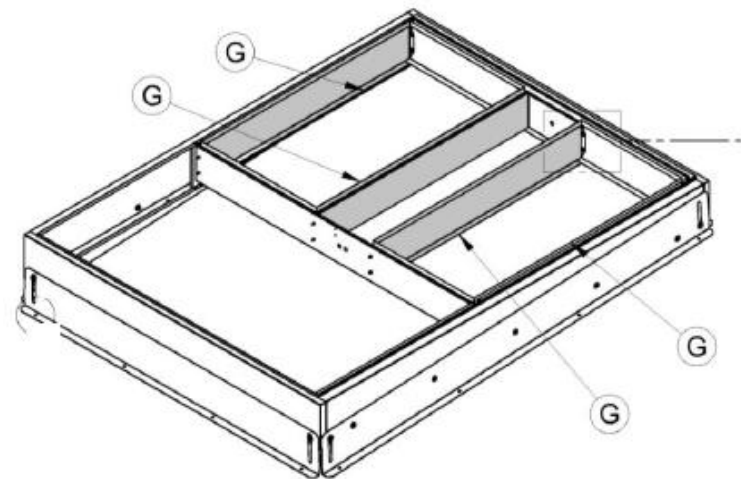
# More flexibility on air distribution



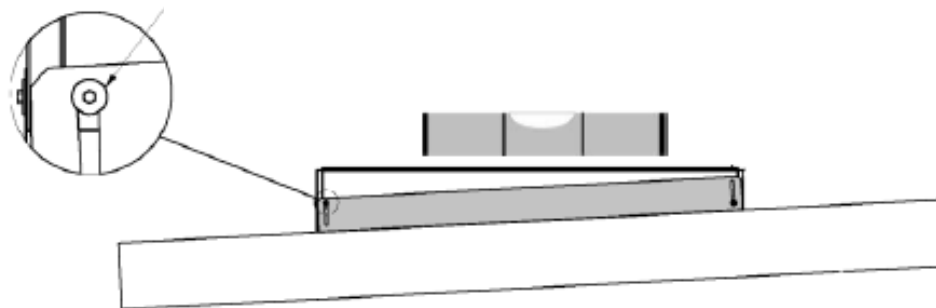
# Roofcurb for supply and return on downflow



Simplify the connection to the ducts  
and the roof insulation

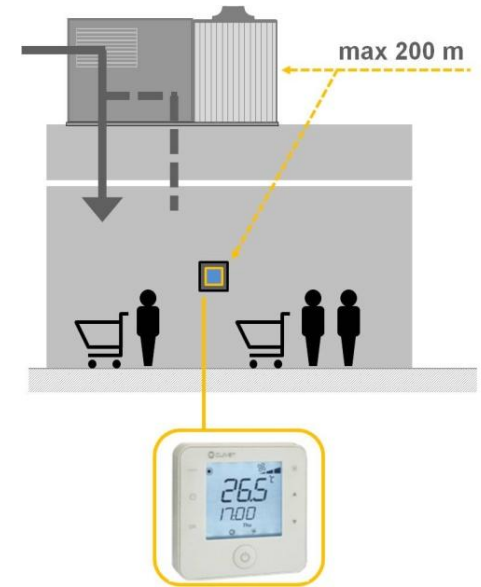


Adjustable to adapt roof slope



# Smart electronic control

- Management by microprocessor
- Control development from Clivet
- Remote control is a standard
- Easy to use by not specialized personnel
- Communication protocol: ModBus, Lonworks, BACnet-IP
- Supervisor: Clivet Master System



# The rooftop range with water source

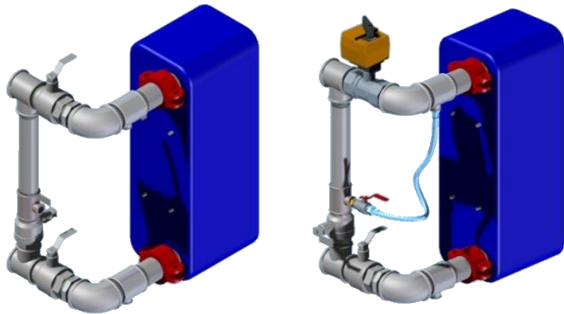
Wide range of market reference

Ready for WLHP and Geothermal applications Geotermici

Thermodynamic heat recovery available

Specific options (strainer = kit) for water source:

- Hydraulic package for constant water flow
- Hydraulic package for variable water flow
- Hydraulic package for well water







## CLIVETPack2

High Attendance application



# The HIGH ATTENDANCE range

## Wherever:

- High attendance is the driver (people/sqm)
- It means High fresh air volume (and higher capacity!)

## Main applications:

- Cinema
- Theatres
- Restaurants
- Meeting rooms
- Leisure / Disco / Casino



# The HIGH ATTENDANCE range

## Main figures:

CSNX-XHE units, air-to-air heat pump with built-in heat recovery

More than 1.000 units sold

Up to **80% fresh air** management

Refrigerant circuit → larger than MID ATTENDANCE units

Further options for the specific application



# The HIGH ATTENDANCE range

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## Main CSNX-XHE individual standard features:

- Airflow control as standard

## Other CSNX-XHE individual optional features:

- Hot-gas reheating for summer humidity control
- Silencers on the return side
- IAQ management (variable fresh air) by either CO<sub>2</sub> or VOC control
- Electric heaters / Hot water coil (below –5°C ambient)
- Steam humidification
- Modbus RS485 gateway





## CLIVETPack2

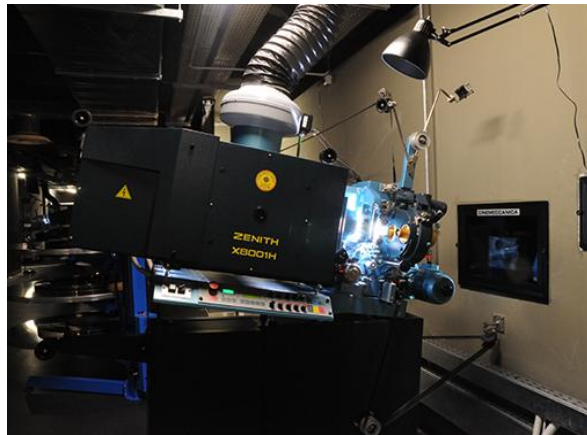
Full Fresh Air application



# The FULL FRESH AIR range

Some specific applications need **full fresh air** HVAC:

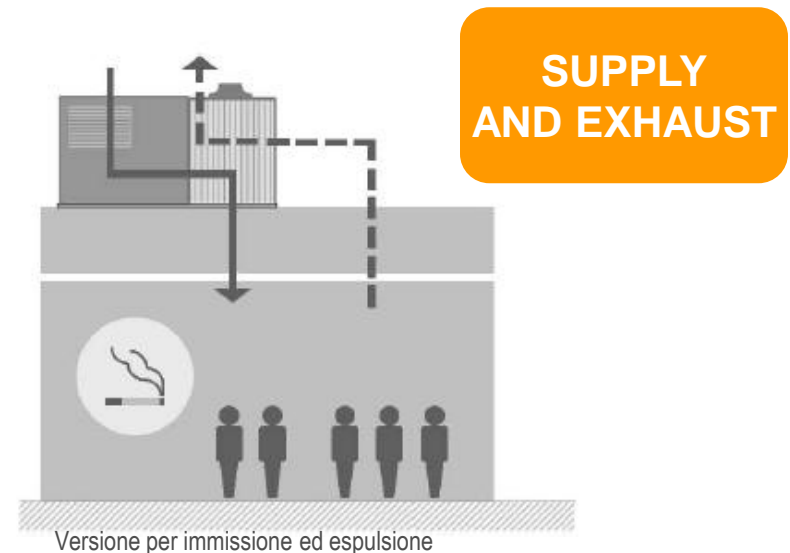
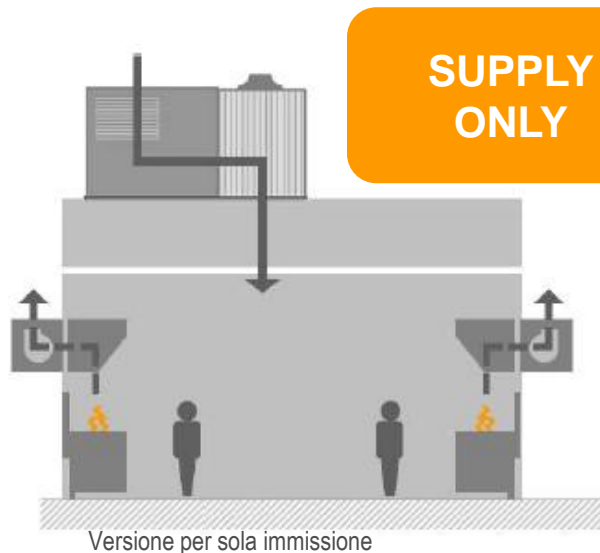
- Commercial and Industrial **kitchens**
  - To balance the hood exhaust
- Projection rooms in Multiplex cinemas
  - To balance the cooling exhaust fans on projectors
- **Smoking** rooms and Chemical **laboratories**



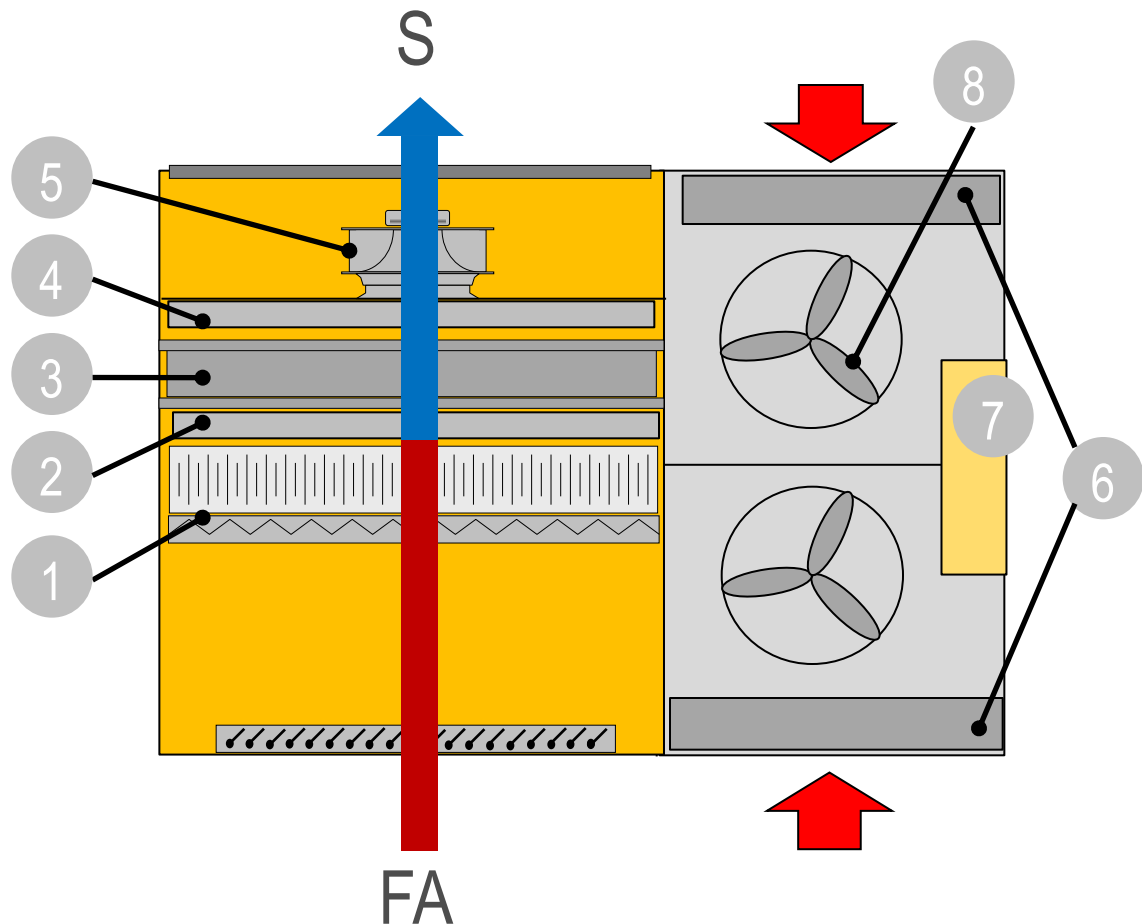
# The FULL FRESH AIR range

CLIVETPACK2 **FFA** is the solution:

- **Industrialised**
- Based on the **Heat pump** technology, 100% fresh air
- **Highly efficient**, to reduce running cost and CO<sub>2</sub> footprint
- Available in **Supply** only / **Supply and Exhaust** versions



# CBFFA configuration with air supply only



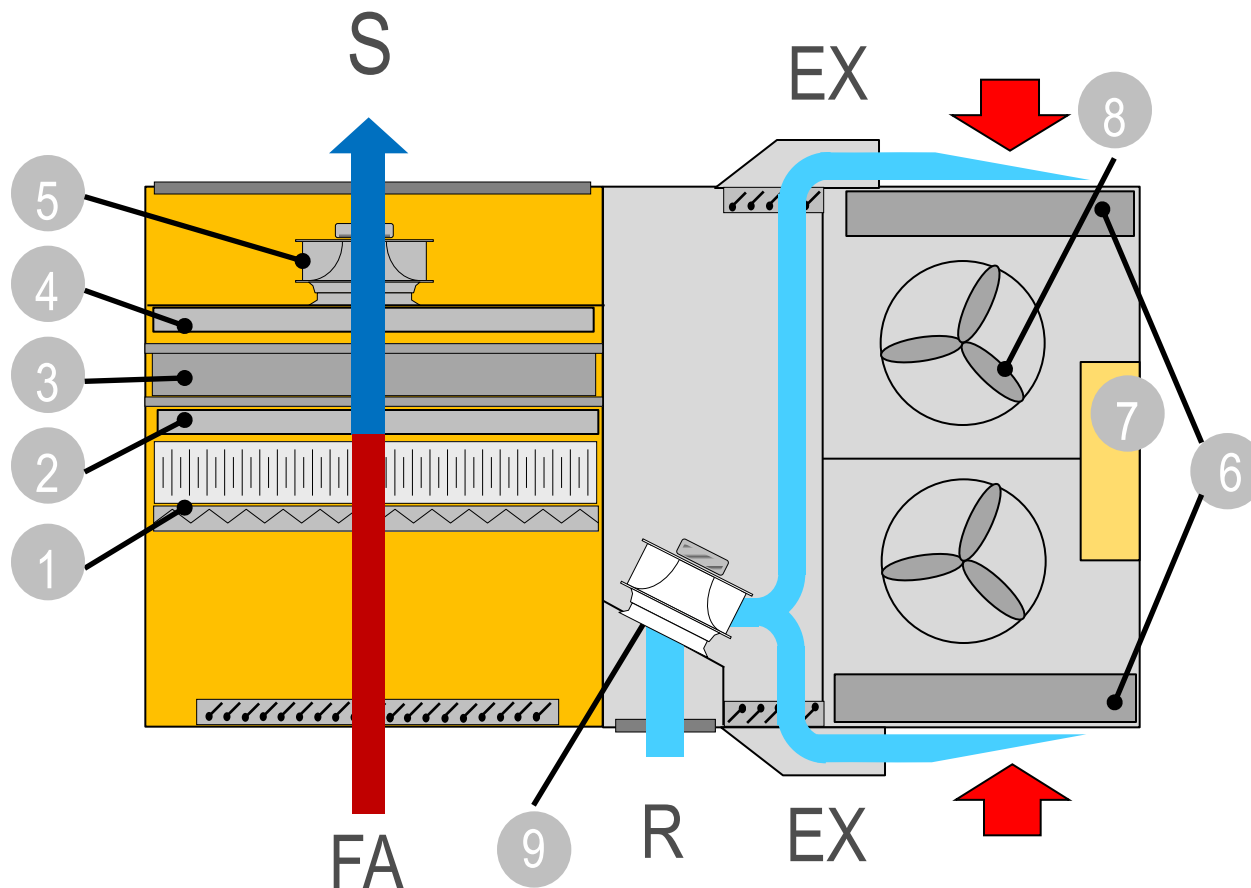
1. Filtration G4 + F7 or Electronic
2. Heating with water coil or electric heaters
3. Exchanger for air handling
4. Hot gas post-heating
5. Supply fan section
6. External exchanger
7. Electrical panel
8. External fan section

FA = fresh air

S = supply air



# CCFFA configuration with air supply and air extraction



1. Filtration G4 + F7 or Electronic
2. Heating with water coil or electric heaters
3. Exchanger for air handling
4. Hot gas post-heating
5. Supply fan section
6. External exchanger
7. Electrical panel
8. External fan section
9. Exhaust fan section

FA = fresh air

S = supply air

R = return air

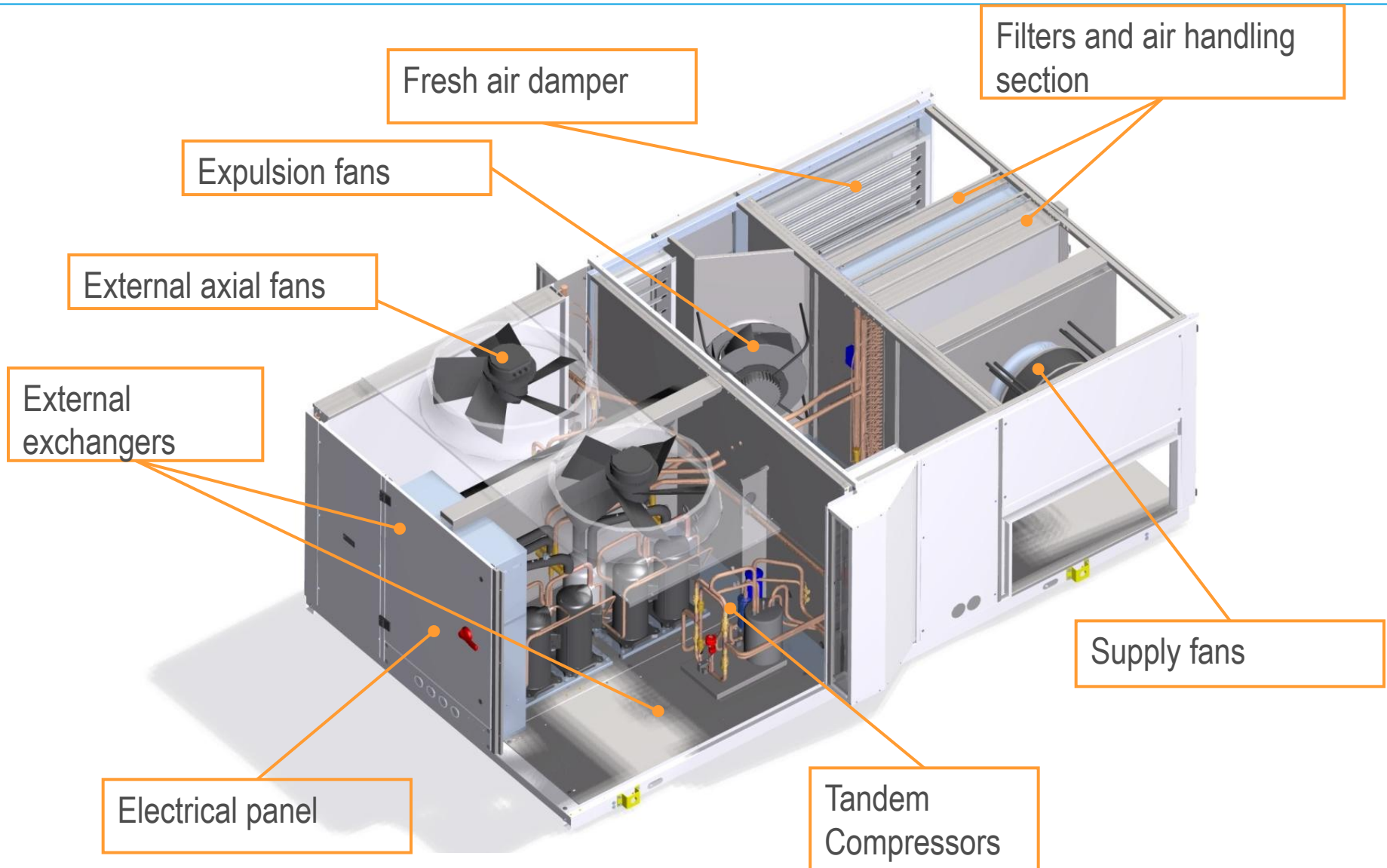
EX = exhaust air

# Functional features

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- **Two** independent **refrigeration circuit**
- Variable capacity with Digital scroll and on/off compressors (sizes 12.2-16.2); **Tandem Scroll compressors** (gr. 20.4-24.4) for seasonal high efficiency
- Radial plug fan with **EC brushless motor**
- Electronic expansion valve (EEV)
- **Microprocessor** management, time scheduling and set point

# High compactness





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