Technical Bulletin

BT14C007GB-01

CLIVETPack

Direct expansion high efficiency packaged rooftop air conditioner for medium attendance areas

R-410A

CSRT-XHE2 49.4 - 110.4 RANGE

AIR-AIR COOL ONLY R-410A

Airflow from 22000 to 60000 m^3/h

- High efficiency
- Energy recovery of exhaust air
- Variable airflow
- Maximum compactness
- Great versatility
- Quick installation

Air conditioning systems

The air-conditioning market sees remarkable advantages in these systems, in terms of energy and plant engineering execution.

These trends are more evident in systems with variable air flow-rate, as the energy requirements depend on the building load and the presence of occupants. Over the entire annual cycle, the control of these systems is, therefore, very complex due to the changing indoor conditions, as well as the changing conditions of the air mixture, which needs to be handled.

Clivet is committed to making traditional systems obsolete, by proposing innovative rooftop air-conditioning systems.

PACKAGED System


	Medium attendance applications			High attendance applications	Full fresh air applications
Air flow	**SMARTPack** 610 ÷ 2700 l/s (12 ÷ 52 kW)	**CLIVETPack** 2500 ÷ 6800 l/s (45 ÷ 138 kW)	**CLIVETPack** 7200 ÷ 16700 l/s (155 ÷ 376 kW)	**CLIVETPack** 1000 ÷ 4600 l/s (33 ÷ 138 kW)	**CLIVETPack FFA** 1700 ÷ 2200 l/s (69 ÷ 83 kW)
					
Air source Cooling only	CKT-XHE 41-151 DC Inverter	CSRT-XHE2 DC Inverter	CSRT-XHE2 49.4-110.4		CSRT-XHE2 FFA DC Inverter
Air source Heat pumps	CKN-XHE 41-151 DC Inverter	CSRN-XHE2 DC Inverter	CSRN-XHE2 49.4-110.4	CSNX-XHE2 DC Inverter	CSRN-XHE2 FFA DC Inverter
Water source Heat pumps		CRH-XHE2 DC Inverter	CRH-XHE2 49.4-110.4	CSNX-XHE2-H DC Inverter	
Electronically controlled ventilation and variable air flow	✔	✔	✔	✔	✔
Free cooling	✔	✔	✔	✔	✔
Thermodynamic energy recovery	✔	✔	✔	✔	✔
THOR (Thermodynamic Overboost Recovery)		✔	✔	✔	
Electronic filtration	✔	✔	✔	✔	✔

High efficiency systems

System strong points:

- THOR thermodynamic energy recovery
- Ventilation electronically controlled
- Variable airflow
- High efficiency filtration
- FREE-COOLING
- Horizontal or bottom return and supply

Complete and decentralised systems

The necessary cooling energy is only produced where and when needed, for this they can be independently be installed next to the zone to be conditioned with a considerable system saving

The single-block design of all of the plant engineering parts are contained inside the unit, already assembled and inspected.

The unit includes plug and play logic. Installation and later maintenance operations are easy and quick

CLIVETPack series for medium attendance applications

Air conditioning systems only for cooling

CSRT-XHE 82 - 302

nominal airflow: 5400 - 18000 m3/h

cooling capacity: 33 - 102 kW

CSRT-XHE2 49.4 - 110.4

nominal airflow: 22000 - 60000 m3/h

cooling capacity: 150 - 370 kW

Reversible heat pump air conditioning systems

CSRN-XHE 82-302

nominal airflow: 5400 - 18000 m3/h

cooling capacity: 33 - 102 kW

CSRN-XHE2 49.4 - 110.4

nominal airflow: 22000 - 60000 m3/h

cooling capacity: 150 - 370 kW

For many businesses, success depends on the right comfort of the users

Correct air conditioning is a fundamental component to manage various retail surfaces. Optimal temperature and humidity, air purification and proper ventilation are essential factors to ensure occupancy of these areas for both users and operators, regardless of external conditions. This is what happens in supermarkets and hypermarkets, shopping centres, stations, airports and industrial warehouses. Fresh air is even more for crucial for commercial catering to control odours and vapours. Finally, also in technical facilities ventilation and air-conditioning are often essential for the correct operation of the equipment they contain.

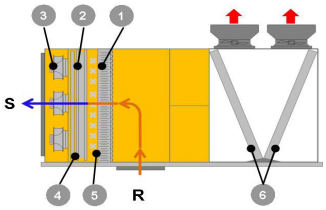
CLIVETPack CSRT-XHE2 delivers all the technological evolution by Clivet to the applications for middle attendance

The specialised ranges for applications with medium to high occupancy are widely used in industrial and commercial buildings. Their success is based on high energy efficiency, compactness, versatility, maintenance and operation simplicity.

Four main configurations providing different air flow control. Each one can be integrated by a broad range of accessories that customise the product based on the application.

CAK configuration: single fan section for full recirculation

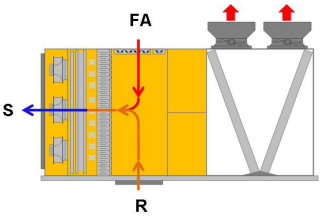
For air conditioning applications only, without the need for air renewal. The supply fan section provides the required supply and return available static pressure.



CBK configuration: single fan section for recirculation and fresh air

For applications where you need to keep the room in over-pressure, with the option of controlling a particular fresh air flow.

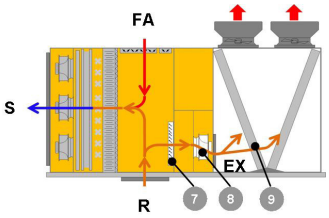
As for the CAK configuration, the supply fan section provides the supply and return available static pressure.



CCK configuration: double fan section for recirculation, fresh air, exhaust, thermodynamic recovery

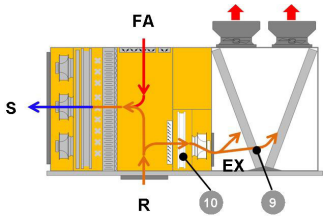
For applications with automatic air renewal and free-cooling function control. In addition to the parts contained in the CBK configuration, the unit is equipped with an exhaust section with thermodynamic energy recovery of the exhaust air.

This air, which is still rich in energy, is mixed with the outdoor air, favouring the temperature conditions on the source side of the exchanger and improving the heating and cooling capacity.



CCKP configuration: double fan section with fresh air and THOR thermodynamic recovery

For applications with automatic air renewal and free-cooling function control. In addition to the parts contained in the CCK configuration, the unit is equipped with an exhaust section with innovative thermodynamic energy recovery of the exhaust air through a dedicated THOR (THermodynamic Overboost Recovery) exchanger.



The energy contained in the exhaust air is recovered and transferred to handling through the refrigeration circuit.

R. Return air
S. Supply air
FA. Fresh air
EX. Exhaust air

1. G4 efficiency filters + H10 equivalent electronic filters
2. Handling exchanger
3. Supply fan section
4. Hot gas reheating exchanger
5. Electric heaters.
6. Source side exchanger
7. Exhaust damper
8. Exhaust fan section
9. Thermodynamic recovery on exhaust air
10. Thermodynamic recovery exchanger, THOR

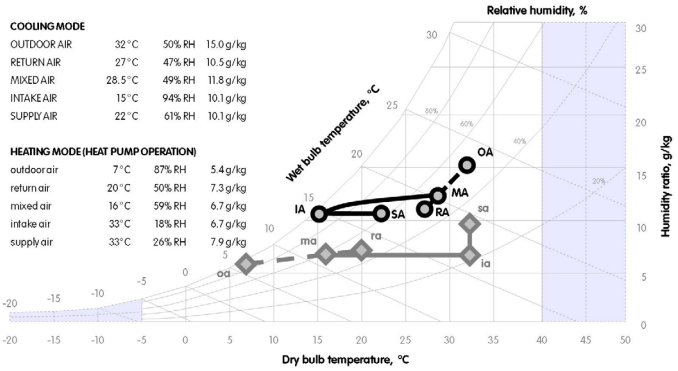
Comfort and air quality in only one product

Temperature and humidity control throughout the year

The unit acts on the overall heat load generated by the outdoor air and by the ambient loads.

Besides cooling the unit can supply heat energy if equipped with electrical heaters, hot water coil or condensed gas with burner heating module with modulating control.

The unit can also automatically control the relative humidity in the served ambient. In cooling mode the dehumidification function can be completed by a post-heating device with hot gas recovery and on the FREE-COOLING enthalpy control. In heating mode, the steam humidifier or the evaporating heater increases the humidity introduced into the air to maintain the desired value in the ambient.



Treatment example at full load for CLIVETPack model CSRT-XHE2 49.4 in standard air flow. Outdoor air flow equal to 30% of that treated. Unit complete with 'post-heating with hot gas'options.

Automatic management of the air renewal

The automatic logic of the air renewal:

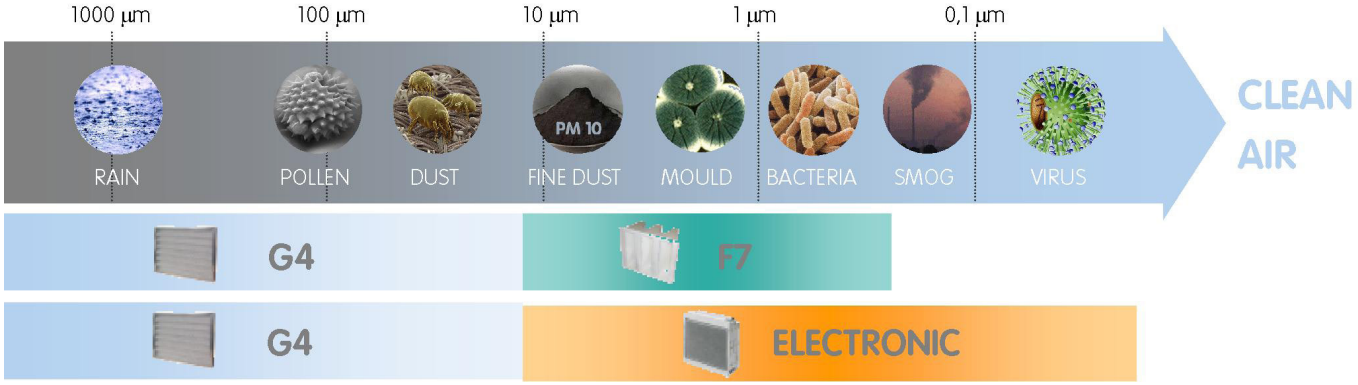
- Carries out the transient steady state in all recirculation mode, to reduce its duration and quickly reach comfort conditions
- Once these conditions have been reached, it operates with fixed open damper, based on the users preferred settings
- Carry out the FREE-COOLING as soon as the external conditions allow it
- In models fitted with air quality control, modulates the outdoor air renewal quantity, therefore guaranteeing the desired air quality with substantial energy and economic savings

Air filtering

Air filtering is an essential function for ensure proper well-being and hygiene conditions are maintained in the areas served. This is why it is subject to special regulations based on specific applications. The units are fitted as standard with large G4 filters with low pressure drops on the treatment area.

Very high filtration efficiency

As a second stage of filtration, there are F7 high efficiency filters or innovate electronic filters available. The efficiency of the fitted electronic filters is equivalent to the H10 classification used in traditional filters, or rather the class identification such as "absolute filter". They are efficient even on fumes, fine dust, particles PM10, PM2.5, PM1, bacteria, germs and virus.



Automatic control of the air quality

When the area is occupied in partial mode, a minor air change is necessary. The air quality probe (which is sensitive to the CO2 tracer) is positioned on the return of the served ambient and automatically determines the opening of the outdoor air damper to give the correct renewal and avoid waste.

Similarly, the probe is also sensitive to VOC (Volatile Organic Compounds) also acts in the presence of tobacco smoke, formaldehyde (for example from solvents, deodorants, glues, paint, detergents), cooked foods.

High energy efficiency within the annual cycle

Ventilation electronically controlled

An important expense entry in the systems management costs is represented by the energy consumption for ventilation, then the research for the correct operating conditions on the systems that forces them to carry out long and costly operations.

The ventilation technology makes it possible to cut back on both of these operational costs: it runs on fans that are coupled directly to electronic control brushless motors, and the control logic offers additional savings.

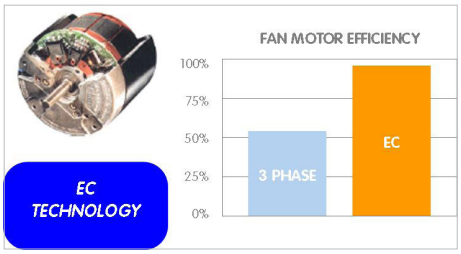
Versatility of reversed blades rotor

This particular type of rotor offers a wider field of operation compared with a traditional forward curved blade fan. When necessary, this can supply high static pressures simply by varying the number of revolutions. The accurate balancing and the self-lubricating bearings ensure its rotating stability over time.

The efficiency of the electronic controlled motor

The external rotor electric motor is driven by the continuous magnetic switching of the stator. The advantages are:

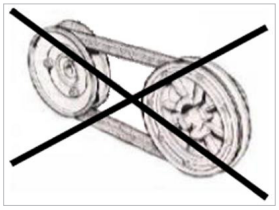
- The lack of brushes and the particular power supply increase efficiency by 70%;
- Even the life cycle increases, thanks to the elimination of the brushes' natural abrasive erosion effects;
- The electronic control also includes a "soft start" solution, which drastically reduces the starting current of the fan and limits even more the system's electrical commitment.



Advantages of direct coupling (plug fan)

The motor's rotation is transmitted directly to the rotor, without the use of transmissions (belts and pulleys):

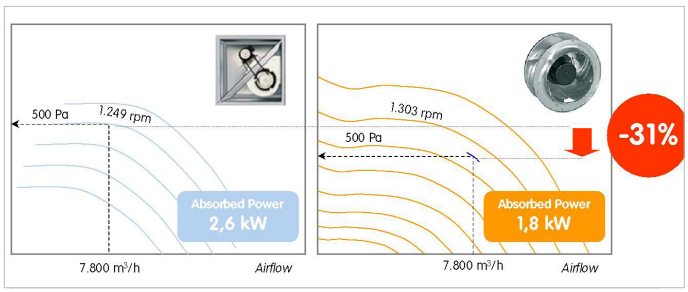
- the transmissions' inefficiencies are eliminated;
- the transmissions' wear and maintenance is eliminated.



Efficiency of the ventilation system increases by 30%

The comprehensive ventilation system, made up of rotor and motor, is therefore very versatile and efficient.

Consumption is 30% lower than a ventilation system of the same capacity used by traditional units available on the market.

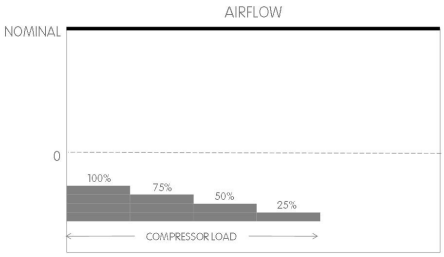


Electrical power absorbed by electric motor, data constructor - Example, referred to flow of 7.800 m3/h with 500 Pa external static pressure.

Automatic management of the air flow

Standard mode

The air flow supply remains constant in all heat load conditions and operation modes.

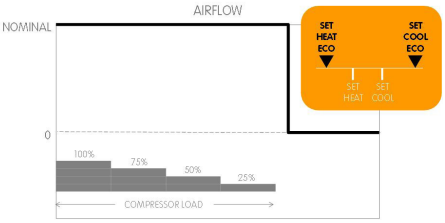


ECO mode

The air flow supply remains constant at varied heat loads and is shutdown when the load is fulfilled (dead zone).

To further increase the energy savings in this condition, it is also possible to set less demanding operation setpoints for the unit in respect to the standard mode.

This function is indicated for the thermal maintenance of the served area in case it is temporarily not used, which can for example occur at night.



The ECO mode can be activated:

- Manually
- Automatically by the functionality of daily and weekly programming supplied as standard
- Automatically by means of the Clivet supervision System

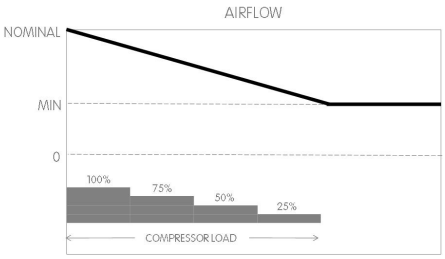
Variable airflow

The air flow supply varies depending on the heat load, up to a minimum value compatible with the distribution system and the chosen air diffusion.

The ventilation remains active even when the load is fulfilled (dead zone).

This option allows a further energy savings

- The movement of the air is always active during the operation of the rooftop unit
- It determines an annual energy consumption comparable or even greater than the compressors.



- The reduction of 20% of the flow generates a saving of 50% on energy absorbed by the ventilators
- With a reduction of the flow equal to 40%, the saving for ventilation exceeds 70%
- The variable airflow can therefore lead to a saving of 30% on an overall electrical consumption of the unit

Applications with textile channels

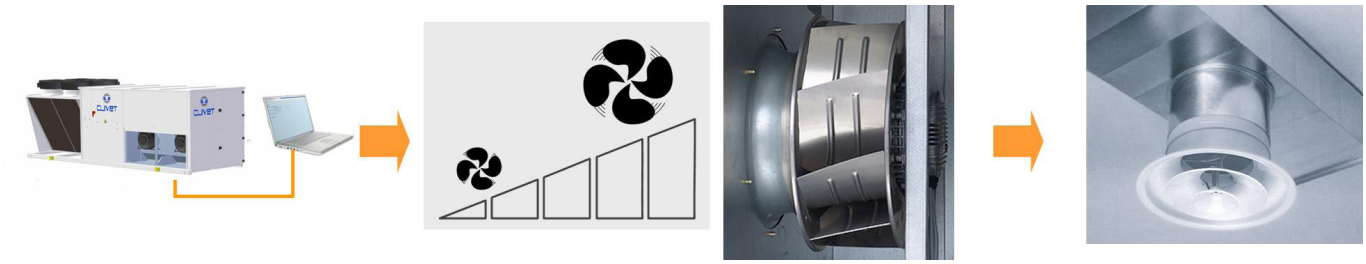
The fans with electronic control allow choosing the preferred ramp for fan start-up.

The units are therefore suitable for majority of the applications with textile channels for the air distribution.

This versatility remains valid in each management mode of the flow (standard, ECO, Variable flow).

The right air flow for every type of system

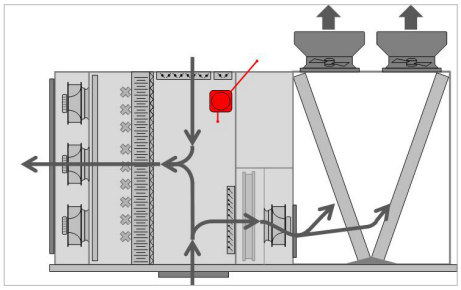
By controlling the fan speed, the airflow can be varied and the static pressure capacity can be adapted to the system pressure drop, making the unit start-up particularly simple. The adjustment or modification of the transmission is no longer required as the ventilation system will adapt itself to the system. The possibility to modify the fan start-up ramp makes this unit suitable for most applications with textile air distribution ducting.



Ambient pressure control

The ambient pressure control device compares the return pressure with the external pressure and compensates any variations by acting on the outdoor air damper.

This way, the unit maintains the relevant ambient pressure desired by the user, who can choose between the overpressure, depression or equal-pressure.



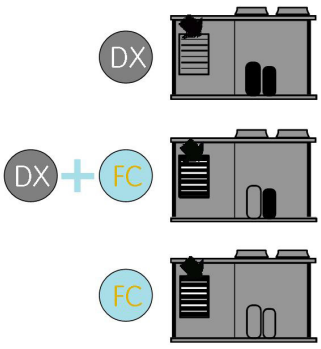
The room pressure control device is fitted as standard in the units with extraction and exhaust (Clivet reference code CCK and CCKP)

FREE-COOLING

As soon as the external conditions allow it, the unit is capable of automatically activating the FREE-COOLING mode, which, keeping the compressors off and drawing in suitably filtered outdoor air allows to cool the served room. This operating mode is especially useful in spring and autumn or in case of high ambient loads. It allows substantial reduction of the unit energy consumption and compressors.

To obtain the maximum energy saving, the FREE-COOLING model is activated even when it is not sufficient to supply all the cqapacity requested. In this case the integration cooling capacity is supplied from cooling by means of compressors.

At reduced load, or even with rigid outdoor air temperatures, the cooling capacity in FREE-COOLING mode is controlled by means of a modulation of the outdoor air damper.



Min. outdoor air damper

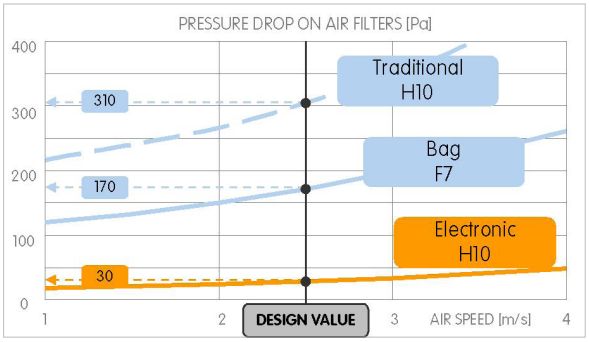
Together with the FREE-COOLING damper, it realizes the air renewal in the space. Its size provides more accurate control for minimum air renewal flow rates. It guarantees the lowest possible noise levels in the room at low air crossing speeds, even with minimum openings.

The electronic filters reduce the energy necessary for ventilation

The highest filtration efficiency is obtained with practically no pressure drops.

This depends on the metal pre-filter that is found upstream of the plate and withholds the coarse particles. Moreover, the metal pre-filter homogeneously distributes the air flow and contributes to the containment of the magnetic field generated during operation.

The energy for the ventilation is thus reduced by more than 10%.

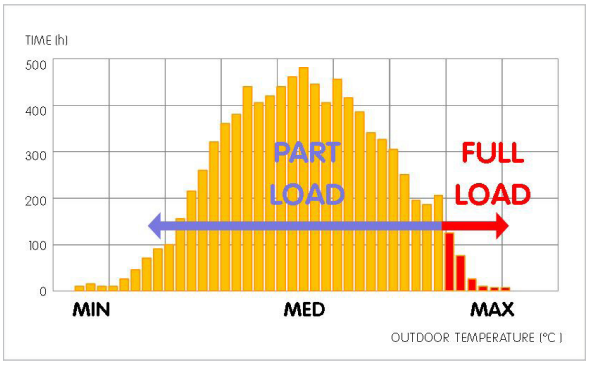


Part load efficiency determines the seasonal efficiency

The system is required to generate maximum capacity only for a short amount of time.

Therefore, it is essential to have the maximum efficiency under part-load conditions.

This is the only way to actually reduce overall yearly consumptions.



Modular Scroll technology boosts performance at part load

Since the maximum capacity is requested only for short periods of time, it is fundamental to place the maximum efficiency in the partial load conditions. The unit uses high efficiency Scroll compressors. The advantages are:

- compressors manufactured in large ranges, with strict quality controls and maximum reliability thanks to the high production volumes
- the refrigerant circuit uses two compressors, almost always of different sizes in order to obtain more control steps. This way, only the necessary energy is supplied.

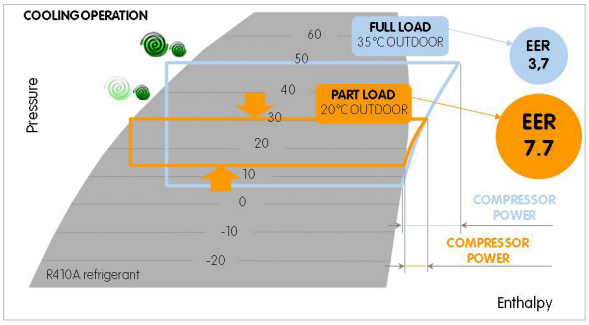
All sizes have a double refrigeration circuit with compressors connected in tandem, for greater reliability and safe operation.

THE SEQUENTIAL DEACTIVATION OF THE COMPRESSORS INCREASES EFFICIENCY

Doubled efficiency

The heat exchange surface is sized for full capacity operation. Under part load condition, some compressors are automatically deactivated. Under this condition, in fact, the compressors in operation make use of a much larger surface.

This entails a reduced condensation temperature and an increased evaporation temperature. This way, the compressor capacity consumption is reduced with respect to the yield thereby increasing the overall efficiency of the unit.

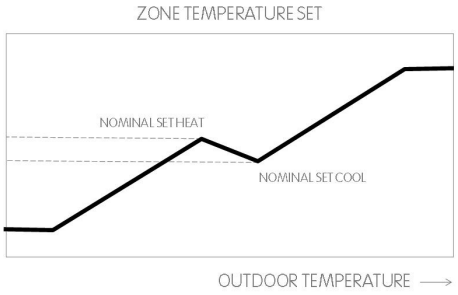


Example referred to CSRT-XHE2 49.4 in the all recirculation operation

Set-point automatic compensation

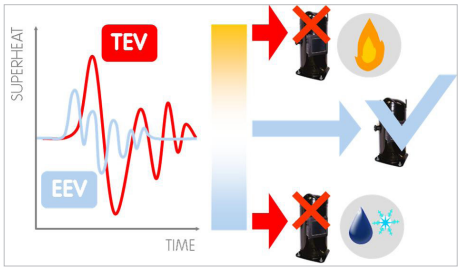
With this function as standard, the temperature set-point can automatically vary in view of the outdoor temperature and of the User settings:

- Further increases the energy saving
- Reduces the temperature difference between the outside and the served area, increasing the user comfort.



Stable and reliable operation

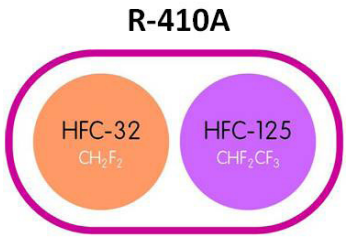
The electronic expansion valve (EEV) adapts rapidly and precisely to the actual load required for usage, allowing stable and reliable adjustment in comparison with mechanical thermostatic valves (TEV). This results also in a further increase in efficiency and longer compressor life. Through control of overheating, it also prevents hazardous phenomena for the compressors, such as overtemperature and return of fluids, thereby further increasing efficiency and durability.



High efficient refrigerant

R410A is the mix of two refrigerants used in equal parts: R32 that supplies the heating capacity and R125 that controls the flammability. It is a chlorine free refrigerant (HFC) with numerous advantages:

- ODP (Ozone Depletion Potential) = 0
- High volumetric effect thanks to the high coefficient global thermal exchange and to the pressure variation (glide) which is almost nil during the evaporation phase
- Elevated density and efficiency, with greater compactness of the refrigeration circuit and therefore the responsible use of materials and small refrigerant quantity, for a reduced environmental impact.



Energy recovery on the exhaust air

The air renewal in buildings is indispensable for checking the air quality and comfort. The movement and the treatment of the outdoor air generate added costs in the realisation of the system and energy consumption in its service life. For this reason the energy recovery devices on ejected air are widely used. Local standards and provisions regulate the application.

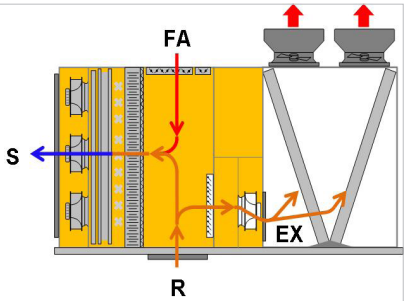
Rooftop in CCK and CCKP configuration are equipped with the energy recovery on the exhaust air

CCK - Thermodynamic energy recovery

Thermodynamic recovery is also included in the CCK configuration and uses the technology of refrigeration circuit with direct expansion.

The unit is equipped with an electronically controlled exhaust fan section that automatically controls the amount of air to reject.

The exhaust air flow is, in fact, directed onto the external finned coil exchanger which is accordingly thermally favoured in its operation cycle. The recovered energy is transferred by the handling exchanger and therefore transferred directly to the supply air.

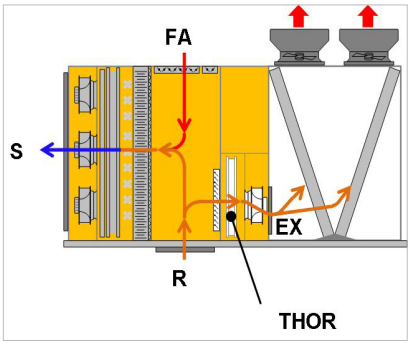


CCKP - THOR thermodynamic energy recovery (THermodynamic Overboost Recovery)

The innovative THOR recovery (THermodynamic Overboost Recovery) is always included in the CCKP configuration and uses direct expansion refrigeration circuit technology.

The unit is equipped with an electronically controlled exhaust fan section that automatically adjusts the amount of air to reject. The exhaust air flow is directed by the exchanger dedicated to recovery, which is an integral part of the refrigeration circuit. The amount of recovered energy is easily measurable like the static heat recovery.

Summer energy recovery provides a dual positive effect: it increases the capacity and offers a significant energy savings.



The main benefits of the energy recovery:

- it increases the total unit efficiency
- it eliminates the greater part of electrical power consumption for the ventilation of passive recovery devices, which also significantly reduce the effective amount of recovered energy
- it is effective for cooling operations, especially in continental and temperate climates where passive recovery device output is essentially negligible due to a low outdoor and indoor temperature difference and enthalpy
- it keeps the unit compact and simplifies its positioning.

Energy recovery from food refrigeration

Modern supermarkets and hypermarkets consume massive amounts of energy every year on food storage. With most of these systems, the heat that they produce is released outdoors through air-cooled condensers.

In winter, energy recovery from cold storage offers new possibilities for energy savings, as it increases the efficiency of the entire air conditioning and food storage system.

Evolution and optimization of the external ventilation

A new diffuser on the fans in the outdoor section optimizes air distribution, with a considerable increase in efficiency.

The amount of electric power input by the motor leads to an equally greater air flow rate till 8%, which improves the energy exchange with a considerable increase in the heating and cooling output.

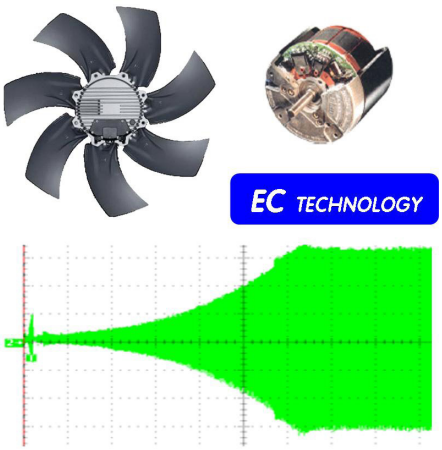
Also, the special aerodynamic shape lowers sound emissions by -3dB(A), to the full benefit of indoor and outdoor sound comfort.

Electronic control ECOBREEZE technology

With ECOBREEZE, the electric motor with an external rotor is driven by the continuous magnetic switching of the stator, deriving from the integrated electronic control.

The advantages are:

- 70% increase in efficiency thanks to the brushless technology and the special electricity supply;
- increase in the working life, thanks to the elimination of the brush wear;
- Reduction in the electrical consumption by the system, thanks to a drastic reduction of the inrush current for the fans obtained using the integrated 'Soft starter' function.



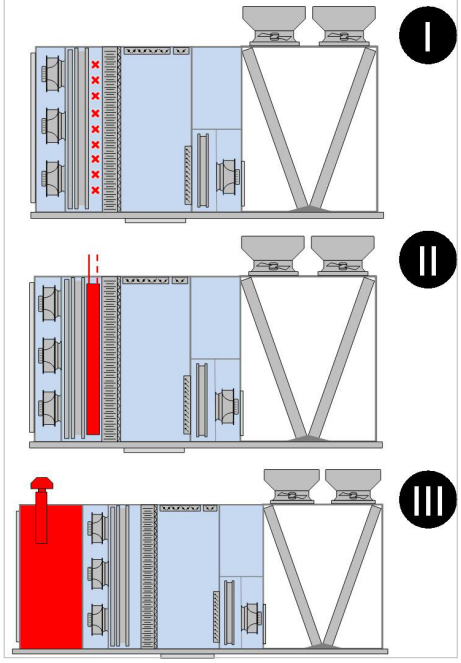
High efficiency heating solutions

The use of electrical heating elements (I) allows to maintain the benefits of the single-block solution both in terms having a simple design and a rational system. This is an interesting solutions in cases where heating demand occurs only for short periods of time when the system is actually used.

Alternatively, the optional hot water coil (II) extends the operating range of the unit to even colder climates. You can choose the option after, for instance, examining the various costs to supply the energy sources for the individual applications. It requires the availability of hot water, which may come from remote heating, a traditional boiler with fossil fuels or from industrial process circulation.

Another available solution is the combustion burner heating module (III). It is the solution frequently used in very cold climates and gas network availability. Unlike systems powered by a thermal power station it does not require the distribution of hot water outside the building: this simplifies the system, eliminates pumping consumption and avoids the use of devices and controls against the risk of freezing.

In very cold climates it is also necessary to foresee the 'Low outdoor temperature configuration" option. The operation fields of the different heating options are shown separately.



Combustion heating modules

The following kinds of modules are available with different heating capacities:

- heating module only with a combustion chamber: the burner is chosen and installed by the user, a flexible option in terms of brand and model, type of operation, fuel and being able to do maintenance with your own technician.
- gas or oil heating module with 2-stage control: both an efficient and cost-effective solution for its low initial investment costs.
- gas-operated condensation module with modulating control: extremely efficient solution that, thanks to the condensation and accurate control, always allows for top comfort levels. It is the best choice for the overall cost reduction throughout the lifespan of the system

Winter thermodynamic energy recovery for unit with hot water coil or gas module

The refrigerating circuit of this unit is of reversible type. Carries out the thermodynamic energy recovery, automatically activating only one compressor that, thanks to the high exchange surface available, operates with highly efficient energy. In respect to the passive recuperators:

- Delivers a notably superior thermal and stable capacity in time. This reduces the capacity requested from the hot water coil or gas module
- Eliminates most of the consumption for ventilation caused by the high pressure drops of the passive exchangers. Therefore, further increases the overall efficiency.

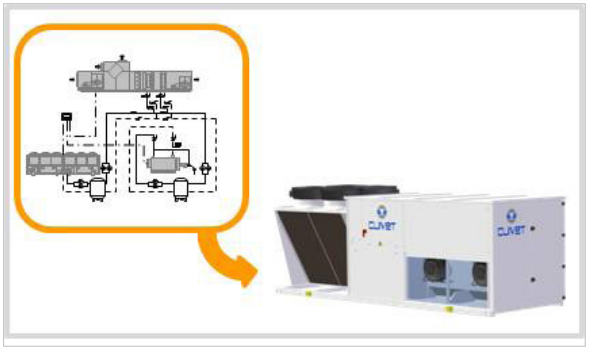
Reliability and saving throughout the entire life-cycle

Great system simplification and increase in reliability

The single block solution significantly reduces the initial system costs in respect of the traditional solutions based on the hydronic systems with separate production, for example by means of chillers and boilers, or on direct expansion systems with fresh air.

Most of the normal engineering activities are in fact created by Clivet inside the unit

- Component selection and dimensioning
- Water and mechanical connections
- Electric and control wiring
- Functional test



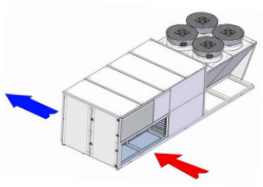
Only the air distribution ducts connection and the power supply of the unit are provided by the Customer.

The air distribution depending on the installation

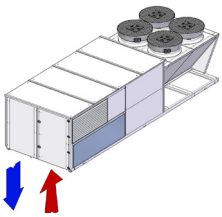
Great flexibility of set-up on site, the air supply and return of these units can be from the side or bottom.

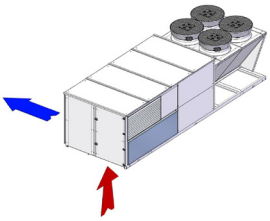
The configuration is selected during offering, choosing the supply and return set-up for the air duct connections, and to adapt the unit to certain architectural design constraints or make it easier to replace existing systems.

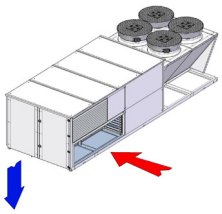
Standard Version



Other available versions





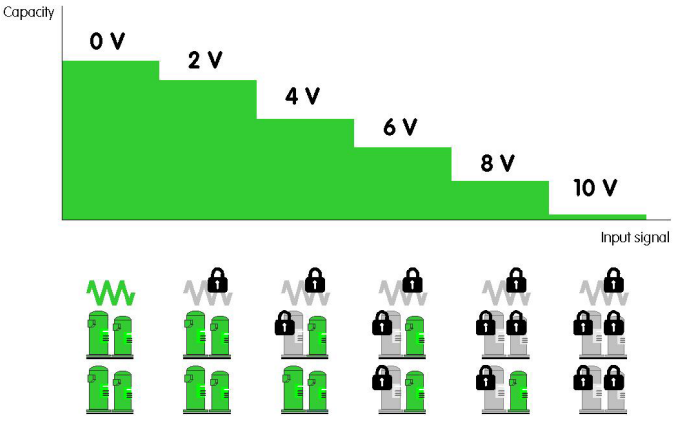


Demand limit

The partial or total activation of the compressors - and the heating electric resistance where present - can be disabled to limit the overall electric capacity absorbed.

The external signal is of analogical type 0-10 V / 4-20 mA. The greater the signal, the lower the capacity that the unit is enabled to deliver, activating the compressors and the electric elements.

The Demand Limit function does not act on the control or on the ventilation, which are therefore always guaranteed, nor on the remaining resources such as hot water coil or the gas heating module.



Airflow configuration: S= supply R = return

The represented number of compressors constitutes an indicative example

Operating completely automatic

The microprocessor control automatically manages operation according to the maximum efficiency criterion and includes many safety and alarm management functions.

It also includes advanced functions, such as daily and weekly programming and automatic maximum power consumption limitation (demand limit).

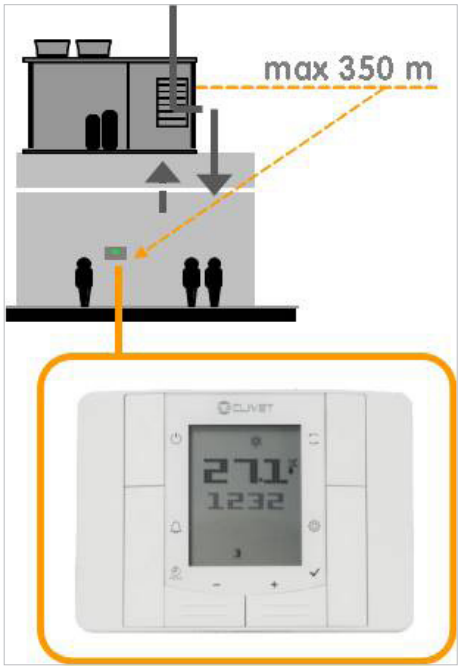
Simple and intuitive user interface

The remote control with user interface (for wall mounting) is supplied as standard and it can be easily used also by not specialized personnel. The connecting cable (not supplied) has a double function of serial communication and power supply.

Among the main functions it allows to:

- unit switching on and off
- daily/weekly start-up or power-off programming of the unit and the Comfort or ECO (energy saving) or Ventilation-only mode
- display the alarm code and the unit stata
- management of the main operating parameters (password-protected)
- selective key lock, unlocked with password

The temperature and humidity measurement is made by probes into the unit: the remote control can therefore be installed also inside the technical control compartment. When the centralised supervision system or an other remote control device is provided, the unit can be supplied without the remote control with the user interface.



Remote system management

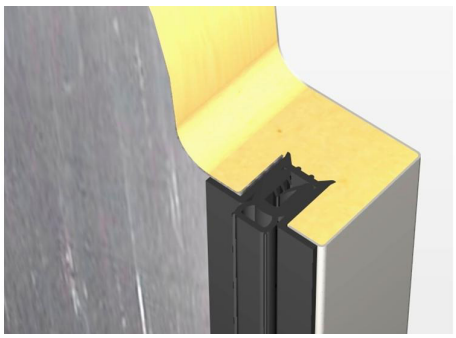
The unit can be remotely managed by:

- Remote control user interface, supplied standard
- Clivet Master System, device to manage a group made of max 8 units
- Clivet P-Matic, supervision system able to be interfaced to other users
- Free contacts supplied as standard, to remotely control the main functions and to display alarms and operating stata.
- Different communication protocols to exchange information with the main supervision systems by serial line.

Composite panels with sandwich structure

The "sandwich" type panelling is lighter and sturdy. They reduce the thermal dispersions and therefore the energetic consumptions.

They are composed of a double steel wall that contains the insulating material, made of injected polyurethane. They are equipped with seal gasket for the whole length of the perimeter.



Easy access for maintenance

The internal components are positioned based on type, in an homogeneous area with easy and safe access, thanks to the hinges that support the larger sized doors to their adjustable hinges and to the device that blocks the access panel to the electrical control board in open position and helps protect the maintenance operator from the rain.

Simplified maintenance

Thanks to the local plug RJ45 available outside the unit, the authorised technical personnel will be able to undertake all the operations to control and maintain the unit by:

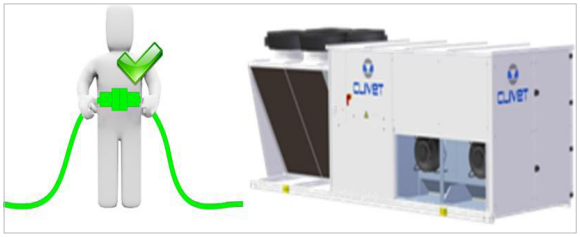
- laptop computer equipped of Ethernet network cable and of web browser (like for example Firefox, Explorer, Chrome, Safari).
- service interface with extensible cable of 1.5 m as available option.

Controlled power supply

Proper power supply ensures optimal unit operation and protects its many electrical components.

The phase monitor, standard supplied:

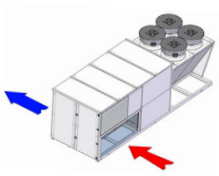
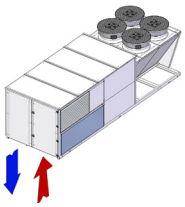
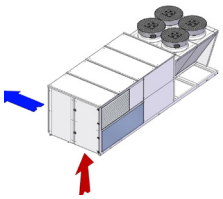
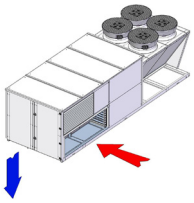
- controls the presence and exact sequence of the phases
- verifica eventuali anomalie di tensione (+/-10%)
- automatically restarts the unit as soon as the proper power supply is restored.



Furthermore it is possible to choose the multifunction phase monitor as optional adding to the previous functions also the manual setting of the overvoltage, undervoltage and slot limit values, over which the unit is automatically switched off.

Unit configuration

Model	Version	Size							
CSRT-XHE2	**CAK** - Full recirculation	49.4	54.4	60.4	70.4	80.4	90.4	100.4	110.4
	CBK - Fresh air								
	CCK - FREE-COOLING, thermodynamic recovery								
	CCKP - FREE-COOLING, THOR thermodynamic recovery								

Functionalities				
Air supply and return	**M0 - R0** Standard unit	**M3 - R3** Option	**M0 - R3** Option	**M3 - R0** Option
				

Filtration	G4	G4 + F7	G4 + FES H10

Auxiliary heating	Electric heater	Hot water coil	Combustion module

Configuration options		
• **FC** - Thermal FREE-COOLING (standard for CCK and CCKP configuration) • **FCE** - Enthalpic FREE-COOLING • **CPHG** - Hot gas re-heating coil • **F7** - High efficiency air filter • **FES** - Electronic filters • **PSAF** - Clogged filter differential pressure switch air side • **EH** - Electric elements • **CHW2** - Two-rows hot water coil • **3WVM** - Modulating 3-way valve • **GD, OD, GC** - Combustion heating module	• **HSE** - Immersed electrodes steam humidifier • **HWS** - Steam humidifier with disposable water • **VENH** - High static pressure fans • **PAQC** - Air quality probe for the CO2 rate check • **PAQCV** - Air quality probe for the CO2 and VOC rate check • **SERM** - Outdoor air motorized ON/OFF damper only CBK) • **SFCM** - Modulating motorized FREE-COOLING damper (only CBK) • **SFCEM** - FREE-COOLING and min. outdoor air motorized and modulating dampers (only for CCK and CCKP configuration) • **MHP** - High and low pressure gauges	• **PCM0** - Sandwich panels of the handling zone in M0 fire reaction class • **RCAW** - Winter thermodynamic active recovery on exhaust air • **DESM** - Smoke detector • **CREFP** - Fan consumption reduction device of external section at variable speed (phase cutting) (standard). • **CREFB** - ECOBREEZE external section fans consumption reduction device • **MOB** - Modbus serial communication module • **LON** - LonWorks serial communication module • **BACIP** - BACnet-IP serial communication module • **MF2** - Multifunction phase monitor • **PFCP** - Power factor correction capacitors (cosfi > 0.9)

Accessories separately supplied		
SIX - Service interface	**CLMX** - Clivet Master System	**AMRX** - Rubber anti-vibrating dampers

Standard unit technical features - Configuration with single fan section for full recirculation (CAK) and for recirculation and fresh air (CBK)

Compressor

Hermetic orbiting scroll compressor complete with motor over-temperature and over-current devices and protection against excessive gas discharge temperature. Fitted on rubber antivibration mounts and complete with oil charge. The oil heater is automatically activated to prevent the oil from being diluted by the refrigerant when the compressor stops. The compressors are connected in TANDEM on a single refrigeration circuit and have a biphasic oil equalisation.

Structure

The support base is assembled with a painted galvanized steel frame. The internal structure is made of zinc - magnesium bent galvanized steel. The alloy Zn - Mg allows an excellent corrosion proofing thanks to the galvanic protection typical of the combination zinc - magnesium.

Panelling

Sandwich panels in the air treatment section with dual walls in steel sheet metal with polyurethane insulation (40 kg/m3), thickness of outer sheet metal 6/10 mm galvanized and painted using polyester powders colour RAL 9001, polyurethane thickness with thermal conductivity coefficient 0.022W/mK, thickness of internal sheet metal 5/10 mm hot galvanized. The panel is also provided with a PVC profile for thermal insulation and a EPDM rubber gasket that ensures the hermetic seal. All panelling can easily be removed to allow complete accessibility to internal components.

Internal exchanger

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.

External exchanger

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. A correct power supply to the expansion valve is ensured by the subcooling circuit; this circuit also prevents the formation of ice at the base of the heat exchanger during winter operation.

Fan

Internal section

Plug fans without scroll with reverse blades driven by electronically-controlled "brushless" dc motors with direct coupling. No transmission sizing is needed.

External section

Helical fans with shaped aluminium blades coupled directly to a three phase electric motor with thermal protection incorporated in version IP 54. Housed in aerodynamically shaped nozzles to increase efficiency and minimise noise levels. They are fitted with protective safety guard grilles.

Supplied with phase cutting speed modulation.

Refrigeration circuit

Refrigeration circuit with:

- refrigerant charge
- sight glass with moisture and liquid indicator
- high pressure safety pressure switch
- low pressure safety switch
- filter dryer
- electronic expansion valve
- liquid receiver
- high pressure safety valve
- low pressure safety valve

Filtration

Outdoor air inlet side and environment return 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).

Drain pan

Internal section

Inox steel AISI 304 condensate collection tray with anti-condensate insulation, welded, fitted with drain pipe.

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

The microprocessor control section includes:

- compressor overload protection and timer
- Demand limit
- potential-free contacts for remote ON-OFF, cumulative alarm, fire alarm inlet, fan status, compressor status, summer/winter mode
- phase monitor
- RJ45 located on the unit's outer surface for inspection and maintenance operations

Remote control with user interface

- switching the unit on and off
- daily/weekly start-up or power-off programming of the unit and the Comfort or ECO (energy saving) or Ventilation-only mode
- manual change of the operating mode (heat or cool) and / or of the temperature setpoint
- display the alarm code and the unit stata
- management of the main operating parameters (password-protected)
- selective key lock, unlocked with password

Accessories

- Downflow version
- Floor air inlet
- Two-rows hot water coil
- Modulating three-way valve
- Modulating two-way valve
- Hot gas re-heating coil
- Combustion heating module
- Recovery exchanger from food refrigeration
- Immersed electrodes steam humidifier
- Water to waste evaporating wet-deck humidifier
- Electric heaters.
- Air quality sensor for CO2 p.p.m. control
- Air quality sensor for CO2 and VOC p.p.m. control
- Winter thermodynamic active recovery on exhaust air ((only for CCKP configuration)
- Outdoor air motorized on/off damper (only for CBK configuration)
- Modulating motorized FREE-COOLING damper (optional for CBK configuration, standard for CCK and CCKP configuration)
- Modulating motorized FREE-COOLING damper and min. outdoor air motorized on/off damper (only for CCK and CCKP configuration)
- High efficiency F7 air filter
- Electronic filters
- Differential pressure switch for dirty air filters
- Serial port RS485 with Modbus protocol
- LonWorks serial communication module
- BACnet-IP serial communication module
- Multi-function phase monitor
- Service interface (accessory separately supplied)
- Power factor correction capacitors (cosfi > 0.9)
- Enthalpy FREE-COOLING (only for CCK and CCKP configuration)
- Constant supply airflow
- Variable airflow
- Device for consumption reduction of the external section ECOBREEZE fans
- High and low pressure gauges
- Smoke detector
- Application for low outdoor temperature
- Spring antivibration mounts (accessory separately supplied)
- Roof curb (separately supplied accessories)
- Clivet Master System (accessory separately supplied)
- Sandwich panels of the handling zone in M0 fire reaction class
- Shipping via Container

All the handling coils can be covered with aluminium - fin guard - copper/copper

Test

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

Configuration with double fan section for recirculation, fresh air, exhaust, thermodynamic recovery (CCK)

Technical features as the configuration with single fan section for full recirculation (CAK) and single fan section for recirculation and fresh air (CBK) and moreover:

Exhaust fan

Plug fans without scroll with reverse blades driven by electronically-controlled "brushless" DC motors with direct coupling.

No drive sizing is required.

Thermodynamic recovery on the exhaust air

The energy content of the exhaust air is recovered by the external exchanger, through a dedicated fan section. The favourable air temperature on the source side increases unit capacity.

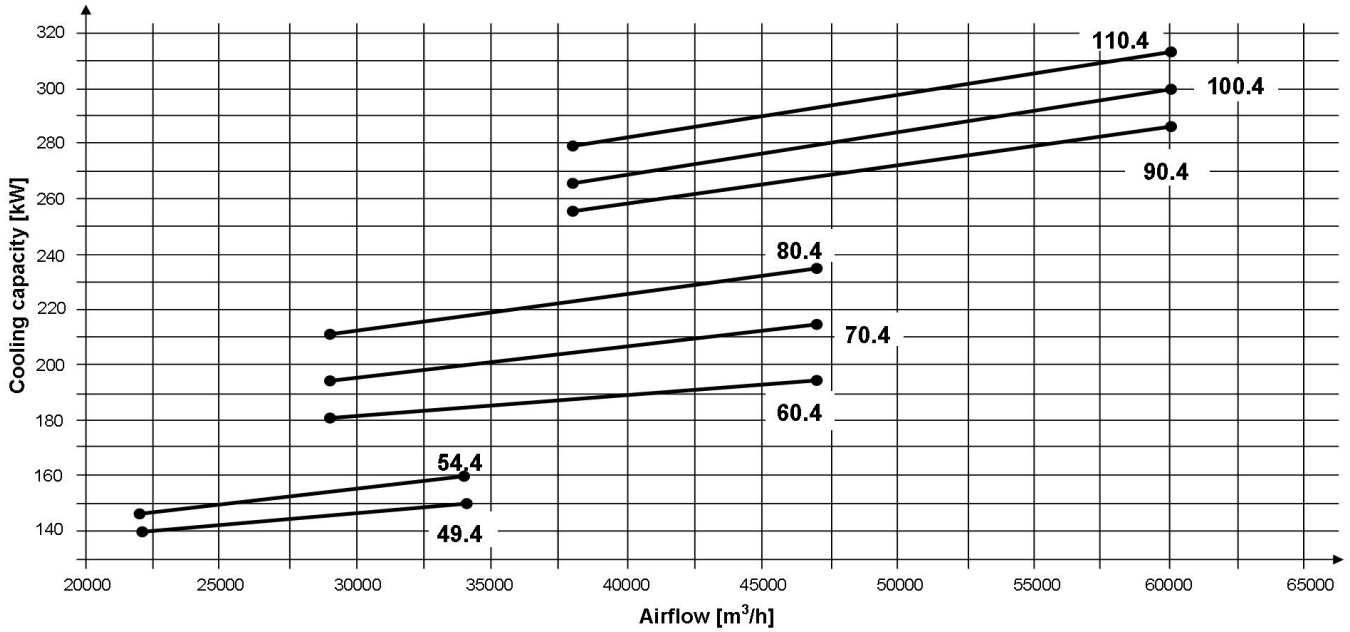
Configuration with double fan section for recirculation, fresh air, exhaust, THOR thermodynamic recovery (CCKP)

Technical features like the configuration with recirculation, renewal, exhaust air and thermodynamic recovery (CCK) and also:

Exchanger for thermodynamic recovery - THOR

The energy content of the exhaust air is recovered by a dedicated exchanger, as integral part of the refrigeration circuit. It is a 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.

The broad CLIVETPack CSRT-XHE2 series



Different heating-cooling handling is available depending on the air flow, based on the selected size.

STANDARD AIRFLOW

General technical data

Size				49.4	54.4	60.4	70.4	80.4	90.4	100.4	110.4
Cooling											
Cooling capacity	CAK	1	kW	154.2	164.1	194.4	212.5	244.4	295.6	311.0	332.6
Sensible capacity		1	kW	116.0	123.9	143.2	163.7	183.6	220.0	231.6	245.2
Compressor power input		1	kW	41.3	45.5	50.4	59.0	65.3	76.5	84.9	95.7
EER		1		3.73	3.61	3.86	3.60	3.74	3.86	3.66	3.48
Cooling capacity	CBK	2	kW	160.8	170.8	202.3	222.5	256.9	308.2	327.2	345.7
Sensible capacity		2	kW	119.0	128.2	148.2	166.8	187.2	226.7	237.3	253.1
Compressor power input		2	kW	41.9	46.0	51.1	60.1	66.1	77.5	86.5	97.2
EER		2		3.84	3.71	3.96	3.70	3.89	3.98	3.78	3.56
Cooling capacity	CCK	3	kW	163.7	174.6	205.3	226.4	261.7	312.5	332.2	351.9
Sensible capacity		3	kW	120.9	130.3	149.7	168.5	189.8	229.5	240.1	256.1
Compressor power input		3	kW	40.6	44.4	49.9	58.6	64.2	75.6	84.3	94.6
EER		3		4.03	3.93	4.11	3.86	4.08	4.13	3.94	3.72
Cooling capacity	CCKP	3	kW	174.4	185.3	219.5	241.2	278.6	334.3	354.9	375.0
Sensible capacity		3	kW	128.3	138.1	159.7	179.7	201.8	244.4	255.7	272.7
Compressor power input		3	kW	41.5	45.5	50.6	59.6	65.5	76.8	85.7	96.3
EER		3		4.20	4.07	4.34	4.05	4.25	4.35	4.14	3.89
Compressor											
Type of compressors		4		Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
No. of compressors			Nr	4	4	4	4	4	4	4	4
Std Capacity control steps			Nr	6	6	4	6	6	6	6	6
Refrigeration circuits			Nr	2	2	2	2	2	2	2	2
Air Handling Section Fans (Supply)											
Type of supply fan		5		RAD	RAD	RAD	RAD	RAD	RAD	RAD	RAD
No. of supply fans			Nr	3	3	4	4	4	6	6	6
Fan diameter			mm	560	560	560	560	560	560	560	560
Supply airflow			m^3/h	26000	29000	33000	37000	44000	51000	56000	60000
Supply airflow			l/s	7222	8056	9167	10278	12222	14167	15556	16667
Installed unit power			kW	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90
Max. static pressure supply fan		6	Pa	760	690	740	650	540	760	690	580
Fans (Exhaust) (only CCK, CCKP-THOR configuration)											
Type of fans		5		RAD	RAD	RAD	RAD	RAD	RAD	RAD	RAD
No. of fans		7		2	2	2	2	2	2	2	2
Installed unit power		7	kW	2.60	2.60	2.70	2.70	2.70	2.70	2.70	2.70
External Section Fans											
Type of fans		8		AX	AX	AX	AX	AX	AX	AX	AX
No. of fans			Nr	2	2	4	4	4	6	6	6
Standard airflow			l/s	12500	12500	23333	23333	23333	35000	35000	35000
Single power input			kW	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Connections											
Condensate drain			mm	30	30	30	30	30	30	30	30
Power supply											
Standard power supply			V	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50

Performances in cooling: Indoor air temp. 27°C/19°C W.B. Entering external exchanger air temperature 35°C D.B./24°C W.B. EER referred only to compressors

1. Performance refers to operation at full re-circulation
2. Performance with 30% of outdoor air
3. Performance with 30% of outdoor air including the energy recovery on the exhaust air
4. SCROLL = scroll compressor
5. RAD = radial fan electronically controlled
6. Net outside static pressure to win the outlet and intake onboard pressure drops
7. Configuration with double fan section for recirculation, fresh air, exhaust, thermodynamic recovery (CCK) and configuration with double fan section with fresh air and THOR thermodynamic recovery (CCKP)
8. AX = axial fan

Sound levels

Size	Sound Power [dB]								Sound pressure level	Sound power level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	[dB(A)]	[dB(A)]
49.4	99	95	98	88	84	75	70	67	72	92
54.4	101	95	95	90	87	78	74	72	72	92
60.4	105	95	95	91	86	80	75	73	72	93
70.4	106	96	95	92	88	83	77	75	73	94
80.4	106	97	96	93	89	82	77	75	74	95
90.4	107	101	100	94	92	85	79	78	76	97
100.4	108	102	101	95	93	86	80	79	77	98
110.4	109	103	102	96	94	87	81	80	78	99

The sound levels are referred to unit operating at full load in nominal conditions. The sound pressure level is referred at a distance of 1 m. from the ducted unit surface operating in free field conditions. External static pressure 50 Pa. (standard UNI EN ISO 9614-2)
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.

Electrical input of optional components

To obtain the electrical input of the unit including accessories, add the standard data in Electrical Data table to those for the selected accessories.

SIZES			49.4	54.4	60.4	70.4	80.4	90.4	100.4	110.4
F.L.A. Absorbed current										
F.L.A. EH20 - 24 kW electric elements		A	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6
F.L.A. EH24 - 36 kW Heating elements		A	52.0	52.0	52.0	52.0	52.0	52.0	52.0	52.0
F.L.A. EH28 - 48 kW electric elements		A	69.4	69.4	69.4	69.4	69.4	69.4	69.4	69.4
F.L.A. HSE8 - Immersed electrodes steam humidifier of 8 kg/h		A	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7
F.L.A. HSE9 - Immersed electrodes steam humidifier of 15 kg/h		A	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2
F.L.A. LTEMP1 - Application for low outdoor temperature		A	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
F.L.A. VENH - High static pressure fans	1	A	8.7	8.7	11.6	11.6	11.6	17.4	17.4	17.4
F.L.I. Power input										
F.L.I. EH20 - Electric elements of 24 kW		kW	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
F.L.I. EH24 - 36 kW heating elements		kW	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
F.L.I. EH28 - 48 kW electric elements		kW	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0
F.L.I. HSE8 - Immersed electrodes steam humidifier of 8 kg/h		kW	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
F.L.I. HSE9 - Immersed electrodes steam humidifier of 15 kg/h		kW	11.3	11.3	11.3	11.3	11.3	11.3	11.3	11.3
F.L.I. LTEMP1 - Application for low outdoor temperature		kW	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
F.L.I. VENH - High static pressure fans	1	kW	4.5	4.5	6.0	6.0	6.0	9.0	9.0	9.0

1. The absorption value that needs to be added on takes into account the difference between the optional high head fans and the standard fans.

Electrical data

Configuration: with direct ductable return (CAK) and outdoor air recicrculation (CBK)

Size			49.4	54.4	60.4	70.4	80.4	90.4	100.4	110.4
F.L.A. - Full load current at max admissible conditions										
F.L.A. - Compressor 1		A	14.6	21.5	30.0	30.0	30.0	30.0	36.5	44.6
F.L.A. - Compressor 2		A	30.0	30.0	30.0	36.5	44.6	59.0	59.0	59.0
F.L.A. - Compressor 3		A	21.5	21.5	30.0	30.0	30.0	30.0	36.5	44.6
F.L.A. - Compressor 4		A	30.0	30.0	30.0	36.5	44.6	59.0	59.0	59.0
F.L.A. - Single External Fan		A	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90
F.L.A. - Single supply fan		A	4.40	4.40	4.40	4.40	4.40	4.40	4.40	4.40
F.L.A. - Total	1	A	118	125	154	167	183	229	242	258
L.R.A. - Locked rotor amperes										
L.R.A. - Compressor 1		A	95.0	118	174	174	174	174	225	272
L.R.A. - Compressor 2		A	174	174	174	225	272	310	310	310
L.R.A. - Compressor 3		A	118	118	174	174	174	174	225	272
L.R.A. - Compressor 4		A	174	174	174	225	272	310	310	310
F.L.I. - Full load power input at max admissible conditions										
F.L.I. - Compressor 1		kW	9.10	13.1	17.0	17.0	17.0	17.0	22.6	27.6
F.L.I. - Compressor 2		kW	17.0	17.0	17.0	22.6	27.6	36.1	36.1	36.1
F.L.I. - Compressor 3		kW	13.1	13.1	17.0	17.0	17.0	17.0	22.6	27.6
F.L.I. - Compressor 4		kW	17.0	17.0	17.0	22.6	27.6	36.1	36.1	36.1
F.L.I. - Single External Fan		kW	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
F.L.I. - Single supply fan		kW	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90
F.L.I. - Total	2	kW	69.1	73.1	87.7	99.0	109	135.6	146.3	156.9
M.I.C. Maximum inrush current										
M.I.C. - Value		A	262	269	298.2	355.6	410.8	479.8	492.7	509

Configuration: with recirculation, exhaust and fresh air (CCK) and mixing chamber with recovery exchanger (CCKP)

Size			49.4	54.4	60.4	70.4	80.4	90.4	100.4	110.4
F.L.A. - Full load current at max admissible conditions										
F.L.A. - Compressor 1		A	14.6	21.5	30.0	30.0	30.0	30.0	36.5	44.6
F.L.A. - Compressor 2		A	30.0	30.0	30.0	36.5	44.6	59.0	59.0	59.0
F.L.A. - Compressor 3		A	21.5	21.5	30.0	30.0	30.0	30.0	36.5	44.6
F.L.A. - Compressor 4		A	30.0	30.0	30.0	36.5	44.6	59.0	59.0	59.0
F.L.A. - Single External Fan		A	3.90	3.90	3.90	3.90	3.90	3.90	3.90	3.90
F.L.A. - Single supply fan		A	4.40	4.40	4.40	4.40	4.40	4.40	4.40	4.40
F.L.A. - Single exhaust air fan		A	4.00	4.00	4.30	4.30	4.30	4.30	4.30	4.30
F.L.A. - Total	1	A	126.0	132.9	162.8	175.7	192.0	237.4	250.3	266.5
L.R.A. - Locked rotor amperes										
L.R.A. - Compressor 1		A	95.0	118	174	174	174	174	225	272
L.R.A. - Compressor 2		A	174	174	174	225	272	310	310	310
L.R.A. - Compressor 3		A	118	118	174	174	174	174	225	272
L.R.A. - Compressor 4		A	174	174	174	225	272	310	310	310
F.L.I. - Full load power input at max admissible conditions										
F.L.I. - Compressor 1		kW	9.10	13.1	17.0	17.0	17.0	17.0	22.6	27.6
F.L.I. - Compressor 2		kW	17.0	17.0	17.0	22.6	27.6	36.1	36.1	36.1
F.L.I. - Compressor 3		kW	13.1	13.1	17.0	17.0	17.0	17.0	22.6	27.6
F.L.I. - Compressor 4		kW	17.0	17.0	17.0	22.6	27.6	36.1	36.1	36.1
F.L.I. - Single External Fan		kW	1.90	1.90	1.90	1.90	1.90	1.90	1.90	1.90
F.L.I. - Single supply fan		kW	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90
F.L.I. – Single exhaust air fan		kW	2.60	2.60	2.80	2.80	2.80	2.80	2.80	2.80
F.L.I. - Total	2	kW	74.3	78.2	93.2	104.5	114.5	141.1	152.4	162.4
M.I.C. Maximum inrush current										
M.I.C. - Value		A	269.2	276.9	306.8	364.2	419.4	488.4	501.3	517.6

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

1. Values not including the accessories. To obtain the value of F.L.A. including accessories, add to the total F.L.A. value that of any accessories (see electrical data of accessories)
2. Values not including the accessories. To obtain the value of F.L.I. including accessories, add to the total F.L.I. value that of any accessories (see electrical data of accessories)

Pressure drops of optional components

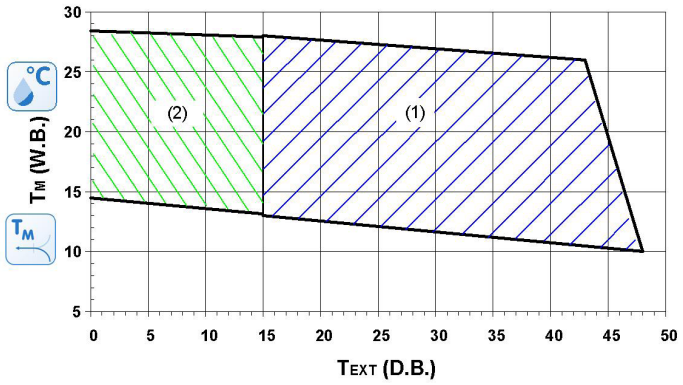
The value of static pressure available on the supply and return duct is obtained by subtracting from the available net maximum pressure (see general table of technical data) the pressure drops of any accessories.

SIZES			49.4	54.4	60.4	70.4	80.4	90.4	100.4	110.4
CHW2 - Two-row hot water coil		Pa	35	43	31	39	52	46	54	61
CPHG - Hot gas re-heating coil		Pa	18	20	19	21	25	23	26	28
CHWER - Energy recovery from food refrigeration		Pa	65	79	59	73	100	90	102	116
HWS - Steam humidifier with disposable water		Pa	23	25	24	26	30	28	31	33
GC - Heating module		Pa	90	100	80	90	100	80	90	100
F7 - F7 high efficiency air filter	1	Pa	130	138	128	137	152	151	162	172
FES - Electronic filters		Pa	61	70	56	65	82	81	92	101

The values shown are to be considered approximate for units operating power in normal use with standard air flow rate.

1. Pressure drops with filters with average dirtiness

Operating range (Cooling)



The limits are meant as an indication and they have been calculated by considering:
- general and non specific sizes,
- standard airflow,
- non-critical positioning of the unit and correct operating and maintenance of the unit,
- operating at full load

To verify the operation field of the operating units with percentages of outdoor air, always calculate the Tm mixing temperature at the internal heat exchanger input.

Tm = internal exchanger entering air temperature
temperature measured with wet bulb (W.B.=WET BULB)

Text = inlet air temperature in the external exchanger
dry bulb measured temperature (D.B.=DRY BULB)
1. Standard operating range

2. Operation range of the unit in FREE-COOLING mode or with automatic distribution of the outdoor ventilation

WET BULB TEMPERATURE - EXAMPLE

25°C W.B. { 40°C D.B. / 30% R.H. | 35°C D.B. / 45% R.H. | 30°C D.B. / 67% R.H.

Accessories

EH - Electric elements

Option indicated for cold climates. Available with different power capacities, it allows to heat up the area served.

Ideal for lower outside temperature applications where it is required to active the heaters only for short duration in the year. In these cases, simplification of the system is more economical than electrical conduction cost.

The fins are made of aluminium, with a size suitable to ensure high efficiency and maintain low power density on the surfaces to limit overheating. The low temperature of the heating elements increases their lifespan and limits the effect of air ionization.

The electrical heating elements are managed by a thermal control device with two power settings.

Matching of the electric elements

Size	49.4	54.4	60.4	70.4	80.4	90.4	100.4	110.4
24 kW	√	√	√	√	√	√	√	√
36 kW	√	√	√	√	√	√	√	√
48 kW	√	√	√	√	√	√	√	√

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

'Electric elements', '2-row hot water coil', 'Combustion heating module' and 'Energy recovery from food refrigeration' cannot be assembled simultaneously.

Combustion heating module

Option recommended for very cold weather, heats the air that needs to be introduced into the room.

The energy modules described below are all made with welded sheet steel and tested in line with European standards. They can be easily inspected for normal cleaning and maintenance. The modules consist of an AISI 430 stainless steel combustion chamber and an AISI 304L stainless steel exchanger on the air line: these are both important materials suitable to operate across a wide operating range in terms of condensation and low temperatures.

The combustion chamber is cylindrical with inverted flame technology. It has wide heat exchange surfaces and allows for low thermal loads. Thanks to these specific features the module can be used with very low input air temperatures and can be combined with burners with a very variable heating capacity.

It is possible to use burners that employ various fuels: natural gas, LPG or oil.

All the chambers are designed to ensure top efficiency in terms of thermal exchange with the air and maximum duration.

'Electric elements', '2-row hot water coil', 'Combustion heating module' and 'Energy recovery from food refrigeration' cannot be assembled simultaneously.

CC0 - Heating module with combustion chamber only

The option allows the choice of combustion module without the burner, which can be selected and installed directly by the Customer.

The module can be coupled both with single-stage, 2-stage or modulating burners. The normal operating range also includes low input air temperatures and high airflows.

The burners used can be any brand of forced draft burner with fuel: natural gas, LPG or oil. When combining a combustion chamber and a burner, follow the maximum capacity values allowed, as shown in the table.

When choosing the model, it is fundamental to use the combustion model based on the capacity that needs to be supplied. Moreover, when the order is placed, state the manufacturer and burner model chosen in order to set up the coupling flange for the combustion chamber. If this information is not available, a standard flange will be supplied, one with a hole for the burner's nozzle. This does not have areas to secure it, which can be created at the installation stage (see the nozzle diameter in the table).

The unit logic is designed to manage the burner with an ON/OFF or modulating (0-10V) signal, a return signal to report any failures or unavailability. The electrical panel is already set up to power the burner (230Vac/1Ph/50Hz max 200 W).

Attention: the installation, the control, the burner check and the correspondence with current regulations in the installation site are provided by the Customer.

Combustion chamber combined with the maximum capacity allowed for the burner

Combustion chamber	Max capacity (kW)	Flue side pressure drop (Pa)	Nozzle diameter (mm)	Min-Max nozzle length (mm)	Available sizes:
G40	46	18	100	100-210	49.4-54.4
G60	69	20	100	100-210	49.4-70.4
G80	93	25	130	100-220	49.4-80.4
G110	127	28	130	100-220	49.4-110.4
G130	151	32	130	100-220	49.4-110.4
G160	186	40	150	100-280	60.4-110.4
G200	232	43	150	100-280	80.4-110.4
G250	290	52	170	110-340	90.4-110.4
G300	348	60	170	110-340	110.4

This option reduces the available static pressure (supply air side).

The component requires gas supply (gas connections to be made by the Customer). The location of the unit and the fume drain mode must comply with laws and standards in force in the Country of use.

The Costumer may choose the flue chimney. Check the available static pressure provided by the burner net of the pressure drops of the combustion chamber.

Important: report the brand and model of the burner to set up the fixing flange. Otherwise, a standard flange will be supplied. Customers will need to drill a hole in it and thread it based on their requirements.

'Electric elements', '2-row hot water coil', 'Combustion heating module' and 'Energy recovery from food refrigeration' cannot be assembled simultaneously.

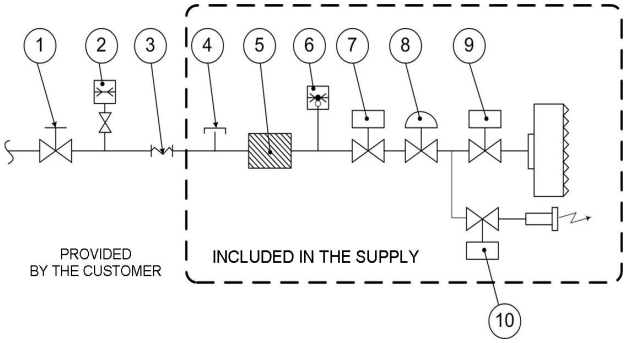
GD - 2-stage gas heating module

Option consisting of a combustion chamber and a 2-stage gas burner with setting damper and servomotor. The burner with low pollutant emissions (NOx below 80 mg/kWh*), in line with Class 3 of the EN 676 European standard is supplied with a gas increase control for methane or LPG. The unit logic controls the whole module as it interacts with the burner's built-in microprocessor control. Sound emissions are extremely contained thanks to the sound-proofed casings. It is easier to conduct maintenance on the equipment thanks to the fact that the components can be accessed even when the burner is installed. The combustion air can be calibrated with a damper that is easy to adjust. The module with the burner is installed and wired on the unit.

* The value of the emissions is determined in accordance with the requirements of the EN 676 standard, in a normalised combustion chamber, based on the mean value of the points of the operating range and standardised at the reference conditions required by the standard.

Heating modules with a burner include:

- 2-stage hot air generator powered with methane
- kit for transformation of power with liquefied petroleum gas (LPG)
- all the control and safety devices



1. GAS COCK
2. GAS PRESSURE GAUGE
3. ANTI-VIBRATION JOINT
4. SUPPLY PRESSURE MEASURING INTAKE
5. GAS FILTER (SMALL SECTION)
6. GAS PRESSURE SWITCH
7. SAFET GAS SOLENOID VLAVE
8. PRESSURE STABILISER
9. REGULATING VALVE
10. START-UP GAS SOLENOID VALVE

Gas use features

Size			G40		G60		G80		G110		G130		G160		G200		G250		G300	
Description			min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max
Nominal heating capacity		kW	16.0	46.0	35.0	69.0	65.0	93.0	65	127	65	151	65	186	120	232	160	290	125	348
Efficiency		%	92.2		91.8		91.3		91.0		90.7		90.3		90.6		90.9		91.3	
Available head for the chimney		Pa	70		140		275		250		200		50		55		100		180	
Fume chimney diameter		mm	120		160		160		180		180		200		200		250		250	

Matching of the gas heating module

Size	49.4	54.4	60.4	70.4	80.4	90.4	100.4	110.4
G40 (46 kW)	√	√	X	X	X	X	X	X
G60 (69 kW)	√	√	√	√	X	X	X	X
G80 (93 kW)	√	√	√	√	√	X	X	X
G110 (127 kW)	√	√	√	√	√	√	√	√
G130 (151 kW)	√	√	√	√	√	√	√	√
G160 (186 kW)	X	X	√	√	√	√	√	√
G200 (232 kW)	X	X	X	X	√	√	√	√
G250 (290 kW)	X	X	X	X	X	√	√	√
G300 (348 kW)	X	X	X	X	X	X	X	√

This option reduces the available static pressure (supply air side).

The component requires gas supply (gas connections to be made by the Customer). The location of the unit and the fume drain mode must comply with laws and standards in force in the Country of use.

The Costumer is responsible for mounting the chimney kit during installation. Based on the specific installation requirements, the length of the chimney can be increased with suitable joints and fittings (not supplied by Clivet).

'Electric elements', '2-row hot water coil', 'Combustion heating module' and 'Energy recovery from food refrigeration' cannot be assembled simultaneously.

OD - 2-stage oil heating module

Option consisting of a combustion chamber and a 2-stage oil burner with a manually set damper. The burner produces standard polluting emissions and in any case below Class 1 of the EN 267 European standard (NOx below 250 mg/kWh), it is supplied with a nozzle and hoses for the oil. It has low sound emissions thanks to the sound-proofing casing. All components are easily accessible simplifying maintenance operations. All components are easily accessible simplifying the maintenance operations. The setting of the combustion air occurs through a damper controlled by an hydraulic piston.

The unit logic controls the module and it interacts with the burner's built-in microprocessor control.

The module with the burner is installed and wired on the unit.

Heating modules with a burner include:

- 2-stage hot air generator powered with oil
- kit of steel chimney for exhaust fumes
- all the control and safety devices

Matching of the oil heating module

Size	49.4	54.4	60.4	70.4	80.4	90.4	100.4	110.4
G60 (69 kW)	√	√	√	√	X	X	X	X
G80 (93 kW)	√	√	√	√	√	X	X	X
G110 (127 kW)	√	√	√	√	√	√	√	√
G130 (151 kW)	√	√	√	√	√	√	√	√
G160 (186 kW)	X	X	√	√	√	√	√	√
G200 (232 kW)	X	X	X	X	√	√	√	√
G250 (290 kW)	X	X	X	X	X	√	√	√
G300 (348 kW)	X	X	X	X	X	X	X	√

This option reduces the available static pressure (supply air side).

The component requires oil supply (oil connections to be made by the Customer). The location of the unit and the fume drain mode must comply with laws and standards in force in the Country of use.

The Costumer is responsible for mounting the chimney kit during installation. Based on the specific installation requirements, the length of the chimney can be increased with suitable joints and fittings (not supplied by Clivet).

'Electric elements', '2-row hot water coil', 'Combustion heating module' and 'Energy recovery from food refrigeration' cannot be assembled simultaneously.

GC - Condensing gas heating module and modulating control

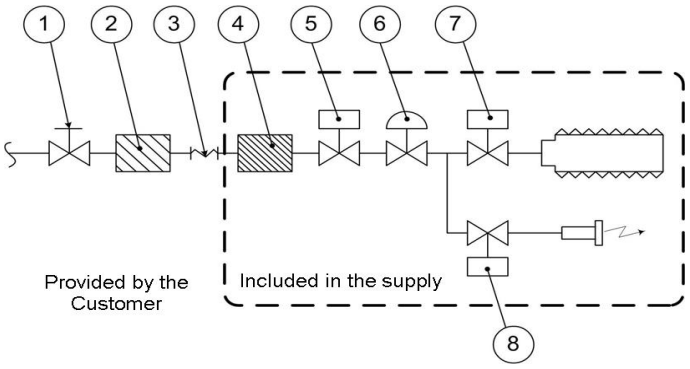
Option consisting of a combustion chamber and condensation burner with modulating control. It is available in various capacities and heats the environment served. The module can be chosen to integrate the heat pump or as an alternative to it. In this case, its heating capacity must be at least equal to the capacity envisioned in the project.

Thanks to the condensation technology with pre-mix and extremely efficient modulation (up to 105% depending on the lower heat value), consumption is very contained and considerably reduced during operation at partial load. The burner with low polluting emissions (NOx lower than 80mg/kWh) in accordance with Class 3 of European standard EN 676.

The heating module includes:

- hot air generator with condensation and integrated modulating adjustment, powered with methane gas
- kit for transformation of power with liquefied petroleum gas (LPG)
- kit of steel chimney for exhaust fumes
- All the control and safety devices

Gas connection diagram



1. GAS COCK
2. GAS FILTER (LARGE SECTION)
3. ANTI-VIBRATION JOINT
4. GAS FILTER (SMALL SECTION)
5. SAFET GAS SOLENOID VLAVE
6. PRESSURE STABILISER
7. MAIN GAS BURNER SOLENOID VALVE
8. PILOT BURNER GAS SOLENOID VALVE

Gas use features

Size			54kW		72kW		96kW		150kW		200kW		300kW	
Description			min	max	min	max	min	max	min	max	min	max	min	max
Nominal heating capacity		kW	15.5	58.0	22.0	78.0	31.5	93.4	46.3	145.0	55.7	197.0	92.6	290.0
Efficiency		%	105	93.1	105	93.8	105	95.3	105.2	93.5	105.1	91.6	105.2	93.5
Produced condensation		l/h	1.45		2.2		2.6		3.87		4.9		7.74	
Gas connection diameter			UNI ISO 7/1-3/4" M		UNI ISO 7/1-1" M		UNI ISO 7/1-1" M		UNI ISO 7/1-1" M		UNI ISO 7/1-1" M		UNI ISO 7/1-1" M	
Fume chimney diameter		mm	80		100		100		100		130		100	
G20 methane gas supply pressure		mbar	20 (Min. 17 Max. 25)											
Gas consumption		m3/h	1.64	6.14	2.33	8.25	3.17	10.37	4.66	16.4	5.61	22.75	9.32	32.8
LPG G31 supply pressure		mbar	37 (Min. 25 Max. 45)											
Gas consumption		m3/h	0.98	3.68	1.4	4.95	1.9	6.21	2.79	9.83	3.36	13.63	6.72	27.26

Matchning of the condensing gas heating module

Size	49.4	54.4	60.4	70.4	80.4	90.4	100.4	110.4
54 kW	√	√	X	X	X	X	X	X
72 kW	√	√	√	√	√	X	X	X
96 kW	√	√	√	√	√	√	√	√
150 kW	√	√	√	√	√	√	√	√
200 kW	X	X	√	√	√	√	√	√
300 kW	X	X	X	X	X	√	√	√

This option reduces the available static pressure (supply air side).

The component requires gas supply (gas connections to be made by the Customer). The location of the unit and the fume drain mode must comply with laws and standards in force in the Country of use.

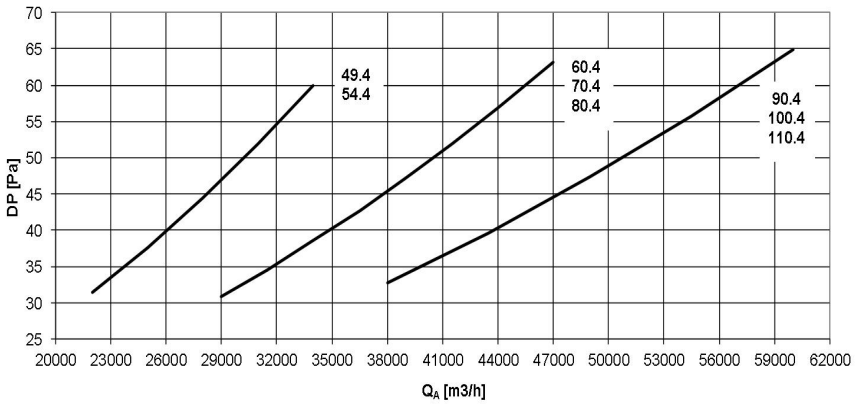
The assembly of the chimney kit must be performed on site by the Customer. According to specific requirements of installation, the chimney length can be increased by means of appropriate joints and fittings (not supplied by Clivet). The maximum length of the chimney is 16 m, in case of fully straight development of the ducts. For further details, refer to the Installation, use and maintenance manual.

'Electric elements', '2-row hot water coil', 'Combustion heating module' and 'Energy recovery from food refrigeration' cannot be assembled simultaneously.

CHW2 - Two-row hot water coil

Option indicated for very cold climates, as it allows to heat up the area served. The exchanger comes with a thermostat for the antifreeze function, which is always active even when the unit is in stand-by, as long as it is operated electrically. If required, force the opening of the valve to the maximum value allowed to allow the air to pass through the exchanger and prevent frost from forming.

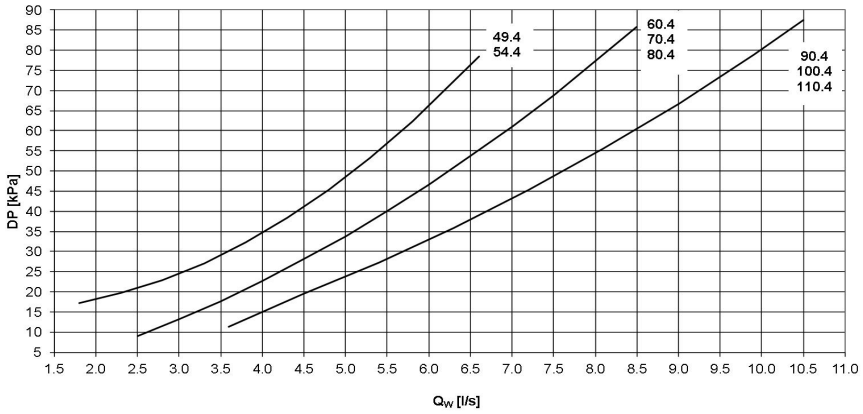
Hot water coil pressure drops: AIR side



The air side pressure drops are relative to the medium air temperature of 20°C and are to be added to the pressure drops due to ducts, terminal devices and any other component that causes a drop in working discharge head.

QA [m3/h] = airflow
DP[Pa] = pressure drops

Hot water coil pressure drops: WATER side



Pressure drops on the water side are calculated considering an average water temperature of 65°C

Qw [l/s] = water flow-rate
DP[kPa] = pressure drops

Qw [l/s] =P / (4.186 x DT)

P = Water coil heating capacity in KW
DT = Temperature difference between inlet / outlet water

This option reduces the available static pressure (supply air side).

The component requires connection to the hot water plumbing system (to be provided for by the client).

'Electric elements', '2-row hot water coil', 'Combustion heating module' and 'Energy recovery from food refrigeration' cannot be assembled simultaneously.

Performances of hot water coil (two-row)

SIZE			Ti/To (°C)											
			80 / 65	70 / 55	70 / 60	60 / 40	80 / 65	70 / 55	70 / 60	60 / 40	80 / 65	70 / 55	70 / 60	60 / 40
			kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt
49.4 54.4	Qo (m3 / h)		22000				28000				34000			
	Qo (l / s)		4444				5556				6667			
	TM (°C)	5	283,9	240,1	253,2	182,0	333,2	281,4	297,3	212,2	377,5	318,5	337,0	239,7
		10	261,1	217,5	230,4	159,3	306,3	254,9	270,7	185,9	347,0	288,6	306,9	209,7
		14	243,0	199,5	212,5	141,4	285,1	233,9	249,6	165,0	323,0	264,7	283,0	186,0
		16	234,0	190,5	203,5	132,5	274,5	223,4	239,1	154,5	311,0	252,9	271,1	174,2
		18	225,0	181,7	194,6	123,5	264,0	213,0	228,7	144,0	299,2	241,1	259,3	162,3
		20	216,1	172,9	185,7	114,6	253,6	202,6	218,3	133,5	287,3	229,3	247,5	150,4
60.4 70.4 80.4	Qo (m3 / h)		29000				38000				47000			
	Qo (l / s)		4889				6111				7222			
	TM (°C)	5	370,3	312,8	330,4	235,7	442,5	373,4	395,4	280,1	506,7	427,2	453,1	319,3
		10	340,4	283,0	300,7	206,3	406,9	338,0	359,9	245,1	465,9	386,8	412,5	279,2
		14	316,7	259,7	277,0	182,8	378,6	310,0	331,7	217,0	433,6	354,7	380,3	247,3
		16	304,9	247,8	265,3	171,1	364,5	295,9	317,5	203,1	417,5	338,7	364,0	231,2
		18	293,2	236,4	253,8	159,5	350,5	282,1	303,7	189,1	401,4	322,8	348,1	215,2
		20	281,4	224,8	242,2	147,9	336,6	268,3	289,9	175,1	385,5	306,7	332,3	199,2
90.4 100.4 110.4	Qo (m3 / h)		38000				49000				60000			
	Qo (l / s)		5333				6667				7500			
	TM (°C)	5	487,8	412,6	434,6	313,4	576,9	487,4	514,4	369,1	656,5	554,3	585,8	418,3
		10	448,6	373,9	395,6	275,1	530,6	441,7	468,5	323,3	603,9	502,4	533,6	366,8
		14	417,3	343,2	364,8	244,5	493,6	405,5	432,1	287,0	561,8	461,1	492,2	325,3
		16	402,0	327,9	349,6	229,0	475,4	387,4	414,0	269,1	541,2	440,6	471,6	304,8
		18	386,7	312,7	334,3	213,7	457,4	369,5	396,0	251,1	520,6	420,1	451,1	284,0
		20	371,4	297,6	319,2	198,4	439,3	351,5	378,0	232,9	500,1	399,7	430,7	263,6

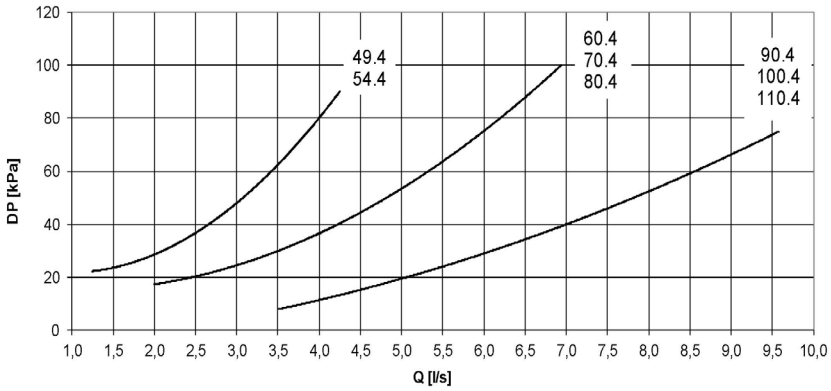
TM = air inlet temperature of water coil (°C)
Ti/To = water temperature inlet/outlet (°C)
Qo = airflow (l/s and m3/h)
kWt = Provided heating capacity (kW)
Thermal yields referred to the max. water coil capacity. The thermo regulator coke the 3-way modulating valve limiting the inlet air temperature at desired values.

3WVM - Modulating 3-way valve

To be combined with hot water coil (optional). It is managed by the built-in microprocessor via a 0-10V signal and allows the fully automatic control of the water coil.

The valve with modulating actuator is provided already assembled and wired built-in the unit.

Valve pressure drops



Q [l/s] = water flow-rate

Dp [kPa] = pressure drop

This accessory has to be coupled to the "CHW2 - Two-row hot water coil" option

LTEMP1 - Application for low outdoor temperature

Option indicated for very cold climates, where the outside temperature can be between -10 and – 30°C.

The option involves self-regulating heater thermostatically controlled able to protect the electrical panel from freezing, ensuring the correct operation.

The special version of the outdoor air damper for the application for low outdoor temperature is made of anti-seize devices that facilitate the correct control of the fresh air in every climatic situation, thanks to the teflon supporting bushings, aluminium flaps, PVC end gaskets and steel leverages to compensate expansions.

The motorised actuator is suitable for operating with low outdoor temperatures.

The devices are built-in installed and wired

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

This accessory operates even when the unit is switched off provided that the power supply is maintained active and the unit continues to be connected.

It is necessary to make precautions against build up of snow and ice in front of the exhaust and outdoor air inlet locations.

RCAW - Winter thermodynamic active recovery on exhaust air (only CCKP configuration)

Option available for 'cold only' unit, equipped with heating system via 'hot water coil' or 'gas heating module'. Recommended when local standards or the energy objectives of the project require recovery of the energy contained in the flow of air expelled from the unit. The recovered energy is used to produce thermal energy with high efficiency, via a special cooling circuit and dedicated adjustment which allow it to function in the winter as a heat pump while running only one of the main compressors. Seasonal energy consumption is therefore substantially lower than that of a unit equipped with static recovery, thanks to the high power generated by the thermodynamic recovery (which reduces the thermal integration on the main heating system) and the lack of high pressure drops of traditional recoveries (which reduces the energy required for ventilation).

Thermodynamic active recovery with 15% of outdoor/exhaust air

Size	Airflow rate	Ta D.B / W.B. [°C]	-5.0 / -5.4		0 / -0.6		5.0 / 3.9		7.0 / 6.1		10.0 / 8.2		15.0 / 13.0	
		Ambient temp. D.B. [°C]	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe
49.4	26000 m³/h	16	22.8	3.3	26,1	3,5	29,7	3,6	31,3	3,7	33,6	3,8	37,3	4,0
		17	22.7	3.4	26,1	3,5	29,6	3,7	31,3	3,8	33,4	3,9	37,3	4,1
		18	22.7	3.5	26	3,6	29,5	3,7	31,1	3,8	33,3	3,9	37,3	4,2
		19	22.7	3.5	25,9	3,7	29,3	3,8	31,0	3,9	33,1	4,0	37,3	4,2
		20	22.6	3.6	25,9	3,7	29,2	3,9	30,9	4,0	33,0	4,1	37,3	4,3
		22	22.5	3.7	25,7	3,8	29,0	4,0	30,6	4,1	32,7	4,2	37,2	4,4
54.4	29000 m³/h	16	34.0	5.0	38,9	5,3	43,5	5,5	46,0	5,7	48,7	5,8	54,2	6,1
		17	34.0	5.1	38,9	5,4	43,4	5,6	46,0	5,8	48,5	5,9	54,2	6,2
		18	34.0	5.2	38,8	5,5	43,2	5,7	45,8	5,9	48,3	6,0	54,2	6,3
		19	34.0	5.3	38,8	5,6	43,1	5,8	45,6	5,9	48,1	6,1	54,2	6,4
		20	33.9	5.4	38,7	5,7	43,0	5,9	45,5	6,0	47,9	6,2	54,2	6,5
		22	33.8	5.6	38,5	5,9	42,8	6,1	45,2	6,2	47,5	6,4	54,1	6,7
60.4	33000 m³/h	16	44.6	7.1	50,8	7,4	57,0	7,8	60,3	7,9	63,8	8,2	70,3	8,5
		17	44.6	7.2	50,7	7,5	57,0	8,0	60,2	8,1	63,6	8,3	70,3	8,7
		18	44.6	7.3	50,7	7,7	56,8	8,1	60,0	8,2	63,3	8,5	70,3	8,8
		19	44.6	7.4	50,6	7,8	56,6	8,2	59,8	8,4	63,1	8,6	70,4	9,0
		20	44.6	7.6	50,6	8,0	56,4	8,4	59,6	8,5	62,9	8,7	70,4	9,2
		22	44.4	7.8	50,4	8,2	56,1	8,6	59,2	8,8	62,5	9,0	70,3	9,5
70.4	37000 m³/h	16	44.7	7.0	50,9	7,3	57,1	7,6	60,3	7,7	63,6	7,9	70,5	8,3
		17	44.7	7.1	50,8	7,4	57,0	7,8	60,3	7,9	63,5	8,1	70,5	8,4
		18	44.7	7.2	50,8	7,5	56,9	7,9	60,1	8,1	63,4	8,2	70,6	8,6
		19	44.7	7.4	50,7	7,7	56,7	8,0	59,9	8,2	63,2	8,4	70,6	8,8
		20	44.6	7.5	50,7	7,8	56,5	8,2	59,7	8,3	63,1	8,5	70,7	9,0
		22	44.5	7.7	50,5	8,1	56,1	8,5	59,4	8,6	62,8	8,8	70,6	9,3
80.4	44000 m³/h	16	45.4	6.8	51,9	7,0	58,4	7,3	61,7	7,4	65,5	7,5	72,6	7,8
		17	45.4	6.9	51,9	7,1	58,4	7,4	61,7	7,6	65,3	7,7	72,6	8,0
		18	45.4	7.0	51,9	7,3	58,2	7,6	61,5	7,7	65,1	7,8	72,7	8,2
		19	45.4	7.2	51,8	7,4	58,0	7,7	61,3	7,9	64,9	8,0	72,8	8,3
		20	45.3	7.3	51,7	7,6	57,8	7,9	61,1	8,0	64,7	8,1	72,8	8,5
		22	45.1	7.5	51,4	7,9	57,5	8,2	60,7	8,3	64,3	8,5	72,7	8,9
90.4	51000 m³/h	16	45.8	6.6	52,5	6,8	59,4	7,0	62,6	7,1	67,0	7,2	74,1	7,3
		17	45.8	6.7	52,4	7,0	59,3	7,2	62,6	7,3	66,8	7,4	74,2	7,5
		18	45.7	6.8	52,4	7,1	59,1	7,3	62,4	7,4	66,6	7,6	74,3	7,7
		19	45.7	7.0	52,3	7,2	59,0	7,5	62,2	7,6	66,4	7,7	74,4	7,9
		20	45.6	7.1	52,2	7,4	58,8	7,6	62,0	7,7	66,2	7,9	74,4	8,1
		22	45.5	7.3	52,0	7,6	58,5	7,9	61,7	8,0	65,8	8,2	74,4	8,5
100.4	56000 m³/h	16	58.7	8.9	67,2	9,3	75,7	9,8	80,1	10,0	85,0	10,3	94,6	10,8
		17	58.5	9.1	67,0	9,5	75,4	9,9	79,9	10,2	84,6	10,5	94,6	11
		18	58.4	9.2	66,8	9,6	75,1	10,1	79,5	10,3	84,1	10,6	94,5	11,1
		19	58.3	9.3	66,6	9,8	74,7	10,2	79,1	10,4	83,6	10,7	94,4	11,3
		20	58.0	9.5	66,4	9,9	74,4	10,3	78,7	10,6	83,2	10,9	94,4	11,4
		22	57.6	9.7	65,9	10,2	73,7	10,6	77,9	10,8	82,3	11,1	94,0	11,7
110.4	60000 m³/h	16	71.8	11.4	82,1	12,0	91,9	12,6	97,4	12,9	102,7	13,3	113,1	14,0
		17	71.7	11.6	82,0	12,2	91,7	12,8	97,2	13,1	102,3	13,5	113,1	14,3
		18	71.7	11.8	81,8	12,4	91,4	13	96,8	13,3	101,8	13,7	113,0	14,5
		19	71.7	12.0	81,6	12,6	91,1	13,2	96,4	13,5	101,4	13,9	113,0	14,7
		20	71.6	12.2	81,4	12,8	90,8	13,4	96,1	13,7	101,0	14,1	113,0	14,9
		22	71.3	12.6	81,1	13,2	90,1	13,8	95,3	14,1	100,1	14,5	112,7	15,4

Ta = fresh air temperature D.B./W.B.
DB = dry bulb WB = wet bulb
kWt = Heating capacity (kW)
kWe = Compressor power input in kW

Performance refers to operation with 15% of expelled and outside air not all thermal yields take into account the heat dissipated by the fan motors
Good operation of winter active thermodynamic recovery is ensured if the limit temperature of the air of mixture between fresh air and recirculation air does not drop below:
+2°C with unit equipped with hot water coil +10°C with unit equipped with gas module

Thermodynamic active recovery with 30% of outdoor/exhaust air

Size	Airflow rate	Ta D.B / W.B. [°C]	-5.0 / -5.4		0 / -0.6		5.0 / 3.9		7.0 / 6.1		10.0 / 8.2		15.0 / 13.0	
		Ambient temp. D.B. [°C]	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe
49.4	26000 m³/h	16	24.3	3.1	27,6	3,3	31,1	3,5	32,4	3,6	34,4	3,8	37,5	4,1
		17	24.2	3.2	27,6	3,4	31	3,6	32,5	3,7	34,6	3,9	37,6	4,1
		18	24.2	3.3	27,6	3,4	31	3,7	32,5	3,8	34,6	3,9	37,7	4,2
		19	24.2	3.3	27,6	3,5	30,9	3,7	32,5	3,8	34,4	4,0	37,8	4,2
		20	24.2	3.4	27,6	3,5	30,8	3,8	32,4	3,9	34,3	4,0	37,9	4,3
		22	24.2	3.5	27,5	3,7	30,6	3,9	32,1	4,0	34	4,1	38	4,4
54.4	29000 m³/h	16	36.0	4.7	40,9	5,0	45,5	5,4	47,6	5,6	49,9	5,8	54,5	6,2
		17	36.0	4.8	41,0	5,1	45,4	5,5	47,7	5,7	50,2	5,9	54,6	6,2
		18	36.0	4.9	41,0	5,2	45,3	5,6	47,7	5,8	50,2	6,0	54,8	6,3
		19	36.0	5.0	41,0	5,3	45,3	5,7	47,7	5,9	50	6,0	54,9	6,4
		20	36.1	5.1	41,0	5,4	45,2	5,7	47,6	5,9	49,8	6,1	55	6,4
		22	36.2	5.2	41,1	5,6	44,9	5,9	47,3	6,0	49,4	6,2	55,3	6,6
60.4	33000 m³/h	16	47.3	6.7	53,5	7,1	59,5	7,6	62,2	7,8	65,2	8,1	70,6	8,5
		17	47.2	6.8	53,6	7,2	59,5	7,7	62,3	7,9	65,7	8,3	70,8	8,7
		18	47.3	6.9	53,6	7,3	59,5	7,9	62,5	8,1	65,7	8,4	71	8,8
		19	47.3	7.0	53,6	7,5	59,5	8,0	62,6	8,2	65,5	8,5	71,3	8,9
		20	47.4	7.1	53,6	7,6	59,4	8,1	62,3	8,3	65,2	8,6	71,5	9,0
		22	47.5	7.3	53,6	7,8	59,0	8,3	61,9	8,5	64,8	8,8	71,9	9,3
70.4	37000 m³/h	16	47.3	6.6	53,7	6,9	59,5	7,4	62,2	7,6	65,1	7,8	70,8	8,3
		17	47.3	6.7	53,7	7,1	59,5	7,5	62,4	7,7	65,6	8,0	71,1	8,4
		18	47.3	6.8	53,7	7,2	59,5	7,7	62,5	7,9	65,6	8,1	71,3	8,6
		19	47.4	6.9	53,7	7,3	59,5	7,8	62,6	8,0	65,4	8,2	71,5	8,7
		20	47.5	7.0	53,7	7,4	59,4	7,9	62,4	8,1	65,3	8,3	71,8	8,8
		22	47.6	7.3	53,8	7,7	59,0	8,1	62,0	8,3	64,9	8,6	72,2	9,1
80.4	44000 m³/h	16	48.2	6.4	54,7	6,7	61,0	7,1	63,7	7,2	67,0	7,5	72,9	7,9
		17	48.1	6.5	54,8	6,8	61,0	7,2	63,9	7,4	67,5	7,6	73,2	8,0
		18	48.2	6.6	54,8	6,9	60,9	7,3	64,0	7,5	67,5	7,7	73,4	8,1
		19	48.2	6.7	54,8	7,1	60,9	7,5	64,1	7,7	67,3	7,9	73,7	8,3
		20	48.2	6.8	54,8	7,2	60,8	7,6	63,9	7,8	67,0	8,0	73,9	8,4
		22	48.3	7.1	54,9	7,4	60,4	7,8	63,5	8,0	66,6	8,2	74,4	8,6
90.4	51000 m³/h	16	48.6	6.2	55,3	6,5	62,0	6,8	64,6	6,9	68,5	7,1	74,5	7,4
		17	48.5	6.3	55,3	6,7	62,0	7,0	64,8	7,1	69,0	7,3	74,7	7,5
		18	48.5	6.5	55,4	6,8	61,9	7,1	65,0	7,2	69,0	7,5	75,0	7,7
		19	48.6	6.6	55,4	6,9	61,9	7,2	65	7,4	68,8	7,6	75,3	7,8
		20	48.6	6.7	55,4	7	61,8	7,4	64,8	7,5	68,6	7,7	75,5	8
		22	48.7	6.9	55,4	7,3	61,4	7,6	64,4	7,7	68,1	7,9	76,1	8,3
100.4	56000 m³/h	16	62.7	8.5	71,3	9	79,4	9,6	83	9,9	87,2	10,3	95,1	10,9
		17	62.5	8.7	71,2	9,2	79,2	9,8	83,1	10,1	87,6	10,5	95,3	11
		18	62.5	8.8	71,1	9,3	79	9,9	83,1	10,2	87,5	10,6	95,5	11,1
		19	62.4	8.9	71	9,4	78,8	10	83	10,3	87	10,7	95,7	11,2
		20	62.4	9.0	70,9	9,6	78,6	10,1	82,6	10,4	86,6	10,8	95,9	11,3
		22	62.3	9.3	70,7	9,8	77,9	10,3	81,8	10,6	85,7	10,9	96,3	11,5
110.4	60000 m³/h	16	76.1	10.7	86,8	11,6	96,2	12,4	100,6	12,8	105,3	13,3	113,7	14,1
		17	76.0	10.9	86,8	11,7	96,1	12,6	100,8	13	105,9	13,5	113,9	14,3
		18	76.1	11.1	86,7	11,9	95,9	12,7	101	13,2	105,8	13,7	114,2	14,4
		19	76.2	11.3	86,7	12,1	95,8	12,9	101	13,3	105,3	13,8	114,5	14,6
		20	76.2	11.5	86,7	12,3	95,6	13,1	100,6	13,5	104,9	13,9	114,8	14,8
		22	76.4	11.8	86,6	12,6	94,9	13,3	99,8	13,7	104	14,2	115,3	15,1

Ta = fresh air temperature D.B./W.B.
DB = dry bulb WB = wet bulb
kWt = Heating capacity (kW)
kWe = Compressor power input in kW

Performance refers to operation with 15% of expelled and outside air not all thermal yields take into account the heat dissipated by the fan motors
Good operation of winter active thermodynamic recovery is ensured if the limit temperature of the air of mixture between fresh air and recirculation air does not drop below:
+2°C with unit equipped with hot water coil +10°C with unit equipped with gas module

Correct functioning of this option requires a modulation device for the air flow on the exterior heat exchange coil (therefore, this must be selected in combination with CREFP and CREFB).

Thermodynamic active recovery with 45% of outdoor/exhaust air

Size	Airflow rate	Ta D.B / W.B. [°C]	-5.0 / -5.4		0 / -0.6		5.0 / 3.9		7.0 / 6.1		10.0 / 8.2		15.0 / 13.0	
		Ambient temp. D.B. [°C]	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe
49.4	26000 m³/h	16	22.8	3.3	26,1	3,5	29,7	3,6	31,3	3,7	33,6	3,8	37,3	4,0
		17	22.7	3.4	26,1	3,5	29,6	3,7	31,3	3,8	33,4	3,9	37,3	4,1
		18	22.7	3.5	26	3,6	29,5	3,7	31,1	3,8	33,3	3,9	37,3	4,2
		19	22.7	3.5	25,9	3,7	29,3	3,8	31	3,9	33,1	4,0	37,3	4,2
		20	22.6	3.6	25,9	3,7	29,2	3,9	30,9	4,0	33	4,1	37,3	4,3
		22	22.5	3.7	25,7	3,8	29	4,0	30,6	4,1	32,7	4,2	37,2	4,4
54.4	29000 m³/h	16	34.0	5.0	38,9	5,3	43,5	5,5	46,0	5,7	48,7	5,8	54,2	6,1
		17	34.0	5.1	38,9	5,4	43,4	5,6	46,0	5,8	48,5	5,9	54,2	6,2
		18	34.0	5.2	38,8	5,5	43,2	5,7	45,8	5,9	48,3	6,0	54,2	6,3
		19	34.0	5.3	38,8	5,6	43,1	5,8	45,6	5,9	48,1	6,1	54,2	6,4
		20	33.9	5.4	38,7	5,7	43	5,9	45,5	6,0	47,9	6,2	54,2	6,5
		22	33.8	5.6	38,5	5,9	42,8	6,1	45,2	6,2	47,5	6,4	54,1	6,7
60.4	33000 m³/h	16	44.6	7.1	50,8	7,4	57,0	7,8	60,3	7,9	63,8	8,2	70,3	8,5
		17	44.6	7.2	50,7	7,5	57,0	8,0	60,2	8,1	63,6	8,3	70,3	8,7
		18	44.6	7.3	50,7	7,7	56,8	8,1	60	8,2	63,3	8,5	70,3	8,8
		19	44.6	7.4	50,6	7,8	56,6	8,2	59,8	8,4	63,1	8,6	70,4	9,0
		20	44.6	7.6	50,6	8,0	56,4	8,4	59,6	8,5	62,9	8,7	70,4	9,2
		22	44.4	7.8	50,4	8,2	56,1	8,6	59,2	8,8	62,5	9,0	70,3	9,5
70.4	37000 m³/h	16	44.7	7.0	50,9	7,3	57,1	7,6	60,3	7,7	63,6	7,9	70,5	8,3
		17	44.7	7.1	50,8	7,4	57	7,8	60,3	7,9	63,5	8,1	70,5	8,4
		18	44.7	7.2	50,8	7,5	56,9	7,9	60,1	8,1	63,4	8,2	70,6	8,6
		19	44.7	7.4	50,7	7,7	56,7	8,0	59,9	8,2	63,2	8,4	70,6	8,8
		20	44.6	7.5	50,7	7,8	56,5	8,2	59,7	8,3	63,1	8,5	70,7	9,0
		22	44.5	7.7	50,5	8,1	56,1	8,5	59,4	8,6	62,8	8,8	70,6	9,3
80.4	44000 m³/h	16	45.4	6.8	51,9	7,0	58,4	7,3	61,7	7,4	65,5	7,5	72,6	7,8
		17	45.4	6.9	51,9	7,1	58,4	7,4	61,7	7,6	65,3	7,7	72,6	8,0
		18	45.4	7.0	51,9	7,3	58,2	7,6	61,5	7,7	65,1	7,8	72,7	8,2
		19	45.4	7.2	51,8	7,4	58,0	7,7	61,3	7,9	64,9	8,0	72,8	8,3
		20	45.3	7.3	51,7	7,6	57,8	7,9	61,1	8,0	64,7	8,1	72,8	8,5
		22	45.1	7.5	51,4	7,9	57,5	8,2	60,7	8,3	64,3	8,5	72,7	8,9
90.4	51000 m³/h	16	45.8	6.6	52,5	6,8	59,4	7,0	62,6	7,1	67	7,2	74,1	7,3
		17	45.8	6.7	52,4	7,0	59,3	7,2	62,6	7,3	66,8	7,4	74,2	7,5
		18	45.7	6.8	52,4	7,1	59,1	7,3	62,4	7,4	66,6	7,6	74,3	7,7
		19	45.7	7.0	52,3	7,2	59,0	7,5	62,2	7,6	66,4	7,7	74,4	7,9
		20	45.6	7.1	52,2	7,4	58,8	7,6	62,0	7,7	66,2	7,9	74,4	8,1
		22	45.5	7.3	52,0	7,6	58,5	7,9	61,7	8,0	65,8	8,2	74,4	8,5
100.4	56000 m³/h	16	58.7	8.9	67,2	9,3	75,7	9,8	80,1	10,0	85	10,3	94,6	10,8
		17	58.5	9.1	67,0	9,5	75,4	9,9	79,9	10,2	84,6	10,5	94,6	11
		18	58.4	9.2	66,8	9,6	75,1	10,1	79,5	10,3	84,1	10,6	94,5	11,1
		19	58.3	9.3	66,6	9,8	74,7	10,2	79,1	10,4	83,6	10,7	94,4	11,3
		20	58.0	9.5	66,4	9,9	74,4	10,3	78,7	10,6	83,2	10,9	94,4	11,4
		22	57.6	9.7	65,9	10,2	73,7	10,6	77,9	10,8	82,3	11,1	94,0	11,7
110.4	60000 m³/h	16	71.8	11.4	82,1	12,0	91,9	12,6	97,4	12,9	102,7	13,3	113,1	14
		17	71.7	11.6	82,0	12,2	91,7	12,8	97,2	13,1	102,3	13,5	113,1	14,3
		18	71.7	11.8	81,8	12,4	91,4	13,0	96,8	13,3	101,8	13,7	113,0	14,5
		19	71.7	12.0	81,6	12,6	91,1	13,2	96,4	13,5	101,4	13,9	113,0	14,7
		20	71.6	12.2	81,4	12,8	90,8	13,4	96,1	13,7	101	14,1	113,0	14,9
		22	71.3	12.6	81,1	13,2	90,1	13,8	95,3	14,1	100,1	14,5	112,7	15,4

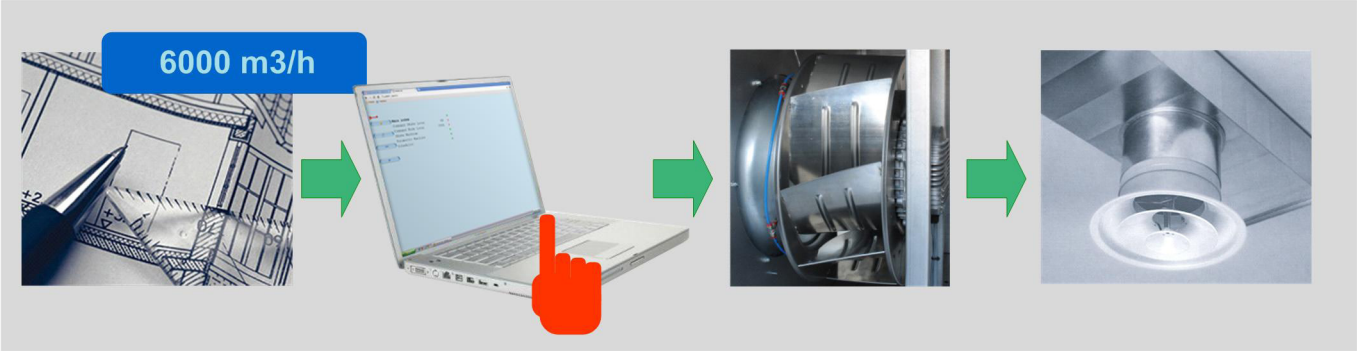
Ta = fresh air temperature D.B./W.B.
DB = dry bulb WB = wet bulb
kWt = Heating capacity (kW)
kWe = Compressor power input in kW

Performance refers to operation with 15% of expelled and outside air not all thermal yields take into account the heat dissipated by the fan motors
Good operation of winter active thermodynamic recovery is ensured if the limit temperature of the air of mixture between fresh air and recirculation air does not drop below:
+2°C with unit equipped with hot water coil +10°C with unit equipped with gas module

Correct functioning of this option requires a modulation device for the air flow on the exterior heat exchange coil (therefore, this must be selected in combination with CREFP and CREFB).

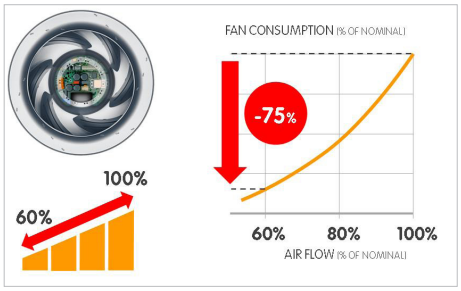
PCOSM - Constant supply airflow

The original technology used eliminates the need for on-site calibration of traditional fans, as well as the time that would be required and the associated costs. The required flow rate is set on the display and maintained automatically by the unit, which controls the speed of the fan sections. During the installation and start-up phase, the unit controls to the effective pressure drop in the air distribution and diffusion system. Furthermore, during its entire operating life, the progressive fouling of the air filters is automatically compensated for thanks to this system.



PVAR - Variable airflow

Option that enables the automatic variation of the treated air flow, according to the effective load. This allows great energy saving, thanks to the reduction of ventilation electrical consumptions. The minimum flow value equal to 60% of the nominal one occurs during the partial load and satisfied set-point operation. As a result, the supply temperature remains unchanged either during full load operation or partial load operation. The device also includes the functions of configuration of the nominal flow directly on the unit display and its automatic control to compensate the dirtying of the air filters.



This option already includes the device for controlling the airflow, called 'PCOSM - Supply constant airflow', which must not be selected

When sizing the distribution and diffusion of the air, keep into consideration that the airflow varies from the nominal value (at full load, in FREE-COOLING mode and during the defrosting phases) to the minimum value, equal to 60% of the nominal flow (at partial load)

CPHG - Hot gas re-heating coil

This option is recommended during the summer when the intakr air dehumidification is required.

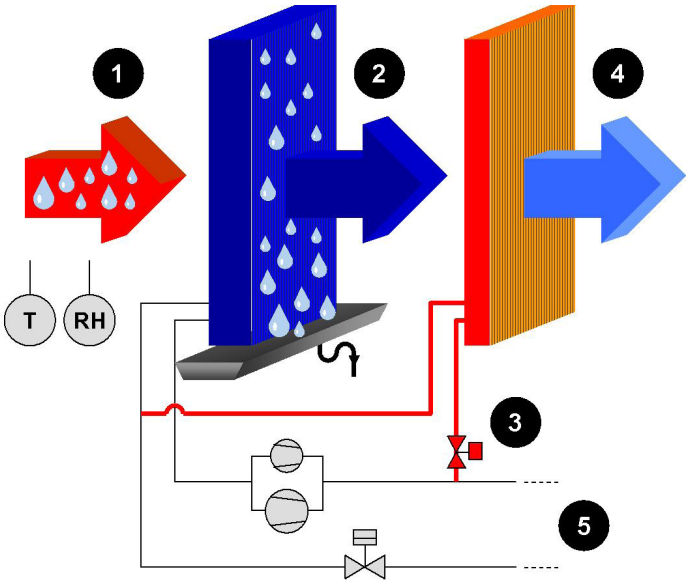
The air flow to enter the room may contain a higher level of humidity than desired. The dehumidification process is used to reduce it. The air flow is first cooled in the handling coil with separation of condensation. It is then freely re-heated to maintain the desired condition of comfort in the served room.

The re-heat coil is located behind the handling coil and is activated by diverting a flow of hot refrigerant gas downstream from the compressors through the action of a dedicated solenoid valve.

The process starts operating based on the humidity set-point established by the user.

With respect to traditional devices, such as electrical electric elements or hot water coils, use of the re-heat coil does not consume any extra energy. It also lowers refrigerant condensation temperature, which provides two positive effects: power absorbed by the compressors is considerably reduced, and at the same time, cooling capacity is increased, resulting in greater efficiency (EER).

Ambient humidity is measured by means of a return humidity probe, which is provided already assembled and wired built-in the unit.



1 Outdoor air and humidity / temperature probe
2 Chilled and dehumidified air in the internal exchanger (evaporator)
3 Automatic hot gas pump valve
4 Air treated by the post-heating exchanger
5 External exchanger (condenser)

Indicative scheme - not in scale

This option reduces the available static pressure (supply air side).

Performances of hot gas re-heating coil

SIZE			OUTDOOR AIR TEMPERATURE (°C)														
			25	27	30	32	35	25	27	30	32	35	25	27	30	32	35
			kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt
49,4	Qo (m3 / h)		22000					26000					34000				
	Qo (l / s)		6111					7222					9444				
	Ta (°C)	10	45,9	49,5	54,8	58,4	63,9	51,2	55,2	61,2	65,3	71,4	59,2	63,8	70,8	75,5	82,6
		12	42,3	45,8	51,2	54,8	60,2	47,2	51,2	57,1	61,1	67,2	54,5	59,1	66,1	70,8	77,8
		14	38,7	42,2	47,5	51,1	56,5	43,2	47,1	53,0	57,1	63,1	49,9	54,5	61,3	66,0	73,0
		16	35,2	38,7	44,0	47,5	52,9	39,2	43,1	49,0	53,0	59,0	45,2	49,8	56,7	61,3	68,3
		18	31,6	35,1	40,4	43,9	49,3	35,2	39,2	45,0	49,0	55,0	40,7	45,2	52,0	56,6	63,6
		20	28,1	31,6	36,8	40,3	45,7	31,3	35,2	41,1	45,0	50,9	36,1	40,6	47,4	52,0	58,9
54,4	Qo (m3 / h)		22000					29000					34000				
	Qo (l / s)		6111					8056					9444				
	Ta (°C)	10	46,4	50,0	55,4	59,0	64,6	54,6	58,8	65,2	69,6	76,1	59,8	64,5	71,5	76,3	83,5
		12	42,7	46,3	51,7	55,3	60,8	50,3	54,5	60,9	65,2	71,7	55,1	59,7	66,7	71,5	78,6
		14	39,1	42,7	48,0	51,6	57,1	46,0	50,2	56,5	60,8	67,3	50,4	55,0	62,0	66,7	73,8
		16	35,5	39,1	44,4	48,0	53,4	41,7	45,9	52,2	56,5	62,9	45,7	50,3	57,2	61,9	69,0
		18	32,0	35,5	40,8	44,3	49,8	37,5	41,7	48,0	52,2	58,6	41,1	45,7	52,5	57,2	64,2
		20	28,4	31,9	37,2	40,7	46,1	33,4	37,5	43,8	47,9	54,3	36,5	41,1	47,9	52,5	59,5
60,4	Qo (m3 / h)		29000					33000					47000				
	Qo (l / s)		8056					9167					13056				
	Ta (°C)	10	61,7	66,4	73,5	78,4	85,7	67,3	72,5	80,3	85,6	93,6	81,8	88,1	97,7	104,2	113,9
		12	56,8	61,6	68,7	73,5	80,8	62,0	67,2	75,0	80,2	88,2	75,4	81,7	91,2	97,6	107,4
		14	52,1	56,8	63,9	68,6	75,9	56,8	62,0	69,7	74,9	82,8	69,0	75,3	84,7	91,2	100,8
		16	47,4	52,0	59,1	63,8	71,0	51,7	56,8	64,5	69,7	77,5	62,7	69,0	78,3	84,7	94,3
		18	42,7	47,3	54,3	59,0	66,2	46,5	51,6	59,3	64,4	72,2	56,4	62,6	72,0	78,3	87,9
		20	38,0	42,6	49,6	54,3	61,4	41,4	46,5	54,1	59,2	67,0	50,2	56,4	65,7	72,0	81,5
70,4	Qo (m3 / h)		29000					37000					47000				
	Qo (l / s)		8056					10278					13056				
	Ta (°C)	10	62,3	67,1	74,3	79,2	86,6	72,0	77,5	85,9	91,6	100,2	82,6	89,0	98,7	105,2	115,1
		12	57,4	62,2	69,4	74,2	81,6	66,4	71,9	80,2	85,9	94,4	76,1	82,5	92,1	98,6	108,4
		14	52,6	57,4	64,5	69,3	76,6	60,8	66,3	74,6	80,2	88,7	69,7	76,1	85,6	92,1	101,8
		16	47,8	52,6	59,7	64,5	71,7	55,2	60,7	68,9	74,5	83,0	63,3	69,7	79,1	85,6	95,3
		18	43,1	47,8	54,9	59,6	66,8	49,7	55,2	63,4	68,9	77,3	57,0	63,3	72,7	79,1	88,8
		20	38,4	43,1	50,1	54,8	62,0	44,3	49,7	57,9	63,4	71,7	50,7	57,0	66,4	72,7	82,3
80,4	Qo (m3 / h)		29000					44000					47000				
	Qo (l / s)		8056					12222					13056				
	Ta (°C)	10	62,9	67,8	75,0	80,0	87,4	79,6	85,7	95,0	101,3	110,8	83,4	89,9	99,7	106,3	116,2
		12	58,0	62,8	70,1	75,0	82,4	73,3	79,5	88,7	95,0	104,4	76,9	83,3	93,0	99,6	109,5
		14	53,1	57,9	65,1	70,0	77,4	67,1	73,3	82,4	88,7	98,1	70,4	76,8	86,5	93,0	102,9
		16	48,3	53,1	60,3	65,1	72,4	61,0	67,1	76,2	82,4	91,8	63,9	70,3	79,9	86,4	96,2
		18	43,5	48,3	55,4	60,2	67,5	54,9	61,0	70,0	76,2	85,5	57,6	63,9	73,4	79,9	89,7
		20	38,8	43,5	50,6	55,4	62,6	48,9	54,9	64,0	70,0	79,3	51,2	57,5	67,1	73,4	83,1
90,4	Qo (m3 / h)		38000					51000					60000				
	Qo (l / s)		10556					14167					16667				
	Ta (°C)	10	80,5	86,6	95,9	102,2	111,7	96,1	103,6	114,7	122,3	133,7	105,0	113,1	125,3	133,6	146,1
		12	74,2	80,4	89,6	95,9	105,3	88,7	96,1	107,2	114,7	126,1	96,8	104,9	117,0	125,3	137,7
		14	68,0	74,2	83,3	89,6	99,0	81,3	88,6	99,7	107,2	118,4	88,7	96,8	108,8	117,0	129,4
		16	61,9	68,0	77,1	83,3	92,7	73,9	81,2	92,2	99,6	110,9	80,6	88,7	100,7	108,8	121,1
		18	55,8	61,9	71,0	77,1	86,4	66,6	73,9	84,8	92,2	103,4	72,6	80,6	92,5	100,7	112,9
		20	49,8	55,8	64,8	70,9	80,2	59,3	66,6	77,5	84,8	95,9	64,7	72,6	84,5	92,6	104,7

SIZE			OUTDOOR AIR TEMPERATURE (°C)														
			25	27	30	32	35	25	27	30	32	35	25	27	30	32	35
			kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt
100,4	Qo (m3 / h)		38000					56000					60000				
	Qo (l / s)		10556					15556					16667				
	Ta (°C)	10	80,9	87,0	96,4	102,7	112,3	100,9	108,8	120,5	128,5	140,4	105,5	113,7	126,0	134,3	146,8
		12	74,6	80,8	90,1	96,4	105,8	93,1	100,8	112,5	120,5	132,4	97,3	105,4	117,6	125,9	138,4
		14	68,4	74,5	83,8	90,0	99,5	85,3	93,1	104,6	112,5	124,4	89,1	97,3	109,4	117,6	130,0
		16	62,2	68,3	77,5	83,7	93,1	77,6	85,3	96,8	104,6	116,4	81,0	89,1	101,2	109,4	121,7
		18	56,1	62,2	71,3	77,5	86,8	69,9	77,5	89,0	96,8	108,5	73,0	81,0	93,0	101,2	113,5
		20	50,0	56,0	65,2	71,3	80,6	62,2	69,8	81,2	89,0	100,7	65,0	73,0	84,9	93,0	105,2
110,4	Qo (m3 / h)		38000					56000					60000				
	Qo (l / s)		10556					15556					16667				
	Ta (°C)	10	81,3	87,5	96,9	103,3	112,8	101,4	109,3	121,1	129,1	141,1	106,1	114,2	126,6	135,0	147,6
		12	75,0	81,2	90,5	96,8	106,4	93,6	101,4	113,1	121,1	133,1	97,8	105,9	118,2	126,6	139,1
		14	68,7	74,9	84,2	90,5	100,0	85,7	93,5	105,2	113,1	125,0	89,6	97,7	109,9	118,2	130,7
		16	62,5	68,7	77,9	84,1	93,6	78,0	85,7	97,3	105,2	117,0	81,4	89,5	101,7	109,9	122,3
		18	56,4	62,5	71,7	77,9	87,3	70,2	77,9	89,4	97,3	109,1	73,4	81,4	93,5	101,7	114,0
		20	50,3	56,3	65,5	71,6	81,0	62,6	70,2	81,6	89,4	101,2	65,3	73,3	85,3	93,5	105,8

Ta = leaving air temperature from the handling coil and entering the post-heating coil
Qo = airflow (l/s)
kWt = Heating capacity (kW)
The reheating coil is powered by the cold gas bled from the condensing coil.
As the condensation hot gas temperature is linked to the outdoor air temperature, the indicative potentials of the post-heating coil are expressed according to the outdoor air temperature.

HSE - Immersed electrodes steam humidifier

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.

Available in different capacities, the device is suitable for using soften water having medium conductivity and is equipped with: water load solenoid valve, disposable cylinder, water drainage solenoid valve, distribution nozzle, control electronic board to verify the water level, conductivity, anti-foam device, water drainage manual forcing. To ensure maximum hygiene, the cylinder can automatically empty after a determined period of stand-by. The device is equipped with anti-freeze function with automatic activation.

The accessory is installed inside the unit and is connected to the electrical panel of the unit.

Ambient humidity is measured by means of a return humidity probe, which is provided already assembled and wired built-in the unit.

Matching of immersed electrode and steam humidification module

Size	49.4	50.4	60.4	70.4	80.4	90.4	100.4	110.4
8 kg/h	√	√	√	√	√	√	√	√
15 kg/h	√	√	√	√	√	√	√	√

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.

HWS - Water to waste evaporating wet-deck humidifier

This option is recommended when quick, efficient humidification of the served room is required. Humidification of the air mixture occurs by passing the air flow through a honeycomb package that is kept humid at all times by a series of nozzles that inject water in small drops. The reserve of water for treatment is taken directly from the water mains. During operation, the pure water vapour is mixed with the air currents. The remaining part, enriched with mineral salts, is collected in the tub and eliminated. The constant exchange of water ensures cleaning of the evaporation septum and provides maximum limitation of the formation and proliferation of Legionnaire's Disease. With this option, energy consumption for water evaporation is limited. Whenever the packaged humidifier is active, in addition to humidifying, adiabatic cooling of the air takes place, which is constantly compensated for by the thermal control device. Direct connection to the plumbing system eliminates the need for special water treatment and easy control of the humidification process by means of the measuring and adjusting device of the water flow rate provided standard.

The accessory is installed inside the unit and is connected to the electrical panel of the unit.

Ambient humidity is measured by means of a return humidity probe, which is provided already assembled and wired built-in the unit.

Size		49.4	54.4	60.4	70.4	80.4	90.4	100.4	110.4
TA (°C) D.B.	TA (°C) W.B.	kg/h	kg/h	kg/h	kg/h	kg/h	kg/h	kg/h	kg/h
30	15,1	150	167	190	213	253	294	323	346
35	17,6	187	209	238	266	317	367	403	432
40	19,8	228	254	289	324	385	447	491	526

Ta D.B.= dry bulb temperature of inlet air to the wet deck.
Ta W.B.= wet bulb temperature of inlet air to the wet deck.
Approximate values of the maximum rate of steam released by the steam humidifier to the air to obtain controlled thermal and humidity conditions in supply. The data refer to a unit with standard airflow in supply.

This option reduces the available static pressure (supply air side).

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.

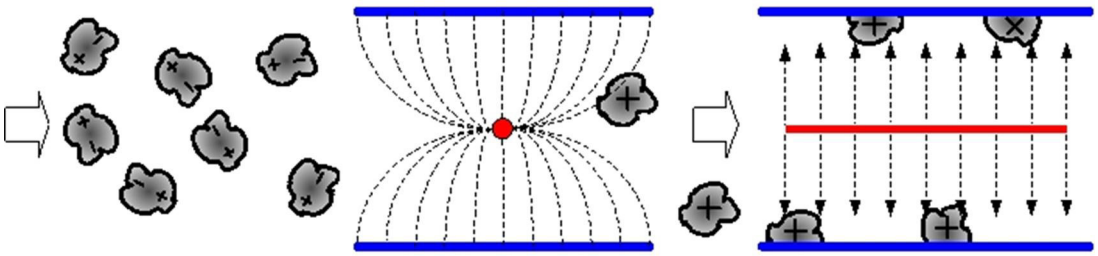
FES - H10 high efficiency electrostatic air filter

Class H10 high-efficiency filters are additional filtering components with an active electrostatic system. Solid or liquid particles contained in the air flow are trapped by an electrical field. The air flow through the filter is affected in two main phases: release of an electrical charge to the particles (ionization), and capture of the particles by electrostatic deposit (captivation). Periodically the filters must be cleaned to remove the captured particles (washing).

The filters are able of trapping fine dusts, some types of viruses and micro-organisms (anti-bacterial action) with very modest pressure drops. The range of use normally includes fine powders that measure less than 1 µm. Typical pollutants are cigarette smoke (0.5÷0.3 µm), oily vapours (1÷0.2 µm), PM10 (particles < 10 µm), PM2.5 (particles < 2.5µm), PM1 (particles < 1µm), etc.

The clogging of the electric filter is signalled by a sensor that allows to schedule the periodic maintenance, which can be easily performed by washing in water with a special non-aggressive detergent for aluminium.

The greater initial cost, as compared to a traditional pocket filter, is recovered quickly since the electrostatic filters last for the entire life of the unit, whereas pocket filters require periodic replacement.



This option reduces the available static pressure (supply air side).

The electronic filters are not suited to filter water steams also in low concentration, oily vapours, large amounts of dust, shavings, powdered iron filings and residues generally, gas. The electronic filters have to absolutely avoid all the following substances: powdered metals also fine, smoke produced by combustion of organic materials and not, flour dusts, dusts and vapours of explosive environments.

F7 - F7 high efficiency air filter

The class F7 are filtering components that are in addition to the standard G4 filters, for more effective filtering. They are widely used in air conditioning systems and industrial applications that require suitable performance concerning fine dusts and particles with dimensions greater than 1 µm.

Class F7 filters are made of fibreglass paper, pleated with constant calibrated spacing, mounted on a metallic frame; the ample filtering surface reduces air side pressure drops. Class F7 filters must be replaced after reaching their limits of dirtiness with scheduled periodic maintenance. An optional accessory, dirty filter differential switch, can be fitted to signal when admissible limit of fouling has been reached so as not to excessively reduce the airflow with respect to the nominal value.

PSAF - Clogged filter differential pressure switch air side

It makes it possible to detect and signal (with a suitable alarm) when the dirtiness of the air filter reaches its maximum level. This provides the unit operator with information on when filter maintenance is required. The detection signal is installed in the unit. It is already connected to the electrical panel and pre-calibrated in the factory. Calibration can be modified by an authorized personnel.

PAQC - Air quality probe for the CO2 rate check

This option is recommended for areas with highly variable crowding. The probe measure the amount of CO2 in the environment and initiates a 0/10V proportional signal. Based on the received signal, the controller regulates amount of outdoor air necessary for IAQ ventilation and thus minimises energy used for treatment.

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

PAQCV - Air quality probe for the CO2 and VOC rate check

The option is recommended in areas with tobacco smoke, formaldehyde (from solvents, deodorants, glues, paints, detergents, food preparation, etc. The probe measures the rate of CO2 and VOC (volatile organic compounds) in the environment and initiates a 0/10V proportional signal. Based on the received signal, the controller regulates amount of outdoor air necessary for IAQ ventilation and thus minimises energy used for treatment.

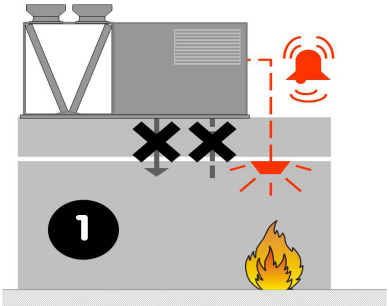
The probe is installed and wired built-in the unit and is located in the return air duct of the unit.

DESM - Smoke detector

This option allows detection of smoke in the room by analyzing the return air. The Tyndal-effect increased sensitivity smoke detector is perfect for ventilation ducts since it is able to detect rarefied smoke in high-speed air flows. Smoke detection occurs using a photo-optical system with a labyrinth chamber. The alarm signal is processed by a built-in micro-processor which verifies the condition and sends a message to the unit controller such as smoke alarm, failure, or service required. The device is installed inside the return duct and it is made up of a sensor, installed inside the return piping, and of a controller that is located on the outside duct.

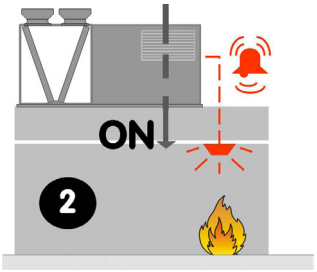
Control logics in the event of alarm signal

COMPLETE UNIT SHUTDOWN



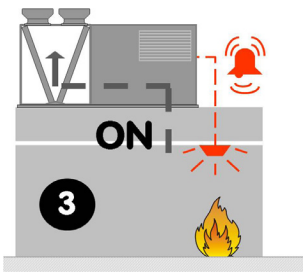
Standard in all configurations

SPACE IN OVERPRESSURE



Standard in the configurations CBK, CCK and CCKP

SPACE IN NEGATIVE PRESSURE



Only with units in CCK and CCKP configuration, thus provided with extraction fans.

The unit is able to manage the signal coming from a fire detection system or fire control unit installed built-in, activating one of the logics illustrated, which can be set by parameters. In presence of alarm signal, the compressors are always switched off; moreover, the remote ON-OFF is disabled together with the switch on/off control from keypad. The unit is manually reset. Rooftop units cannot be used as fume extractor.

Any fire detection devices on board the unit must be considered as an auxiliary safety system, and, accordingly, must not be a replacement for any fire detection devices in the room

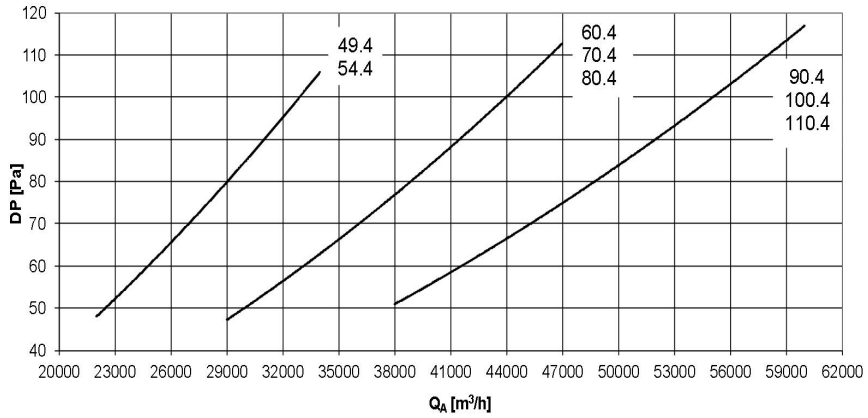
CHWER - Energy recovery from food refrigeration

This option makes it possible, during the winter season, to recover the heating energy produced by food storage in supermarkets, hypermarkets or food factories. It is a technical solution that recovers a significant heating resource, which is otherwise normally released outdoors.

The unit logic assigns a priority value to this function based on the heating availability of the resource, and integrates the overall output of the unit.

The option is comprised of a water exchanger, which is automatically controlled by a dedicated valve. With electrically powered units, the frost function is enabled, which forces the valve open when required.

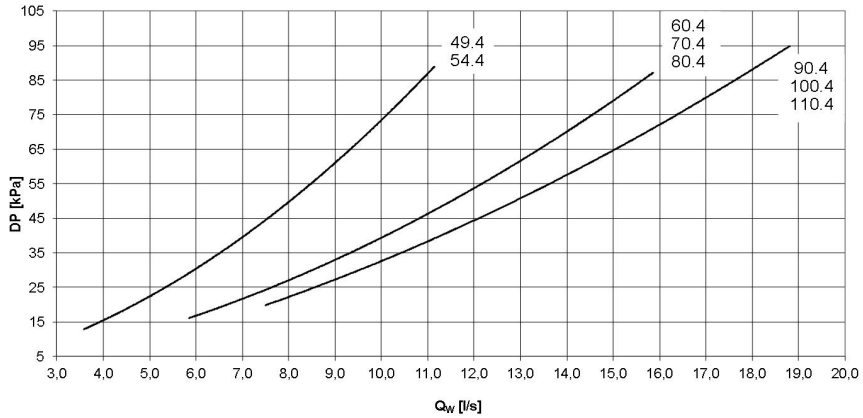
Hot water coil pressure drops: AIR side



The air side pressure drops are relative to the medium air temperature of 20°C and are to be added to the pressure drops due to ducts, terminal devices and any other component that causes a drop in working discharge head.

QA [m3/h] = airflow
DP[Pa] = pressure drops

Hot water coil pressure drops: WATER side



Pressure drops on the water side are calculated considering an average water temperature of 65°C

Qw [l/s] = water flow-rate
DP[kPa] = pressure drops

Qw [l/s] =P / (4.186 x DT)

P = Water coil heating capacity in KW
DT = Temperature difference between inlet / outlet water

This option reduces the available static pressure (supply air side).

The component requires connection to the hot water plumbing system (to be provided for by the client).

'Electric elements', '2-row hot water coil', 'Combustion heating module' and 'Energy recovery from food refrigeration' cannot be assembled simultaneously.

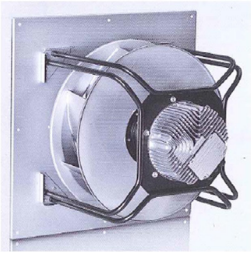
Performances of water heating coil

SIZE			Ti/To (°C)								
			45 / 40	40 / 35	35 / 30	45 / 40	40 / 35	35 / 30	45 / 40	40 / 35	35 / 30
			kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt
49.4 54.4	Qo (m3 / h)		22000			28000			34000		
	Qo (l / s)		4444			5555			6667		
	TM (°C)	5	233,1	201,7	170,3	280,9	242,9	204,9	324,9	280,9	236,7
		10	200,0	168,9	138,0	241,1	203,4	165,9	278,9	235,2	191,5
		14	174,1	143,3	112,5	209,9	172,5	135,1	242,8	199,4	155,9
		16	161,3	130,7	99,9	194,3	157,2	119,9	224,8	181,7	138,3
		18	148,6	118,0	87,3	179,1	142,0	104,7	207,1	164,1	120,7
		20	136,1	105,5	74,8	163,8	126,9	89,6	189,5	146,5	103,2
60.4 70.4 80.4	Qo (m3 / h)		29000			38000			47000		
	Qo (l / s)		4889			6111			7222		
	TM (°C)	5	311,1	269,2	227,4	384,0	332,1	280,1	450,4	389,4	328,1
		10	267,0	225,6	184,2	329,5	278,0	226,7	386,7	326,0	265,4
		14	232,4	191,4	150,2	286,8	235,8	184,7	336,5	276,4	216,1
		16	215,3	174,5	133,4	265,6	214,9	163,8	311,6	251,8	191,6
		18	198,4	157,6	116,7	244,7	194,1	143,1	287,1	227,4	167,2
		20	181,6	140,9	100,0	223,9	173,4	122,5	262,6	203,0	143,0
90.4 100.4 110.4	Qo (m3 / h)		38000			49000			60000		
	Qo (l / s)		5333			6667			7500		
	TM (°C)	5	403,4	349,3	295,0	491,2	424,7	358,5	571,2	494,0	416,4
		10	346,2	292,7	239,0	421,5	355,9	290,2	490,6	413,9	337,1
		14	301,4	248,3	195,0	367,0	301,8	236,6	427,1	350,9	274,7
		16	279,3	226,4	173,2	340,0	275,1	210,0	395,7	319,7	243,6
		18	257,3	204,6	151,5	313,1	248,7	183,5	364,4	288,8	212,7
		20	235,6	182,9	129,9	286,6	222,1	157,1	333,4	258,0	181,9

TM = air inlet temperature of water coil (°C)
Ti/To = water temperature inlet/outlet (°C)
Qo = airflow (l/s and m3/h)
kWt = Provided heating capacity (kW)
Thermal yields referred to the max. water coil capacity. The thermo regulator coke the 3-way modulating valve limiting the inlet air temperature at desired values.

VENH - High static pressure electric fans

A higher capacity fan section is available for applications requiring high supply and return static pressure. The option is comprised of radial fans coupled directly to electronically controlled motors (brushless). When you select a unit on the www.clivet.com website, if you enter the air flow-rate, the available supply and return pressure and the accessories that determine the pressure drop on the air side, you will be automatically shown a selection of high static pressure fans, when required.



Option that cause the variation of the unit electrical data.

FCE - Enthalpic FREE-COOLING

This option is used to reduce energy consumption and compressor wear by using the outdoor air as an energy source to lower the thermal loads and ambient humidity. The temperature control compares the temperature and the humidity between the outdoor environment and the served environment and decides the amount of fresh air needed to guarantee the correct temperature and humidity set-points in the environment, keeping the compressors shut off.

The air humidity, both outside and inside the environment, is measured by means of humidity probes on the outdoor and return air intake, which are provided already installed and wired on the unit.

CREFB - ECOBREEZE external section fans consumption reduction device

Option indicated to reduce the ventilation electric energy consumption considerably and limit sound emissions inside the external section of the unit. ECOBREEZE logic allows the external axial fans to operate at a variable rotation speed, according to the operation conditions of the cooling circuit. Reducing the speed when the heat load is reduced, benefits the sound emissions, especially during the night, when sensitivity to noise is enhanced. During summer operation, fans can further increase their speed, to respond to situations in which operation limits are temporarily exceeded. ECOBREEZE option uses special fans powered by brushless electrical motors, with complete electronic control, and distinguished by a very high efficiency.

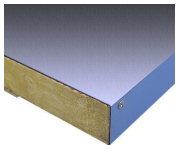
MHP - High and low pressure gauges

Allows the pressure measurement of the refrigerant to the compressor intake and supply, making the inspection of these parameters easier for the technicians involved in the management of the unit.

The two liquid pressure gauges and corresponding pressure sockets are installed built-in the unit in an easily accessible location.

PCM0 - Sandwich panels of the handling zone in M0 fire reaction class

Option indicated when, by law, the air treatment area must have metallic internal walls made with fire-proof insulating material. Sandwich panels with dual walls made of steel sheet metal with fire-proof insulation made of Rockwool ((90 kg/m3) comply with the French standards, which require "M0" reaction to fire class.



CCCA - Copper / aluminium coil with acrylic lining

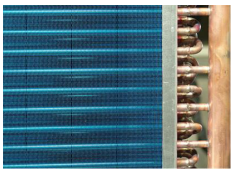
Coils with copper pipes and aluminium fins with acrylic lacquering. Can be used in settings with moderately aggressive low saline concentrations and other chemical agents.

Attention!

- Cooling capacity variation -2.7%

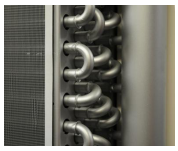
- variation in compressor power input +4.2%

- operating range reduction -2.1°C



CCCA1 - Copper/aluminum coil with Fin Guard (Silver) treatment

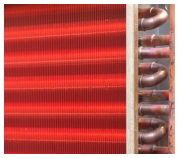
A treatment which offers an optimal thermal exchange and guarantees and protects the finned coil exchangers from corrosion over time. Can be used in settings with very aggressive saline concentrations and other chemical agents in the air thus maintaining the performance of the coils over time.



CCCC - Copper / copper coil

Coils with copper pipes, copper fins and brass structure. Can be used in settings with moderately aggressive low saline concentrations and other chemical agents. The options are available for:

- external coil
- internal coil
- hot water coil
- re-heating coil



This option is not suitable for application in sulphuric environments

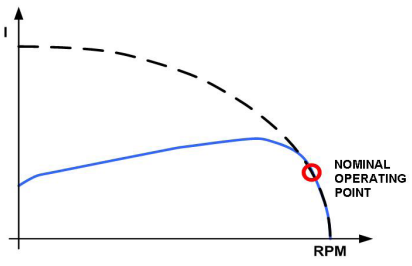
Option available on request

SFSTC - Progressive compressor start-up Soft starter

This option is also known as "Soft starter". An electronic device which automatically starts up the compressors gradually, reducing the starting current for the unit by around 40% in comparison with the nominal value.

This results in the electrical capacity system and the related protection devices being sized with lower parameters, thus having a lower initial investment cost.

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



(---) POWER INPUT WITHOUT SFSTC OPTION
(__) POWER INPUT WITH SFSTC OPTION

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

Allows to perform the connection to supervision systems by using BACnet-IP as a communication protocol. It allows to access the entire 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)

PFCP - Power factor correction capacitors (cosfi > 0.9)

The component is necessary to lower the phase difference between current and voltage in the electromagnetic components of the unit, such as asynchronous motors. By re-phasing it is possible to reduce the intensity of the line current by reducing a part of the power of the mains (reactive power). This leads to an economic benefit which the energy provider grants to the final user. The component makes it possible to bring the cosfi power factor to values which on average are greater than 0.9.

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

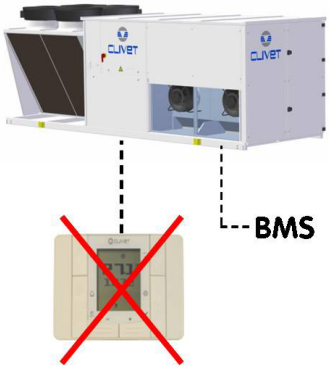
MF2 - Multifunction phase monitor

The phase monitor controls the electrical parameters of the power line to the unit. It works on the command circuit and orders the unit to be switched off when one of the following cases is present: when the phase connections do not respect the correct sequence, or when there is over voltage or under voltage for a certain amount of time (limit values of over and under voltage and the time interval can be manually and separately set). When the line conditions are re-established, the unit is re-armed automatically.

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

The device prevents sudden changes of voltage; however, the voltage must always be in a range between 380V and 480V.

NCRC - Remote control with user interface: not required



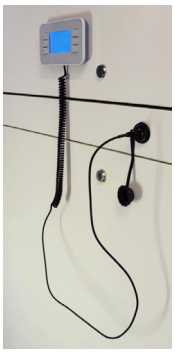
If you choose this option, the unit is supplied without a graphical control user interface, although it retains all the features. Option that can be chosen when there is a supervision system or another remote management device.

The remote control with user interface can be still used in conjunction with a supervision system and in general with a serial connection.

Accessories separately supplied

SIX - Service interface

The device allows to fully control the unit for start-up and maintenance operations conducted by authorised technical personnel. It must be connected on the outside of the unit via the RJ45 connector and the 1.5m connection cable that can be further extended. The device can be easily applied on the unit's surface thanks to the magnetic support. It is protected from the elements thanks to the IP68 protection. The control has a backlit screen, comfortable buttons and a graphical interface with a browsing menu and submenu.



All device functions can be repeated with a normal portable PC connected to the unit with an Ethernet cable and equipped with an internet navigation browser.

AMRX - Rubber anti-vibrating dampers

The rubber antivibration mounts must be fixed to designated housings on the support stringers and are used to dampen vibrations produced by the unit, thereby reducing the noise transmitted to the support structures. They are flexible bodies able to dampen axial and tangential stresses and maintain the mechanical properties almost constant over time thanks to high resistance materials of which they are made.

Alternatively, rubberized neoprene anti-vibration strips may be used on the unit longitudinal support members (not supplied by Clivet)

CLMX - Clivet Master System

CLIVET MASTER SYSTEM is the ideal system for the remote and centralised control of the CLIVETPack and SMARTPack climate control units. It can manage up to eight units connected with a serial connection. It includes a box for wall installation, as well as the electronic power supply and serial communication devices, a controller with a touch-screen display and a USB port at the front used to export the alarm log. The device allows to easily and intuitively access all the information on the status of the system and the climate control units. It also provides:

- auto-detection of units connected,
- setting all unit parameters,
- setting of the zone set-point
- unit stata display,
- control and management of the alarms and creation of an alarm log,
- hourly operation scheduling (ON / OFF / ECO),
- rotation of the units even for individual areas,
- temperature, humidity and air quality trends
- automatic language management (English, Italian, French, Spanish and German)

The component must be combined with the RS485 serial port option with Modbus protocol built-in of each rooftop

Operating temperature from 0°C to 50°C with relative humidity lower than 90% without condensate

P-MATIC - Clivet supervisory system

Clivet P-MATIC is a Clivet supervision system that allow to schedule and manage all the installed Clivet conditioning units, optimizing their functional operating and the others systems in order to reduce the energy consumption.

The software navigation is easy and intuitive, thanks to the tridimensional graphic interface. It is so possible to change complex activities of system operating into simple and reliable activities made by the Customer.

Clivet P-MATIC let to visualize the maintenance status of the conditioning units, valuate and manage the alarms.

The user operates on the system, through the supervision Workstation or the user interface display on the PLC (Programmable Logic Controller), according to the controller installation component. The data Exchange between the Workstation, the units and the remote control electronic devices is performed by serial/bus network on RS485 standard communication protocol, or by LAN network (Local Area Network) Ethernet TCP/IP.

The integrated remote monitoring software allows accessing to the Clivet on-line technical assistance services.

For further information refer to the technical documentation.

Performance

On the web site www.clivet.com are available the performances of the CAK, CBK, CCK and CCKP configuration.

Size 49.4 CCKP configuration

Cooling performance with 30% of outdoor and exhaust air

Air flow	Ta (°C) D.B./ W.B.	Outdoor air temperature °C D.B/W.B.																							
		20 / 12				25 / 18				30 / 22				35 / 24				40 / 25				45 / 26			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
22000 m³/h	22 / 16	150,5	112,5	28,8	5,23	165,8	115,6	32,4	5,12	165,5	112	36,3	4,56	159,9	112,5	40,4	3,96	151,8	115,1	45,0	3,37	152,2	116,9	50,2	3,03
	24 / 17	153,7	116,2	29,0	5,30	168,1	119,3	32,6	5,16	168,4	115,8	36,6	4,60	162,8	117	40,6	4,01	153,9	119,2	45,2	3,40	155,1	123,2	51,8	2,99
	26 / 18	156,7	120	29,2	5,37	165,5	119,5	32,8	5,05	171,2	119,8	36,8	4,65	165,4	120,9	40,8	4,05	156,3	122,8	45,4	3,44	161,7	128,8	53,1	3,05
	27 / 19	160,3	119,4	29,4	5,45	165,9	117,5	33,0	5,03	171,3	117,8	37,0	4,63	168,2	120,8	41,1	4,09	159,6	122,4	45,7	3,49	166,9	129,6	53,8	3,10
	28 / 20	164	118,7	29,6	5,54	166,3	115,4	33,3	4,99	171,5	115,8	37,3	4,60	171	120,7	41,3	4,14	163	121,8	46,0	3,54	172,4	130,4	54,6	3,16
	30 / 22	171,6	117,3	30,0	5,72	173,5	113,5	33,8	5,13	171,8	111,8	37,7	4,56	177,5	119,3	41,8	4,25	170,1	120,6	46,6	3,65	-	-	-	-
26000 m³/h	22 / 16	156,7	119,1	29,2	5,37	171,4	123,2	32,8	5,23	170,8	119,2	36,8	4,64	165,6	119,3	40,8	4,06	157,8	121,2	45,6	3,46	152,7	126,4	50,5	3,02
	24 / 17	160,1	123,2	29,4	5,45	174	127	33,0	5,27	173,7	123,7	37,0	4,69	168,8	124,1	41,0	4,12	159,6	126,3	45,8	3,48	159,2	133,3	51,9	3,07
	26 / 18	163,4	127,5	29,6	5,52	171,9	127,1	33,2	5,18	176,2	128,4	37,2	4,74	171,5	128,6	41,3	4,15	161,2	131,6	46,0	3,50	167,7	138,9	53,3	3,15
	27 / 19	167,2	126,8	29,7	5,63	172,5	124,6	33,4	5,16	176,5	126,1	37,5	4,71	174,4	128,3	41,5	4,20	164,6	131,1	46,3	3,56	173,2	139,8	54,0	3,21
	28 / 20	171,0	126,1	29,9	5,72	173,3	122,1	33,7	5,14	176,8	123,8	37,7	4,69	177,4	127,9	41,8	4,24	168,1	130,5	46,6	3,61	179,0	140,7	54,7	3,27
	30 / 22	178,8	124,6	30,3	5,90	180,4	120,2	34,2	5,27	177,5	119,1	38,2	4,65	183,9	126,5	42,4	4,34	175,3	129,2	47,3	3,71	-	-	-	-
34000 m³/h	22 / 16	165,0	132,4	29,6	5,57	181,1	134,5	33,4	5,42	179,7	130,8	37,3	4,82	173,4	131,6	41,4	4,19	164,2	135,9	46,2	3,55	162,2	141,9	51,2	3,17
	24 / 17	168,9	136,9	29,8	5,67	183,6	139,7	33,6	5,46	182,7	136,3	37,5	4,87	176,4	137,7	41,6	4,24	166,9	140,9	46,5	3,59	169,2	151,2	52,9	3,20
	26 / 18	172,6	141,7	30,0	5,75	180,9	140,6	33,8	5,35	185,7	141,6	37,8	4,91	179,1	143,5	41,9	4,27	169,3	146,0	46,7	3,63	177,9	157,1	54,0	3,29
	27 / 19	176,5	140,8	30,2	5,84	181,4	137,9	34,1	5,32	185,8	139,1	38,1	4,88	182,0	143,2	42,1	4,32	172,5	145,9	47,0	3,67	183,2	158,2	54,5	3,36
	28 / 20	180,4	139,9	30,4	5,93	181,9	135,2	34,3	5,30	186,0	136,4	38,3	4,86	185	142,9	42,4	4,36	175,9	145,7	47,3	3,72	188,7	159,3	55,0	3,43
	30 / 22	188,4	138,1	30,8	6,12	189,4	133,1	34,8	5,44	186,5	131,0	38,9	4,79	191,5	141,6	43,0	4,45	182,9	145,3	47,9	3,82	-	-	-	-

Size 54.4 CCKP configuration

Cooling performance with 30% of outdoor and exhaust air

Air flow	Ta (°C) D.B./ W.B.	Outdoor air temperature °C D.B/W.B.																							
		20 / 12				25 / 18				30 / 22				35 / 24				40 / 25				45 / 26			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
22000 m³/h	22 / 16	156,8	117,7	31,1	5,04	173	120,3	35,2	4,91	171	117,4	39,6	4,32	166,9	116	44,0	3,79	159,8	116,3	49,3	3,24	160,3	124,2	56,7	2,83
	24 / 17	160,6	120,9	31,4	5,11	175,3	123,9	35,4	4,95	174,7	120,7	39,8	4,39	170,0	120,1	44,3	3,84	161	121,2	49,6	3,25	162,2	130,6	57,9	2,80
	26 / 18	164,4	123,9	31,7	5,19	172,3	124,4	35,6	4,84	178,4	123,8	40,1	4,45	173,0	123,7	44,6	3,88	161,5	126,8	49,9	3,24	165,2	132,8	57,7	2,86
	27 / 19	167,8	123,7	31,9	5,26	172,5	122,5	35,8	4,82	178,5	121,7	40,3	4,43	176,3	123,2	44,8	3,94	165	126,2	50,2	3,29	168,6	132	57,7	2,92
	28 / 20	171,3	123,4	32,1	5,34	172,8	120,5	36,0	4,80	178,6	119,6	40,6	4,40	179,5	122,7	45,1	3,98	168,9	125,5	50,5	3,34	172,1	131,1	57,8	2,98
	30 / 22	178,5	122,5	32,5	5,49	180,3	118,6	36,5	4,94	179,2	115,1	41,1	4,36	185,6	122,1	45,6	4,07	176,5	124	51,1	3,45	-	-	-	-
29000 m³/h	22 / 16	168,3	128,5	32,0	5,26	183,9	132,3	35,9	5,12	182,6	127,6	40,3	4,53	175,8	128,6	44,7	3,93	167,1	131,7	50,0	3,34	171,3	141,3	57,7	2,97
	24 / 17	172,2	132,7	32,2	5,35	186,5	136,7	36,2	5,15	185,2	133,4	40,5	4,57	179,6	132,7	45,1	3,98	170	135,5	50,4	3,37	175,3	144,6	58,2	3,01
	26 / 18	176	137	32,4	5,43	184,0	137,0	36,4	5,05	187,6	139	40,7	4,61	182,3	138,1	45,3	4,02	172,9	138,9	50,9	3,40	186,6	151,5	59,6	3,13
	27 / 19	179,6	136,7	32,5	5,53	184,6	134,4	36,6	5,04	188	136,2	41,0	4,59	185,3	138,1	45,5	4,07	176,2	138,8	51,2	3,44	194,7	153,6	60,7	3,21
	28 / 20	183,3	136,3	32,7	5,61	185,2	131,8	36,8	5,03	188,6	133,4	41,3	4,57	188,3	138,1	45,8	4,11	179,6	138,9	51,5	3,49	203,1	155,8	61,7	3,29
	30 / 22	191	135,3	33,1	5,77	192,8	129,7	37,4	5,16	189,7	127,6	41,8	4,54	195,1	136,6	46,4	4,20	186,5	138,9	52,0	3,59	-	-	-	-
34000 m³/h	22 / 16	174	136,2	32,2	5,40	190,6	138,9	36,3	5,25	188,1	135,1	40,7	4,62	180,4	136,9	45,1	4,00	171,6	140,1	50,4	3,40	176,9	150,1	57,4	3,08
	24 / 17	177,7	141,3	32,4	5,48	193,8	143,0	36,6	5,30	190,8	140,9	41,0	4,65	184,1	142,1	45,4	4,06	174,2	145,4	50,7	3,44	179,5	156,5	58,1	3,09
	26 / 18	181,4	146,3	32,6	5,56	190,3	144,7	36,7	5,19	193,6	146,4	41,2	4,70	188	146,2	45,7	4,11	176,7	150,6	50,9	3,47	191,4	164,1	59,8	3,20
	27 / 19	185,3	145,5	32,8	5,65	190,5	142,4	36,9	5,16	194,1	143,5	41,5	4,68	191,4	145,5	46,0	4,16	179,9	150,5	51,3	3,51	199,8	166,6	60,8	3,29
	28 / 20	189,4	144,7	33,1	5,72	190,6	140,1	37,2	5,12	194,6	140,5	41,8	4,66	194,9	144,6	46,3	4,21	183,2	150,4	51,8	3,54	208,4	169,1	61,8	3,37
	30 / 22	197,9	142,5	33,6	5,89	198,5	137,6	37,8	5,25	195,6	134,6	42,3	4,62	201,3	143,9	46,9	4,29	190,1	150,1	52,7	3,61	-	-	-	-

kWf = Cooling capacity in kW
kWe = Compressor power input in kW
kWs = Sensible cooling capacity (kW)
EER referred only to compressors
Ta = Indoor air temperature D.B/W.B
DB = dry bulb
WB = wet bulb
Not all cooling yields take into account the heat dissipated by the fan motors.

Size 60.4 CCKP configuration

Cooling performance with 30% of outdoor and exhaust air

Air flow	Ta (°C) D.B./ W.B.	Outdoor air temperature °C D.B/W.B.																							
		20 / 12				25 / 18				30 / 22				35 / 24				40 / 25				45 / 26			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
29000 m³/h	22 / 16	189,5	142,4	35,2	5,38	208,8	146,5	39,7	5,26	209,5	140,5	44,6	4,70	202	142,2	49,3	4,10	192,8	142,9	55,1	3,50	189,4	153,6	62,2	3,05
	24 / 17	194,3	146,4	35,4	5,49	212,5	150,4	39,9	5,33	212,4	146,5	44,9	4,73	205,3	148,4	49,5	4,15	194,7	149,2	55,3	3,52	192,1	158,6	62,3	3,08
	26 / 18	198,7	150,6	35,7	5,57	208,7	151,5	40,1	5,20	215,1	152,4	45,1	4,77	208,5	153,9	49,8	4,19	196,5	155,7	55,3	3,55	197,2	162	63	3,13
	27 / 19	202,7	150,5	35,9	5,65	208,9	149,3	40,3	5,18	215,4	149,9	45,4	4,74	212,3	153,4	50,1	4,24	200,4	155,3	55,7	3,60	201,9	161,6	63,6	3,17
	28 / 20	207	150,2	36	5,75	209,1	147,1	40,6	5,15	215,7	147,3	45,6	4,73	216,1	153	50,4	4,29	204,6	154,5	56,2	3,64	206,8	161,1	64,1	3,23
	30 / 22	216,1	148,9	36,4	5,94	217,9	145	41,2	5,29	216,4	142,3	46,2	4,68	225	150,8	51,0	4,41	213,4	152,6	57	3,74	-	-	-	-
33000 m³/h	22 / 16	196,5	148,3	35,5	5,54	214,6	153,5	40,2	5,34	215,4	146,9	45,1	4,78	208,2	148,2	49,7	4,19	196,5	151,8	55,5	3,54	197,1	160,8	63,1	3,12
	24 / 17	201	153,3	35,7	5,63	218,3	157,9	40,4	5,40	218,3	154,1	45,2	4,83	212,7	153,5	50,0	4,25	199,2	157,1	55,9	3,56	197,8	167,8	62,8	3,15
	26 / 18	205,8	157,9	35,9	5,73	215,6	158,0	40,7	5,30	221,8	160,2	45,3	4,90	216	159,6	50,3	4,29	201,3	162,5	56,4	3,57	202,8	172,2	63,3	3,20
	27 / 19	210,3	157,2	36,2	5,81	216,3	155,0	40,9	5,29	222,3	157,2	45,6	4,88	219,5	159,7	50,6	4,34	205,2	162,4	56,7	3,62	207,3	172,2	63,9	3,24
	28 / 20	215,1	156,4	36,4	5,91	217,1	152,0	41,2	5,27	222,9	154,2	45,9	4,86	223,1	159,7	50,9	4,38	209,3	162,2	57,1	3,67	212	172	64,4	3,29
	30 / 22	224,9	154,3	36,9	6,09	225,6	150,5	41,8	5,40	224,4	147,8	46,5	4,83	230,7	159	51,5	4,48	217,8	161,8	57,7	3,77	-	-	-	-
47000 m³/h	22 / 16	211,9	168,4	36,3	5,84	230,4	175,5	40,9	5,63	228,0	170,4	45,8	4,98	221,6	169,6	50,6	4,38	206,7	178	56,5	3,66	202,2	188	63,3	3,19
	24 / 17	216,3	175,7	36,4	5,94	233,9	181,3	41,2	5,68	232,8	176,6	46,1	5,05	225,4	178,3	50,9	4,43	209,3	185	57	3,67	198,4	194,7	62,9	3,15
	26 / 18	220,9	182,3	36,6	6,04	231,1	181,7	41,5	5,57	237,8	182,3	46,4	5,13	229,2	185,5	51,2	4,48	211,7	191,7	57,6	3,68	203,7	198,5	63,1	3,23
	27 / 19	225,6	181,5	36,9	6,11	231,8	178,1	41,8	5,55	237,9	179,2	46,7	5,09	233,1	185,1	51,5	4,53	215,9	191,5	57,9	3,73	207	198,4	63,3	3,27
	28 / 20	230,4	180,5	37,1	6,21	232,6	174,4	42,1	5,52	238,0	176,0	47,0	5,06	237	184,6	51,8	4,58	220,5	191,2	58,2	3,79	210,2	198,1	63,4	3,32
	30 / 22	240,3	178,2	37,6	6,39	241,3	172,7	42,6	5,66	238,3	169,5	47,7	5,00	245,2	183,3	52,5	4,67	229,9	190,4	58,8	-	-	-	-	-

Size 70.4 CCKP configuration

Cooling performance with 30% of outdoor and exhaust air

Air flow	Ta (°C) D.B./ W.B.	Outdoor air temperature °C D.B/W.B.																							
		20 / 12				25 / 18				30 / 22				35 / 24				40 / 25				45 / 26			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
29000 m³/h	22 / 16	206,7	152,6	41,0	5,04	225,4	158,7	46,0	4,90	225,2	153,0	51,5	4,37	217,9	152,6	57,3	3,80	205,6	155,4	65,0	3,16	216,5	169,3	75,0	2,89
	24 / 17	210,8	157,7	41,3	5,10	229,4	162,7	46,3	4,95	229,7	157,6	51,9	4,43	221,9	158,3	57,7	3,85	209,2	160,5	65,3	3,20	226,7	174,3	76,5	2,96
	26 / 18	215,3	162,1	41,6	5,18	225,9	162,6	46,7	4,84	234,2	161,9	52,3	4,48	225	163,7	58,1	3,87	213,3	165,0	65,4	3,26	237,4	180,9	77,5	3,06
	27 / 19	219,7	162,1	41,9	5,24	226,4	159,8	47,0	4,82	234,3	159,2	52,7	4,45	228,5	163,7	58,4	3,91	217,8	164,4	65,9	3,31	246,3	182,4	78,4	3,14
	28 / 20	224,3	161,8	42,2	5,32	227,0	156,9	47,4	4,79	234,5	156,4	53,0	4,42	232,1	163,6	58,8	3,95	222,5	163,9	66,5	3,35	255,5	183,8	79,4	3,22
	30 / 22	234,2	160,6	42,9	5,46	236,5	155,1	48,1	4,92	235,1	150,5	53,8	4,37	241,1	162	59,6	4,05	231,9	162,8	67,6	3,43	-	-	-	-
37000 m³/h	22 / 16	218,3	168,4	41,8	5,22	240,2	171,5	47,0	5,11	236,7	168,2	52,4	4,52	229,2	166,6	58,4	3,92	218,8	169,7	65,7	3,33	232,7	191,5	76,5	3,04
	24 / 17	223,4	174	42,1	5,31	242,9	178,1	47,3	5,14	241,7	173,2	52,9	4,57	232,6	175,3	58,6	3,97	221,7	176,2	66,3	3,34	241,5	194,3	77	3,14
	26 / 18	228,4	179,8	42,4	5,39	239,6	178,2	47,7	5,02	246,8	177,7	53,3	4,63	237,1	180,5	59,1	4,01	224,6	182,4	66,9	3,36	252,2	203,8	78,2	3,23
	27 / 19	233,6	178,6	42,8	5,46	240,7	174,4	48,1	5,00	246,8	174,9	53,7	4,60	241,4	179,7	59,6	4,05	228,9	182,4	67,5	3,39	260,9	206,9	79,1	3,30
	28 / 20	238,9	177,4	43,2	5,53	241,9	170,5	48,5	4,99	246,8	172	54,1	4,56	245,6	178,9	60,0	4,09	233,5	182,3	68,1	3,43	269,7	209,7	80	3,37
	30 / 22	249,7	175,1	44,0	5,68	251,8	168,2	49,2	5,12	246,9	166,1	54,9	4,50	254,4	177,1	61,0	4,17	243,2	181,8	69,3	3,51	-	-	-	-
47000 m³/h	22 / 16	229,1	184,8	42,6	5,38	251,8	187,3	47,7	5,28	248	182,5	53,4	4,64	239,6	182,1	59,2	4,05	227,2	188,9	66,6	3,41	248,7	217,3	77,4	3,21
	24 / 17	235,6	190	43,0	5,48	255	194,8	48,0	5,31	252,2	189,6	53,8	4,69	244,1	190,1	59,7	4,09	231,4	196,0	66,9	3,46	263,6	226,5	79,0	3,34
	26 / 18	242,1	194,9	43,4	5,58	250,8	196,4	48,5	5,17	256,4	196,6	54,2	4,73	247,6	198,3	60,1	4,12	235,7	202,8	67,1	3,51	262,4	246,4	79,5	3,30
	27 / 19	247	194,3	43,7	5,65	251,3	192,7	48,9	5,14	256,9	192,8	54,6	4,71	251,6	197,9	60,5	4,16	240,5	202,5	67,8	3,55	262,4	255,9	79,9	3,28
	28 / 20	252,1	193,6	44,0	5,73	251,9	188,9	49,3	5,11	257,5	188,9	55,0	4,68	255,7	197,5	61,0	4,19	245,6	202,3	68,5	3,59	265,5	265,5	80,2	3,31
	30 / 22	262,4	192,1	44,7	5,87	263,2	185	50,0	5,26	259,0	180,6	55,9	4,63	264,4	196,4	61,9	4,27	256,4	201,5	70,1	3,66	-	-	-	-

kWf = Cooling capacity in kW
kWe = Compressor power input in kW
kWs = Sensible cooling capacity (kW)
EER referred only to compressors
Ta = Indoor air temperature D.B/W.B
DB = dry bulb
WB = wet bulb
Not all cooling yields take into account the heat dissipated by the fan motors.

Size 80.4 CCKP configuration

Cooling performance with 30% of outdoor and exhaust air

Air flow	Ta (°C) D.B./ W.B.	Outdoor air temperature °C D.B/W.B.																							
		20 / 12				25 / 18				30 / 22				35 / 24				40 / 25				45 / 26			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
29000 m³/h	22 / 16	220,5	164,3	44,5	4,96	244,3	169,4	50,0	4,89	246,9	162,6	56,3	4,39	238,6	162,6	62,8	3,80	224,7	163,6	71,4	3,15	224,4	171,9	77,8	2,88
	24 / 17	227,0	167,8	44,8	5,07	247,7	174,1	50,3	4,92	251,3	167,3	56,7	4,43	241,9	170	62,8	3,85	229,8	166,9	71,8	3,20	226,5	176,9	78,3	2,89
	26 / 18	233,0	171,5	45,0	5,18	243,8	173,9	50,5	4,83	256	171,6	57,1	4,48	247,5	173,7	63,1	3,92	235	169,6	72,2	3,25	231,5	180,2	78,9	2,93
	27 / 19	237,7	171,5	45,3	5,25	244,3	171,3	50,8	4,81	256,7	168,7	57,4	4,47	252,8	172,6	63,5	3,98	239,1	169,5	72,7	3,29	236,4	179,1	79,6	2,97
	28 / 20	242,5	171,5	45,6	5,32	244,8	168,6	51,1	4,79	257,3	165,8	57,7	4,46	258,2	171,6	63,9	4,04	243,1	169,7	73,2	3,32	241,6	177,9	80,2	3,01
	30 / 22	252,4	171,1	46,1	5,48	256,7	165,9	51,9	4,95	258,6	160,1	58,3	4,44	268,1	170,0	64,7	4,14	251,4	169,8	74,2	3,39	-	-	-	-
44000 m³/h	22 / 16	248,0	190,1	46,0	5,39	273,9	194,5	51,6	5,31	271,9	189,3	57,8	4,70	262,9	188,5	64,5	4,08	244,6	193	73,4	3,33	250,7	204,5	80,6	3,11
	24 / 17	253,7	196,7	46,3	5,48	277,6	201,4	51,9	5,35	277	195,9	58,3	4,75	267,6	196,6	64,8	4,13	249,2	199,7	73,6	3,39	252,8	212,8	80,8	3,13
	26 / 18	259,4	203,0	46,5	5,58	273,3	202,4	52,2	5,24	281,6	202,6	58,7	4,80	273,4	202,5	65,1	4,20	253,6	206,5	73,8	3,44	260,4	218,8	82	3,18
	27 / 19	265,7	201,6	46,9	5,67	274,3	198,6	52,5	5,22	282,5	198,6	59,0	4,79	278,6	201,8	65,5	4,25	258,4	206,4	74,2	3,48	267	219,1	82,9	3,22
	28 / 20	272,1	199,9	47,3	5,75	275,3	194,8	52,8	5,21	283,4	194,7	59,4	4,77	283,8	201,0	65,9	4,31	263,5	206,4	74,6	3,53	273,7	219,3	83,8	3,27
	30 / 22	285,7	195,8	48,2	5,93	287,3	191,3	53,7	5,35	285,1	187,0	60,1	4,74	293,4	199,6	66,8	4,39	274,2	205,8	75,5	3,63	-	-	-	-
47000 m³/h	22 / 16	252,6	194,2	46,1	5,48	278,5	198,4	51,8	5,38	274,4	195,7	57,9	4,74	265,2	195,1	64,5	4,11	250,4	195,9	73,4	3,41	255,0	211,9	81,0	3,15
	24 / 17	258,0	201,2	46,4	5,56	282,8	204,5	52,2	5,42	280,8	200,9	58,4	4,81	270,5	203,0	64,8	4,17	253,1	205,1	73,7	3,43	257,2	219,4	81,3	3,16
	26 / 18	263,7	207,8	46,8	5,63	278,3	205,7	52,6	5,29	286,5	206,5	58,9	4,86	275,8	209,9	65,2	4,23	255,2	214,9	73,8	3,46	262,2	225,9	81,9	3,20
	27 / 19	269,9	206,3	47,2	5,72	279	201,9	53,0	5,26	287,0	203,2	59,2	4,85	280,8	209,5	65,5	4,29	260,6	214,2	74,3	3,51	267,2	226,5	82,5	3,24
	28 / 20	276,3	204,8	47,6	5,80	279,6	198,2	53,4	5,24	287,4	199,8	59,5	4,83	285,8	208,9	65,9	4,34	266,4	213	74,8	3,56	272,3	227,1	83,1	3,28
	30 / 22	289,5	201,2	48,4	5,98	290,9	195,8	54,2	5,37	288,7	192,8	60,1	4,80	295,6	207,4	66,8	4,43	278,3	210,6	75,8	3,67	-	-	-	-

Size 90.4 CCKP configuration

Cooling performance with 30% of outdoor and exhaust air

Air flow	Ta (°C) D.B./ W.B.	Outdoor air temperature °C D.B/W.B.																							
		20 / 12				25 / 18				30 / 22				35 / 24				40 / 25				45 / 26			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
38000 m³/h	22 / 16	275,8	201,9	53,0	5,20	302,9	210	59,6	5,08	303,7	206,3	66,0	4,60	297,7	204,1	73,6	4,04	285,5	204,9	82,3	3,47	280,3	212,6	92,3	3,04
	24 / 17	280,8	209,2	53,3	5,27	307,8	215,6	59,9	5,14	308,5	213,0	66,5	4,64	302,6	211,8	74,0	4,09	289	211,5	82,9	3,49	283,4	219,2	92,8	3,05
	26 / 18	285,5	216,6	53,6	5,33	302,7	215,8	60,3	5,02	312,7	220,2	66,9	4,67	305,8	220	74,4	4,11	292	218,5	83,5	3,50	286,3	226,4	93,5	3,06
	27 / 19	292,9	215,2	54,0	5,42	303,6	212,2	60,7	5,00	314,2	215,8	67,4	4,66	310,6	220,2	74,8	4,15	296,9	218,9	83,9	3,54	290,8	226,3	94,2	3,09
	28 / 20	300,3	213,8	54,4	5,52	304,7	208,4	61,1	4,99	315,8	211,3	67,8	4,66	315,5	220,3	75,2	4,20	302,2	219,3	84,3	3,58	295,4	226,1	95	3,11
	30 / 22	315,3	210,8	55,2	5,71	318,3	205,7	62,0	5,13	319	202,3	68,8	4,64	329,0	217,1	76,3	4,31	313,0	219,8	85,1	3,68	-	-	-	-
51000 m³/h	22 / 16	296,8	226,9	54,2	5,48	326,6	233,2	60,9	5,36	327,1	226,7	67,7	4,83	316,8	227,9	75,3	4,21	302,5	231,9	83,7	3,61	298,2	244,8	94,3	3,16
	24 / 17	304,9	233,2	54,6	5,58	332,2	240	61,3	5,42	333	235,1	68,2	4,88	323,5	235,7	75,9	4,26	307,9	239,3	84,2	3,66	299,3	255,4	94,8	3,16
	26 / 18	312,8	239,6	54,9	5,70	327,9	240	61,8	5,31	338,8	243,0	68,7	4,93	328,8	244,5	76,3	4,31	312,7	247,3	84,6	3,70	307,6	260,3	96,4	3,19
	27 / 19	318,9	239,7	55,3	5,77	329,1	235,3	62,3	5,28	339	239,5	69,1	4,91	334,3	244,4	76,8	4,35	318,2	247,4	85,2	3,73	315,1	259,4	97,6	3,23
	28 / 20	325,2	239,6	55,6	5,85	330,3	230,6	62,8	5,26	339,4	235,8	69,5	4,88	339,9	244,1	77,3	4,40	323,9	247,5	85,7	3,78	322,7	258,2	98,8	3,27
	30 / 22	338,2	238,8	56,4	6,00	343,7	228,1	63,8	5,39	340,8	227,7	70,3	4,85	351,4	242,8	78,4	4,48	335,4	247,4	86,9	3,86	-	-	-	-
60000 m³/h	22 / 16	308,7	239,8	54,8	5,63	337,8	247,4	61,6	5,48	337,8	240,4	68,5	4,93	326,8	242,6	75,9	4,31	309	250,7	84,6	3,65	309,7	262,7	95,9	3,23
	24 / 17	315,2	249,5	55,1	5,72	342,9	255,6	62,1	5,52	343,7	250,7	68,8	5,00	331,5	254,8	76,3	4,34	313,5	259,8	85,1	3,68	315,4	268,6	97	3,25
	26 / 18	321,9	258,9	55,4	5,81	337,6	257,6	62,5	5,40	350,4	259,4	69,2	5,06	337,7	263,7	76,9	4,39	318,1	268,6	85,5	3,72	338,8	283,9	100,7	3,36
	27 / 19	329,5	257,2	55,8	5,91	338,4	253,1	62,9	5,38	351,2	254,5	69,7	5,04	344	262,3	77,5	4,44	324,2	268,6	86,0	3,77	355,7	289,5	103,2	3,45
	28 / 20	337,1	255,4	56,3	5,99	339,4	248,6	63,3	5,36	352	249,6	70,3	5,01	350,3	260,9	78,0	4,49	330,5	268,6	86,5	3,82	373,1	295,3	105,8	3,53
	30 / 22	352,3	251,9	57,2	6,16	354,9	243,9	64,4	5,51	354	239,4	71,3	4,96	362,5	259,3	79,1	4,58	343,3	268,2	87,5	3,92	--	-	-	-

kWf = Cooling capacity in kW
kWe = Compressor power input in kW
kWs = Sensible cooling capacity (kW)
EER referred only to compressors
Ta = Indoor air temperature D.B/W.B
DB = dry bulb
WB = wet bulb
Not all cooling yields take into account the heat dissipated by the fan motors.

Size 100.4 CCKP configuration

Cooling performance with 30% of outdoor and exhaust air

Air flow	Ta (°C) D.B./ W.B.	Outdoor air temperature °C D.B/W.B.																							
		20 / 12				25 / 18				30 / 22				35 / 24				40 / 25				45 / 26			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
38000 m³/h	22 / 16	281,0	210,0	58,2	4,83	312,0	216,4	65,2	4,79	311,4	211,5	73,1	4,26	305,4	208,5	81,7	3,74	295,0	208,6	91,5	3,22	291,6	217,7	102,8	2,84
	24 / 17	289,0	214,6	58,7	4,92	315,9	222,7	65,6	4,82	316,3	218,0	73,6	4,30	310,8	215,9	82,2	3,78	298,8	214,9	92,0	3,25	293,5	225,5	103,3	2,84
	26 / 18	296,6	219,4	59,1	5,02	311,5	221,7	66,1	4,71	320,4	225,2	74,1	4,32	315,6	223,1	82,4	3,83	302,0	221,4	92,4	3,27	297,6	231,8	104,2	2,86
	27 / 19	303,8	218,5	59,6	5,10	313	217,5	66,6	4,70	321,8	221	74,6	4,31	321,2	223	82,9	3,87	307,5	221,3	93,1	3,30	303	231,1	105,1	2,88
	28 / 20	311,0	217,6	60,0	5,18	314,5	213,3	67,1	4,69	323,2	216,8	75,1	4,30	327,0	222,9	83,3	3,93	313,4	221,1	93,8	3,34	308,6	230,3	106,0	2,91
	30 / 22	325,4	216,1	60,9	5,34	327,8	211,6	68,1	4,81	326,2	208,4	76,1	4,29	340,0	220,3	84,6	4,02	325,5	220,5	95,1	3,42	-	-	-	-
56000 m³/h	22 / 16	314,8	240,5	60,3	5,22	347,7	245,3	67,7	5,14,0	348,0	235,9	75,7	4,60	333,4	241,7	83,8	3,98	315,2	250,1	93,5	3,37	316,2	263,4	106,2	2,98
	24 / 17	321,7	249,0	60,7	5,30	354,4	251,4	68,2	5,20	353,1	245,9	76,3	4,63	340,5	250,6	84,3	4,04	321,2	256,3	94,5	3,40	322,9	271,4	107,8	3,00
	26 / 18	328,3	257,4	61,1	5,37	348,6	252,9	68,7	5,07	358,3	255,3	76,8	4,67	348,0	257,3	85,0	4,09	327,1	262,3	95,5	3,43	334,2	279,6	109,8	3,04
	27 / 19	336	256,4	61,5	5,46	349,1	249,0	69,1	5,05	359,2	250,7	77,3	4,65	354,9	255,7	85,7	4,14	333,3	262,2	96,1	3,47	342,8	281,1	111,2	3,08
	28 / 20	343,9	255,1	62,0	5,55	349,6	245,2	69,6	5,02	360,3	246,1	77,8	4,63	361,9	254,1	86,4	4,19	339,7	262,4	96,6	3,52	351,9	282,6	112,7	3,12
	30 / 22	360,1	252	63,0	5,72	363,2	243,0	70,7	5,14	362,8	236,3	78,9	4,60	374,5	252,6	87,6	4,28	352,8	262,6	97,8	3,61	-	-	-	-
60000 m³/h	22 / 16	319,3	247,8	60,5	5,28	351,4	253,0	67,9	5,18	349,9	246	75,8	4,62	339,8	244,8	84,5	4,02	319,8	254,9	94,4	3,39	321,9	273,8	107,4	3,00
	24 / 17	326,5	256,3	61,0	5,35	356,6	261,8	68,3	5,22	356,4	254,6	76,5	4,66	345,3	255,6	85,1	4,06	326,6	262	95,1	3,43	331,4	280,1	109,3	3,03
	26 / 18	334,0	264,2	61,4	5,44	352,6	261,7	68,8	5,13	362,5	263,4	77,0	4,71	351,0	265,9	85,5	4,11	333,5	268,6	95,6	3,49	342,2	288	110,8	3,09
	27 / 19	342,0	262,8	61,9	5,53	354,4	256,1	69,4	5,11	363,4	258,6	77,6	4,68	357,0	266,0	85,9	4,16	339,9	268,4	96,3	3,53	350,7	289,4	112,0	3,13
	28 / 20	350,1	261,2	62,4	5,61	356,1	250,8	69,9	5,09	364,3	253,9	78,1	4,66	363,1	266,0	86,4	4,20	346,2	268,5	97,0	3,57	359,3	290,6	113,1	3,18
	30 / 22	366,7	257,6	63,5	5,77	370,4	247,9	71,0	5,22	366	244,6	79,1	4,63	377,6	262,3	87,8	4,30	359,0	268,5	98,3	3,65	-	-	-	-

Size 110.4 CCKP configuration

Cooling performance with 30% of outdoor and exhaust air

Air flow	Ta (°C) D.B./ W.B.	Outdoor air temperature °C D.B/W.B.																							
		20 / 12				25 / 18				30 / 22				35 / 24				40 / 25				45 / 26			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
38000 m³/h	22 / 16	295,2	217,8	65,0	4,54	326,6	224,9	72,9	4,48	325,1	220,5	81,6	3,98	320,7	215,6	91,0	3,52	308,5	215,3	102,1	3,02	307,2	226,1	114,3	2,69
	24 / 17	303,0	222,5	65,5	4,63	330,4	231,6	73,2	4,51	333,8	224,2	82,3	4,06	325,7	223,5	91,5	3,56	309,5	224,3	102,6	3,02	312,7	230,4	115,4	2,71
	26 / 18	311,4	226,5	66,1	4,71	325,7	230,5	73,8	4,41	341,9	227,9	83,0	4,12	331,5	229,5	92,0	3,60	311,1	232,5	103,1	3,02	316,6	239,2	116,8	2,71
	27 / 19	317,8	226,5	66,6	4,77	327,1	226,2	74,3	4,40	342,1	224,8	83,4	4,10	337,7	229,0	92,6	3,65	317,6	231,9	103,7	3,06	321,9	240,4	118,0	2,73
	28 / 20	324,6	226,3	67,1	4,84	328,5	221,9	74,9	4,39	342,4	221,4	83,9	4,08	344,0	228,3	93,2	3,69	324,8	230,8	104,4	3,11	327,4	241,6	119,3	2,74
	30 / 22	339,1	225,0	68,1	4,98	342,9	219,6	75,9	4,52	343,4	214,5	84,9	4,04	357,5	226,0	94,4	3,79	339,8	228,5	105,7	3,21	-	-	-	-
60000 m³/h	22 / 16	335,8	257,4	67,7	4,96	369,8	263,6	75,9	4,87	367,9	255,5	84,7	4,34	356,5	254	94,3	3,78	337,4	261,7	105,3	3,20	347,0	280,0	113,1	3,07
	24 / 17	343,4	265,5	68,4	5,02	376,6	270,0	76,6	4,92	375,8	262,9	85,5	4,40	364,0	262,7	95,0	3,83	341,5	271,9	106,0	3,22	350,3	292,7	107	3,27
	26 / 18	351,0	273,2	69,0	5,09	371,8	269,6	77,2	4,82	382,1	271,9	86,1	4,44	369,1	272,9	95,6	3,86	345,3	282,1	106,5	3,24	356,3	297,7	108,3	3,29
	27 / 19	359,6	271,5	69,5	5,17	373,1	264,4	77,8	4,80	382,6	266,9	86,7	4,41	375	272,7	96,3	3,89	352,7	281	107,4	3,28	362,5	296,1	108,9	3,33
	28 / 20	368,4	269,7	70,1	5,26	374,6	259,1	78,4	4,78	383,2	261,9	87,3	4,39	381,1	272,4	96,9	3,93	360,6	279,6	108,3	3,33	368,9	294,2	109,4	3,37
	30 / 22	386,5	265,4	71,2	5,43	390,2	255,4	79,7	4,90	384,4	252	88,6	4,34	395,8	269,6	98,3	4,03	376,5	277	110,1	3,42	-	-	-	-

kWf = Cooling capacity in kW
kWe = Compressor power input in kW
kWs = Sensible cooling capacity (kW)
EER referred only to compressors
Ta = Indoor air temperature D.B/W.B
DB = dry bulb
WB = wet bulb
Not all cooling yields take into account the heat dissipated by the fan motors.

Handling electric fan performance - Standard airflow

Available static pressure (Pa) (supply + return)			90	100	120	150	180	210	240	270	300	330	360	390	420	450	510
49.4	Airflow	m3/h	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000
	Airflow	l/s	7222	7222	7222	7222	7222	7222	7222	7222	7222	7222	7222	7222	7222	7222	7222
	Fan RPM	rpm	1183	1192	1210	1236	1262	1285	1311	1337	1364	1387	1413	1439	1462	1488	1535
	Total input	kW	2.94	3.03	3.21	3.48	3.77	4.02	4.34	4.65	4.92	5.16	5.44	5.74	6.00	6.31	6.92
54.4	Airflow	m3/h	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000
	Airflow	l/s	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056
	Fan RPM	rpm	1300	1308	1323	1347	1368	1392	1413	1436	1460	1481	1505	1526	1550	1574	1619
	Total input	kW	3.77	3.86	4.04	4.34	4.62	4.93	5.21	5.55	5.90	6.23	6.56	6.83	7.15	7.47	8.11
60.4	Airflow	m3/h	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000
	Airflow	l/s	9167	9167	9167	9167	9167	9167	9167	9167	9167	9167	9167	9167	9167	9167	9167
	Fan RPM	rpm	1141	1150	1166	1194	1221	1246	1274	1299	1327	1355	1379	1407	1435	1457	1507
	Total input	kW	3.60	3.72	3.91	4.28	4.64	5.00	5.40	5.72	6.04	6.44	6.76	7.16	7.56	7.92	8.72
70.4	Airflow	m3/h	37000	37000	37000	37000	37000	37000	37000	37000	37000	37000	37000	37000	37000	37000	37000
	Airflow	l/s	10278	10278	10278	10278	10278	10278	10278	10278	10278	10278	10278	10278	10278	10278	10278
	Fan RPM	rpm	1257	1263	1280	1305	1327	1351	1378	1398	1423	1445	1470	1495	1517	1542	1590
	Total input	kW	4.60	4.72	4.96	5.36	5.72	6.12	6.52	6.92	7.40	7.76	8.16	8.56	8.92	9.36	10.24
80.4	Airflow	m3/h	44000	44000	44000	44000	44000	44000	44000	44000	44000	44000	44000	-	-	-	-
	Airflow	l/s	12222	12222	12222	12222	12222	12222	12222	12222	12222	12222	12222	-	-	-	-
	Fan RPM	rpm	1456	1463	1477	1497	1518	1539	1558	1579	1597	1618	1636	-	-	-	-
	Total input	kW	6.84	6.96	7.28	7.68	8.12	8.60	9.00	9.48	9.92	10.44	10.92	-	-	-	-
90.4	Airflow	m3/h	51000	51000	51000	51000	51000	51000	51000	51000	51000	51000	51000	51000	51000	51000	51000
	Airflow	l/s	14167	14167	14167	14167	14167	14167	14167	14167	14167	14167	14167	14167	14167	14167	14167
	Fan RPM	rpm	1184	1193	1211	1235	1262	1289	1313	1340	1364	1391	1418	1442	1468	1491	1540
	Total input	kW	6.06	6.24	6.60	7.08	7.62	8.28	8.82	9.36	9.84	10.38	10.98	11.52	12.12	12.72	13.98
100.4	Airflow	m3/h	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000
	Airflow	l/s	15556	15556	15556	15556	15556	15556	15556	15556	15556	15556	15556	15556	15556	15556	15556
	Fan RPM	rpm	1286	1294	1310	1332	1357	1381	1403	1427	1452	1474	1496	1521	1545	1570	1615
	Total input	kW	7.56	7.68	8.10	8.64	9.24	9.84	10.44	11.16	11.82	12.30	12.84	16.50	14.16	14.82	16.08
110.4	Airflow	m3/h	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	-
	Airflow	l/s	16667	166667	166667	166667	166667	16667	16667	16667	16667	16667	16667	16667	16667	16667	-
	Fan RPM	rpm	1364	1372	1387	1408	1431	11451	1476	1496	1517	1540	1563	1583	1606	1627	-
	Total input	kW	8.76	9.00	9.42	9.96	10.62	11.16	11.94	12.60	13.26	14.04	14.64	15.24	15.90	16.50	-

The performance takes into account the pressure drops in the unit (pressure drops in handling 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.

Handling electric fan performance - Minimum airflow

Available static pressure (Pa) (supply + return)			90	100	120	150	180	210	240	270	300	330	360	390	420	450	510
49.4	Airflow	m3/h	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000
	Airflow	l/s	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111
	Fan RPM	rpm	1032	1043	1060	1091	1120	1152	1180	1212	1239	1270	1297	1327	1354	1384	1439
	Total input	kW	2,09	2,17	2,31	2,56	2,81	3,06	3,27	3,51	3,72	3,99	4,25	4,53	4,80	5,10	5,73
54.4	Airflow	m3/h	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000
	Airflow	l/s	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111
	Fan RPM	rpm	1032	1043	1060	1091	1120	1152	1180	1212	1239	1270	1297	1327	1354	1384	1439
	Total input	kW	2,09	2,17	2,31	2,56	2,81	3,06	3,27	3,51	3,72	3,99	4,25	4,53	4,80	5,10	5,73
60.4	Airflow	m3/h	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000
	Airflow	l/s	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056
	Fan RPM	rpm	1029	1040	1057	1086	1118	1150	1178	1210	1238	1266	1296	1327	1353	1380	1439
	Total input	kW	2,79	2,89	3,07	3,38	3,75	4,04	4,32	4,68	4,96	5,28	5,64	6,04	6,40	6,76	7,60
70.4	Airflow	m3/h	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000
	Airflow	l/s	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056
	Fan RPM	rpm	1029	1040	1057	1086	1118	1150	1178	1210	1238	1266	1296	1327	1353	1380	1439
	Total input	kW	2,79	2,89	3,07	3,38	3,75	4,04	4,32	4,68	4,96	5,28	5,64	6,04	6,40	6,76	7,60
80.4	Airflow	m3/h	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000
	Airflow	l/s	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056
	Fan RPM	rpm	1029	1040	1057	1086	1118	1150	1178	1210	1238	1266	1296	1327	1353	1380	1439
	Total input	kW	2,79	2,89	3,07	3,38	3,75	4,04	4,32	4,68	4,96	5,28	5,64	6,04	6,40	6,76	7,60
90.4	Airflow	m3/h	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000
	Airflow	l/s	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556
	Fan RPM	rpm	942	954	978	1011	1044	1080	1111	1146	1177	1211	1245	1274	1307	1335	1393
	Total input	kW	3,44	3,60	3,92	4,28	4,66	5,10	5,51	6,00	6,48	7,02	7,56	8,40	8,64	9,12	10,26
100.4	Airflow	m3/h	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000
	Airflow	l/s	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556
	Fan RPM	rpm	942	954	978	1011	1044	1080	1111	1146	1177	1211	1245	1274	1307	1335	1393
	Total input	kW	3,44	3,60	3,92	4,28	4,66	5,10	5,51	6,00	6,48	7,02	7,56	8,40	8,64	9,12	10,26
110.4	Airflow	m3/h	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000
	Airflow	l/s	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556
	Fan RPM	rpm	942	954	978	1011	1044	1080	1111	1146	1177	1211	1245	1274	1307	1335	1393
	Total input	kW	3,44	3,60	3,92	4,28	4,66	5,10	5,51	6,00	6,48	7,02	7,56	8,40	8,64	9,12	10,26

The performance takes into account the pressure drops in the unit (pressure drops in handling 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.

Handling electric fan performance - High airflow

Available static pressure (Pa) (supply + return)			90	100	120	150	180	210	240	270	300	330	360	390	420	450	510
49.4	Airflow	m3/h	34000	34000	34000	34000	34000	34000	34000	34000	34000	-	-	-	-	-	-
	Airflow	l/s	9444	9444	9444	9444	9444	9444	9444	9444	9444	-	-	-	-	-	-
	Fan RPM	rpm	1484	1493	1505	1527	1546	1567	1585	1603	1624	-	-	-	-	-	-
	Total input	kW	5,37	5,52	5,70	6,06	6,36	6,72	7,05	7,38	7,77	-	-	-	-	-	-
54.4	Airflow	m3/h	34000	34000	34000	34000	34000	34000	34000	34000	34000	-	-	-	-	-	-
	Airflow	l/s	9444	9444	9444	9444	9444	9444	9444	9444	9444	-	-	-	-	-	-
	Fan RPM	rpm	1484	1493	1505	1527	1546	1567	1585	1603	1624	-	-	-	-	-	-
	Total input	kW	5,37	5,52	5,70	6,06	6,36	6,72	7,05	7,38	7,77	-	-	-	-	-	-
60.4	Airflow	m3/h	47000	47000	47000	47000	47000	47000	47000	-	-	-	-	-	-	-	-
	Airflow	l/s	13056	13056	13056	13056	13056	13056	13056	-	-	-	-	-	-	-	-
	Fan RPM	rpm	1545	1552	1566	1586	1605	1625	1641	-	-	-	-	-	-	-	-
	Total input	kW	8,04	8,20	8,52	9,00	9,44	9,92	10,36	-	-	-	-	-	-	-	-
70.4	Airflow	m3/h	47000	47000	47000	47000	47000	47000	47000	-	-	-	-	-	-	-	-
	Airflow	l/s	13056	13056	13056	13056	13056	13056	13056	-	-	-	-	-	-	-	-
	Fan RPM	rpm	1545	1552	1566	1586	1605	1625	1641	-	-	-	-	-	-	-	-
	Total input	kW	8,04	8,20	8,52	9,00	9,44	9,92	10,36	-	-	-	-	-	-	-	-
80.4	Airflow	m3/h	47000	47000	47000	47000	47000	47000	47000	-	-	-	-	-	-	-	-
	Airflow	l/s	13056	13056	13056	13056	13056	13056	13056	-	-	-	-	-	-	-	-
	Fan RPM	rpm	1545	1552	1566	1586	1605	1625	1641	-	-	-	-	-	-	-	-
	Total input	kW	8,04	8,20	8,52	9,00	9,44	9,92	10,36	-	-	-	-	-	-	-	-
90.4	Airflow	m3/h	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	-
	Airflow	l/s	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	-
	Fan RPM	rpm	1366	1371	1387	1410	1431	1454	1474	1497	1518	1541	1562	1585	1606	1627	-
	Total input	kW	8,82	8,94	9,36	10,02	10,62	11,28	11,88	12,60	13,26	14,04	14,64	15,30	15,84	16,50	-
100.4	Airflow	m3/h	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	-
	Airflow	l/s	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	-
	Fan RPM	rpm	1366	1371	1387	1410	1431	1454	1474	1497	1518	1541	1562	1585	1606	1627	-
	Total input	kW	8,82	8,94	9,36	10,02	10,62	11,28	11,88	12,60	13,26	14,04	14,64	15,30	15,84	16,50	-
110.4	Airflow	m3/h	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	-
	Airflow	l/s	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	-
	Fan RPM	rpm	1366	1371	1387	1410	1431	1454	1474	1497	1518	1541	1562	1585	1606	1627	-
	Total input	kW	8,82	8,94	9,36	10,02	10,62	11,28	11,88	12,60	13,26	14,04	14,64	15,30	15,84	16,50	-

The performance takes into account the pressure drops in the unit (pressure drops in handling 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.

High static pressure electric fan performance - Standard airflow

Available static pressure (Pa) (supply+return)			300	360	420	480	540	600	660	720	780	840	900	960	1020	1080	1140
49.4	Airflow	m3/h	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000	26000
	Airflow	l/s	7222	7222	7222	7222	7222	7222	7222	7222	7222	7222	7222	7222	7222	7222	7222
	Fan RPM	rpm	1550	1593	1638	1682	1727	1775	1817	1854	1900	1940	1981	2020	2055	2098	2136
	Total input	kW	5,37	5,91	6,51	7,08	7,68	8,37	9,00	9,60	10,38	11,07	11,73	12,42	13,05	13,99	14,61
54.4	Airflow	m3/h	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	-
	Airflow	l/s	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	-
	Fan RPM	rpm	1673	1713	1753	1798	1833	1877	1917	1956	1995	2032	2070	2111	2147	2181	-
	Total input	kW	6,48	7,08	7,68	8,37	8,97	9,69	10,35	11,04	11,76	12,48	13,23	14,10	14,91	15,60	-
60.4	Airflow	m3/h	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000
	Airflow	l/s	9167	9167	9167	9167	9167	9167	9167	9167	9167	9167	9167	9167	9167	9167	9167
	Fan RPM	rpm	1500	1548	1596	1643	1690	1732	1777	1821	1867	1907	1946	1991	2031	2069	2109
	Total input	kW	6,64	7,40	8,12	8,92	9,72	10,48	11,36	12,24	13,20	14,00	14,84	15,84	16,80	17,72	18,72
70.4	Airflow	m3/h	37000	37000	37000	37000	37000	37000	37000	37000	37000	37000	37000	37000	37000	37000	37000
	Airflow	l/s	10278	10278	10278	10278	10278	10278	10278	10278	10278	10278	10278	10278	10278	10278	10278
	Fan RPM	rpm	1626	1668	1711	1750	1793	1835	1877	1918	1955	1995	2034	2067	2109	2147	2184
	Total input	kW	8,08	8,84	9,68	10,48	11,32	12,16	13,08	14,00	14,88	15,88	16,88	17,76	18,84	19,84	20,88
80.4	Airflow	m3/h	44000	44000	44000	44000	44000	44000	44000	44000	44000	44000	44000	-	-	-	-
	Airflow	l/s	12222	12222	12222	12222	12222	12222	12222	12222	12222	12222	1222	-	-	-	-
	Fan RPM	rpm	1852	1889	1926	1962	1995	2031	2067	2102	2136	2171	2206	-	-	-	-
	Total input	kW	11,32	12,16	13,04	13,96	14,84	15,84	16,88	17,92	18,84	19,88	20,96	-	-	-	-
90.4	Airflow	m3/h	51000	51000	51000	51000	51000	51000	51000	51000	51000	51000	51000	51000	51000	51000	51000
	Airflow	l/s	14167	14167	14167	14167	14167	14167	14167	14167	14167	14167	14167	14167	14167	14167	14167
	Fan RPM	rpm	1546	1592	1639	1685	1730	1771	1815	1858	1900	1942	1980	2018	2058	2100	2139
	Total input	kW	10,80	11,94	13,14	14,28	15,54	16,74	18,06	19,38	20,82	22,14	23,46	24,78	26,22	27,78	29,34
100.4	Airflow	m3/h	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000	56000
	Airflow	l/s	15556	15556	15556	15556	15556	15556	15556	15556	15556	15556	15556	15556	15556	15556	15556
	Fan RPM	rpm	1652	1695	1737	1779	1821	1860	1901	1942	1982	2018	2057	2093	2131	2171	2206
	Total input	kW	12,78	13,92	15,24	16,50	17,82	19,02	20,40	21,78	23,28	24,66	26,22	27,60	29,10	30,78	32,22
110.4	Airflow	m3/h	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	-	-
	Airflow	l/s	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	-	-
	Fan RPM	rpm	1740	1780	1816	1856	1895	1935	1974	2010	2048	2086	2126	2160	2193	-	-
	Total input	kW	14,58	15,78	16,98	18,36	19,80	21,12	22,56	23,88	25,38	26,94	28,62	30,12	31,68	-	-

The performance takes into account the pressure drops in the unit (pressure drops in handling 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.
Performances with "VENH - High static pressure electric fans" option.

High static pressure electric fan performance - Minimum airflow

Available static pressure (Pa) (supply+return)			420	480	540	600	660	720	780	840	900	960	1020	1080	1140	1200	1260
49.4	Airflow	m3/h	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000
	Airflow	l/s	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111
	Fan RPM	rpm	1496	1545	1596	1642	1692	1737	1785	1828	1874	1919	1957	2000	2044	2081	2126
	Total input	kW	5,19	5,70	6,30	6,87	7,47	8,01	8,64	9,27	9,93	10,65	11,25	11,94	12,63	13,26	14,07
54.4	Airflow	m3/h	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000	22000
	Airflow	l/s	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111	6111
	Fan RPM	rpm	1496	1545	1596	1642	1692	1737	1785	1828	1874	1919	1957	2000	2044	2081	2126
	Total input	kW	5,19	5,70	6,30	6,87	7,47	8,01	8,64	9,27	9,93	10,65	11,25	11,94	12,63	13,26	14,07
60.4	Airflow	m3/h	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000
	Airflow	l/s	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056
	Fan RPM	rpm	1489	1542	1590	1644	1686	1732	1783	1826	1869	1914	1953	1994	2040	2080	2122
	Total input	kW	6,84	7,60	8,32	9,16	9,84	10,60	11,52	12,32	13,16	14,08	14,88	15,72	16,72	17,64	18,60
70.4	Airflow	m3/h	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000
	Airflow	l/s	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056
	Fan RPM	rpm	1489	1542	1590	1644	1686	1732	1783	1826	1869	1914	1953	1994	2040	2080	2122
	Total input	kW	6,84	7,60	8,32	9,16	9,84	10,60	11,52	12,32	13,16	14,08	14,88	15,72	16,72	17,64	18,60
80.4	Airflow	m3/h	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000	29000
	Airflow	l/s	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056	8056
	Fan RPM	rpm	1489	1542	1590	1644	1686	1732	1783	1826	1869	1914	1953	1994	2040	2080	2122
	Total input	kW	6,84	7,60	8,32	9,16	9,84	10,60	11,52	12,32	13,16	14,08	14,88	15,72	16,72	17,64	18,60
90.4	Airflow	m3/h	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000
	Airflow	l/s	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556
	Fan RPM	rpm	1418	1467	1523	1578	1627	1675	1726	1772	1821	1870	1910	1957	2000	2042	2086
	Total input	kW	9,18	10,02	11,10	12,24	13,32	14,40	15,60	16,68	17,94	19,20	20,34	21,72	22,98	24,30	25,80
100.4	Airflow	m3/h	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000
	Airflow	l/s	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556
	Fan RPM	rpm	1418	1467	1523	1578	1627	1675	1726	1772	1821	1870	1910	1957	2000	2042	2086
	Total input	kW	9,18	10,02	11,10	12,24	13,32	14,40	15,60	16,68	17,94	19,20	20,34	21,72	22,98	24,30	25,80
110.4	Airflow	m3/h	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000
	Airflow	l/s	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556	10556
	Fan RPM	rpm	1418	1467	1523	1578	1627	1675	1726	1772	1821	1870	1910	1957	2000	2042	2086
	Total input	kW	9,18	10,02	11,10	12,24	13,32	14,40	15,60	16,68	17,94	19,20	20,34	21,72	22,98	24,30	25,80

The performance takes into account the pressure drops in the unit (pressure drops in handling 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.
Performances with "VENH - High static pressure electric fans" option.

High static pressure electric fan performance - High airflow

Available static pressure (Pa) (supply+return)			240	300	360	420	480	540	600	660	720	780	840	900	960	1020
49.4	Airflow	m3/h	34000	34000	34000	34000	34000	34000	34000	34000	34000	34000	34000	-	-	-
	Airflow	l/s	9444	9444	9444	9444	9444	9444	9444	9444	9444	9444	9444	-	-	-
	Fan RPM	rpm	1901	1884	1919	1956	1990	2026	2059	2095	2128	2164	2197	-	-	-
	Total input	kW	8,88	8,85	9,48	10,17	10,83	11,55	12,27	13,05	13,83	14,64	15,39	-	-	-
54.4	Airflow	m3/h	34000	34000	34000	34000	34000	34000	34000	34000	34000	34000	34000	-	-	-
	Airflow	l/s	9444	9444	9444	9444	9444	9444	9444	9444	9444	9444	9444	-	-	-
	Fan RPM	rpm	1901	1884	1919	1956	1990	2026	2059	2095	2128	2164	2197	-	-	-
	Total input	kW	8,88	8,85	9,48	10,17	10,83	11,55	12,27	13,05	13,83	14,64	15,39	-	-	-
60.4	Airflow	m3/h	47000	47000	47000	47000	47000	47000	47000	47000	47000	-	-	-	-	-
	Airflow	l/s	13056	13056	13056	13056	13056	13056	13056	13056	13056	-	-	-	-	-
	Fan RPM	rpm	1916	1949	1983	2019	2052	2086	2118	2153	2184	-	-	-	-	-
	Total input	kW	12,16	12,96	13,80	14,76	15,68	16,68	17,64	18,72	19,76	-	-	-	-	-
70.4	Airflow	m3/h	47000	47000	47000	47000	47000	47000	47000	47000	47000	-	-	-	-	-
	Airflow	l/s	13056	13056	13056	13056	13056	13056	13056	13056	13056	-	-	-	-	-
	Fan RPM	rpm	1916	1949	1983	2019	2052	2086	2118	2153	2184	-	-	-	-	-
	Total input	kW	12,16	12,96	13,80	14,76	15,68	16,68	17,64	18,72	19,76	-	-	-	-	-
80.4	Airflow	m3/h	47000	47000	47000	47000	47000	47000	47000	47000	47000	-	-	-	-	-
	Airflow	l/s	13056	13056	13056	13056	13056	13056	13056	13056	13056	-	-	-	-	-
	Fan RPM	rpm	1916	1949	1983	2019	2052	2086	2118	2153	2184	-	-	-	-	-
	Total input	kW	12,16	12,96	13,80	14,76	15,68	16,68	17,64	18,72	19,76	-	-	-	-	-
90.4	Airflow	m3/h	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000
	Airflow	l/s	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667
	Fan RPM	rpm	1700	1739	1779	1817	1857	1895	1935	1972	2009	2049	2084	2123	2160	2195
	Total input	kW	13,38	14,52	15,78	17,04	18,42	19,74	21,18	22,50	23,88	25,38	26,88	28,50	30,12	31,74
100.4	Airflow	m3/h	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000
	Airflow	l/s	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667
	Fan RPM	rpm	1700	1739	1779	1817	1857	1895	1935	1972	2009	2049	2084	2123	2160	2195
	Total input	kW	13,38	14,52	15,78	17,04	18,42	19,74	21,18	22,50	23,88	25,38	26,88	28,50	30,12	31,74
110.4	Airflow	m3/h	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000	60000
	Airflow	l/s	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667	16667
	Fan RPM	rpm	1700	1739	1779	1817	1857	1895	1935	1972	2009	2049	2084	2123	2160	2195
	Total input	kW	13,38	14,52	15,78	17,04	18,42	19,74	21,18	22,50	23,88	25,38	26,88	28,50	30,12	31,74

The performance takes into account the pressure drops in the unit (pressure drops in handling 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.
Performances with "VENH - High static pressure electric fans" option.

Exhaust electric fan performance

% of exhaust air			10%	20%	30%	40%	50%
49.4	Airflow	m3/h	2600	5200	7800	10400	13000
	Airflow	l/s	722	1444	2167	2889	3611
	Fan RPM	rpm	663	707	811	955	1115
	Total input	kW	0,16	0,47	0,67	0,96	1,37
54.4	Airflow	m3/h	2900	5800	8700	11600	14500
	Airflow	l/s	806	1611	2417	3222	4028
	Fan RPM	rpm	665	726	858	1029	1212
	Total input	kW	0,33	0,51	0,75	1,13	1,66
60.4	Airflow	m3/h	3300	6600	9900	13200	16500
	Airflow	l/s	917	1833	2750	3667	4583
	Fan RPM	rpm	600	603	649	719	811
	Total input	kW	0,47	0,61	0,79	1,01	1,33
70.4	Airflow	m3/h	3700	7400	11100	14800	18500
	Airflow	l/s	1028	2056	3083	4111	5139
	Fan RPM	rpm	600	611	672	761	871
	Total input	kW	0,49	0,65	0,86	1,16	1,57
80.4	Airflow	m3/h	4400	8800	13200	17600	22000
	Airflow	l/s	1222	2444	3667	4889	6111
	Fan RPM	rpm	600	630	719	843	987
	Total input	kW	0,52	0,72	1,01	1,45	2,10
90.4	Airflow	m3/h	5200	10400	15600	20800	26000
	Airflow	l/s	1444	2889	4333	5778	7222
	Fan RPM	rpm	590	652	780	943	1123
	Total input	kW	0.54	0.80	1.21	1.88	2.88
100.4	Airflow	m3/h	5600	11200	16800	22400	28000
	Airflow	l/s	1556	3111	4667	6222	7778
	Fan RPM	rpm	591	669	815	998	1193
	Total input	kW	0.56	0.85	1.34	2.15	3.38
110.4	Airflow	m3/h	6000	12000	18000	24000	30000
	Airflow	l/s	1667	3333	5000	6667	8333
	Fan RPM	rpm	593	686	853	1052	1265
	Total input	kW	0.57	0.91	1.48	2.44	3.96

The percentage of exhaust air refers to the unit rated flow.
Exhaust electric fans collect from the environment only the quantity of air that will be exhausted.
The data refer to the return static pressure of 150 Pa, which usually occurs in the systems.

Option compatibility

REF.	DESCRIPTION	CAK	CBK	CCK	CCKP
	Versions				
REC	Active energy recovery of the exhaust air (CCK version)	-	-	√	-
THR	THOR thermodynamic energy recovery of the exhaust air (CCKP version)	-	-	-	√
FC	Thermal FREE-COOLING	-	-	√	√
FCE	Enthalpy FREE-COOLING	-	-	0	0
	Configurations				
CREFP	Device for consumption reduction of the external section at variable speed (phase-cutting)	√	√	√	√
CREFB	Device for consumption reduction of the external section ECOBREEZE fans	0	0	0	0
CHW2	Two-rows hot water coil	0	0	0	0
3WVM	Modulating 3-way valve	0	0	0	0
2WVM	Modulating 2-way valve	0	0	0	0
EH	Electric heaters.	0	0	0	0
CC0	Heating module with combustion chamber only	0	0	0	0
GD	Gas heating module with 2-stage modulation	0	0	0	0
OD	Oil heating module with 2-stage modulation	0	0	0	0
GC	Modulating condensation gas heating module	0	0	0	0
CHWER	Energy recovery from food refrigeration	0	0	0	0
AMRX	Rubber antivibration mounts	◊	◊	◊	◊
RCX	Roof curb	◊	◊	◊	◊
PCM0	Sandwich panels of the handling zone in M0 fire reaction class	0	0	0	0
RCAW	Winter thermodynamic active recovery on exhaust air	-	-	-	0
	Refrigeration circuit				
EVE	Electronic expansion valve	√	√	√	√
MHP	High and low pressure gauges	0	0	0	0
CPHG	Hot gas re-heating coil	0	0	0	0
	Aeraulic circuit				
MF	Front air outlet	√	√	√	√
M3	Downflow version	0	0	0	0
R0	Horizontal return	√	√	√	√
R3	Floor air inlet	0	0	0	0
PCOSM	Constant supply airflow	0	0	0	0
PVAR	Variable airflow	0	0	0	0
FPG4	Pleated air filter class G4 (EN779 norm)	√	√	√	√
F7	High efficiency F7 air filter	0	0	0	0
FES	Electronic filters	0	0	0	0
PSAF	Clogged filter differential pressure switch air side	0	0	0	0
HSE	Immersed electrodes steam humidifier	0	0	0	0
HWS	Water to waste evaporating wet-deck humidifier	0	0	0	0
LTEMP1	Application for low outdoor temperature	0	0	0	0
VENH	High head fans	0	0	0	0
AXI	High efficiency diffuser for axial fan - AxiTop	√	√	√	√
PAQC	Air quality probe for CO_2 rate check	0	0	0	0
PAQCV	Air quality sensor for CO_2 and VOC rate check	0	0	0	0
SER	Outdoor air damper manually set	-	√	-	-
SERM	Outdoor air motorized on/off damper	-	0	-	-
SFCM	Modulating motorized FREE-COOLING damper	-	√	√	√
SFCEM	Modulating motorized FREE-COOLING damper and min. outdoor air motorized on/off damper	-	-	0	0

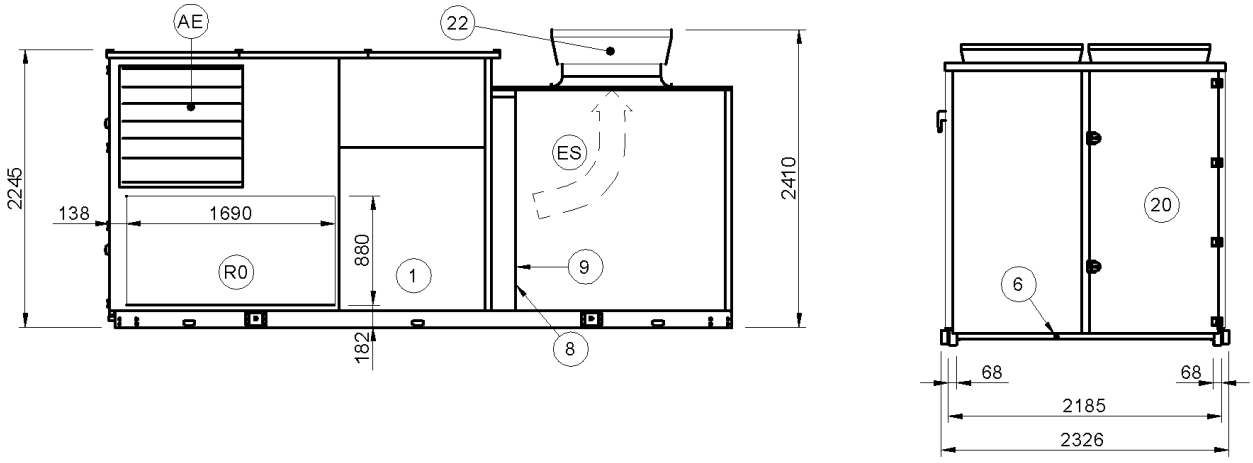
√ Standard componen
0 Optional component
◊ The accessory can be separately supplied (optional
- Not available

REF.	DESCRIPTION	CAK	CBK	CCK	CCKP
	Electric circuit				
CRC	Remote control with user interface	√	√	√	√
NCRC	Remote control with user interface: not required	0	0	0	0
SIX	Service interface	◊	◊	◊	◊
MOB	Serial port RS485 with Modbus protocol	0	0	0	0
LON	RS485 serial port with LONWORKS protocol	0	0	0	0
BACIP	BACnet-IP communication module	0	0	0	0
CLMX	Clivet Master System	◊	◊	◊	◊
DESM	Smoke detector	0	0	0	0
PM	Phase monitor	√	√	√	√
MF2	Multi-function phase monitor	0	0	0	0
PFCP	Power factor correction capacitors (cosfi > 0.9)	0	0	0	0
SFSTC	Progressive compressor start-up device	0	0	0	0
	Various				
SC0	Shipping via Container	0	0	0	0

√ Standard componen
0 Optional component
◊ The accessory can be separately supplied (optional
- Not available

Dimensional drawings

Size 49.4 - 54.4



1. Compressor compartment
2. Electrical panel
3. Connector for keyboard or PC connection
4. Power input
5. Humidifier connections
6. Condensate drain
7. Functional spaces
8. Water heating coil inlet Ø 1" 1/2
9. Water heating coil outlet Ø 1" 1/2
10. Reheat coil (optional)
11. Treatment coil
12. water heating coil (optional)
13. F7 / Electronic filters (optional)
14. Standard G4 filters
15. Electric fan (supply - return)
16. Exhaust electric fan (CCK - CCKP version)
17. Lifting brackets (removable)
18. Outdoor air damper (CBK - CCK - CCKP version)
19. Exhaust overpressure damper (CCK - CCKP version)
20. Access for coil - filter - heater inspection
21. Exhaust air recovery coil (only CCKP version)
22. Axitop (removable)

(R0) Horizontal air return
(R3) Downflow return (optional)
(M0) Horizontal air supply
(M3) Downflow supply (optional)
(AE) Outdoor air intake
(ES) Exhaust air (CCK - CCKP version)
(H1) Wall with same height as unit on a maximum of three sides
(*) Anti-vibration mount position
(**) Suggested minimum clearance

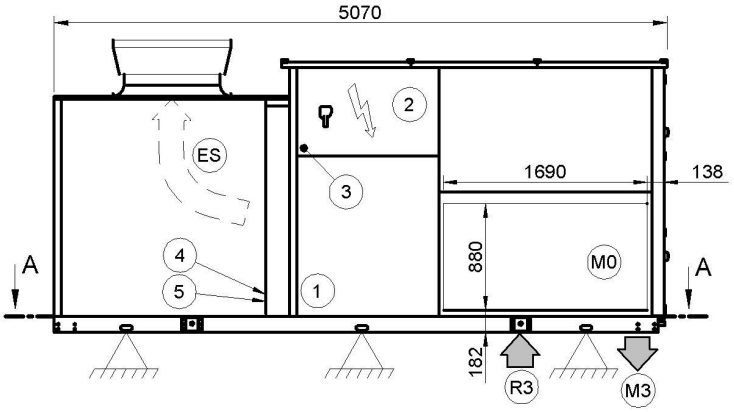
WEIGHT DISTRIBUTION

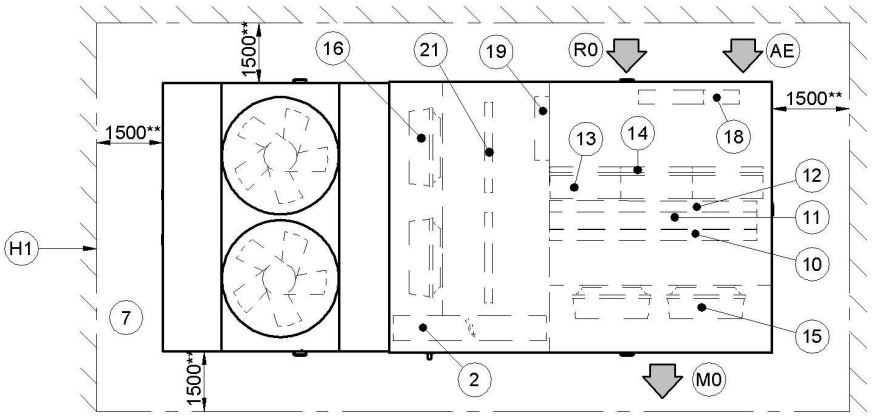
Size		49.4			54.4		
Configuration	**kg**	**CAK/CBK**	**CCK**	**CCKP**	**CAK/CBK**	**CCK**	**CCKP**
W1 Supporting point	kg	410	432	451	471	494	513
W2 Supporting point	kg	368	388	405	423	443	460
W3 Supporting point	kg	305	321	335	351	367	381
W4 Supporting point	kg	305	321	335	351	367	381
W5 Supporting point	kg	336	355	370	387	405	421
W6 Supporting point	kg	378	399	416	435	456	473
Operating weight	kg	2102	2217	2313	2418	2533	2630
Shipping weight	kg	2102	2217	2313	2418	2533	2630

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

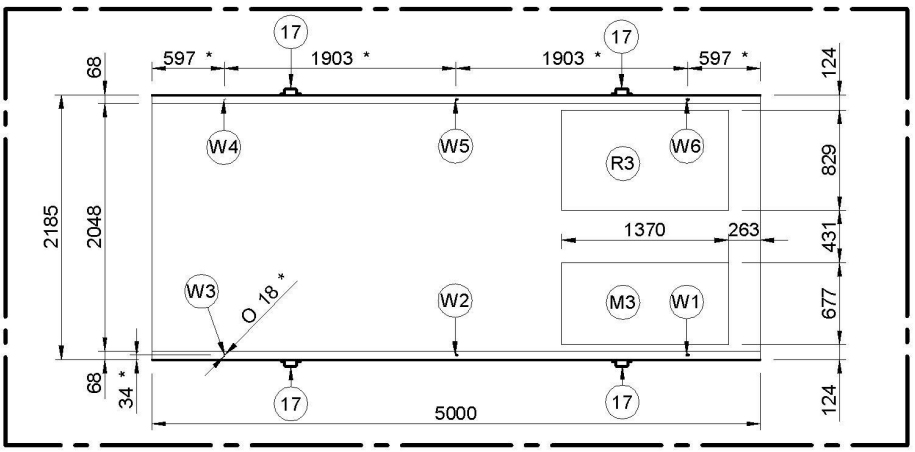
Size 49.4 - 54.4

DAA7V49 4_54 4_00
Date: 20/01/2014

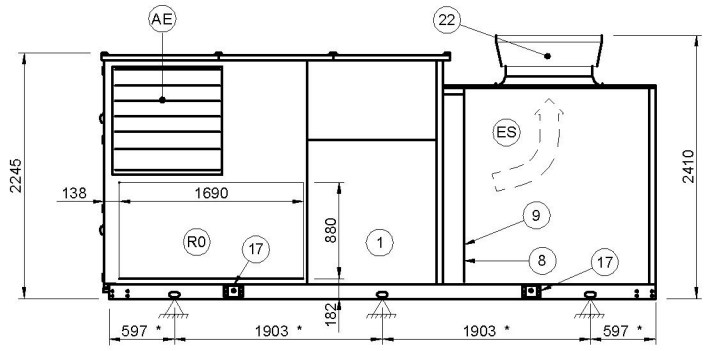


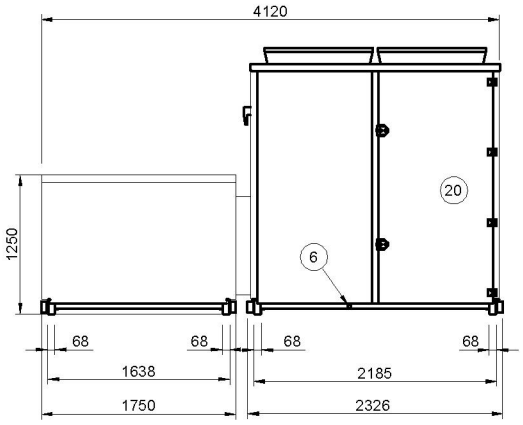


Sez A-A



Size 49.4 - 54.4 Combustion module





1. Compressor compartment
2. Electrical panel
3. Connector for keyboard or PC connection
4. Power input
5. Humidifier connections
6. Condensate drain
7. Functional spaces
8. Water heating coil inlet Ø 1" 1/2
9. Water heating coil outlet Ø 1" 1/2
10. Reheat coil (optional)
11. Treatment coil
12. Water heating coil (optional)
13. F7 / Electronic filters (optional)
14. Standard G4 filters
15. Electric fan (supply - return)
16. Exhaust electric fan (CCK - CCKP version)
17. Lifting brackets (removable)
18. Outdoor air damper (CBK - CCK - CCKP version)
19. Exhaust overpressure damper (CCK - CCKP version)
20. Access for coil - filter - heater inspection
21. Exhaust air recovery coil (only CCKP version)
22. Axitop (removable)
23. Gas module (to be connected to the unit during installation)

(R0) Horizontal air return
(R3) Downflow return (optional)
(M0) Horizontal air supply
(AE) Outdoor air intake
(ES) Exhaust air (CCK - CCKP version)
(H1) Wall with same height as unit on a maximum of three sides
(*) Anti-vibration mount position
(**) Suggested minimum clearance

WEIGHT DISTRIBUTION

Size		49.4			54.4		
Configuration	**kg**	**CAK/CBK**	**CCK**	**CCKP**	**CAK/CBK**	**CCK**	**CCKP**
W1 Supporting point	kg	410	432	451	471	494	513
W2 Supporting point	kg	368	388	405	423	443	460
W3 Supporting point	kg	305	321	335	351	367	381
W4 Supporting point	kg	305	321	335	351	367	381
W5 Supporting point	kg	336	355	370	387	405	421
W6 Supporting point	kg	378	399	416	435	456	473
Operating weight	kg	2102	2217	2313	2418	2533	2630
Shipping weight	kg	2102	2217	2313	2418	2533	2630

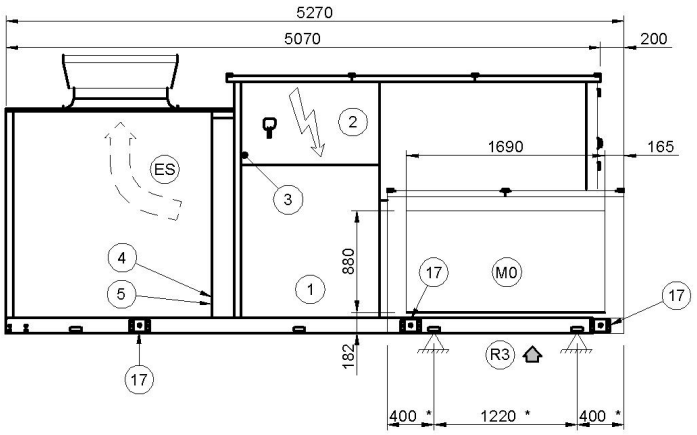
GAS MODULE WEIGHT DISTRIBUTION

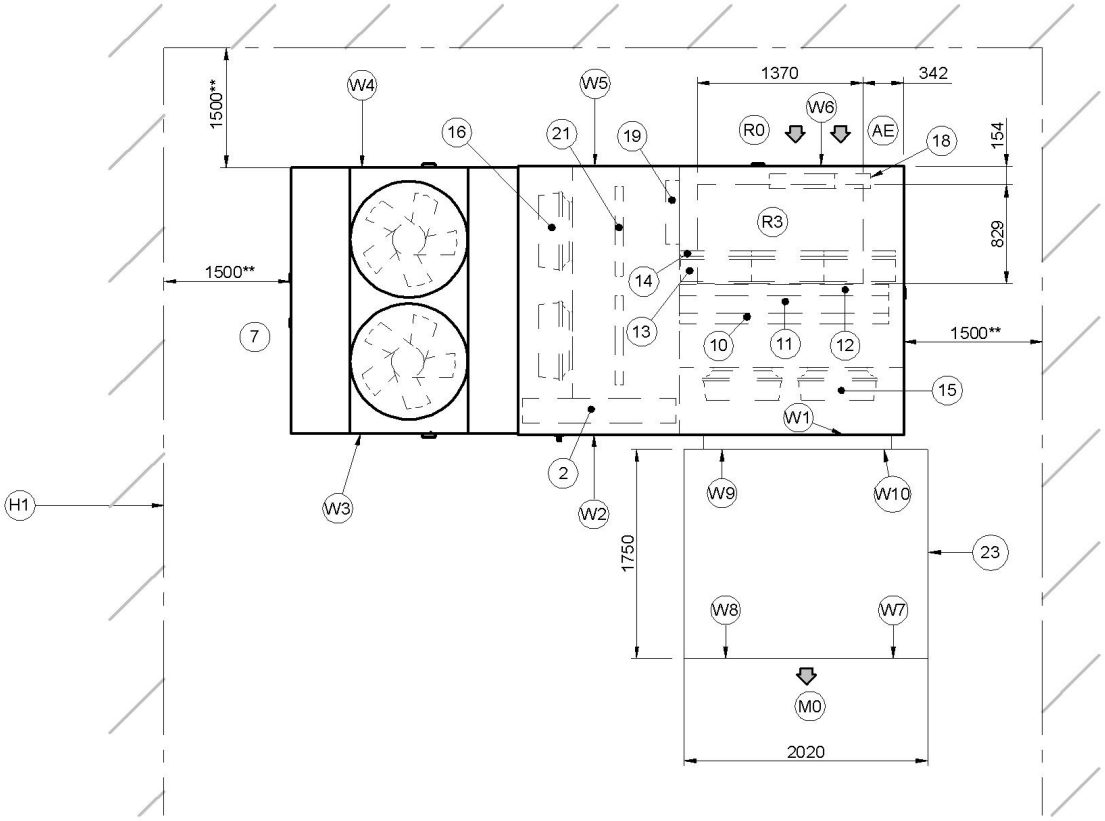
Size		49.4	54.4
W7 Supporting point	kg	140	140
W8 Supporting point	kg	95	95
W9 Supporting point	kg	95	95
W10 Supporting point	kg	140	140
Operating weight	kg	470	470
Shipping weight	kg	470	470

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

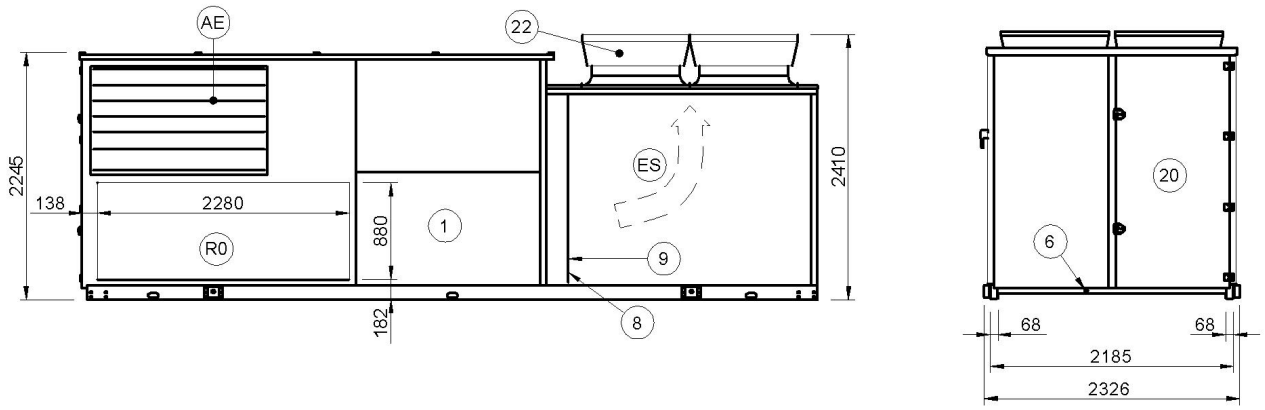
Size 49.4 - 54.4 Combustion module

DAA7V49 4_54 4_G01X_00
Date: 20/01/2014





Size 60.4 - 70.4 - 80.4



1. Compressor compartment
2. Electrical panel
3. Connector for keyboard or PC connection
4. Power input
5. Humidifier connections
6. Condensate drain
7. Functional spaces
8. Water heating coil inlet Ø 2"
9. Water heating coil outlet Ø 2"
10. Reheat coil (optional)
11. Treatment coil
12. Water heating coil (optional)
13. F7 / Electronic filters (optional)
14. Standard G4 filters
15. Electric fan (supply - return)
16. Exhaust electric fan (CCK - CCKP version)
17. Lifting brackets (removable)
18. Outdoor air damper (CBK - CCK - CCKP version
19. Exhaust overpressure damper (CCK - CCKP version)
20. Access for coil - filter - heater inspection
21. Exhaust air recovery coil (only CCKP version)
22. Axitop (removable)

(R0) Horizontal air return
(R3) Downflow return (optional)
(M0) Horizontal air supply
(M3) Downflow supply (optional)
(AE) Outdoor air intake
(ES) Exhaust air (CCK - CCKP version)
(H1) Wall with same height as unit on a maximum of three sides
(*) Anti-vibration mount position
(**) Suggested minimum clearance

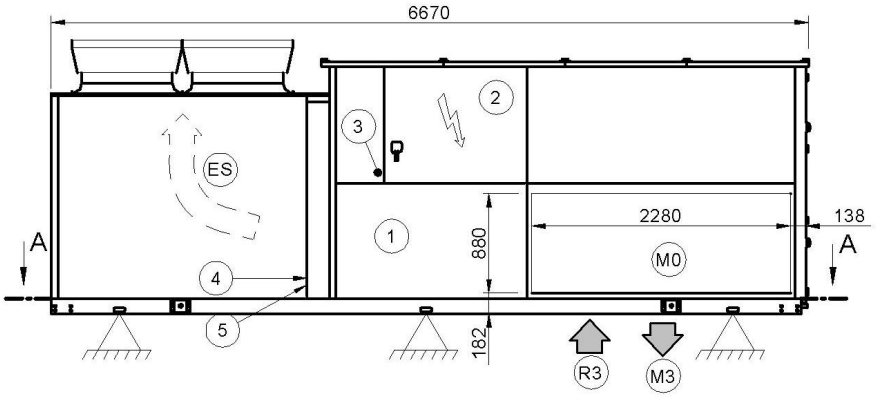
WEIGHT DISTRIBUTION

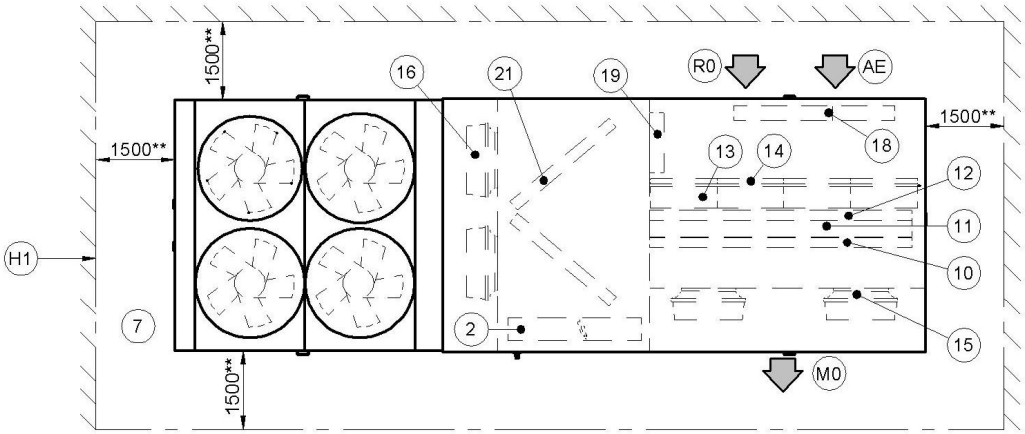
Size		60.4			70.4			80.4		
Configuration	**kg**	**CAK/CBK**	**CCK**	**CCKP**	**CAK/CBK**	**CCK**	**CCKP**	**CAK/CBK**	**CCK**	**CCKP**
W1 Supporting point	kg	502	531	556	539	569	593	620	650	675
W2 Supporting point	kg	450	477	499	484	510	533	557	583	605
W3 Supporting point	kg	373	395	413	401	423	441	461	483	502
W4 Supporting point	kg	373	395	413	401	423	441	461	483	502
W5 Supporting point	kg	412	436	456	442	467	487	509	533	554
W6 Supporting point	kg	463	490	513	498	525	548	573	600	623
Operating weight	kg	2573	2725	2851	2765	2916	3043	3181	3333	3460
Shipping weight	kg	2573	2725	2851	2765	2916	3043	3181	3333	3460

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

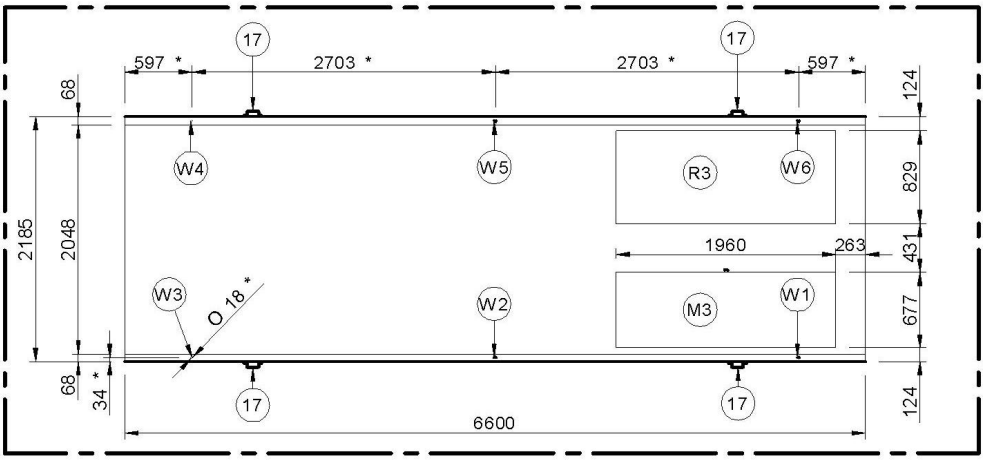
Size 60.4 - 70.4 - 80.4

DAA7V60 4_80 4_00
Date: 20/01/2014

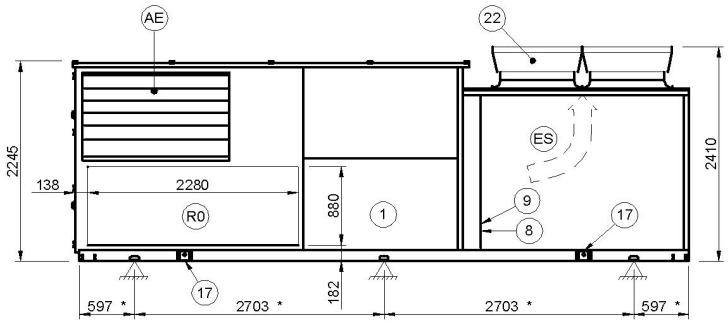


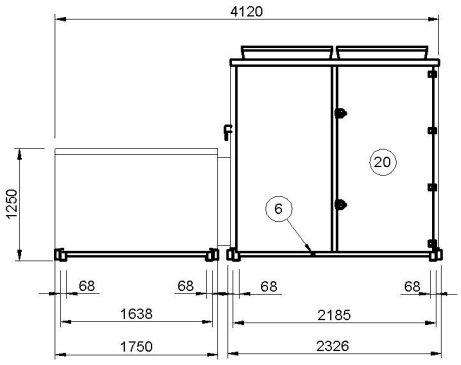


Sez A-A



Size 60.4 - 70.4 - 80.4 Combustion module





1. Compressor compartment
2. Electrical panel
3. Connector for keyboard or PC connection
4. Power input
5. Humidifier connections
6. Condensate drain
7. Functional spaces
8. Water heating coil inlet Ø 2"
9. Water heating coil outlet Ø 2"
10. Reheat coil (optional)
11. Treatment coil
12. Water heating coil (optional)
13. F7 / Electronic filters (optional)
14. Standard G4 filters
15. Electric fan (supply - return)
16. Exhaust electric fan (CBK - CCK - CCKP version)
17. Lifting brackets (removable)
18. Outdoor air damper
19. Exhaust overpressure damper (CCK - CCKP version)
20. Access for coil - filter - heater inspection
21. Exhaust air recovery coil (only CCKP version)
22. Axitop (removable)
23. Gas module (to be connected to the unit during installation)

(R0) Horizontal air return
(R3) Downflow return (optional)
(M0) Horizontal air supply
(AE) Outdoor air intake
(ES) Exhaust air (CCK - CCKP version)
(H1) Wall with same height as unit on a maximum of three sides
(*) Anti-vibration mount position
(**) Suggested minimum clearance

WEIGHT DISTRIBUTION

Size		60.4			70.4			80.4		
Configuration	**kg**	**CAK/CBK**	**CCK**	**CCKP**	**CAK/CBK**	**CCK**	**CCKP**	**CAK/CBK**	**CCK**	**CCKP**
W1 Supporting point	kg	502	531	556	539	569	593	620	650	675
W2 Supporting point	kg	450	477	499	484	510	533	557	583	605
W3 Supporting point	kg	373	395	413	401	423	441	461	483	502
W4 Supporting point	kg	373	395	413	401	423	441	461	483	502
W5 Supporting point	kg	412	436	456	442	467	487	509	533	554
W6 Supporting point	kg	463	490	513	498	525	548	573	600	623
Operating weight	kg	2573	2725	2851	2765	2916	3043	3181	3333	3460
Shipping weight	kg	2573	2725	2851	2765	2916	3043	3181	3333	3460

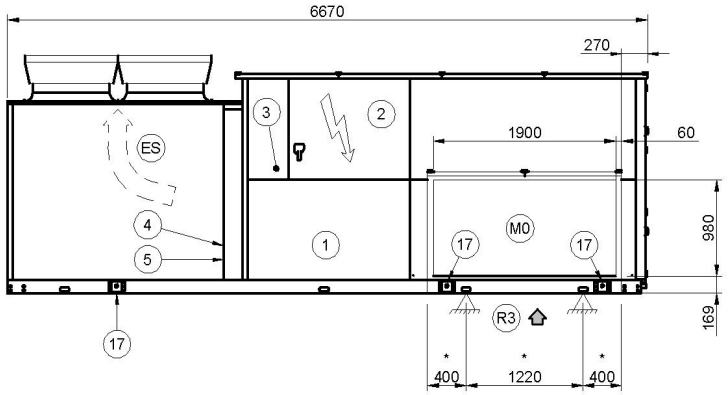
GAS MODULE WEIGHT DISTRIBUTION

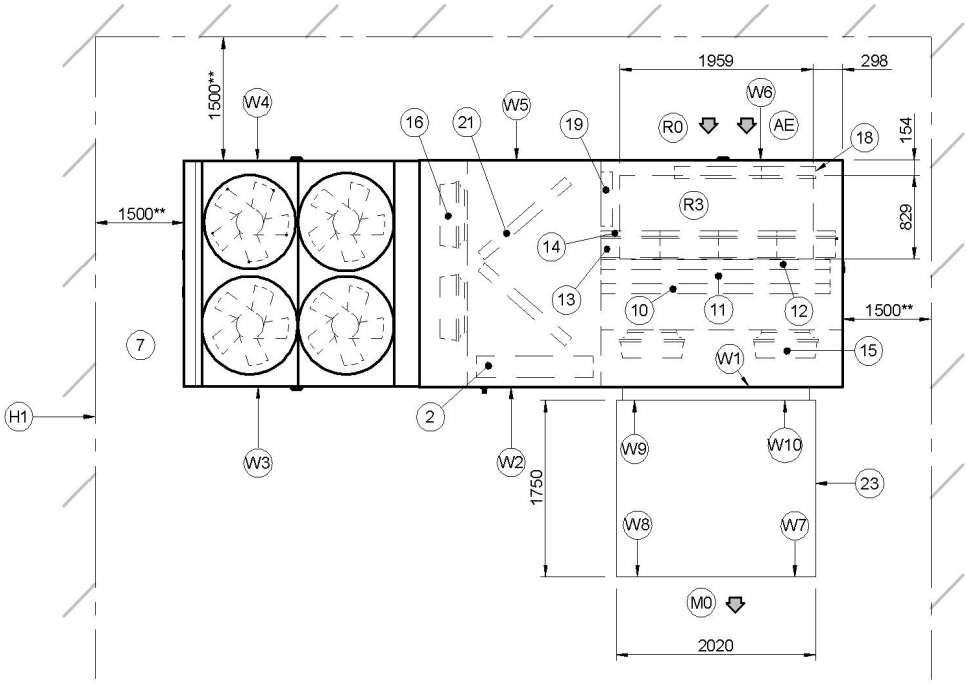
Size		60.4	70.4	80.4
W7 Supporting point	kg	140	140	140
W8 Supporting point	kg	95	95	95
W9 Supporting point	kg	95	95	95
W10 Supporting point	kg	140	140	140
Operating weight	kg	470	470	470
Shipping weight	kg	470	470	470

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

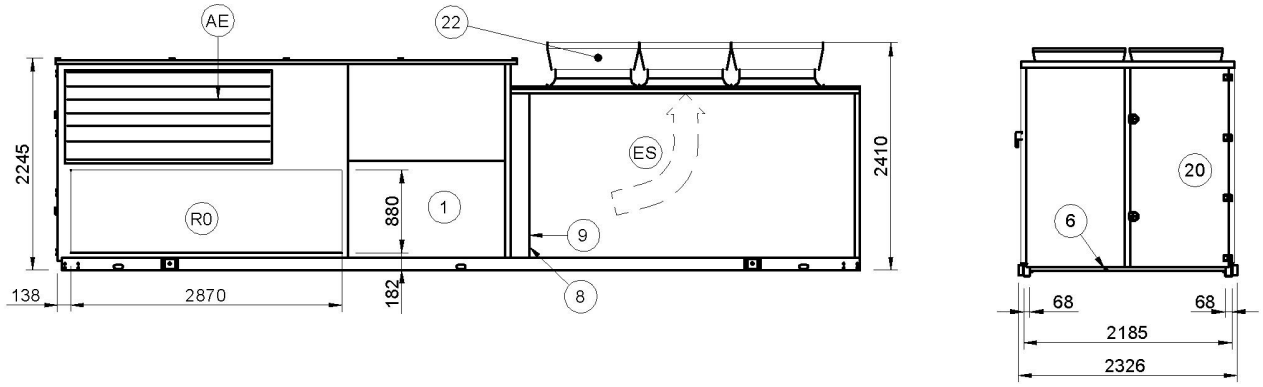
Size 60.4 - 70.4 - 80.4 Combustion module

DAA7V60 4_80 4_G01X_00
Date: 20/01/2014





Size 90.4 - 100.4 - 110.4



1. Compressor compartment
2. Electrical panel
3. Connector for keyboard or PC connection
4. Power input
5. Humidifier connections
6. Condensate drain
7. Functional spaces
8. Water heating coil inlet Ø 2"
9. Water heating coil outlet Ø 2"
10. Reheat coil (optional)
11. Treatment coil
12. Water heating coil (optional)
13. F7 / Electronic filters (optional)
14. Standard G4 filters
15. Electric fan (supply - return)
16. Exhaust electric fan (CCK - CCKP version)
17. Lifting brackets (removable)
18. Outdoor air damper (CBK - CCK - CCKP version)
19. Exhaust overpressure damper (CCK - CCKP version)
20. Access for coil - filter - heater inspection
21. Exhaust air recovery coil (only CCKP version)
22. Axitop (removable)

(R0) Horizontal air return
(R3) Downflow return
(M0) Horizontal air supply
(M3) Downflow supply (optional)
(AE) Outdoor air intake
(ES) Exhaust air (CCK - CCKP version)
(H1) Wall with same height as unit on a maximum of three sides
(*) Anti-vibration mount position
(**) Suggested minimum clearance

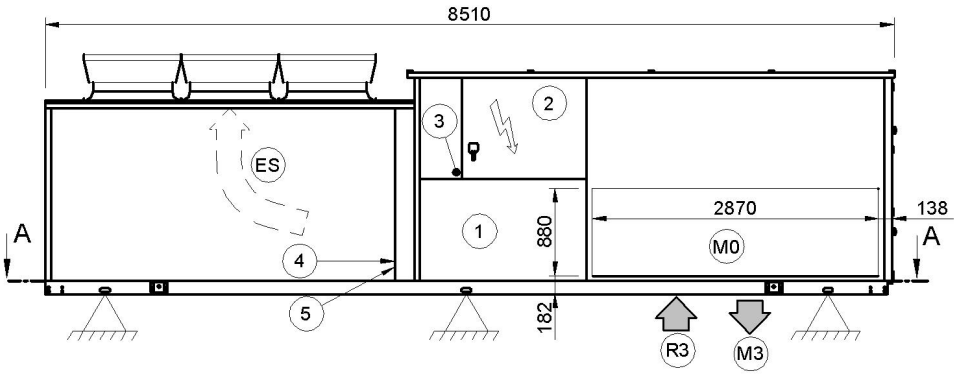
WEIGHT DISTRIBUTION

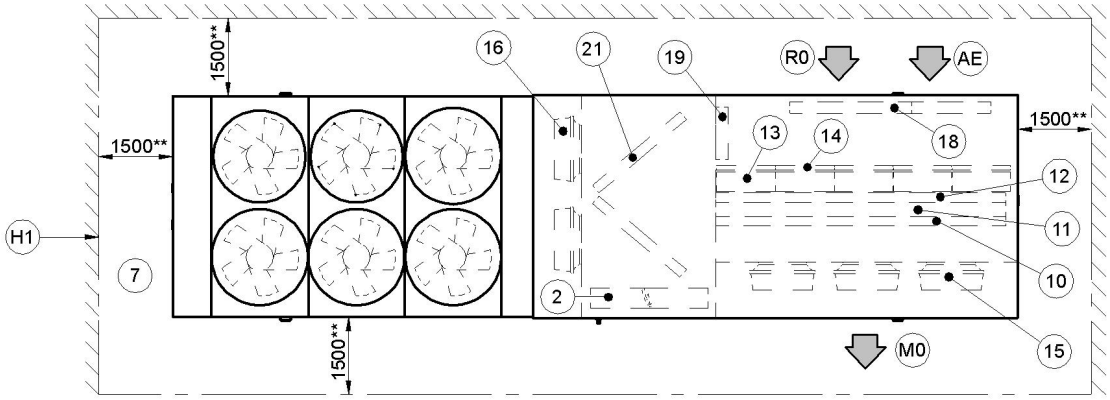
Size		90.4			100.4			110.4		
Configuration	**kg**	**CAK/CBK**	**CCK**	**CCKP**	**CAK/CBK**	**CCK**	**CCKP**	**CAK/CBK**	**CCK**	**CCKP**
W1 Supporting point	kg	640	678	709	688	725	757	791	829	861
W2 Supporting point	kg	574	608	637	617	651	679	710	744	773
W3 Supporting point	kg	476	504	527	512	539	563	588	617	640
W4 Supporting point	kg	476	504	527	512	539	563	588	617	640
W5 Supporting point	kg	525	556	582	564	595	621	649	680	706
W6 Supporting point	kg	591	626	655	635	670	699	731	765	795
Operating weight	kg	3283	3477	3637	3528	3720	3882	4059	4252	4414
Shipping weight	kg	3283	3477	3637	3528	3720	3882	4059	4252	4414

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

Size 90.4 - 100.4 - 110.4

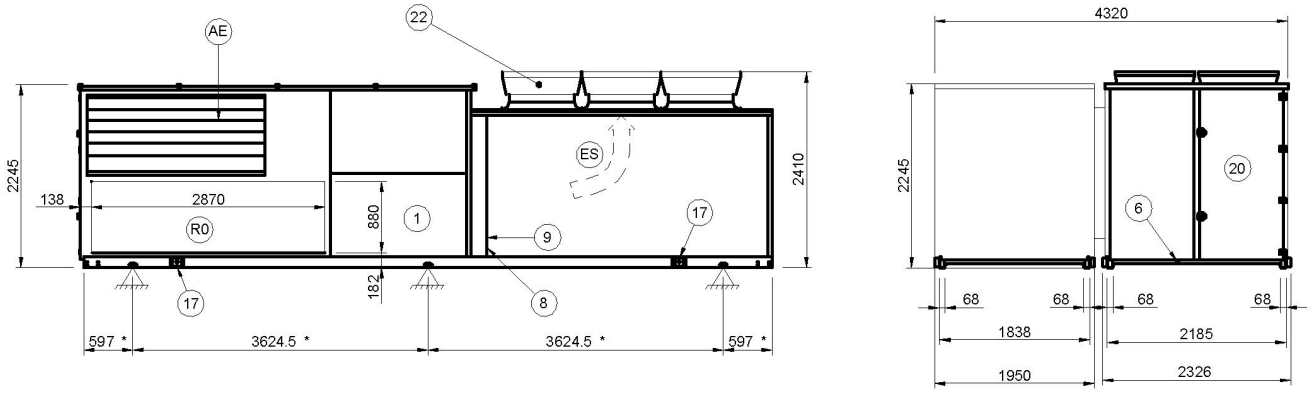
DAA7V90 4_110 4_00
Date: 20/01/2014





Sez A-A

Size 90.4 - 100.4 - 110.4 Combustion module



1. Compressor compartment
2. Electrical panel
3. Connector for keyboard or PC connection
4. Power input
5. Humidifier connections
6. Condensate drain
7. Functional spaces
8. Water heating coil inlet Ø 2"
9. Water heating coil outlet Ø 2"
10. Reheat coil (optional)
11. Treatment coil
12. Water heating coil (optional)
13. F7 / Electronic filters (optional)
14. Standard G4 filters
15. Electric fan (supply - return)
16. Exhaust electric fan (CCK - CCKP version)
17. Lifting brackets (removable)
18. Outdoor air damper (CBK - CCK - CCKP version)
19. Exhaust overpressure damper (CCK - CCKP version)
20. Access for coil - filter - heater inspection
21. Exhaust air recovery coil (only CCKP version)
22. Axitop (removable)
23. Gas module (to be connected to the unit during installation)

(R0) Horizontal air return
(R3) Downflow return (optional)
(M0) Horizontal air supply
(AE) Outdoor air intake
(ES) Exhaust air (CCK - CCKP version)
(H1) Wall with same height as unit on a maximum of three sides
(*) Anti-vibration mount position
(**) Suggested minimum clearance

WEIGHT DISTRIBUTION

Size		90.4			100.4			110.4		
Configuration	**kg**	**CAK/CBK**	**CCK**	**CCKP**	**CAK/CBK**	**CCK**	**CCKP**	**CAK/CBK**	**CCK**	**CCKP**
W1 supporting point	kg	640	678	709	688	725	757	791	829	861
W2 Supporting point	kg	574	608	637	617	651	679	710	744	773
W3 Supporting point	kg	476	504	527	512	539	563	588	617	640
W4 Supporting point	kg	476	504	527	512	539	563	588	617	640
W5 Supporting point	kg	525	556	582	564	595	621	649	680	706
W6 Supporting point	kg	591	626	655	635	670	699	731	765	795
Operating weight	kg	3283	3477	3637	3528	3720	3882	4059	4252	4414
Shipping weight	kg	3283	3477	3637	3528	3720	3882	4059	4252	4414

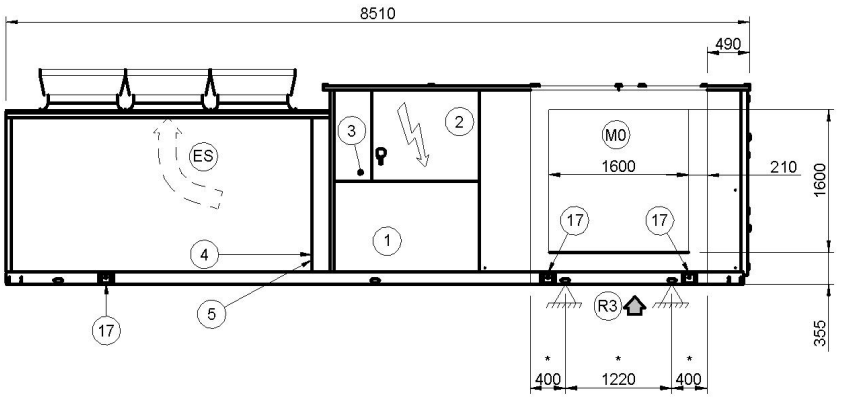
GAS MODULE WEIGHT DISTRIBUTION

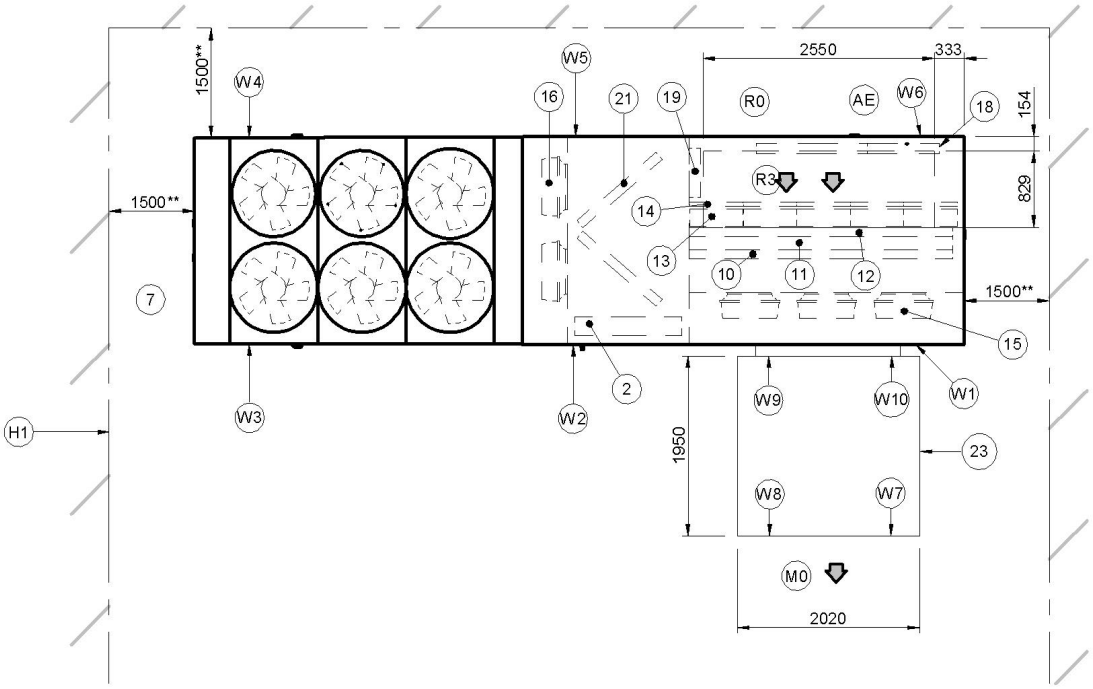
Size		90.4	100.4	110.4
W7 Supporting point	kg	245	245	245
W8 Supporting point	kg	165	165	165
W9 Supporting point	kg	165	165	165
W10 Supporting point	kg	245	245	245
Operating weight	kg	820	820	820
Shipping weight	kg	820	820	820

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

Size 90.4 - 100.4 - 110.4 Combustion module

DAA7V90 4_110 4_G02X_00
Date: 20/01/2014





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