Technical Bulletin

BT14H003GB-01

CLIVETPack

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

CSRN-XHE2 15.1-45.2 RANGE

AIR-AIR HEAT PUMP R-410A

Air flow-rate from 8500 to 25000 m3/h

- High efficiency R-410A scroll compressors
- Two single refrigeration circuits
- Maximum compacteness
- Supply and return versatility
- Variable airflow
- Quick installation

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 CSRN-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.

Two 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.

The outdoor air damper can be supplied:

- with manual setting (standard)
- ON/OFF actuator (option)
- with modulating actuator (option)

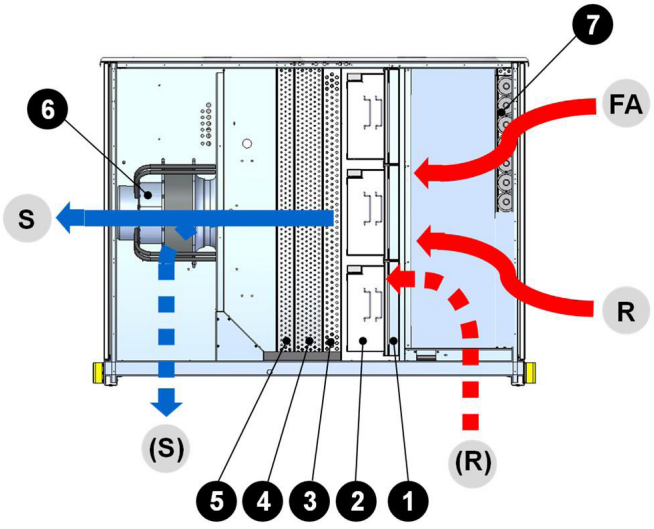
The actuator can be controlled for the opening:

- at a preset value,
- by the air quality probe signal,
- by the temperature measurement on the outdoor air

To keep a specific pressure in the served room, an appropriate air exhaust system must be provided.

S. Air supply - (S) optional
R. Air return - (R) optional
FA. Fresh air (only CBK onf.)

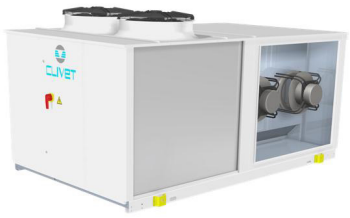
1. Class G4 air filters
2. Second stage of high efficiency filtration (F7 or electronic)
3. Hot water exchanger (optional)
4. Handling exchanger
5. Hot gas reheating exchanger
6. Supply fan, EC motor plug-fan
7. Air renewal damper (only CBK conf.)



CLIVETPack series for medium attendance applications

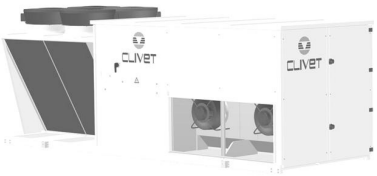
SMARTPACK
CKT-XHE 41 - 151 cooling only
CKN-XHE 41 - 151 reversible heat pump
Nominal airflow: 2200 - 9600 m3/h
Cooling capacity: 12 - 52 kW
Configurations:
CAK single fan section for full recirculation
CBK single fan section for recirculation and fresh air
CCK double fan section for recirculation, fresh air, exhaust, thermodynamic recovery

CLIVETPACK
CSRT-XHE2 15.1 - 45.2 cooling only
CSRN-XHE2 15.1 - 45.2 reversible heat pump
Nominal airflow: 9000 - 23000 m3/h
Cooling capacity: 47 - 129 kW
Configurations:
CAK single fan section for full recirculation
CBK single fan section for recirculation and fresh air



CLIVETPACK
CSRT-XHE 122 - 452 cooling only
CSRN-XHE 122 - 452 reversible heat pump
Nominal airflow: 8000 - 24000 m3/h
Cooling capacity: 45.6 - 144 kW
Configurations:
CB single fan section for recirculation and fresh air
CC double fan section for recirculation, fresh air, exhaust, thermodynamic recovery

CLIVETPACK
CSRT-XHE2 49.4 - 110.4 cooling only
CSRN-XHE2- 49.4 - 110.4 reversible heat pump
Nominal airflow: 22000 - 60000 m3/h
Cooling capacity: 155 - 376 kW
Configurations:
CAK single fan section for full recirculation
CBK single fan section for recirculation and fresh air
CCK double fan section for recirculation, fresh air, exhaust, thermodynamic recovery
CCKP double fan section with fresh air and THOR thermodynamic recovery



Clivet series for high attendance applications

CLIVETPACK
CSNX-XHE 82 - 402 reversible heat pump
Nominal airflow: 3600 - 16500 m3/h
Fresh airflow up to 80%
Cooling capacity: 45.6 - 144 kW
Configurations:
CB single fan section for recirculation and fresh air
CC double fan section for recirculation, fresh air, exhaust, thermodynamic recovery

Clivet series for full fresh air application

CLIVETPACK
CSRT-XHE-FFA 204 - 244 cooling only
CSRN-XHE-FFA 204 - 244 reversible heat pump
Nominal airflow: 6000 - 8000 m3/h
Cooling capacity: 69 - 83 kW
Configurations:
FFA double fan section for full fresh air, exhaust, thermodynamic recovery

Complete and decentralised systems

The necessary heat or 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 packaged design of all of the plant engineering parts are contained inside the unit, already assembled and inspected.

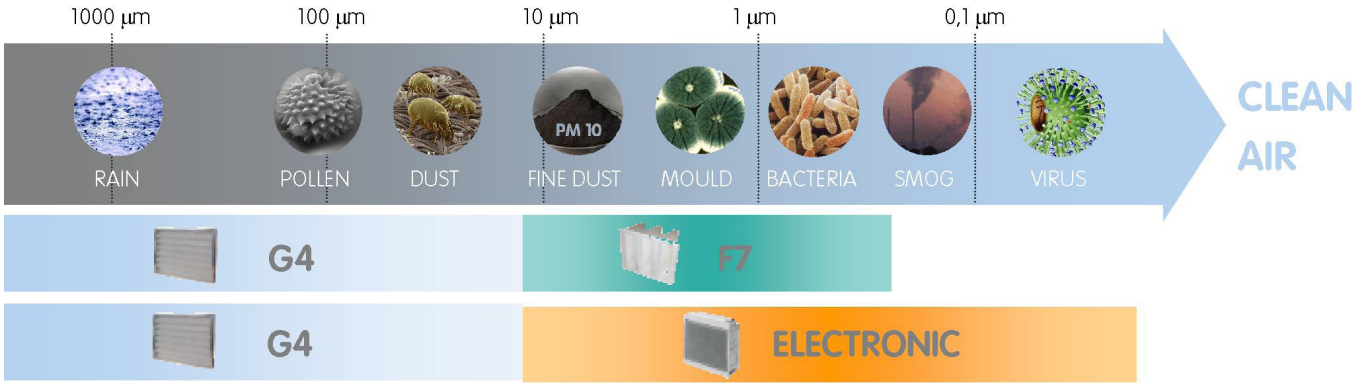
The unit includes plug and play logic. Installation and later maintenance operations are easy and quick.

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.

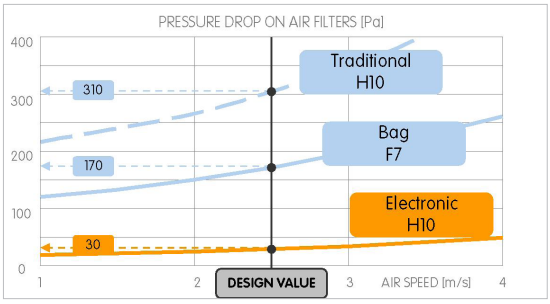


The electronic filters reduce the energy necessary for ventilation

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%.



Air quality electronic control (CBK conf.)

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.

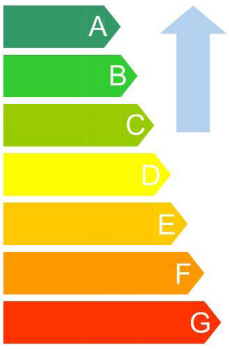
Automatic management of the air renewal

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
- 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

High energy efficiency within the annual cycle

Increases the building value



The high efficiency reduces the complex primary energy requirements and the CO2 emissions compared to traditional solutions. It follows the improvement of the energy class of the building and therefore its value on the property market.

It is often possible to access the foreseen benefits to promote the use of the unit at low consumption.

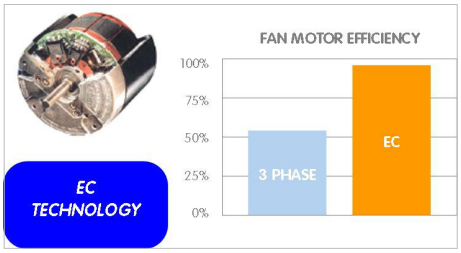
The small consumptions also reduce the environmental impact of the system, further improving the public image on this sensitive issue.

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.

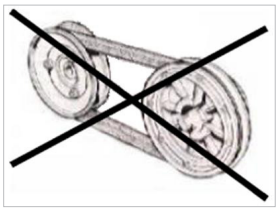
The ventilation technology makes it possible to cut back on both of these operational costs: it runs on fans that are coupled directly to electronic control brushless motors, and the control logic offers additional savings.

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.

Advantages of direct coupling (plug fan)



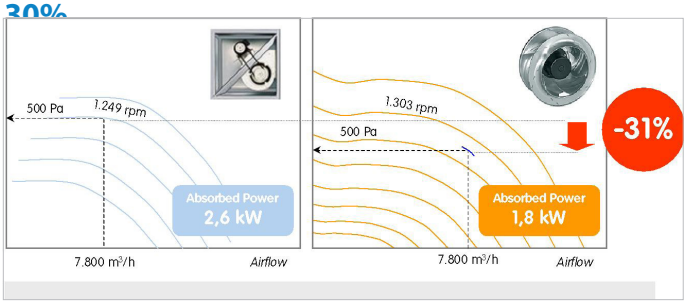
The motor's rotation is transmitted directly to the rotor, without the use of transmissions (belts and pulleys):

- 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.

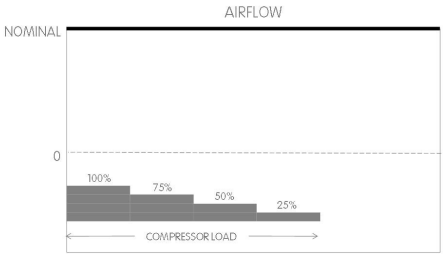


Electrical power absorbed by electric motor, data constructor - Example, referred to flow of 7.800 m3/h with 500 Pa external static pressure.

Automatic management of the air flow

Standard mode

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

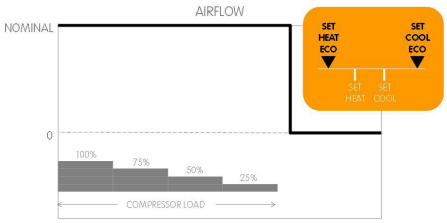


ECO mode

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:

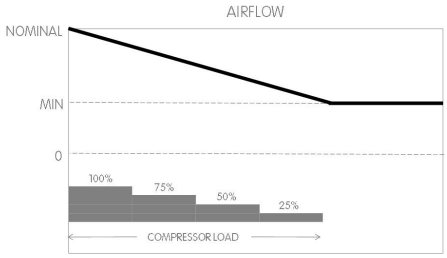
- Manually
- Automatically by the functionality of daily and weekly programming supplied as standard
- Automatically by means of the Clivet supervision System

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

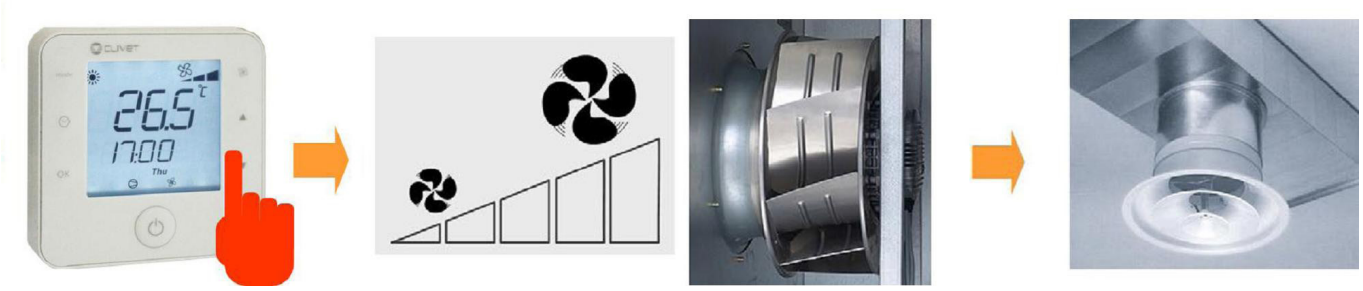
The fans with electronic control allow choosing the preferred ramp for fan start-up.

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

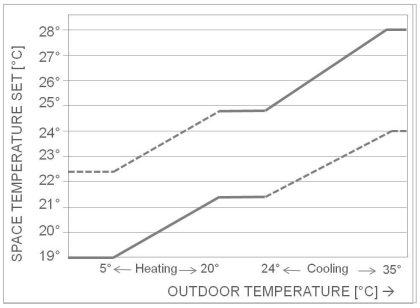
By controlling the fan speed, the airflow can be varied and the static pressure capacity can be adapted to the system pressure drop, making the unit start-up particularly simple. The adjustment or modification of the transmission is no longer required as the ventilation system will adapt itself to the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



Set-point automatic compensation

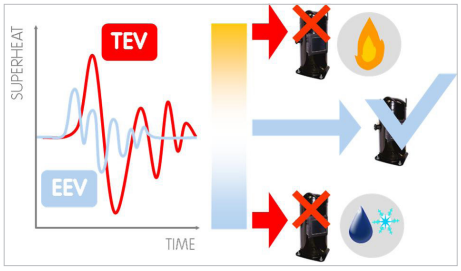
With this function as standard, the temperature set-point can automatically vary in view of the outdoor temperature and of the User settings:

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



Stable and reliable operation

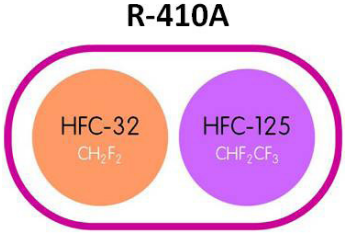
The electronic expansion valve (EEV) adapts rapidly and precisely to the actual load required for usage, allowing stable and reliable adjustment in comparison with mechanical thermostatic valves (TEV). This results also in a further increase in efficiency and longer compressor life. Through control of 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.

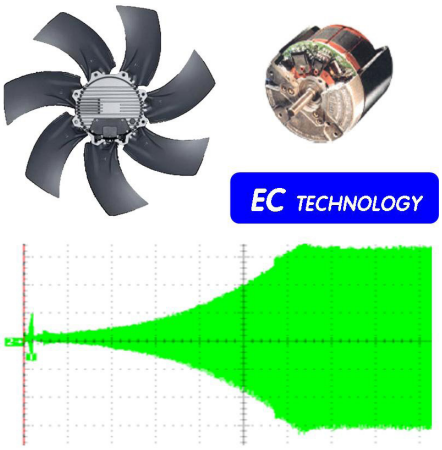


Electronic control ECOBREEZE technology

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.

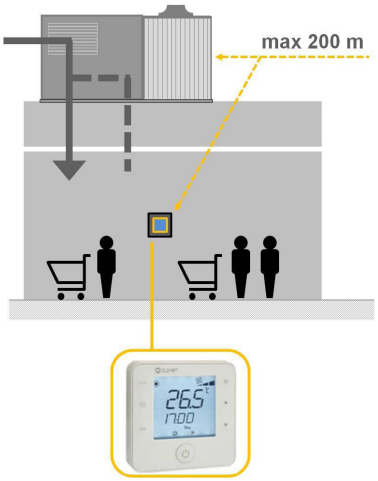


Simple and intuitive user interface

Di serie viene fornita una innovativa interfaccia grafica predisposta per l'installazione a parete (con cablaggio e alimentazione a 230V a cura del Cliente) e con possibilità di essere staccata dal supporto e collegata a bordo macchina per le operazioni di manutenzione.

Among the main functions it allows to:

- the temperature and humidity measurement is made by probes into the unit;
- daily/weekly start-up or power-off programming of the unit;
- operating mode (heat or cool) and/or set-point manual change ;
- alarm and unit stata display;
- operating paramenter management



Remote system management

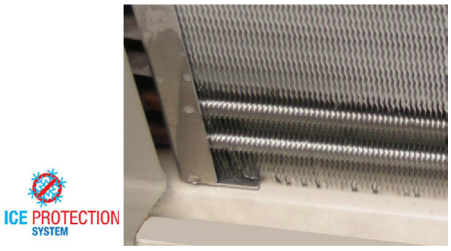
The unit can be remotely managed by:

- 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
- Potential-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.

Heat exchangers protected against the formation of ice

The particular technology of the heat pump developed by Clivet guarantees its continued and reliable operation.

The ICE PROTECTION SYSTEM device prevents icing on the base of the external exchanger during winter operation, thanks to a special subcooling circuit. This prevents damages caused by freezing.



Smart management of defrosts

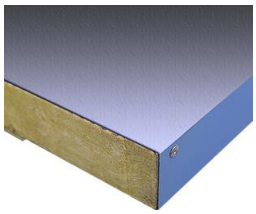
The automatic defrost cycles on the remaining external exchanger surface are managed in predictive mode, reducing both the frequency and the duration. The built-in electronics analyses not only the external conditions, but also the evaporation pressure variation in the exchanger.

The standard defrosting cycle management involves the stop of the ventilation. This reduces the time required for defrosting and prevents the introduction of too cold air in the served area, maintaining comfortable conditions for the users.

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

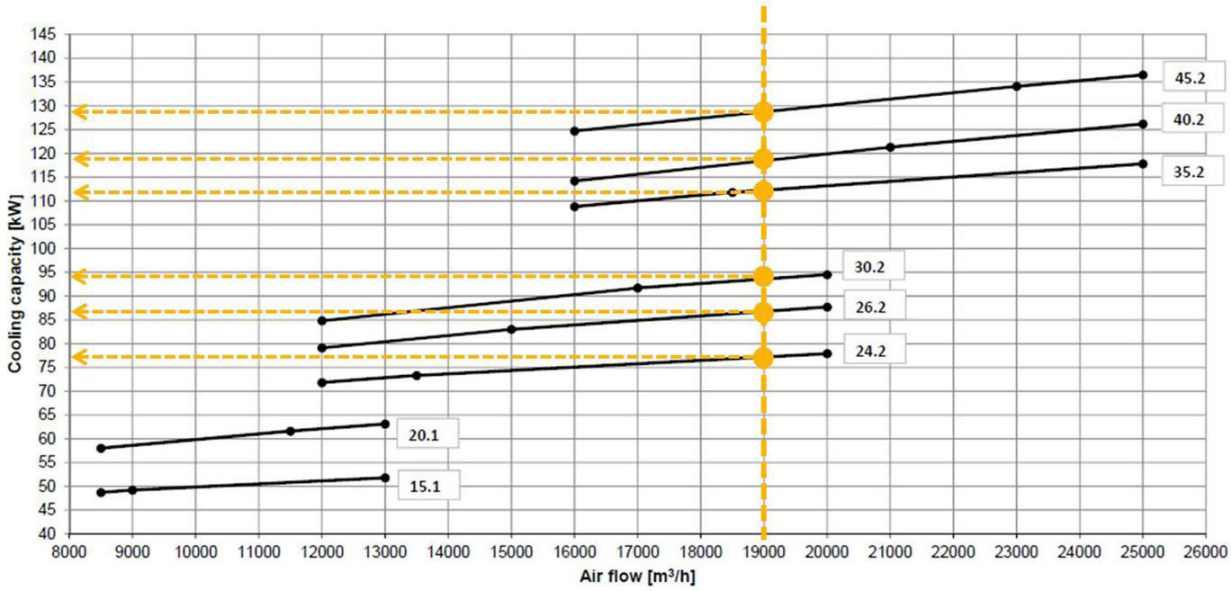
The internal components are positioned based on type, in an homogeneous area with easy and safe access, thanks to the hinges that support the larger sized doors to their adjustable hinges and to the device that blocks the access panel to the electrical control board in open position and helps protect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

How choosing the unit

The selection of the most appropriate size for an installation can be performed starting from the supply airflow value, established this value it is possible to choose among different available thermo-refrigerant treatments.

It is well-known that buildings built with modern technologies, that improve efficiency, have different needs than the previous buildings. In this case, the designer has to design systems with different potentialities.

Example: with airflow at 19000 m3/h, 6 possible cooling capacities are highlighted to do a different treatment, allowing to the designer to have a wide choice.



With same airflow is available a different thermo-refrigerant treatment depending on the selected size.

Unit configuration

CSRN-XHE2	30.2	CBK	M0	R3	SERMD	CHW2	PCOS	CREFO
		(1)	(2)	(3)	(4)	(5)	(6)	(7)

1. Configuration
CAK configuration: single fan section for full recirculation
CBK configuration: single fan section for recirculation and fresh air

2. Air supply
M0 Horizontal supply
M3 Downflow supply

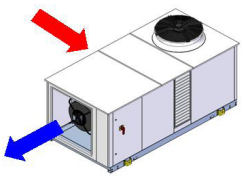
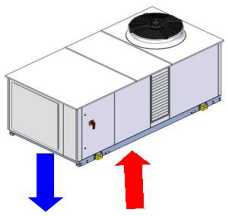
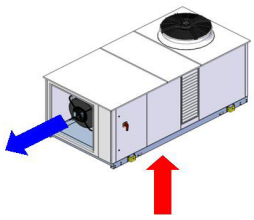
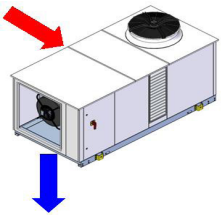
3. Air return
R0 Horizontal return
R3 Downflow return

4. Outdoor air damper
Standard
SERM - Outdoor air on/off motorized damper
SERMD - Modulating motorized fresh air shutter

5. Auxiliary heating
Standard
EH - Electric elements
CHW2 - 2row hot water coil

6. Airflow
Standard
PCOS - Supply constant airflow
PVAR - Variable airflow

7. External section fan
CREFO - Device to reduce the consumption levels of on/off fans on the external section
CREFB - ECOBREEZE external section fans consumption reduction device

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

Filtration	G4	G4+F7	G4+FES H10

Auxiliary heating	Heat pump standard unit and electric heaters	Heat pump and hot water coil option

Accessories separately supplied	
CLMX - Clivet Master System	**AMRX -** Rubber antivibration mounts

Standard unit technical specifications

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.

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.

Refrigeration circuit

Refrigeration circuit with:

- refrigerant charge
- liquid flow and moisture indicator
- safety high pressure switch
- filter dryer
- electronic expansion valve
- non-return valve
- 4-way reverse cycle valve
- liquid receiver
- liquid separator
- 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

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
- operating mode manual change (protected by password)
- selective key lock, unlocked with password

Accessories

- Downflow supply
- Downflow return
- Two-rows hot water coil
- Modulating 3-way valve
- Modulating 2-way valve
- Electric heaters
- Hot gas re-heating coil
- Immersed electrodes steam humidifier
- Water to waste evaporating wet-deck humidifier
- Air quality probe for CO2 rate check
- Air quality sensor for CO2 and VOC rate check
- Outdoor air motorized ON/OFF damper (only for CBK configuration)
- Modulating motorized outdoor air damper (only for CBK configuration)
- High static pressure fans
- High efficiency F7 air filter
- High efficiency H10 electronic filters
- Differential pressure switch for dirty air filters
- Serial communication module to Modbus supervisor
- Serial communication module to LonWorks supervisor
- Serial communication module for BACnet-IP supervisor
- Phase monitor
- Power factor correction capacitors (cosfi > 0.9)
- 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
- Rubber antivibration mounts (supplied separately)
- Clivet Master System (accessory separately supplied)
- Sandwich panels of the handling zone in M0 fire reaction class
- Set up for shipping via container
- Roof curb

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.

STANDARD AIRFLOW

Configuration: CAK in the all recirculation operation

General technical data

Size			15.1	20.1	24.2	26.2	30.2	35.2	40.2	45.2
Cooling										
Cooling capacity		kW	49,2	61,6	73,3	83,0	91,7	111,8	121,3	134,1
Sensible capacity		kW	38,3	48,0	54,9	61,7	68,3	83,1	89,9	99,8
Compressor power input		kW	13,0	18,0	20,7	22,1	25,9	30,1	34,4	39,1
EER			3,78	3,42	3,54	3,76	3,54	3,71	3,53	3,43
Heating										
Heating capacity		kW	48,5	63,1	72,6	84,7	93,6	113,6	128,1	143,7
Compressor power input		kW	10,1	13,9	16,5	19,0	21,4	25,3	30,9	33,0
COP			4,80	4,54	4,40	4,46	4,37	4,49	4,15	4,35
Compressor										
Type of compressors			Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
No. of compressors		No	1	1	2	2	2	2	2	2
Std Capacity control steps		No	1	1	2	2	2	2	2	2
Refrigeration circuits		No	1	1	2	2	2	2	2	2
Air Handling Section Fans (Supply)										
Type of supply fan			RAD	RAD	RAD	RAD	RAD	RAD	RAD	RAD
Number of supply fans		Nr	1	1	2	2	2	2	2	2
Fan diameter		mm	630	630	560	560	560	630	630	630
Supply airflow		l/s	2500	3194	3750	4167	4722	5139	5833	6389
Supply airflow		m^3/h	9000	11500	13500	15000	17000	18500	21000	23000
Installed unit power		kW	2.75	2.75	2.90	2.90	2.90	2.75	2.75	2.75
Max. static pressure supply fan		Pa	510	390	510	510	510	510	440	380
High static pressure air handling section fans (OPTIONAL)										
Type of supply fan			RAD	RAD	RAD	RAD	RAD	RAD	RAD	RAD
Number of supply fans		Nr	1	1	2	2	2	2	2	2
Fan diameter		mm	630	630	560	560	560	630	630	630
Supply airflow		l/s	2500	3194	3750	4167	4722	5139	5833	6389
Supply airflow		m^3/h	9000	11500	13500	15000	17000	18500	21000	23000
Installed unit power		kW	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Max. static pressure supply fan		Pa	1020	825	1020	1020	1020	1020	1000	830
External Section Fans										
Type of fans			AX	AX	AX	AX	AX	AX	AX	AX
Number of fans		No	1	1	2	2	2	2	2	2
Fan diameter		mm	800	800	800	800	800	800	800	800
Standard airflow		l/s	5835	5835	11670	11670	11670	11670	11670	11670
Installed unit power		kW	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Connections										
Condensate drain			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

Performance refers to operation at full re-circulation

1. Indoor air temperature 27°C D.B./19°C W.B. entering external exchanger air temperature 35°C D.B./24°C W.B. EER referred only to compressors
2. Indoor air temperature 20°C D.B./12°C W.B. entering external exchanger air temperature 7°C D.B./6°C W.B. COP referred only to compressors
3. SCROLL = scroll compressors
4. RAD = radial fan electronically controlled
5. Net outside static pressure to win the outlet and intake onboard pressure drops
6. AX = axial fan

STANDARD AIRFLOW

Configuration: CAK in the all recirculation operation

Sound levels

Size	Sound power level (dB)								Sound power level	Sound pressure level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
15.1	85	86	84	79	78	72	69	63	83	64
20.1	86	83	85	81	80	75	70	64	84	66
24.2	90	88	89	82	80	78	71	66	86	67
26.2	91	89	89	83	81	78	73	69	87	68
30.2	90	89	89	85	83	80	74	69	88	69
35.2	92	89	90	86	84	82	74	71	89	70
40.2	93	90	91	86	84	82	75	72	90	71
45.2	94	91	92	88	85	82	77	73	91	72

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 data

Size			15.1	20.1	24.2	26.2	30.2	35.2	40.2	45.2
F.L.A. - Full load current at max admissible conditions										
F.L.A. - Compressor 1		A	30.8	40.1	24.4	26.6	30.8	30.8	40.1	40.1
F.L.A. - Compressor 2		A	-	-	24.4	26.6	30.8	40.1	40.1	49.3
F.L.A. - Single External Fan		A	3.90	3.90	7.80	7.80	7.80	7.80	7.80	7.80
F.L.A. - Single supply fan		A	4.30	4.30	8.80	8.80	8.80	8.60	8.60	8.60
F.L.A. - Total	1	A	39.5	48.8	66.0	70.4	78.8	87.8	97.1	106
L.R.A. - Locked rotor amperes										
L.R.A. - Compressor 1		A	197	218	147	158	197	197	215	215
L.R.A. - Compressor 2		A	-	-	147	158	197	215	215	260
F.L.I. - Full load power input at max admissible conditions										
F.L.I. - Compressor 1		kW	18.5	24.8	14.6	16.5	18.5	18.5	24.8	24.8
F.L.I. - Compressor 2		kW	-	-	14.6	16.5	18.5	24.8	24.8	30.1
F.L.I. - Single External Fan		kW	1.90	1.90	3.80	3.80	3.80	3.80	3.80	3.80
F.L.I. - Single supply fan		kW	2.80	2.80	5.80	5.80	5.80	5.60	5.60	5.60
F.L.I. - Total	2	kW	23.5	29.8	39.1	42.9	46.9	52.9	59.2	64.5
M.I.C. Maximum inrush current										
M.I.C. - Value		A	206	224	189	202	245	263	272	317

Data refer to standard units.
Power supply: 400/3/50 Hz. Voltage variation: max. +/-10%
Voltage unbalance between phases: max 2 %
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)

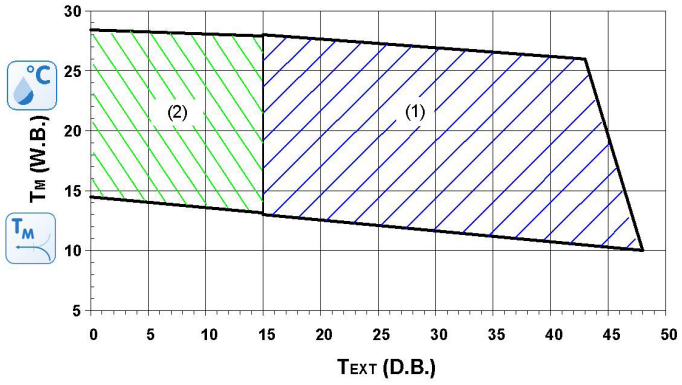
Pressure drops of optional components

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			15.1	20.1	24.2	26.2	30.2	35.2	40.2	45.2
CHW2 - Two-row hot water coil		Pa	22	34	22	26	32	25	31	36
CPHG - Hot gas re-heating coil		Pa	11	17	11	13	17	13	16	18
CHWER - Energy recovery from the food refrigeration		Pa	42	64	42	49	60	47	58	68
HWS - Steam humidifier		Pa	31	52	31	35	50	35	50	60
F7 - F7 high efficiency air filter	1	Pa	145	168	145	153	167	159	167	178
FES - High efficiency electronic filters		Pa	28	44	28	33	45	38	50	62

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

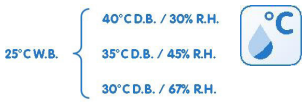
To verify the operation field of the operating units with percentages of outdoor air, always calculate the Tm mixing temperature at the internal heat exchanger input.

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

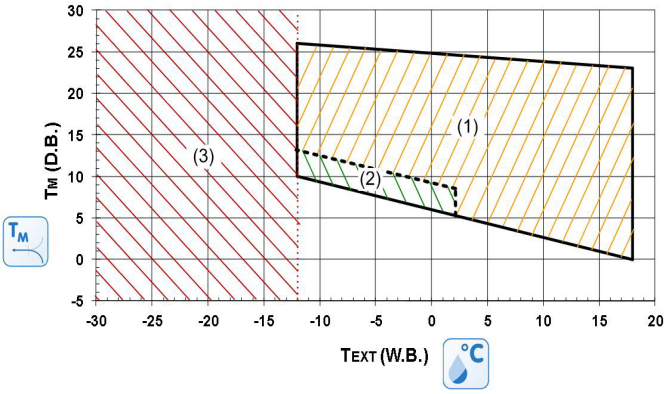
Text = entering internal exchanger air temperature, , temperature measured with dry bulb (D.B.=DRY BULB)

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



Operating range (Heating)



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 = entering internal exchanger air temperature, , temperature measured with dry bulb (D.B.=DRY BULB)

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

1. Operation range at full load
2. Range in which the unit operation is allowed only for a limited period (max 1 hour)
3. Operation range of the unit equipped with "application for low outdoor temperature" and "hot water coil" or "gas heating module" options. The heat pump circuit is not active.

In extended operating mode, in heat pump operation with an outdoor air temperature of less than 6°C, the unit performs defrosts by reversing the cycle, activating one circuit at a time and maintaining the ventilation active to eliminate the ice that forms on the surfaces of the outside exchanger. In the event of negative temperatures, the water resulting from the defrosts must be drained so as to avoid the accumulation of ice near the base of the unit. Make sure that this does not constitute a danger for people or things. With an outdoor air temperature between –10°C and –30°C install the following options: hot water coil or gas heating module and outdoor air low temperature configuration.

Accessories

EH - Electric elements

The option is indicated for cold climate and permit to preheat the inlet air to the water treatment battery and to extend the work limit.

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	15.1	20.1	24.2	26.2	30.2	35.2	40.2	45.2
9 kW	√	√	-	-	-	-	-	-
12 kW	√	√	√	√	√	-	-	-
18 kW	√	√	√	√	√	√	√	√
24 kW	-	-	√	√	√	√	√	√
36 kW	-	-	-	-	-	√	√	√

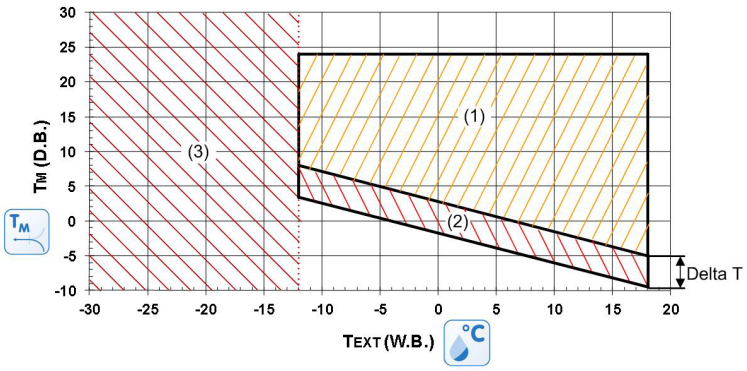
This option involves variation of the main electrical data of the unit.

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

Operation field extension with electric heaters

SIZES	Airflow [m3/h]	POWER ELECTRIC HEATERS / DELTA T [°C]				
		9 kW	12 kW	18 kW	24kW	36 kW
15.1	9000	3.0	4.0	5.9	-	-
20.1	11500	2.3	3.1	4.6	-	-
24.2	13500	-	2.6	4.0	5.3	-
26.2	15000	-	2.4	3.6	4.7	-
30.2	17000	-	2.1	3.1	4.2	-
35.2	18500	-	-	2.9	3.8	5.8
40.2	21000	-	-	2.5	3.4	5.1
45.2	23000	-	-	2.3	3.1	4.6

The minimum operating temperature of the heat pump with electric heater change and depends on the series and the power of the electric heater. The minimum temperature is easily to reckon subtrahend the DT value (table following below) to the entering internal exchanger air temperature TM(D.M.) for standard unit, at the desired conditions.



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 = entering internal exchanger air temperature, , temperature measured with dry bulb (D.B.=DRY BULB)

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

1. Operation range at full load
2. Range in which the unit operation is allowed only for a limited period (max 1 hour)
3. Operation range of the unit equipped with "application for low outdoor temperature" and "hot water coil" or "gas heating module" options. The heat pump circuit is not active.

With an outdoor air temperature between –10°C and –30°C install the following options: Hot water coil or gas heating module and outdoor air low temperature configuration

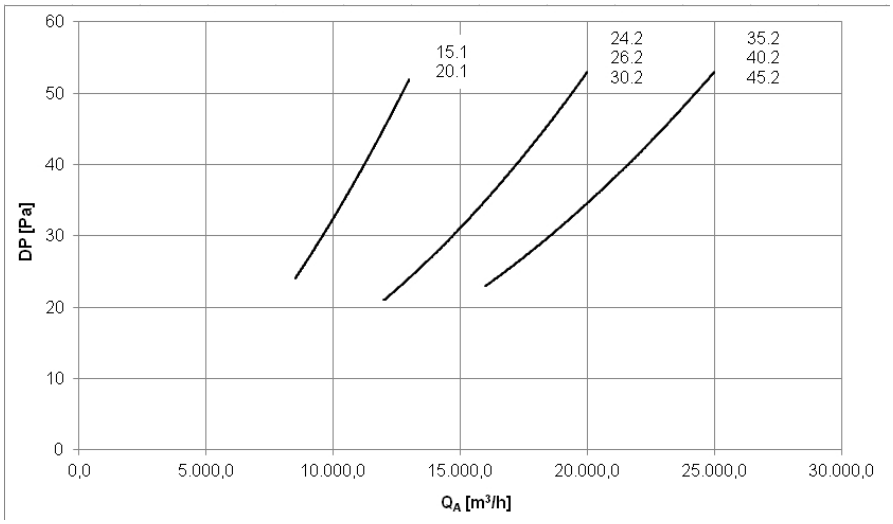
CHW2 - Two-row hot water coil

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.

The hot water coil allows the integration of the heat pump capacity, as being placed before the treating coil, it pre-heats the air, extending the operation limits of the unit. If the water coil operates as integration to the heat pump, the control logic reduces the potential at a pre-determined limit value, which prevents to make the compressors work at too high condensation temperatures. On the other hand, if the water coil is used as main resource (i.e. availability of the compressors) the potential supplied will be the highest.

In the event laws or local standards encourage the use of the district heating, and so the use of hot water coil heating with the obligation to recover the energy contained inside the exhaust air flow, a turning point can be set, that is an outside air temperature, below which the unit uses the water coil as main resource and operates also as thermodynamic recuperator at very high efficiency, using the nominal capacity of the heat pump circuit only partially

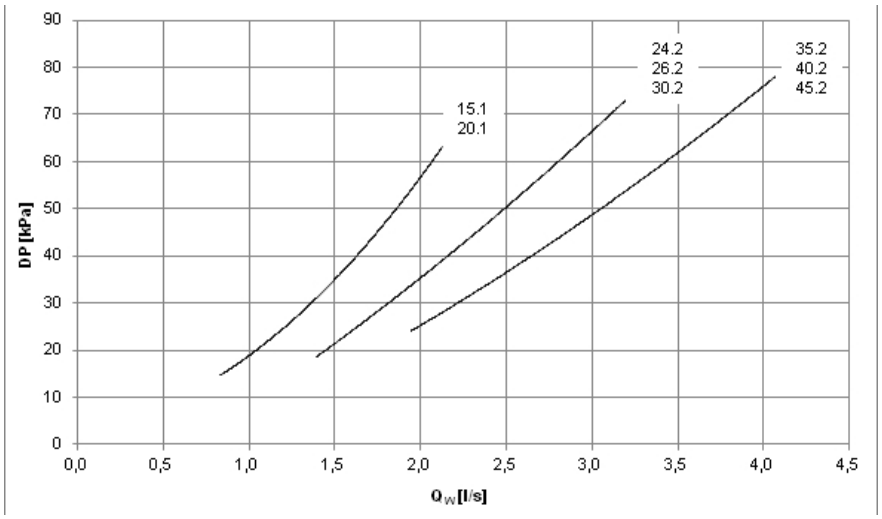
Hot water coil pressure drops: AIR side



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 = pressure drop [kPa]

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).

'2 range hot water coil' or 'Electric elements' cannot be assembled simultaneously.

Performances of hot water coil (two-row)

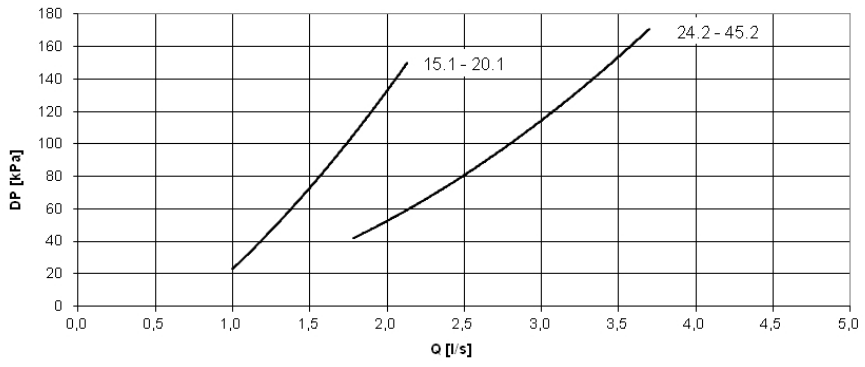
			Ti/To (°C)											
			80 / 65	70 / 55	70 / 60	60 / 40	80 / 65	70 / 55	70 / 60	60 / 40	80 / 65	70 / 55	70 / 60	60 / 40
			kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt
15.1 20.1	Qo (m3 / h)		8500				10750				13000			
	Qo (l / s)		2361				2986				3611			
	TM (°C)	5	71,0	93,8	98,9	110,9	82,5	109,5	115,7	129,6	93,0	123,7	130,9	146,5
		10	62,2	84,9	90,0	102,0	72,3	99,2	105,4	119,2	81,4	112,0	119,2	134,8
		14	55,2	77,9	83,0	94,9	64,1	91,0	97,1	110,9	72,1	102,8	109,9	125,4
		16	51,7	74,4	79,5	91,4	60,0	86,9	93,0	106,8	67,5	98,2	105,3	120,8
		18	48,2	71,0	76,0	87,9	55,9	82,9	89,0	102,7	62,9	93,6	100,7	116,2
		20	44,7	67,5	72,5	84,4	51,9	78,8	84,9	98,7	58,3	89,0	96,1	111,6
24.2 26.2 30.2	Qo (m3 / h)		12000				16000				20000			
	Qo (l / s)		3333				4444				5555			
	TM (°C)	5	103,4	136,1	143,4	160,9	124,5	164,9	174,0	195,2	143,4	190,3	201,2	225,4
		10	90,6	123,3	130,5	147,9	109,2	149,3	158,5	179,3	125,4	172,4	183,2	207,2
		14	80,5	113,1	120,3	137,7	96,9	137,0	146,1	166,9	111,2	158,2	169,0	192,9
		16	75,4	108,1	115,2	132,6	90,7	130,9	140,0	160,8	104,2	151,1	161,9	185,7
		18	70,3	103,1	110,2	127,5	84,6	124,8	133,9	154,6	97,1	144,0	154,8	178,7
		20	65,3	98,0	105,1	122,5	78,4	118,7	127,8	148,5	90,0	137,0	147,8	171,6
35.2 40.2 45.2	Qo (m3 / h)		16000				19500				25000			
	Qo (l / s)		4444				5416				6944			
	TM (°C)	5	134,9	177,9	187,4	210,3	153,4	202,8	214,0	240,0	179,4	238,0	251,6	281,9
		10	118,4	161,1	170,6	193,3	134,4	183,8	194,9	220,6	157,0	215,6	229,2	259,1
		14	105,1	147,9	157,3	179,9	119,4	168,6	179,7	205,3	139,3	197,9	211,3	241,2
		16	98,5	141,3	150,7	173,3	111,8	161,1	172,1	197,8	130,5	189,0	202,5	232,3
		18	91,8	134,7	144,1	166,6	104,2	153,6	164,6	190,2	121,6	180,2	193,6	223,5
		20	85,2	128,1	137,5	160,0	96,7	146,1	157,2	182,7	112,7	171,4	184,9	214,6

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 DROPS

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

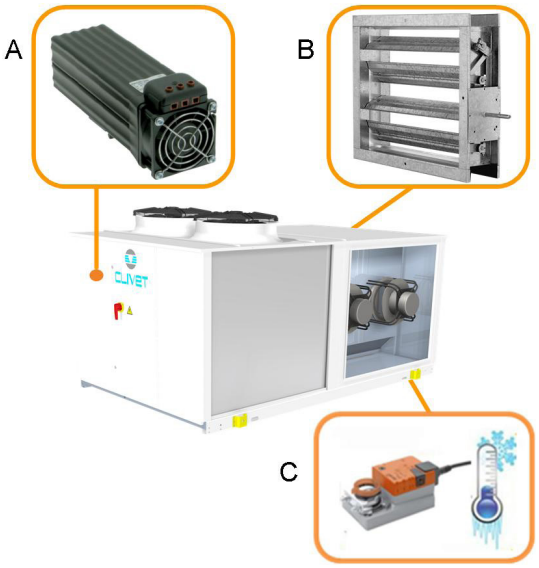
LTEMP1 - Application for low outdoor temperature

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

A. The option includes self-regulating heaters with thermostats that can protect the electrical panel from freezing to make sure it operates correctly.

B. 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.

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



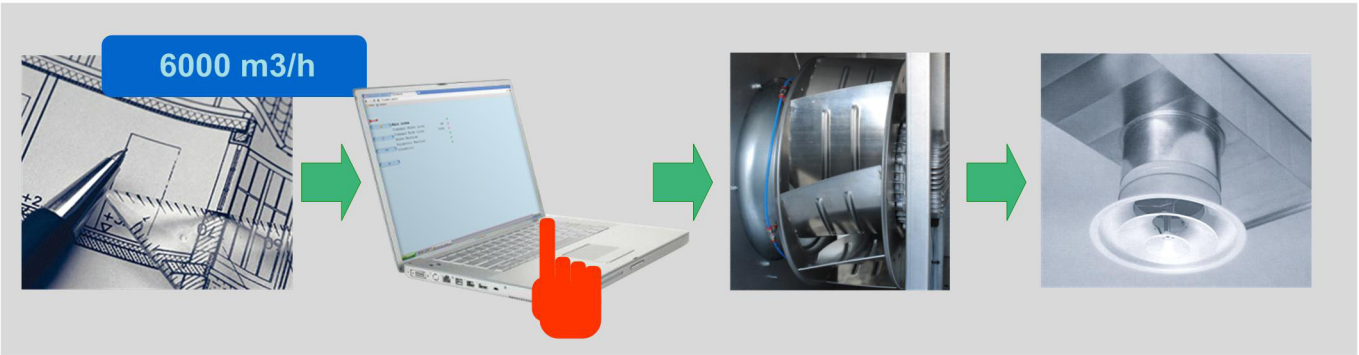
This operation involves variation of the main electrical data of the unit.

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.

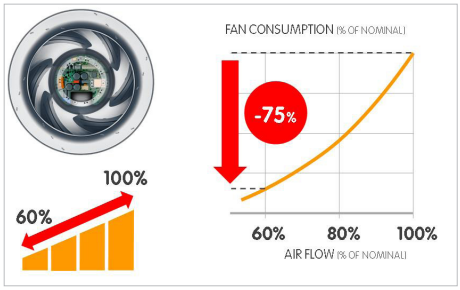
PCOSM - Constant supply airflow

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 ventilating 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.

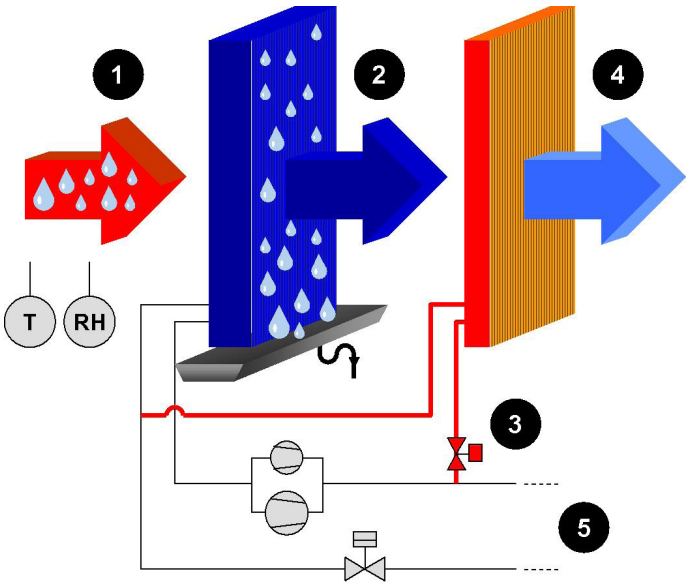
The re-heat coil is located behind the handling coil and is activated by diverting a flow of hot refrigerant gas downstream from the compressors through the action of a dedicated solenoid valve.

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.

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



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. 5 External exchanger (condenser)

Indicative scheme - not in scale

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
15.1	Qo (m3 / h)		8000					9000					13000				
	Qo (l / s)		2361					2500					3611				
	Ta (°C)	10	17,9	19,2	21,3	22,7	24,9	18,5	19,9	22,1	23,5	25,7	22,9	24,7	27,4	29,2	31,9
		12	16,5	17,8	19,9	21,3	23,4	17,0	18,5	20,6	22,1	24,2	21,1	22,9	25,5	27,4	30,1
		14	15,1	16,5	18,5	19,9	22,0	15,6	17,0	19,2	20,6	22,8	19,3	21,1	23,7	25,5	28,2
		16	13,7	15,1	17,1	18,5	20,6	14,2	15,6	17,7	19,1	21,3	17,5	19,3	21,9	23,7	26,4
		18	12,3	13,7	15,7	17,1	19,2	12,8	14,2	16,3	17,7	19,8	15,8	17,5	20,1	21,9	24,6
		20	11,0	12,3	14,4	15,7	17,8	11,4	12,8	14,9	16,3	18,4	14,0	15,8	18,4	20,1	22,8
20.1	Qo (m3 / h)		8500					11500					13000				
	Qo (l / s)		2361					3194					3611				
	Ta (°C)	10	17,9	19,2	21,3	22,7	24,9	21,4	23,0	25,5	27,2	29,8	22,9	24,7	27,4	29,2	31,9
		12	16,5	17,8	19,9	21,3	23,4	19,7	21,3	23,8	25,5	28,0	21,1	22,9	25,5	27,4	30,1
		14	15,1	16,5	18,5	19,9	22,0	18,0	19,7	22,1	23,8	26,3	19,3	21,1	23,7	25,5	28,2
		16	13,7	15,1	17,1	18,5	20,6	16,4	18,0	20,4	22,1	24,6	17,5	19,3	21,9	23,7	26,4
		18	12,3	13,7	15,7	17,1	19,2	14,7	16,3	18,8	20,4	22,9	15,8	17,5	20,1	21,9	24,6
		20	11,0	12,3	14,4	15,7	17,8	13,1	14,7	17,1	18,8	21,3	14,0	15,8	18,4	20,1	22,8
24.2	Qo (m3 / h)		12000					13500					20000				
	Qo (l / s)		3333					3750					5556				
	Ta (°C)	10	26,7	28,7	31,8	33,9	37,0	28,6	30,8	34,1	36,4	39,7	36,0	38,8	43,0	45,8	50,1
		12	24,6	26,6	29,7	31,8	34,9	26,4	28,6	31,9	34,1	37,5	33,2	36,0	40,2	43,0	47,2
		14	22,6	24,6	27,6	29,7	32,8	24,3	26,4	29,7	31,9	35,2	30,5	33,2	37,4	40,2	44,4
		16	20,6	22,6	25,6	27,6	30,7	22,1	24,3	27,5	29,7	33,0	27,8	30,5	34,6	37,4	41,6
		18	18,6	20,6	23,6	25,6	28,7	19,9	22,1	25,3	27,5	30,8	25,0	27,8	31,8	34,6	38,8
		20	16,6	18,6	21,5	23,6	26,6	17,8	19,9	23,1	25,3	28,6	22,3	25,0	29,1	31,8	36,0

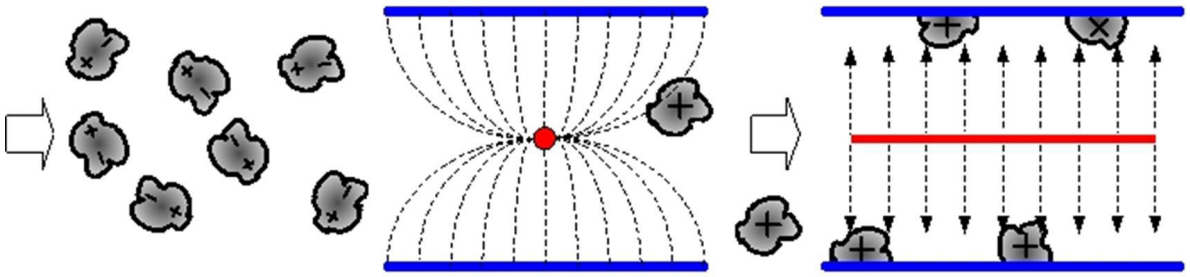
Ta = leaving air temperature from the handling coil and entering the post-heating coil
Qo = airflow (l/s)
kWt = Heating capacity (kW)
The reheating coil is powered by the cold gas bled from the condensing coil.
As the condensation hot gas temperature is linked to the outdoor air temperature, the indicative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

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
26.2	Qo (m3 / h)		12000					15000					20000				
	Qo (l / s)		3333					4167					5556				
	Ta (°C)	10	26,7	28,7	31,8	33,9	37,0	30,5	32,8	36,4	38,7	42,3	36,0	38,8	43,0	45,8	50,1
		12	24,6	26,6	29,7	31,8	34,9	28,2	30,5	34,0	36,3	39,9	33,2	36,0	40,2	43,0	47,2
		14	22,6	24,6	27,6	29,7	32,8	25,8	28,1	31,6	34,0	37,5	30,5	33,2	37,4	40,2	44,4
		16	20,6	22,6	25,6	27,6	30,7	23,5	25,8	29,3	31,6	35,1	27,8	30,5	34,6	37,4	41,6
		18	18,6	20,6	23,6	25,6	28,7	21,2	23,5	26,9	29,3	32,8	25,0	27,8	31,8	34,6	38,8
		20	16,6	18,6	21,5	23,6	26,6	18,9	21,2	24,6	26,9	30,4	22,3	25,0	29,1	31,8	36,0
30.2	Qo (m3 / h)		12000					17000					20000				
	Qo (l / s)		3333					4722					5556				
	Ta (°C)	10	26,7	28,7	31,8	33,9	37,0	32,8	35,3	39,1	41,7	45,6	36,0	38,8	43,0	45,8	50,1
		12	24,6	26,6	29,7	31,8	34,9	30,3	32,8	36,6	39,1	43,0	33,2	36,0	40,2	43,0	47,2
		14	22,6	24,6	27,6	29,7	32,8	27,8	30,3	34,0	36,6	40,4	30,5	33,2	37,4	40,2	44,4
		16	20,6	22,6	25,6	27,6	30,7	25,3	27,8	31,5	34,0	37,8	27,8	30,5	34,6	37,4	41,6
		18	18,6	20,6	23,6	25,6	28,7	22,8	25,3	29,0	31,5	35,3	25,0	27,8	31,8	34,6	38,8
		20	16,6	18,6	21,5	23,6	26,6	20,4	22,8	26,5	29,0	32,8	22,3	25,0	29,1	31,8	36,0
35.2	Qo (m3 / h)		16000					19000					25000				
	Qo (l / s)		4444					5278					6944				
	Ta (°C)	10	33,8	36,5	40,4	43,1	47,1	37,5	40,4	44,8	47,8	52,3	43,9	47,4	52,6	56,1	61,4
		12	31,2	33,8	37,7	40,4	44,4	34,5	37,4	41,8	44,8	49,2	40,5	43,9	49,0	52,5	57,8
		14	28,5	31,1	35,0	37,7	41,7	31,6	34,5	38,8	41,8	46,2	37,0	40,4	45,5	49,0	54,2
		16	25,9	28,5	32,4	35,0	39,0	28,7	31,6	35,9	38,8	43,2	33,6	37,0	42,1	45,5	50,7
		18	23,3	25,9	29,8	32,4	36,3	25,8	28,7	33,0	35,9	40,2	30,2	33,5	38,6	42,0	47,2
		20	20,7	23,3	27,2	29,7	33,7	22,9	25,8	30,1	32,9	37,3	26,8	30,2	35,2	38,6	43,7
40.2	Qo (m3 / h)		16000					21000					25000				
	Qo (l / s)		4444					5833					6944				
	Ta (°C)	10	33,8	36,5	40,4	43,1	47,1	39,8	42,9	47,5	50,7	55,5	43,9	47,4	52,6	56,1	61,4
		12	31,2	33,8	37,7	40,4	44,4	36,6	39,7	44,3	47,5	52,2	40,5	43,9	49,0	52,5	57,8
		14	28,5	31,1	35,0	37,7	41,7	33,5	36,6	41,2	44,3	49,0	37,0	40,4	45,5	49,0	54,2
		16	25,9	28,5	32,4	35,0	39,0	30,4	33,5	38,0	41,2	45,8	33,6	37,0	42,1	45,5	50,7
		18	23,3	25,9	29,8	32,4	36,3	27,3	30,4	35,0	38,0	42,7	30,2	33,5	38,6	42,0	47,2
		20	20,7	23,3	27,2	29,7	33,7	24,3	27,3	31,9	34,9	39,6	26,8	30,2	35,2	38,6	43,7
45.2	Qo (m3 / h)		16000					23000					25000				
	Qo (l / s)		4444					6389					6944				
	Ta (°C)	10	33,8	36,5	40,4	43,1	47,1	41,9	45,2	50,1	53,5	58,5	43,9	47,4	52,6	56,1	61,4
		12	31,2	33,8	37,7	40,4	44,4	38,6	41,9	46,7	50,1	55,1	40,5	43,9	49,0	52,5	57,8
		14	28,5	31,1	35,0	37,7	41,7	35,3	38,5	43,4	46,7	51,7	37,0	40,4	45,5	49,0	54,2
		16	25,9	28,5	32,4	35,0	39,0	32,0	35,3	40,1	43,4	48,3	33,6	37,0	42,1	45,5	50,7
		18	23,3	25,9	29,8	32,4	36,3	28,8	32,0	36,8	40,1	45,0	30,2	33,5	38,6	42,0	47,2
		20	20,7	23,3	27,2	29,7	33,7	25,6	28,8	33,6	36,8	41,7	26,8	30,2	35,2	38,6	43,7

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.

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

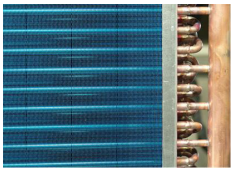
The class F7 are filtering components that are in addition to the standard G4 filters, for more effective filtering. They are widely used in air conditioning systems and industrial applications that require suitable performance concerning fine dusts and particles with dimensions greater than 1 µm. Class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

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

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.

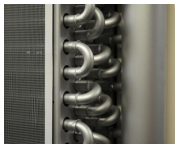
CCCA - Copper / aluminium coil with acrylic lining



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!

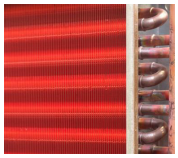
- Cooling capacity variation -2.7%
- variation in compressor power input +4.2%
- operating range reduction -2.1°C

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 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

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	15.1	20.1	24.2	26.2	30.2	35.2	40.2	45.2
3 kg/h	√	√	√	√	√	-	-	-
5 kg/h	√	√	√	√	√	-	-	-
8 kg/h	√	√	√	√	√	√	√	√
15 kg/h	√	√	√	√	√	√	√	√

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

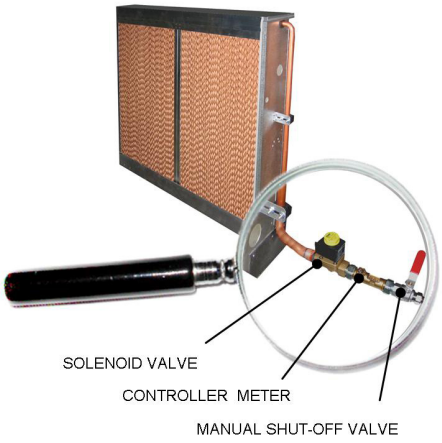
This accessory requires connection to a water supply network and discharge water circuit with adeguate frost protection. Requires its own power supply and have to be connected to the unit. Installation and wiring to customer care.

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		15.1	20.1	24.2	26.2	30.2	35.2	40.2	45.2
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	52	66	78	86	98	107	121	132
35	17,6	65	83	97	108	122	133	151	166
40	19,8	79	101	118	131	149	162	184	201

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. To customer care.

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

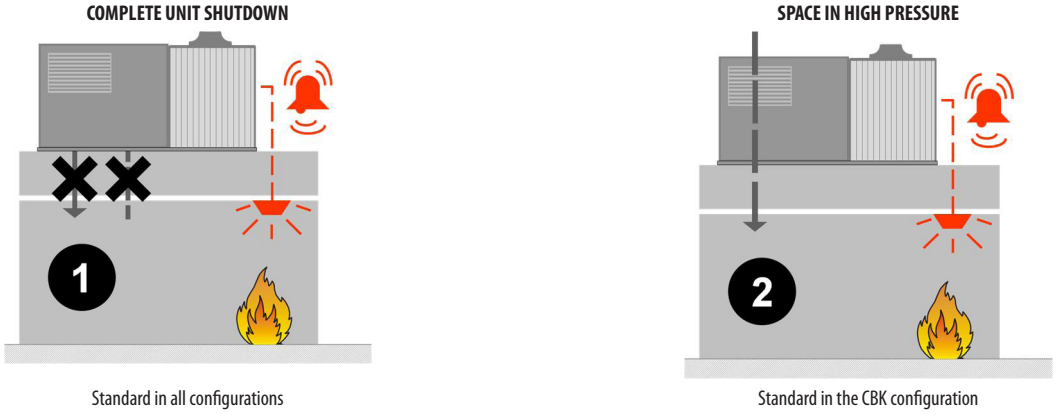
The option is recommended in areas with tobacco smoke, formaldehyde (from solvents, deodorants, glues, paints, detergents, food preparation, etc. The probe measures the rate of CO2 and VOC (volatile organic compounds) in the environment and initiates a 0/10V proportional signal. Based on the received 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



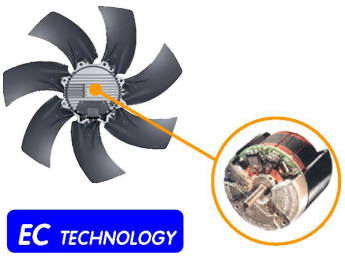
Standard in all configurations

Standard in the CBK configuration

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 built-in 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.

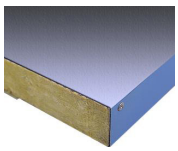
CREFB - ECOBREEZE external section fans consumption reduction device



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.

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.

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.

PTCO - Set up for shipping via container

Option that allows shipping via container.

It includes the sheet steel slide application for an easy unit scrolling, packaging with protective angle brackets and nylons, anchoring systems. If necessary the lateral lifting brackets and the main isolator switch handle can be removed to avoid damages during transport (components removed and put inside the unit).

For particular requirements, please contact Clivet Shipping Department.

VENH - High static pressure fans

A higher capacity fan section is available for applications requiring high supply and return head. 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, the available supply and return pressure and the accessories that determine the head loss on the air side, you will be automatically shown a selection of high head fans, when required.

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

CMSC9 - Serial communication module for Modbus supervisor

This enables the serial connection of the supervision system, using Modbus as the communication protocol. It enables access to the complete list of operational variables, commands and alarms. Using this accessory every unit can dialogue with the main supervision systems.

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)

CMSC10 - Serial communication module for LonWorks supervisor

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)

CMSC11 - Serial communication module for BACnet-IP supervisor

Allows the serial connection to supervision systems by using BACnet-IP as a communication protocol. It allows the access to the entire list of operating variables, controls and alarms. With this accessory every unit can communicate with the main supervision systems.

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.

PM - Phase monitor

The phase monitor allows verifying the proper phase connection and their unbalance in the units, which are powered by a three-phase system.

The monitor communicates with the control circuit and orders the switch-off of the unit, should one of the following cases occur: improper phase connection, the limit value referring to the unbalance between the phases is exceeded, over/undervoltage for a certain amount of time. Once the line conditions are restored, the unit is reactivated manually.

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

Accessories separately supplied

AMRX - Rubber antivibration mounts

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 configurations.

Size 15.1 CBK configuration

Cooling performance with 30% of outdoor 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
8500 m³/h	22 / 16	49,6	38,7	9,5	5,2	50,6	36,7	10,6	4,8	50,3	35,2	11,8	4,3	48,2	35,6	12,9	3,7	45,9	35,8	14,2	3,2	44,3	37,5	15,9	2,79
	24 / 17	50,7	40,0	9,6	5,3	51,5	38,3	10,7	4,8	51,2	36,8	11,8	4,3	49,0	37,2	13,0	3,8	46,7	37,3	14,3	3,3	45,7	39,1	16,1	2,84
	26 / 18	51,8	41,4	9,6	5,4	52,9	39,3	10,8	4,9	52,3	38,2	11,9	4,4	49,9	38,7	13,1	3,8	47,5	38,9	14,5	3,3	47,2	40,3	16,4	2,88
	27 / 19	53,1	41,1	9,7	5,5	54,1	39,0	10,9	5,0	53,3	38,2	12,0	4,4	50,8	38,5	13,2	3,8	48,4	38,9	14,6	3,3	48,3	40,5	16,6	2,91
	28 / 20	54,3	40,8	9,8	5,5	55,3	38,7	11,0	5,0	54,3	38,1	12,1	4,5	51,8	38,4	13,3	3,9	49,2	38,9	14,7	3,3	–	–	–	–
	30 / 22	56,9	40,1	10,0	5,7	57,5	38,4	11,1	5,2	56,4	37,7	12,3	4,6	53,8	38,0	13,5	4,0	51,0	38,9	14,9	3,4	–	–	–	–
9000 m³/h	22 / 16	50,1	39,5	9,5	5,3	51,1	37,5	10,6	4,8	50,7	36,1	11,8	4,3	48,6	36,3	13,0	3,7	46,2	36,7	14,3	3,2	44,7	38,6	16,0	2,79
	24 / 17	51,3	40,8	9,6	5,3	52,1	39,1	10,7	4,9	51,7	37,7	11,9	4,3	49,5	37,9	13,0	3,8	47,0	38,3	14,4	3,3	46,1	40,3	16,2	2,85
	26 / 18	52,4	42,3	9,7	5,4	53,3	40,3	10,8	4,9	52,7	39,2	12,0	4,4	50,3	39,5	13,2	3,8	47,9	39,9	14,5	3,3	47,6	41,6	16,5	2,88
	27 / 19	53,6	42,0	9,8	5,5	54,5	40,0	10,9	5,0	53,7	39,1	12,0	4,5	51,3	39,3	13,2	3,9	48,8	39,9	14,6	3,3	48,7	41,9	16,7	2,92
	28 / 20	54,9	41,7	9,9	5,5	55,7	39,7	11,0	5,1	54,8	38,9	12,1	4,5	52,3	39,2	13,3	3,9	49,6	39,9	14,7	3,4	–	–	–	–
	30 / 22	57,5	40,9	10,0	5,8	58,0	39,3	11,2	5,2	56,9	38,5	12,3	4,6	54,3	38,9	13,5	4,0	51,4	39,8	14,9	3,4	–	–	–	–
13000 m³/h	22 / 16	53,9	45,3	9,8	5,5	54,6	42,9	10,9	5,0	53,7	41,9	12,0	4,5	51,1	42,5	13,2	3,9	48,6	42,9	14,6	3,3	–	–	–	–
	24 / 17	54,9	47,3	9,9	5,5	55,6	45,1	11,0	5,1	54,6	44,0	12,1	4,5	52,1	44,5	13,3	3,9	49,5	45,0	14,7	3,4	–	–	–	–
	26 / 18	56,0	49,2	10,0	5,6	56,7	47,1	11,1	5,1	55,6	46,0	12,2	4,6	53,4	45,8	13,4	4,0	50,5	47,0	14,8	3,4	–	–	–	–
	27 / 19	57,4	48,8	10,0	5,7	57,8	46,9	11,2	5,2	56,6	45,9	12,3	4,6	54,3	45,7	13,5	4,0	51,4	47,1	15,0	3,4	–	–	–	–
	28 / 20	58,7	48,4	10,1	5,8	58,9	46,7	11,3	5,2	57,7	45,7	12,4	4,7	55,3	45,5	13,6	4,1	52,3	47,1	15,1	3,5	–	–	–	–
	30 / 22	61,6	47,3	10,3	6,0	61,3	46,3	11,4	5,4	60,0	45,1	12,6	4,8	57,3	45,1	13,9	4,1	54,2	47,1	15,3	3,5	–	–	–	–

Heating performance with 30% of outdoor air

Airflow	Ta (°C) DB	Outdoor air temperature °C.D.B/W.B.																	
		-7 / -8			-5 / -6			0 / -1			2 / 1			7 / 6			12 / 11		
		kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
8500 m³/h	10	33.5	6.1	5,5	35,6	6,4	5,6	41,8	7,2	5,8	44,1	7,5	5,9	50,2	8,3	6,0	57	9,2	6,2
	15	33.4	6.7	5,0	35,6	7	5,1	41,7	7,8	5,3	43,9	8,1	5,4	49,7	8,9	5,6	56,2	9,8	5,7
	18	33.4	7.0	4,8	35,5	7,3	4,9	41,4	8,1	5,1	43,6	8,4	5,2	49,2	9,3	5,3	55,6	10,2	5,5
	20	33.3	7.2	4,6	35,4	7,5	4,7	41,3	8,3	5,0	43,4	8,7	5,0	49	9,5	5,2	55,2	10,4	5,3
	22	33.2	7.4	4,5	35,4	7,7	4,6	41,1	8,6	4,8	43,2	8,9	4,9	48,8	9,7	5,0	54,9	10,7	5,1
	25	33.1	7.7	4,3	35,3	8	4,4	40,9	8,9	4,6	43	9,2	4,7	48,5	10,1	4,8	54,3	11	4,9
9000 m³/h	10	33.5	6.1	5,5	35,7	6,4	5,6	41,8	7,1	5,9	44,1	7,4	6,0	50,3	8,2	6,1	57,1	9,1	6,3
	15	33.5	6.6	5,1	35,6	6,9	5,2	41,6	7,7	5,4	43,9	8	5,5	49,7	8,8	5,6	56,3	9,7	5,8
	18	33.4	6.9	4,8	35,5	7,2	4,9	41,4	8	5,2	43,6	8,3	5,3	49,3	9,1	5,4	55,8	10	5,6
	20	33.3	7.1	4,7	35,5	7,4	4,8	41,2	8,2	5,0	43,4	8,6	5,0	49,1	9,4	5,2	55,4	10,3	5,4
	22	33.3	7.3	4,6	35,4	7,6	4,7	41,1	8,4	4,9	43,2	8,8	4,9	48,9	9,6	5,1	55	10,5	5,2
	25	33.2	7.7	4,3	35,3	8	4,4	40,9	8,8	4,6	43,1	9,1	4,7	48,6	10	4,9	54,4	10,9	5,0
13000 m³/h	10	–	–	–	–	–	–	41,9	6,5	6,4	44,3	6,8	6,5	50,7	7,5	6,8	57,9	8,2	7,1
	15	33.5	6.1	5,5	35,8	6,4	5,6	41,7	7	6,0	44,1	7,3	6,0	50,2	8	6,3	57,1	8,7	6,6
	18	33.5	6.4	5,2	35,7	6,7	5,3	41,5	7,4	5,6	43,8	7,6	5,8	49,8	8,3	6,0	56,8	9,1	6,2
	20	33.4	6.6	5,1	35,6	6,9	5,2	41,3	7,6	5,4	43,6	7,8	5,6	49,6	8,6	5,8	56,5	9,3	6,1
	22	33.3	6.8	4,9	35,5	7,1	5,0	41,1	7,8	5,3	43,5	8,1	5,4	49,5	8,8	5,6	56,3	9,6	5,9
	25	33.2	7.1	4,7	35,4	7,4	4,8	41	8,1	5,1	43,3	8,4	5,4	49,2	9,1	5,4	55,8	9,9	5,6

Ta = Indoor air temperature D.B/W.B
DB = Dry bulb
WB = Wet bulb
kWf = Cooling capacity in kW
kWs = Sensible cooling capacity (kW)
kWe = Compressor power input in kW
kWt = Heating capacity (kW)
EER referred only to compressors
COP referred only to compressors
The fan motor heating is not considered

Size 20.1 CBK configuration

Cooling performance with 30% of outdoor 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
8500 m³/h	22 / 16	59,3	44,5	12,4	4,8	60,3	42,7	14,0	4,3	59,7	41,6	15,7	3,8	57,6	40,7	17,6	3,3	54,5	39,8	19,8	2,8	54,2	41,5	23,4	2,32
	24 / 17	60,6	45,9	12,5	4,8	61,5	44,2	14,1	4,4	60,8	42,9	15,8	3,8	58,4	42,6	17,7	3,3	55,5	41,6	19,9	2,8	–	–	–	–
	26 / 18	61,8	47,4	12,6	4,9	63,1	45,3	14,2	4,4	61,9	44,3	15,9	3,9	60,0	43,3	17,8	3,4	56,6	43,1	20,1	2,8	–	–	–	–
	27 / 19	63,4	47,0	12,7	5,0	64,6	45,0	14,3	4,5	63,7	43,6	16,1	4,0	61,0	43,4	17,9	3,4	57,7	43,2	20,2	2,9	–	–	–	–
	28 / 20	65,0	46,6	12,8	5,1	66,1	44,6	14,4	4,6	65,2	43,3	16,2	4,0	62,1	43,4	18,1	3,4	58,8	43,2	20,4	2,9	–	–	–	–
	30 / 22	68,3	45,8	13,0	5,3	69,2	43,9	14,7	4,7	67,8	42,9	16,4	4,1	64,4	43,4	18,3	3,5	61,2	43,1	20,7	3,0	–	–	–	–
11500 m³/h	22 / 16	63,9	49,5	12,7	5,0	65,0	46,7	14,4	4,5	63,7	45,9	16,1	4,0	61,0	45,4	17,9	3,4	57,5	46,0	20,1	2,9	–	–	–	–
	24 / 17	65,4	51,1	12,8	5,1	66,4	48,3	14,5	4,6	65,1	47,3	16,2	4,0	62,0	47,5	18,0	3,4	58,6	48,0	20,3	2,9	–	–	–	–
	26 / 18	66,8	52,8	12,9	5,2	67,6	50,3	14,6	4,6	66,3	48,7	16,3	4,1	62,9	49,5	18,1	3,5	60,0	49,7	20,4	2,9	–	–	–	–
	27 / 19	68,4	52,3	13,0	5,3	68,9	50,3	14,7	4,7	67,6	48,9	16,4	4,1	64,1	49,3	18,3	3,5	61,3	49,6	20,6	3,0	–	–	–	–
	28 / 20	70,1	51,9	13,2	5,3	70,2	50,3	14,8	4,7	68,8	48,9	16,5	4,2	65,3	49,1	18,4	3,5	62,6	49,6	20,8	3,0	–	–	–	–
	30 / 22	73,4	50,9	13,4	5,5	73,2	49,4	15,0	4,9	71,5	48,4	16,8	4,3	67,7	48,7	18,7	3,6	65,3	49,3	21,1	3,1	–	–	–	–
13000 m³/h	22 / 16	65,8	51,5	12,9	5,1	66,9	48,4	14,5	4,6	65,5	47,5	16,2	4,0	62,4	47,3	18,1	3,4	58,9	48,2	20,3	2,9	–	–	–	–
	24 / 17	67,5	53,0	13,0	5,2	68,5	49,8	14,6	4,7	66,7	49,6	16,3	4,1	63,5	49,6	18,2	3,5	60,1	50,4	20,4	2,9	–	–	–	–
	26 / 18	69,3	54,5	13,1	5,3	69,6	52,1	14,7	4,7	68,0	51,4	16,4	4,1	64,4	51,8	18,3	3,5	61,3	52,6	20,6	3,0	–	–	–	–
	27 / 19	70,7	54,3	13,2	5,4	70,9	52,2	14,8	4,8	69,1	51,5	16,5	4,2	65,6	51,6	18,5	3,5	62,5	52,6	20,8	3,0	–	–	–	–
	28 / 20	72,2	54,0	13,3	5,4	72,2	52,2	14,9	4,8	70,3	51,4	16,6	4,2	66,9	51,3	18,6	3,6	63,8	52,6	20,9	3,1	–	–	–	–
	30 / 22	75,2	53,5	13,5	5,6	75,0	51,8	15,2	4,9	73,0	50,8	16,9	4,3	69,5	50,7	18,9	3,7	66,4	52,5	21,3	3,1	–	–	–	–

Heating performance with 30% of outdoor air

Airflow	Ta (°C) DB	Outdoor air temperature °C.D.B/W.B.																	
		-7 / -8			-5 / -6			0 / -1			2 / 1			7 / 6			12 / 11		
		kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
8500 m³/h	10	43.4	9.2	4,7	46,2	9,6	4,8	54	10,6	5,1	57	11,1	5,1	64,6	12,3	5,3	72,9	13,7	5,3
	15	43.5	9.9	4,4	46,4	10,3	4,5	54,1	11,5	4,7	56,9	11,9	4,8	63,8	13,2	4,8	71,4	14,6	4,9
	18	43.6	10.3	4,2	46,4	10,8	4,3	53,8	12	4,5	56,5	12,5	4,5	63,2	13,7	4,6	70,5	15,2	4,6
	20	43.5	10.6	4,1	46,3	11,1	4,2	53,6	12,3	4,4	56,2	12,8	4,4	62,9	14,1	4,5	70	15,6	4,5
	22	43.5	10.9	4,0	46,2	11,4	4,1	53,4	12,7	4,2	56	13,2	4,2	62,5	14,5	4,3	69,5	16	4,3
	25	43.3	11.4	3,8	46,1	11,9	3,9	53,2	13,2	4,0	55,7	13,7	4,1	62	15,1	4,1	68,7	16,6	4,1
11500 m³/h	10	43.6	8.5	5,1	46,4	8,8	5,3	53,9	9,7	5,6	57,1	10,1	5,7	65,1	11,1	5,9	73,8	12,2	6,0
	15	43.5	9.1	4,8	46,3	9,5	4,9	53,8	10,4	5,2	56,9	10,8	5,3	64,5	11,9	5,4	72,8	13	5,6
	18	43.5	9.6	4,5	46,3	9,9	4,7	53,7	10,9	4,9	56,6	11,3	5,0	64,1	12,4	5,2	72,1	13,6	5,3
	20	43.4	9.8	4,4	46,1	10,2	4,5	53,6	11,2	4,8	56,5	11,6	4,9	63,8	12,7	5,0	71,7	14	5,1
	22	43.3	10.1	4,3	46	10,5	4,4	53,4	11,5	4,6	56,3	12	4,7	63,6	13,1	4,9	71,3	14,4	5,0
	25	43.2	10.6	4,1	45,8	11	4,2	53,2	12	4,4	56,1	12,5	4,5	63,2	13,6	4,6	70,6	15	4,7
1300 m³/h	10	–	–	–	46,3	8,5	5,4	54	9,4	5,7	57,2	9,7	5,9	65,3	10,6	6,2	74,3	11,6	6,4
	15	43.4	8.9	4,9	46,2	9,2	5,0	54	10,1	5,3	57	10,4	5,5	64,6	11,4	5,7	73,2	12,5	5,9
	18	43.4	9.3	4,7	46,1	9,6	4,8	53,8	10,5	5,1	56,7	10,9	5,2	64,2	11,9	5,4	72,5	13	5,6
	20	43.3	9.6	4,5	46	9,9	4,6	53,7	10,8	5,0	56,5	11,2	5,0	63,9	12,2	5,2	72,1	13,4	5,4
	22	43.2	9.8	4,4	45,9	10,2	4,5	53,6	11,2	4,8	56,3	11,5	4,9	63,6	12,6	5,0	71,6	13,8	5,2
	25	43.0	10.3	4,2	45,7	10,6	4,3	53,2	11,6	4,6	56	12	4,7	63,2	13,1	4,8	71	14,3	5,0

Ta = Indoor air temperature D.B/W.B
DB = Dry bulb
WB = Wet bulb
kWf = Cooling capacity in kW
kWs = Sensible cooling capacity (kW)
kWe = Compressor power input in kW
kWt = Heating capacity (kW)
EER referred only to compressors
COP referred only to compressors
The fan motor heating is not considered

Size 24.2 CBK configuration

Cooling performance with 30% of outdoor 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
12000 m³/h	22 / 16	71,7	55,3	14,8	4,8	73,6	52,5	16,6	4,4	73,8	50,2	18,5	4,0	70,9	50,2	20,5	3,5	66,9	51,2	22,7	2,9	65,6	52,3	26,4	2,5
	24 / 17	73,6	56,7	14,9	4,9	75,1	54,4	16,7	4,5	75,0	52,4	18,6	4,0	72,1	52,3	20,6	3,5	68,8	52,3	22,9	3,0	67,2	54,2	26,4	2,5
	26 / 18	75,5	58,1	15,1	5,0	77,1	55,8	16,8	4,6	76,4	54,3	18,7	4,1	73,8	53,8	20,8	3,5	70,2	54,2	23,1	3,0	68,7	56,0	26,6	2,6
	27 / 19	77,3	57,8	15,2	5,1	78,9	55,4	17,0	4,6	78,1	53,8	18,9	4,1	75,1	53,8	20,9	3,6	71,5	54,3	23,2	3,1	–	–	–	–
	28 / 20	79,0	57,5	15,3	5,2	80,7	55,0	17,1	4,7	79,7	53,5	19,0	4,2	76,5	53,8	21,0	3,6	72,9	54,3	23,3	3,1	–	–	–	–
	30 / 22	82,8	56,8	15,5	5,3	83,6	55,0	17,3	4,8	82,9	53,1	19,3	4,3	79,2	53,6	21,3	3,7	75,7	54,3	23,6	3,2	–	–	–	–
13500 m³/h	22 / 16	73,8	57,2	15,0	4,9	75,4	54,4	16,7	4,5	75,2	52,3	18,6	4,0	72,3	52,4	20,6	3,5	68,4	53,3	22,8	3,0	65,3	54,5	26,2	2,5
	24 / 17	75,6	59,0	15,1	5,0	76,9	56,6	16,8	4,6	76,6	54,5	18,7	4,1	73,7	54,4	20,7	3,6	69,0	54,8	23,1	3,0	67,2	56,7	26,4	2,5
	26 / 18	77,4	60,7	15,2	5,1	78,8	58,4	17,0	4,6	78,2	56,4	18,9	4,1	75,2	56,3	20,9	3,6	70,7	57,0	23,2	3,0	69,2	58,7	26,6	2,6
	27 / 19	79,2	60,4	15,3	5,2	80,5	58,1	17,1	4,7	79,8	56,2	19,0	4,2	76,6	56,2	21,0	3,6	72,2	57,2	23,3	3,1	–	–	–	–
	28 / 20	81,0	60,1	15,4	5,3	82,2	57,8	17,2	4,8	81,4	55,9	19,2	4,2	78,0	56,1	21,2	3,7	73,7	57,3	23,5	3,1	–	–	–	–
	30 / 22	84,8	59,3	15,7	5,4	85,5	57,3	17,5	4,9	84,5	55,6	19,4	4,4	80,9	55,8	21,5	3,8	76,8	57,4	23,7	3,2	–	–	–	–
20000 m³/h	22 / 16	80,8	65,3	15,4	5,2	81,9	62,3	17,2	4,8	80,7	60,2	19,1	4,2	76,9	61,2	21,1	3,6	73,2	62,3	23,4	3,1	70,9	63,9	26,0	2,7
	24 / 17	82,5	68,0	15,5	5,3	83,7	64,8	17,3	4,8	82,2	63,2	19,2	4,3	78,3	64,3	21,2	3,7	74,9	64,9	23,5	3,2	72,5	66,5	26,4	2,7
	26 / 18	84,2	70,7	15,7	5,4	85,4	67,5	17,4	4,9	83,7	66,2	19,4	4,3	79,6	67,1	21,4	3,7	76,6	67,5	23,7	3,2	–	–	–	–
	27 / 19	86,1	70,3	15,8	5,4	87,1	67,3	17,6	4,9	85,3	66,1	19,5	4,4	81,1	66,9	21,5	3,8	78,1	67,5	23,9	3,3	–	–	–	–
	28 / 20	87,9	69,9	15,9	5,5	88,8	67,1	17,7	5,0	86,9	65,8	19,6	4,4	82,6	66,6	21,7	3,8	79,6	67,5	24,1	3,3	–	–	–	–
	30 / 22	91,8	69,0	16,1	5,7	92,3	66,5	18,0	5,1	90,2	65,0	19,9	4,5	85,7	66,0	22,0	3,9	82,6	67,5	24,4	3,4	–	–	–	–

Heating performance with 30% of outdoor air

Airflow	Ta (°C) DB	Outdoor air temperature °C.D.B/W.B.																		
		-7 / -8			-5 / -6			0 / -1			2 / 1			7 / 6			12 / 11		
		kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
12000 m³/h	10	50.7	10.8	4,7	54,1	11,2	4,8	62,9	12,3	5,1	66,4	12,7	5,2	75,1	13,8	5,4	85	15,2	5,6
	15	50.8	11.5	4,4	54,2	12	4,5	62,4	13,1	4,8	65,8	13,5	4,9	74,4	14,8	5,0	84	16,2	5,2
	18	50.9	12.0	4,2	54,2	12,4	4,4	62,3	13,6	4,6	65,6	14,1	4,7	74	15,4	4,8	83,2	16,9	4,9
	20	50.8	12.3	4,1	54	12,8	4,2	62,2	13,9	4,5	65,5	14,4	4,5	73,6	15,8	4,7	82,6	17,3	4,8
	22	50.7	12.6	4,0	53,9	13,1	4,1	62,1	14,3	4,3	65,2	14,8	4,4	73,2	16,2	4,5	82	17,8	4,6
	25	50.6	13.1	3,9	53,7	13,5	4,0	61,8	14,9	4,1	64,8	15,4	4,2	72,6	16,8	4,3	81	18,5	4,4
13500 m³/h	10	–	–	–	54	10,9	5,0	62,9	12	5,2	66,4	12,4	5,4	75,3	13,4	5,6	85,3	14,7	5,8
	15	50.8	11.3	4,5	54,1	11,7	4,6	62,6	12,7	4,9	66	13,2	5,0	74,6	14,4	5,2	84,3	15,7	5,4
	18	50.9	11.7	4,4	54,1	12,1	4,5	62,4	13,2	4,7	65,7	13,7	4,8	74,2	14,9	5,0	83,6	16,3	5,1
	20	50.8	12.0	4,2	54	12,5	4,3	62,2	13,6	4,6	65,5	14,1	4,6	73,8	15,3	4,8	83	16,7	5,0
	22	50.7	12.3	4,1	53,8	12,8	4,2	62,1	13,9	4,5	65,3	14,4	4,5	73,4	15,7	4,7	82,4	17,2	4,8
	25	50.6	12.8	4,0	53,7	13,2	4,1	61,8	14,5	4,3	64,9	15	4,3	72,8	16,3	4,5	81,5	17,9	4,6
20000 m³/h	10	–	–	–	–	–	–	62,8	10,9	5,8	66,6	11,2	5,9	76,1	12,1	6,3	86,6	13,1	6,6
	15	50.6	10.4	4,9	53,9	10,8	5,0	62,4	11,6	5,4	66,2	12	5,5	75,3	12,9	5,8	85,4	13,9	6,1
	18	50.6	10.9	4,6	53,9	11,2	4,8	62,4	12,1	5,2	65,9	12,5	5,3	74,8	13,4	5,6	84,8	14,5	5,8
	20	50.5	11.1	4,5	53,7	11,5	4,7	62,3	12,4	5,0	65,8	12,8	5,1	74,5	13,7	5,4	84,5	14,9	5,7
	22	50.4	11.4	4,4	53,5	11,8	4,5	62,2	12,7	4,9	65,6	13,1	5,0	74,3	14,1	5,3	84,2	15,3	5,5
	25	50.1	11.9	4,2	53,2	12,2	4,4	62,1	13,3	4,7	65,4	13,6	4,8	73,9	14,7	5,0	83,6	15,9	5,3

Ta = Indoor air temperature D.B/W.B
DB = Dry bulb
WB = Wet bulb
kWf = Cooling capacity in kW
kWs = Sensible cooling capacity (kW)
kWe = Compressor power input in kW
kWt = Heating capacity (kW)
EER referred only to compressors
COP referred only to compressors
The fan motor heating is not considered

Size 26.2 CBK configuration

Cooling performance with 30% of outdoor 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
12000 m³/h	22 / 16	78,8	58,5	15,5	5,1	80,3	56,1	17,4	4,6	80,1	54,7	19,6	4,1	78,4	54,0	21,8	3,6	74,1	54,5	24,2	3,1	70,9	53,8	27,4	2,6
	24 / 17	80,6	60,3	15,6	5,2	81,8	57,8	17,5	4,7	82,4	56,2	19,7	4,2	79,6	56,5	21,9	3,6	75,5	56,3	24,4	3,1	72,5	55,6	27,5	2,6
	26 / 18	82,3	62,2	15,7	5,2	83,7	59,4	17,6	4,8	84,6	57,7	19,9	4,3	80,3	59,4	21,8	3,7	76,7	58,6	24,5	3,1	73,9	57,6	27,6	2,7
	27 / 19	84,2	61,9	15,8	5,3	85,5	59,2	17,8	4,8	86,2	57,7	20,0	4,3	81,9	59,2	22,0	3,7	78,1	58,7	24,6	3,2	75,4	57,7	27,7	2,7
	28 / 20	86,1	61,7	16,0	5,4	87,3	59,1	17,9	4,9	87,9	57,6	20,1	4,4	83,7	59,0	22,1	3,8	79,5	58,7	24,8	3,2	76,9	57,7	27,8	2,8
	30 / 22	89,9	61,3	16,2	5,5	90,2	59,8	18,2	5,0	91,6	57,4	20,3	4,5	87,2	58,5	22,4	3,9	82,3	58,8	25,0	3,3	–	–	–	–
15000 m³/h	22 / 16	83,0	63,7	15,8	5,3	84,7	60,5	17,7	4,8	85,0	58,4	19,9	4,3	81,9	58,4	22,1	3,7	77,0	59,4	24,6	3,1	74,0	60,5	27,8	2,7
	24 / 17	85,0	65,7	15,9	5,3	86,5	62,6	17,8	4,9	86,6	60,9	20,0	4,3	83,4	61,1	22,2	3,8	78,7	61,8	24,7	3,2	76,1	62,0	27,9	2,7
	26 / 18	86,9	67,7	16,0	5,4	88,4	65,0	18,0	4,9	88,2	63,3	20,1	4,4	85,2	63,1	22,3	3,8	80,3	63,9	24,9	3,2	78,1	63,3	28,1	2,8
	27 / 19	89,0	67,4	16,1	5,5	90,3	64,9	18,1	5,0	89,9	63,3	20,2	4,5	86,8	63,1	22,4	3,9	81,8	63,9	25,0	3,3	79,9	63,0	28,2	2,8
	28 / 20	91,1	67,0	16,3	5,6	92,3	64,7	18,2	5,1	91,7	63,2	20,3	4,5	88,4	63,1	22,5	3,9	83,3	63,8	25,2	3,3	81,6	62,7	28,3	2,9
	30 / 22	95,2	66,4	16,5	5,8	96,3	64,1	18,5	5,2	95,6	62,7	20,6	4,6	91,6	63,1	22,8	4,0	86,4	63,5	25,5	3,4	–	–	–	–
20000 m³/h	22 / 16	89,1	70,3	16,1	5,5	90,5	67,3	18,1	5,0	89,8	65,3	20,2	4,4	86,5	65,2	22,4	3,9	81,3	65,2	25,0	3,3	75,6	68,5	28,0	2,7
	24 / 17	91,0	73,1	16,2	5,6	92,3	70,2	18,2	5,1	91,7	67,9	20,3	4,5	88,1	68,3	22,5	3,9	83,5	67,9	25,0	3,3	76,9	70,6	28,2	2,7
	26 / 18	92,9	75,8	16,4	5,7	94,4	72,2	18,3	5,2	93,6	70,6	20,5	4,6	89,7	71,1	22,7	4,0	85,3	70,5	25,2	3,4	78,7	72,1	28,4	2,8
	27 / 19	94,9	75,6	16,5	5,8	96,5	71,5	18,4	5,2	95,7	70,2	20,6	4,6	91,3	70,9	22,8	4,0	87,0	70,6	25,4	3,4	80,1	72,0	28,5	2,8
	28 / 20	96,9	75,3	16,6	5,8	98,6	70,8	18,6	5,3	97,7	69,9	20,7	4,7	93,1	70,5	22,9	4,1	88,9	70,6	25,6	3,5	81,8	71,9	28,7	2,9
	30 / 22	101,1	74,5	16,9	6,0	102,6	70,1	18,9	5,4	101,4	69,6	21,0	4,8	96,5	69,7	23,2	4,2	93,1	70,4	25,9	3,6	–	–	–	–

Heating performance with 30% of outdoor air

Airflow	Ta (°C) DB	Outdoor air temperature °C.D.B/W.B.																		
		-7 / -8			-5 / -6			0 / -1			2 / 1			7 / 6			12 / 11		
		kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
12000 m³/h	10	59,5	12,4	4,8	63,3	13	4,9	73,4	14,4	5,1	77,5	14,9	5,2	88	16,4	5,4	99,1	18,2	5,4
	15	59,3	13,4	4,4	62,9	13,9	4,5	73,2	15,4	4,8	77,1	16	4,8	86,9	17,6	4,9	97	19,4	5,0
	18	59,2	13,9	4,3	62,8	14,5	4,3	72,6	16,1	4,5	76,4	16,7	4,6	85,9	18,3	4,7	95,7	20,2	4,7
	20	59,1	14,3	4,1	62,7	15	4,2	72,2	16,5	4,4	76	17,1	4,4	85,3	18,8	4,5	94,8	20,8	4,6
	22	58,9	14,7	4,0	62,6	15,4	4,1	71,8	16,9	4,2	75,6	17,6	4,3	84,7	19,3	4,4	93,9	21,3	4,4
	25	58,8	15,3	3,8	62,5	16	3,9	71,6	17,6	4,1	75,2	18,3	4,1	83,7	20,1	4,2	92,7	22,2	4,2
15000 m³/h	10	59,7	11,7	5,1	63,4	12,2	5,2	73,5	13,5	5,4	77,7	13,9	5,6	88,5	15,2	5,8	100,2	16,7	6,0
	15	59,5	12,6	4,7	63,2	13,1	4,8	73,2	14,4	5,1	77,3	14,9	5,2	87,4	16,3	5,4	98,4	17,9	5,5
	18	59,4	13,2	4,5	63	13,7	4,6	72,7	15	4,8	76,7	15,5	4,9	86,5	17	5,1	97,4	18,7	5,2
	20	59,2	13,5	4,4	62,8	14,1	4,5	72,4	15,4	4,7	76,3	16	4,8	86	17,5	4,9	96,7	19,2	5,0
	22	59	13,9	4,2	62,6	14,5	4,3	72,1	15,8	4,6	75,9	16,4	4,6	85,6	18	4,8	96,1	19,7	4,9
	25	58,7	14,5	4,0	62,3	15	4,2	71,9	16,5	4,4	75,6	17,1	4,4	85	18,7	4,5	95	20,5	4,6
20000 m³/h	10	–	–	-	–	–	-	73,9	12,4	6,0	78	12,8	6,1	89	14	6,4	101,8	15,2	6,7
	15	59,8	11,8	5,1	63,4	12,2	5,2	73,2	13,3	5,5	77,3	13,7	5,6	88,1	14,9	5,9	100	16,3	6,1
	18	59,6	12,3	4,8	63,1	12,8	4,9	72,8	13,8	5,3	76,9	14,3	5,4	87,6	15,5	5,7	99	16,9	5,9
	20	59,4	12,7	4,7	62,9	13,1	4,8	72,5	14,2	5,1	76,6	14,7	5,2	87,2	16	5,5	98,4	17,4	5,7
	22	59,1	13	4,5	62,7	13,5	4,6	72,2	14,6	4,9	76,4	15,1	5,1	86,8	16,4	5,3	97,8	17,9	5,5
	25	58,8	13,6	4,3	62,5	14,1	4,4	72,1	15,3	4,7	76,2	15,8	4,8	86,2	17,1	5,0	96,9	18,7	5,2

Ta = Indoor air temperature D.B/W.B
DB = Dry bulb
WB = Wet bulb
kWf = Cooling capacity in kW
kWs = Sensible cooling capacity (kW)
kWe = Compressor power input in kW
kWt = Heating capacity (kW)
EER referred only to compressors
COP referred only to compressors
The fan motor heating is not considered

Size 30.2 CBK configuration

Cooling performance with 30% of outdoor 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	84,6	62,6	18,4	4,6	87,2	58,6	20,6	4,2	86,8	57,5	22,8	3,8	84,1	56,5	25,1	3,4	79,2	58,2	27,8	2,8	73,6	59,3	31,0	2,4
	24 / 17	86,9	63,5	18,6	4,7	88,5	61,0	20,7	4,3	88,1	59,6	23,0	3,8	85,3	58,7	25,3	3,4	80,4	60,3	28,0	2,9	75,8	60,6	31,2	2,4
	26 / 18	89,0	64,4	18,7	4,8	90,4	62,8	20,8	4,3	89,6	61,5	23,2	3,9	87,0	60,8	25,4	3,4	82,3	62,0	28,2	2,9	78,0	62,0	31,4	2,5
	27 / 19	90,8	64,7	18,9	4,8	92,4	62,5	21,0	4,4	91,1	62,4	23,2	3,9	88,7	60,8	25,6	3,5	84,0	61,9	28,4	3,0	79,9	61,7	31,6	2,5
	28 / 20	92,6	64,9	19,0	4,9	94,5	62,1	21,2	4,5	92,9	62,6	23,3	4,0	90,5	60,8	25,8	3,5	85,8	61,7	28,6	3,0	81,8	61,4	31,8	2,6
	30 / 22	96,4	65,2	19,3	5,0	99,1	62,1	21,6	4,6	97,0	61,7	23,7	4,1	94,0	60,6	26,2	3,6	89,3	61,4	28,9	3,1	–	–	–	–
44000 m³/h	22 / 16	92,8	70,6	19,0	4,9	94,7	67,2	21,2	4,5	93,7	65,6	23,4	4,0	90,4	64,7	25,8	3,5	85,3	66,0	28,6	3,0	81,1	67,4	32,2	2,5
	24 / 17	94,9	72,5	19,2	4,9	96,7	69,6	21,4	4,5	95,9	67,7	23,6	4,1	92,2	67,6	26,0	3,5	86,6	68,7	28,9	3,0	82,7	69,9	32,5	2,5
	26 / 18	96,8	74,4	19,3	5,0	99,2	71,5	21,5	4,6	98,0	69,8	23,8	4,1	93,7	70,1	26,2	3,6	88,5	71,0	29,1	3,0	84,7	72,2	32,9	2,6
	27 / 19	99,2	73,9	19,5	5,1	101,4	71,1	21,7	4,7	99,9	69,5	24,0	4,2	95,5	70,0	26,4	3,6	90,2	70,8	29,3	3,1	–	–	–	–
	28 / 20	101,5	73,4	19,7	5,2	103,7	70,7	21,9	4,7	101,9	69,2	24,2	4,2	97,4	69,8	26,6	3,7	92,0	70,7	29,5	3,1	–	–	–	–
	30 / 22	106,5	72,2	20,0	5,3	106,8	70,5	22,2	4,8	106,1	68,5	24,6	4,3	101,0	69,3	27,0	3,7	95,7	70,2	30,0	3,2	–	–	–	–
47000 m³/h	22 / 16	97,0	74,1	19,3	5,0	98,3	70,1	21,5	4,6	96,9	69,4	23,7	4,1	93,0	69,5	26,1	3,6	87,8	70,5	29,0	3,0	84,2	71,9	32,6	2,6
	24 / 17	98,9	77,0	19,5	5,1	100,1	73,4	21,6	4,6	99,1	71,8	23,9	4,1	94,9	72,1	26,2	3,6	89,1	73,8	29,2	3,1	86,0	75,0	32,7	2,6
	26 / 18	101,0	79,8	19,6	5,2	102,6	75,8	21,8	4,7	101,3	74,1	24,1	4,2	96,5	75,0	26,5	3,6	90,9	76,7	29,5	3,1	–	–	–	–
	27 / 19	103,2	79,4	19,8	5,2	104,9	75,5	22,0	4,8	103,0	74,2	24,3	4,2	98,3	74,8	26,7	3,7	92,7	76,5	29,7	3,1	–	–	–	–
	28 / 20	105,5	78,9	19,9	5,3	107,2	75,1	22,2	4,8	104,9	74,1	24,4	4,3	100,1	74,6	26,9	3,7	94,6	76,4	29,9	3,2	–	–	–	–
	30 / 22	110,4	77,8	20,3	5,4	111,5	74,5	22,5	5,0	108,9	73,4	24,8	4,4	103,9	74,0	27,3	3,8	98,3	76,0	30,3	3,2	–	–	–	–

Heating performance with 30% of outdoor air

Airflow	Ta (°C) DB	Outdoor air temperature °C.D.B/W.B.																		
		-7 / -8			-5 / -6			0 / -1			2 / 1			7 / 6			12 / 11		
		kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
12000 m³/h	10	65,2	14,4	4,5	69,6	15,1	4,6	80,5	16,9	4,8	85,1	17,7	4,8	96,1	19,6	4,9	107,8	21,7	5,0
	15	65,3	15,5	4,2	69,7	16,2	4,3	80,3	18	4,5	84,5	18,8	4,5	94,7	20,9	4,5	105,6	23,1	4,6
	18	65,4	16,1	4,1	69,6	16,9	4,1	79,8	18,8	4,2	83,8	19,6	4,3	93,7	21,6	4,3	104,2	24	4,3
	20	65,3	16,6	3,9	69,4	17,3	4,0	79,4	19,2	4,1	83,3	20	4,2	93,1	22,1	4,2	103,3	24,5	4,2
	22	65,2	17	3,8	69,3	17,8	3,9	79,1	19,7	4,0	82,9	20,5	4,0	92,5	22,7	4,1	102,3	25,1	4,1
	25	65	17,6	3,7	69	18,4	3,8	78,5	20,5	3,8	82,4	21,3	3,9	91,6	23,5	3,9	101,1	26	3,9
17000 m³/h	10	64,8	13	5,0	69,1	13,6	5,1	81	15,2	5,3	85,6	15,9	5,4	97,5	17,5	5,6	110,6	19,2	5,8
	15	64,9	14	4,6	69,2	14,7	4,7	80,6	16,3	4,9	85,2	16,9	5,0	96,6	18,7	5,2	108,9	20,5	5,3
	18	65	14,7	4,4	69,1	15,3	4,5	80,3	16,9	4,8	84,8	17,6	4,8	96	19,4	4,9	107,7	21,3	5,1
	20	64,9	15,1	4,3	69	15,7	4,4	80	17,4	4,6	84,5	18,1	4,7	95,4	19,9	4,8	106,8	21,8	4,9
	22	64,9	15,5	4,2	68,9	16,1	4,3	79,8	17,8	4,5	84,2	18,5	4,6	94,8	20,3	4,7	105,9	22,3	4,7
	25	64,8	16,1	4,0	68,8	16,8	4,1	79,4	18,5	4,3	83,7	19,2	4,4	93,9	21,1	4,5	104,6	23,1	4,5
20000 m³/h	10	–	–	-	69,2	13	5,3	81	14,5	5,6	85,8	15,2	5,6	98,1	16,7	5,9	111,5	18,3	6,1
	15	65	13,5	4,8	69,3	14,1	4,9	80,9	15,7	5,2	85,6	16,3	5,3	97	17,8	5,4	109,8	19,5	5,6
	18	65,1	14,1	4,6	69,3	14,7	4,7	80,5	16,3	4,9	85	16,9	5,0	96,1	18,5	5,2	108,7	20,2	5,4
	20	65	14,5	4,5	69,2	15,1	4,6	80,2	16,7	4,8	84,5	17,3	4,9	95,7	18,9	5,1	108	20,6	5,2
	22	64,9	14,9	4,4	69	15,6	4,4	79,9	17,1	4,7	84,2	17,7	4,8	95,3	19,4	4,9	107,3	21,1	5,1
	25	64,7	15,6	4,1	68,8	16,2	4,2	79,7	17,8	4,5	84	18,4	4,6	94,7	20,1	4,7	106,2	21,9	4,8

Ta = Indoor air temperature D.B/W.B
DB = Dry bulb
WB = Wet bulb
kWf = Cooling capacity in kW
kWs = Sensible cooling capacity (kW)
kWe = Compressor power input in kW
kWt = Heating capacity (kW)
EER referred only to compressors
COP referred only to compressors
The fan motor heating is not considered

Size 35.2 CBK configuration

Cooling performance with 30% of outdoor 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
16000 m³/h	22 / 16	108,7	82,9	21,2	5,1	111,0	78,8	23,8	4,7	111,2	76,1	26,6	4,2	107,2	75,5	29,6	3,6	100,9	77,2	32,6	3,1	96,3	75,9	37,7	2,6
	24 / 17	111,6	85,1	21,3	5,2	113,4	81,9	24,0	4,7	113,5	78,6	26,8	4,2	109,4	78,2	29,8	3,7	103,7	79,0	33,0	3,1	97,9	78,3	37,7	2,6
	26 / 18	114,5	87,1	21,5	5,3	115,9	84,2	24,2	4,8	115,6	81,1	27,0	4,3	110,8	82,0	29,9	3,7	105,9	81,5	33,3	3,2	99,8	80,8	37,8	2,6
	27 / 19	117,0	86,9	21,7	5,4	118,4	83,8	24,3	4,9	118,3	80,5	27,2	4,3	113,1	81,6	30,1	3,8	107,9	81,2	33,5	3,2	101,6	80,7	37,9	2,7
	28 / 20	119,5	86,6	21,8	5,5	120,9	83,4	24,5	4,9	120,8	80,2	27,4	4,4	115,4	81,2	30,3	3,8	109,9	80,9	33,8	3,3	103,4	80,5	38,1	2,7
	30 / 22	124,7	86,0	22,1	5,6	126,6	82,7	24,9	5,1	125,6	80,0	27,7	4,5	120,0	80,4	30,7	3,9	114,2	80,3	34,4	3,3	–	–	–	–
18500 m³/h	22 / 16	112,7	86,6	21,4	5,3	114,9	82,5	24,1	4,8	114,6	79,7	26,9	4,3	110,0	79,4	29,9	3,7	103,6	80,6	33,1	3,1	98,1	81,5	37,9	2,6
	24 / 17	115,3	89,3	21,6	5,3	117,3	85,7	24,3	4,8	116,8	82,9	27,1	4,3	112,3	82,3	30,1	3,7	105,9	84,6	33,2	3,2	100,0	84,3	38,1	2,6
	26 / 18	117,9	91,8	21,8	5,4	119,6	88,8	24,4	4,9	118,8	86,1	27,2	4,4	113,9	86,4	30,2	3,8	108,2	87,2	33,5	3,2	102,4	87,1	38,4	2,7
	27 / 19	120,6	91,5	21,9	5,5	122,1	88,5	24,6	5,0	121,3	86,0	27,4	4,4	116,2	86,1	30,4	3,8	110,3	86,9	33,8	3,3	104,3	87,1	38,6	2,7
	28 / 20	123,4	91,2	22,1	5,6	124,5	88,2	24,8	5,0	123,8	85,7	27,6	4,5	118,5	85,8	30,6	3,9	112,4	86,6	34,1	3,3	106,2	87,1	38,9	2,7
	30 / 22	128,9	90,4	22,4	5,8	130,3	87,2	25,2	5,2	128,7	85,2	28,0	4,6	123,1	85,0	31,0	4,0	116,7	85,8	34,6	3,4	–	–	–	–
25000 m³/h	22 / 16	120,9	96,2	21,9	5,5	122,3	91,9	24,6	5,0	120,9	89,4	27,4	4,4	116,0	88,9	30,4	3,8	109,1	91,5	33,6	3,2	104,4	94,6	38,8	2,7
	24 / 17	123,3	100,3	22,1	5,6	124,6	96,1	24,8	5,0	123,9	92,4	27,6	4,5	118,4	92,7	30,6	3,9	110,5	95,7	34,1	3,2	106,3	98,7	39,1	2,7
	26 / 18	125,8	104,1	22,2	5,7	127,3	99,7	25,0	5,1	126,8	95,5	27,8	4,6	120,4	96,7	30,8	3,9	112,6	99,8	34,3	3,3	109,0	101,6	39,4	2,8
	27 / 19	128,6	103,4	22,4	5,7	129,9	99,3	25,1	5,2	129,1	95,4	28,0	4,6	122,5	96,7	31,0	4,0	114,6	99,9	34,5	3,3	110,7	102,0	39,7	2,8
	28 / 20	131,4	102,5	22,6	5,8	132,6	98,8	25,3	5,2	131,5	95,3	28,2	4,7	124,6	96,6	31,2	4,0	116,7	99,9	34,7	3,4	112,5	102,4	40,0	2,8
	30 / 22	137,5	100,5	22,9	6,0	138,6	97,3	25,7	5,4	136,2	94,8	28,6	4,8	129,0	96,4	31,6	4,1	120,9	99,8	35,2	3,4	–	–	–	–

Heating performance with 30% of outdoor air

Airflow	Ta (°C) DB	Outdoor air temperature °C.D.B/W.B.																		
		-7 / -8			-5 / -6			0 / -1			2 / 1			7 / 6			12 / 11		
		kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
16000 m³/h	10	79,7	15,9	5,0	84,9	16,6	5,1	98,2	18,5	5,3	103,9	19,2	5,4	118	21,3	5,5	133,2	23,7	5,6
	15	79,6	17,2	4,6	84,8	17,9	4,7	98	19,8	4,9	103,4	20,7	5,0	116,6	22,9	5,1	130,4	25,3	5,2
	18	79,6	17,9	4,4	84,7	18,7	4,5	97,4	20,7	4,7	102,7	21,6	4,8	115,6	23,8	4,9	128,8	26,3	4,9
	20	79,5	18,5	4,3	84,4	19,3	4,4	97	21,3	4,6	102,2	22,2	4,6	114,8	24,5	4,7	127,7	27	4,7
	22	79,3	19	4,2	84,2	19,8	4,3	96,6	21,9	4,4	101,7	22,8	4,5	114,1	25,1	4,5	126,7	27,7	4,6
	25	79	19,8	4,0	83,9	20,6	4,1	96,2	22,8	4,2	101,1	23,7	4,3	112,9	26,1	4,3	125	28,8	4,3
18500 m³/h	10	-	-	-	85	16	5,3	98,5	17,7	5,6	104,2	18,5	5,6	118,5	20,4	5,8	134,2	22,5	6,0
	15	79,7	16,6	4,8	84,9	17,3	4,9	98,3	19,1	5,1	103,7	19,8	5,2	117,1	21,8	5,4	131,7	24	5,5
	18	79,6	17,3	4,6	84,7	18	4,7	97,8	19,9	4,9	103	20,7	5,0	116	22,7	5,1	130,3	25	5,2
	20	79,4	17,8	4,5	84,5	18,6	4,5	97,4	20,4	4,8	102,5	21,3	4,8	115,4	23,4	4,9	129,3	25,7	5,0
	22	79,3	18,4	4,3	84,2	19,1	4,4	97,1	21	4,6	102,1	21,8	4,7	114,8	24	4,8	128,4	26,4	4,9
	25	79	19,1	4,1	83,8	19,9	4,2	96,6	21,9	4,4	101,5	22,8	4,5	113,9	24,9	4,6	126,9	27,5	4,6
25000 m³/h	10	-	-	-	84,9	14,8	5,7	98,8	16,3	6,1	104,6	16,9	6,2	119,4	18,5	6,5	136	20,3	6,7
	15	79,7	15,4	5,2	84,9	16	5,3	98,4	17,5	5,6	104	18,2	5,7	118,2	19,9	5,9	133,9	21,7	6,2
	18	79,7	16,1	5,0	84,8	16,7	5,1	97,8	18,3	5,3	103,3	19	5,4	117,4	20,7	5,7	132,7	22,6	5,9
	20	79,5	16,6	4,8	84,5	17,2	4,9	97,4	18,8	5,2	102,9	19,5	5,3	116,8	21,3	5,5	131,9	23,2	5,7
	22	79,3	17,1	4,6	84,3	17,7	4,8	97,1	19,3	5,0	102,6	20	5,1	116,3	21,9	5,3	131,1	23,9	5,5
	25	79,1	17,8	4,4	84	18,5	4,5	96,9	20,2	4,8	102,2	20,9	4,9	115,6	22,8	5,1	129,8	24,8	5,2

Ta = Indoor air temperature D.B/W.B
DB = Dry bulb
WB = Wet bulb
kWf = Cooling capacity in kW
kWs = Sensible cooling capacity (kW)
kWe = Compressor power input in kW
kWt = Heating capacity (kW)
EER referred only to compressors
COP referred only to compressors
The fan motor heating is not considered

Size 40.2 CBK configuration

Cooling performance with 30% of outdoor 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
16000 m³/h	22 / 16	114,1	85,3	23,7	4,8	116,5	81,6	26,7	4,4	117,6	77,9	30,2	3,9	112,8	77,8	33,7	3,3	107,7	78,9	37,0	2,9	103,0	80,9	42,9	2,4
	24 / 17	117,0	87,1	23,9	4,9	118,3	85,0	26,8	4,4	120,0	80,7	30,4	3,9	114,8	81,0	33,9	3,4	109,4	81,8	37,2	2,9	105,9	83,0	43,1	2,5
	26 / 18	120,0	89,0	24,1	5,0	121,2	86,8	27,0	4,5	122,6	83,3	30,5	4,0	117,0	83,9	34,0	3,4	111,9	83,9	37,5	3,0	109,1	85,0	43,5	2,5
	27 / 19	122,4	89,1	24,2	5,1	124,0	86,2	27,2	4,6	125,2	82,9	30,8	4,1	119,3	83,8	34,2	3,5	114,1	83,6	37,8	3,0	111,7	84,8	43,8	2,6
	28 / 20	124,9	89,1	24,3	5,1	126,9	85,6	27,4	4,6	127,7	82,6	31,0	4,1	121,7	83,6	34,4	3,5	116,4	83,4	38,1	3,1	114,3	84,5	44,1	2,6
	30 / 22	130,3	88,9	24,6	5,3	133,6	84,9	27,9	4,8	132,7	82,1	31,4	4,2	126,5	83,1	34,8	3,6	120,9	82,7	38,6	3,1	–	–	–	–
21000 m³/h	22 / 16	123,8	93,0	24,1	5,1	126,3	88,8	27,3	4,6	125,7	84,5	30,8	4,1	119,8	85,7	34,3	3,5	114,4	85,6	37,8	3,0	110,0	88,1	43,8	2,5
	24 / 17	126,6	95,9	24,3	5,2	128,6	92,5	27,4	4,7	128,1	87,9	31,0	4,1	122,0	89,0	34,5	3,5	116,9	88,7	38,1	3,1	113,1	91,7	44,0	2,6
	26 / 18	129,2	98,9	24,5	5,3	131,0	95,1	27,6	4,7	130,6	91,0	31,2	4,2	125,7	92,0	34,7	3,6	119,4	92,3	38,4	3,1	115,9	95,1	44,4	2,6
	27 / 19	132,0	98,7	24,6	5,4	133,7	94,5	27,8	4,8	133,1	91,9	31,3	4,3	128,0	91,8	34,9	3,7	121,6	92,4	38,7	3,1	118,4	95,4	44,6	2,7
	28 / 20	134,8	98,3	24,8	5,4	136,4	93,9	28,0	4,9	135,7	92,0	31,5	4,3	130,5	91,4	35,1	3,7	123,8	92,6	39,0	3,2	121,0	95,6	45,0	2,7
	30 / 22	140,5	97,7	25,2	5,6	142,3	93,7	28,5	5,0	141,1	91,2	31,9	4,4	135,4	90,7	35,5	3,8	128,4	92,6	39,5	3,3	–	–	–	–
25000 m³/h	22 / 16	128,8	99,1	24,5	5,3	131,1	94,5	27,7	4,7	129,7	91,9	31,0	4,2	124,4	91,0	34,7	3,6	117,5	92,6	38,4	3,1	115,6	94,4	44,7	2,6
	24 / 17	131,5	102,8	24,6	5,3	133,6	98,4	27,8	4,8	132,6	95,1	31,2	4,3	126,8	94,6	34,9	3,6	121,2	94,9	38,5	3,1	118,1	98,1	45,1	2,6
	26 / 18	134,2	106,4	24,8	5,4	136,5	101,8	28,0	4,9	135,0	98,6	31,4	4,3	128,8	99,0	35,1	3,7	123,4	98,4	38,9	3,2	120,6	101,6	45,6	2,6
	27 / 19	137,2	105,9	25,0	5,5	139,3	101,4	28,2	4,9	137,5	98,7	31,6	4,4	131,3	98,7	35,4	3,7	125,3	98,5	39,2	3,2	122,7	101,7	46,0	2,7
	28 / 20	140,2	105,2	25,2	5,6	142,3	100,9	28,4	5,0	140,1	98,5	31,8	4,4	133,9	98,3	35,6	3,8	127,3	98,4	39,5	3,2	124,8	101,8	46,4	2,7
	30 / 22	146,4	103,5	25,6	5,7	148,1	100,0	28,8	5,1	145,6	97,8	32,2	4,5	139,0	97,4	36,0	3,9	131,6	98,1	40,1	3,3	–	–	–	–

Heating performance with 30% of outdoor air

Airflow	Ta (°C) DB	Outdoor air temperature °C.D.B/W.B.																		
		-7 / -8			-5 / -6			0 / -1			2 / 1			7 / 6			12 / 11		
		kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
16000 m³/h	10	90.5	20.4	4,5	96,2	21,3	4,5	111,5	23,9	4,7	117,5	25	4,7	132	27,7	4,8	147,2	31	4,7
	15	90.8	22.0	4,1	96,8	22,9	4,2	111	25,6	4,3	116,6	26,8	4,4	130,1	29,7	4,4	143,8	33	4,4
	18	91.0	22.9	4,1	96,9	23,9	4,1	110,1	26,7	4,1	115,6	27,9	4,1	128,8	31	4,2	141,9	34,2	4,1
	20	90.8	23.6	3,9	96,5	24,7	3,9	109,5	27,5	4,0	114,9	28,7	4,0	127,8	31,8	4,0	140,9	35	4,0
	22	90.6	24.3	3,7	96,1	25,4	3,8	108,8	28,2	3,9	114,2	29,5	3,9	126,7	32,6	3,9	139,8	35,8	3,9
	25	90.2	25.3	3,6	95,6	26,4	3,6	108,1	29,3	3,7	113,2	30,6	3,7	125,1	33,7	3,7	138,6	37,2	3,7
21000 m³/h	10	90.6	18.8	5,0	96,3	19,6	4,9	111,6	21,6	5,2	118,2	22,5	5,3	134,1	24,9	5,4	151,1	27,6	5,5
	15	90.7	20.2	4,5	96,4	21,1	4,6	111,5	23,2	4,8	117,7	24,2	4,9	132,3	26,7	5,0	148,2	29,6	5,0
	18	90.7	21.1	4,3	96,4	22	4,4	110,9	24,2	4,6	116,9	25,2	4,6	130,9	27,7	4,7	146,3	30,7	4,8
	20	90.6	21.7	4,3	96,2	22,7	4,2	110,5	24,9	4,4	116,3	25,9	4,5	130,2	28,5	4,6	145	31,5	4,6
	22	90.4	22.4	4,1	96,1	23,3	4,1	110,1	25,5	4,3	115,8	26,6	4,4	129,5	29,3	4,4	143,7	32,2	4,5
	25	90.2	23.3	3,9	95,8	24,3	3,9	109,5	26,7	4,1	115,1	27,8	4,1	128,4	30,5	4,2	142	33,4	4,3
25000 m³/h	10	–	–	-	96,8	18,7	5,2	112	20,5	5,5	118,6	21,3	5,6	134,6	23,3	5,8	152,7	25,7	5,9
	15	91.0	19.3	4,8	96,8	20,1	4,8	111,6	22	5,1	117,9	22,9	5,1	133,4	25	5,3	149,9	27,6	5,4
	18	91.0	20.1	4,5	96,6	20,9	4,6	111,2	23,1	4,8	117,4	23,9	4,9	132,6	26,1	5,1	148,2	28,7	5,2
	20	90.7	20.7	4,5	96,2	21,5	4,5	110,9	23,7	4,7	117,1	24,6	4,8	131,9	26,8	4,9	147,1	29,4	5,0
	22	90.5	21.3	4,3	95,9	22,2	4,3	110,7	24,4	4,5	116,7	25,3	4,6	131,1	27,5	4,8	145,9	30,2	4,8
	25	90.1	22.2	4,1	95,4	23,1	4,1	110,1	25,4	4,3	115,9	26,3	4,4	129,9	28,6	4,5	144,3	31,4	4,6

Ta = Indoor air temperature D.B/W.B
DB = Dry bulb
WB = Wet bulb
kWf = Cooling capacity in kW
kWs = Sensible cooling capacity (kW)
kWe = Compressor power input in kW
kWt = Heating capacity (kW)
EER referred only to compressors
COP referred only to compressors
The fan motor heating is not considered

Size 45.2 CBK configuration

Cooling performance with 30% of outdoor 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
16000 m³/h	22 / 16	125,0	91,6	26,9	4,6	127,9	87,7	30,4	4,2	127,1	85,1	34,2	3,7	122,8	84,0	38,1	3,2	116,6	84,4	42,3	2,8	112,6	85,8	48,6	2,3
	24 / 17	127,3	94,7	27,0	4,7	130,2	90,8	30,6	4,3	129,6	87,8	34,4	3,8	125,3	86,5	38,3	3,3	118,5	87,5	42,6	2,8	115,8	88,1	49,0	2,4
	26 / 18	129,3	98,1	27,1	4,8	132,4	93,9	30,7	4,3	131,8	90,7	34,6	3,8	127,6	89,4	38,5	3,3	121,4	89,7	43,0	2,8	118,7	90,6	49,4	2,4
	27 / 19	132,5	97,4	27,3	4,9	135,0	93,8	30,9	4,4	134,5	90,5	34,8	3,9	130,1	89,0	38,8	3,4	123,8	89,5	43,3	2,9	121,2	90,4	49,8	2,4
	28 / 20	135,7	96,7	27,5	4,9	137,7	93,7	31,0	4,4	137,3	90,2	35,0	3,9	132,7	88,6	39,0	3,4	126,3	89,2	43,7	2,9	123,8	90,1	50,2	2,5
	30 / 22	142,3	95,1	27,9	5,1	143,8	92,1	31,5	4,6	143,1	89,3	35,5	4,0	138,0	87,6	39,5	3,5	131,4	88,7	44,4	3,0	–	–	–	–
23000 m³/h	22 / 16	137,2	104,2	27,6	5,0	139,3	99,5	31,2	4,5	137,9	95,8	35,0	3,9	132,6	95,0	39,0	3,4	125,3	96,1	43,8	2,9	122,7	98,4	50,0	2,5
	24 / 17	140,3	107,6	27,8	5,0	142,4	102,8	31,4	4,5	140,7	99,4	35,3	4,0	134,9	98,8	39,2	3,4	127,6	100,3	44,1	2,9	125,1	102,4	50,1	2,5
	26 / 18	143,5	110,8	28,0	5,1	145,5	106,0	31,6	4,6	143,5	102,9	35,5	4,0	137,4	102,9	39,4	3,5	130,2	104,1	44,5	2,9	–	–	–	–
	27 / 19	146,7	110,3	28,3	5,2	148,5	105,5	31,8	4,7	145,8	103,0	35,7	4,1	139,9	102,7	39,7	3,5	132,7	104,2	44,8	3,0	–	–	–	–
	28 / 20	150,0	109,7	28,5	5,3	151,6	104,9	32,1	4,7	148,6	102,7	35,9	4,1	142,5	102,4	40,0	3,6	135,3	104,3	45,1	3,0	–	–	–	–
	30 / 22	156,8	108,3	29,0	5,4	158,4	103,5	32,6	4,9	154,8	101,6	36,4	4,3	147,8	101,7	40,5	3,6	140,7	104,2	45,8	3,1	–	–	–	–
25000 m³/h	22 / 16	140,4	107,2	27,8	5,1	141,9	102,7	31,3	4,5	140,3	99,0	35,2	4,0	135,0	98,0	39,2	3,4	127,1	99,6	44,1	2,9	124,4	101,2	50,2	2,5
	24 / 17	143,6	110,7	28,0	5,1	144,9	106,5	31,5	4,6	143,0	102,9	35,4	4,0	137,3	102,1	39,5	3,5	129,9	103,7	44,4	2,9	–	–	–	–
	26 / 18	147,0	113,9	28,2	5,2	148,1	109,9	31,8	4,7	145,9	106,5	35,7	4,1	139,7	106,4	39,6	3,5	132,5	107,7	44,9	3,0	–	–	–	–
	27 / 19	150,2	113,4	28,5	5,3	151,2	109,4	32,1	4,7	148,1	106,2	35,9	4,1	142,3	106,1	39,9	3,6	135,1	107,9	45,2	3,0	–	–	–	–
	28 / 20	153,5	112,8	28,7	5,3	154,3	108,9	32,3	4,8	150,9	105,8	36,1	4,2	144,9	105,8	40,2	3,6	137,7	107,9	45,6	3,0	–	–	–	–
	30 / 22	160,3	111,4	29,3	5,5	161,8	106,6	32,8	4,9	157,3	104,6	36,7	4,3	150,2	105,0	40,8	3,7	143,4	107,8	46,3	3,1	–	–	–	–

Heating performance with 30% of outdoor air

Airflow	Ta (°C) DB	Outdoor air temperature °C.D.B/W.B.																		
		-7 / -8			-5 / -6			0 / -1			2 / 1			7 / 6			12 / 11		
		kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
16000 m³/h	10	100.2	22.3	4,5	106,6	23,3	4,6	124	26,1	4,8	130,7	27,2	4,8	147,1	30,2	4,9	164,3	33,7	4,9
	15	100.4	24.1	4,2	106,8	25,1	4,3	123,6	28	4,4	129,7	29,3	4,4	144,8	32,4	4,5	160,6	36,1	4,4
	18	100.6	25.1	4,0	106,8	26,3	4,1	122,7	29,3	4,2	128,6	30,6	4,2	143,2	33,8	4,2	158,5	37,6	4,2
	20	100.4	25.9	4,0	106,5	27,1	3,9	122,1	30,2	4,0	127,9	31,4	4,1	142,2	34,8	4,1	157,2	38,6	4,1
	22	100.2	26.7	3,8	106,2	27,9	3,8	121,5	31,1	3,9	127,2	32,3	3,9	141,2	35,8	3,9	155,9	39,7	3,9
	25	99.8	27.9	3,7	105,8	29,1	3,6	120,8	32,4	3,7	126,3	33,7	3,7	139,9	37,2	3,8	152,1	40,7	3,7
23000 m³/h	10	100.4	20.1	5,0	107	20,9	5,1	124	23,1	5,4	131,1	24	5,5	149,1	26,3	5,7	168,7	29	5,8
	15	100.3	21.7	4,7	106,8	22,6	4,7	124	24,8	5,0	130,7	25,7	5,1	147,5	28,3	5,2	165,9	31,1	5,3
	18	100.3	22.7	4,5	106,7	23,6	4,5	123,3	25,9	4,8	129,9	26,9	4,8	146,4	29,5	5,0	164,2	32,4	5,1
	20	100.2	23.4	4,3	106,5	24,3	4,4	122,9	26,6	4,6	129,4	27,7	4,7	145,7	30,3	4,8	163,2	33,4	4,9
	22	100.1	24.1	4,2	106,3	25	4,3	122,5	27,4	4,5	128,9	28,5	4,5	145	31,2	4,6	162,1	34,3	4,7
	25	99.9	25.1	4,0	106,1	26,1	4,1	121,9	28,6	4,3	128,3	29,7	4,3	144	32,5	4,4	160,3	35,7	4,5
25000 m³/h	10	–	–	#DIV/0!	107,2	20,4	5,3	124	22,5	5,5	131,3	23,3	5,6	149,6	25,5	5,9	169,3	28	6,0
	15	100.3	21.2	4,8	106,9	22	4,9	124	24,1	5,1	130,9	25	5,2	147,9	27,4	5,4	166,7	30	5,6
	18	100.2	22.2	4,5	106,7	23	4,6	123,4	25,2	4,9	130,1	26,2	5,0	146,7	28,6	5,1	165,2	31,3	5,3
	20	100.1	22.9	4,5	106,5	23,7	4,5	123	26	4,7	129,5	26,9	4,8	146,1	29,4	5,0	164,2	32,3	5,1
	22	100.0	23.5	4,3	106,3	24,4	4,4	122,6	26,7	4,6	129,1	27,7	4,7	145,5	30,3	4,8	163,3	33,2	4,9
	25	99.8	24.6	4,1	106	25,4	4,2	122,1	27,9	4,4	128,5	28,9	4,4	144,6	31,5	4,6	161,5	34,6	4,7

Ta = Indoor air temperature D.B/W.B
DB = Dry bulb
WB = Wet bulb
kWf = Cooling capacity in kW
kWs = Sensible cooling capacity (kW)
kWe = Compressor power input in kW
kWt = Heating capacity (kW)
EER referred only to compressors
COP referred only to compressors
The fan motor heating is not considered

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
15.1	Airflow	m3/h	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000
	Airflow	l/s	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
	Fan RPM	rpm	881	892	911	940	968	997	1025	1052	1079	1108	1134	1162	1187	1214	1262
	Total input	kW	0,83	0,87	0,93	1,03	1,13	1,24	1,35	1,46	1,58	1,70	1,82	1,95	2,07	2,21	2,48
20.1	Airflow	m3/h	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	-	-	-	-
	Airflow	l/s	3194	3194	3194	3194	3194	3194	3194	3194	3194	3194	3194	-	-	-	-
	Fan RPM	rpm	1067	1075	1090	1114	1137	1158	1182	1204	1226	1248	1271	-	-	-	-
	Total input	kW	1,37	1,41	1,48	1,6	1,73	1,85	1,98	2,11	2,23	2,37	2,51	-	-	-	-
24.2	Airflow	m3/h	13500	13500	13500	13500	13500	13500	13500	13500	13500	13500	13500	13500	13500	13500	13500
	Airflow	l/s	3750	3750	3750	3750	3750	3750	3750	3750	3750	3750	3750	3750	3750	3750	3750
	Fan RPM	rpm	994	1004	1024	1060	1090	1123	1155	1187	1218	1249	1280	1310	1338	1367	1424
	Total input	kW	1,31	1,36	1,46	1,62	1,75	1,89	2,04	2,20	2,36	2,54	2,72	2,90	3,08	3,28	3,68
26.2	Airflow	m3/h	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000
	Airflow	l/s	4167	4167	4167	4167	4167	4167	4167	4167	4167	4167	4167	4167	4167	4167	4167
	Fan RPM	rpm	1079	1090	1108	1137	1167	1195	1226	1256	1285	1311	1339	1367	1395	1422	1477
	Total input	kW	1,60	1,67	1,76	1,94	2,12	2,26	2,42	2,58	2,76	2,92	3,10	3,28	3,48	3,68	4,12
30.2	Airflow	m3/h	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000
	Airflow	l/s	4722	4722	4722	4722	4722	4722	4722	4722	4722	4722	4722	4722	4722	4722	4722
	Fan RPM	rpm	1193	1201	1217	1243	1269	1295	1321	1348	1372	1398	1424	1449	1474	1499	1547
	Total input	kW	2,08	2,12	2,24	2,42	2,60	2,80	3,00	3,16	3,34	3,52	3,70	3,90	4,10	4,30	4,72
35.2	Airflow	m3/h	18500	18500	18500	18500	18500	18500	18500	18500	18500	18500	18500	18500	18500	18500	18500
	Airflow	l/s	5139	5139	5139	5139	5139	5139	5139	5139	5139	5139	5139	5139	5139	5139	5139
	Fan RPM	rpm	908	916	935	963	992	1019	1048	1075	1101	1129	1154	1180	1206	1231	1280
	Total input	kW	1,81	1,87	2,00	2,20	2,42	2,64	2,88	3,10	3,34	3,58	3,82	4,08	4,34	4,62	5,18
40.2	Airflow	m3/h	21000	21000	21000	21000	21000	21000	21000	21000	21000	21000	21000	21000	21000	-	-
	Airflow	l/s	5833	5833	5833	5833	5833	5833	5833	5833	5833	5833	5833	5833	5833	-	-
	Fan RPM	rpm	999	1007	1024	1048	1047	1098	1123	1148	1172	1197	1221	1244	1269	-	-
	Total input	kW	2,32	2,38	2,54	2,76	3,00	3,22	3,46	3,72	3,96	4,24	4,52	4,78	5,06	-	-
45.2	Airflow	m3/h	23000	23000	23000	23000	23000	23000	23000	23000	23000	23000	23000	-	-	-	-
	Airflow	l/s	6389	6389	6389	6389	6389	6389	6389	6389	6389	6389	6389	-	-	-	-
	Fan RPM	rpm	1074	1082	1097	1119	1142	1165	1187	1210	1232	1255	1277	-	-	-	-
	Total input	kW	2,80	2,88	3,04	3,26	3,52	3,78	4,02	4,28	4,54	4,82	5,10	-	-	-	-

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
15.1	Airflow	m3/h	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500
	Airflow	l/s	2361	2361	2361	2361	2361	2361	2361	2361	2361	2361	2361	2361	2361	2361	2361
	Fan RPM	rpm	846	856	876	906	938	967	998	1026	1054	1084	1111	1139	1165	1191	1242
	Total input	kW	0,75	0,78	0,85	0,94	1,04	1,14	1,26	1,36	1,47	1,59	1,71	1,84	1,96	2,09	2,34
20.1	Airflow	m3/h	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500
	Airflow	l/s	2361	2361	2361	2361	2361	2361	2361	2361	2361	2361	2361	2361	2361	2361	2361
	Fan RPM	rpm	846	856	876	906	938	967	998	1026	1054	1084	1111	1139	1165	1191	1242
	Total input	kW	0,75	0,78	0,85	0,94	1,04	1,14	1,26	1,36	1,47	1,59	1,71	1,84	1,96	2,09	2,34
24.2	Airflow	m3/h	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000
	Airflow	l/s	3333	3333	3333	3333	3333	3333	3333	3333	3333	3333	3333	3333	3333	3333	3333
	Fan RPM	rpm	917	928	954	988	1024	1060	1095	1127	1164	1197	1230	1262	1293	1322	1382
	Total input	kW	1,09	1,13	1,22	1,34	1,47	1,61	1,76	1,91	2,08	2,21	2,42	2,60	2,78	2,94	3,34
26.2	Airflow	m3/h	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000
	Airflow	l/s	3333	3333	3333	3333	3333	3333	3333	3333	3333	3333	3333	3333	3333	3333	3333
	Fan RPM	rpm	917	928	954	988	1024	1060	1095	1127	1164	1197	1230	1262	1293	1322	1382
	Total input	kW	1,09	1,13	1,22	1,34	1,47	1,61	1,76	1,91	2,08	2,21	2,42	2,60	2,78	2,94	3,34
30.2	Airflow	m3/h	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000
	Airflow	l/s	3333	3333	3333	3333	3333	3333	3333	3333	3333	3333	3333	3333	3333	3333	3333
	Fan RPM	rpm	917	928	954	988	1024	1060	1095	1127	1164	1197	1230	1262	1293	1322	1382
	Total input	kW	1,09	1,13	1,22	1,34	1,47	1,61	1,76	1,91	2,08	2,21	2,42	2,60	2,78	2,94	3,34
35.2	Airflow	m3/h	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000
	Airflow	l/s	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444
	Fan RPM	rpm	821	833	853	886	917	949	980	1010	1040	1069	1097	1125	1152	1178	1230
	Total input	kW	1,42	1,48	1,59	1,78	1,98	2,20	2,40	2,60	2,82	3,06	3,28	3,52	3,76	4,00	4,52
40.2	Airflow	m3/h	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000
	Airflow	l/s	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444
	Fan RPM	rpm	821	833	853	886	917	949	980	1010	1040	1069	1097	1125	1152	1178	1230
	Total input	kW	1,42	1,48	1,59	1,78	1,98	2,20	2,40	2,60	2,82	3,06	3,28	3,52	3,76	4,00	4,52
45.2	Airflow	m3/h	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000
	Airflow	l/s	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444
	Fan RPM	rpm	821	833	853	886	917	949	980	1010	1040	1069	1097	1125	1152	1178	1230
	Total input	kW	1,42	1,48	1,59	1,78	1,98	2,20	2,40	2,60	2,82	3,06	3,28	3,52	3,76	4,00	4,52

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
15.1	Airflow	m3/h	13000	13000	13000	13000	13000	13000	13000	-	-	-	-	-	-	-
	Airflow	l/s	3611	3611	3611	3611	3611	3611	3611	-	-	-	-	-	-	-
	Fan RPM	rpm	1183	1189	1203	1224	1243	1263	1284	-	-	-	-	-	-	-
	Total input	kW	1,80	1,84	1,93	2,06	2,19	2,32	2,47	-	-	-	-	-	-	-
20.1	Airflow	m3/h	13000	13000	13000	13000	13000	13000	13000	-	-	-	-	-	-	-
	Airflow	l/s	3611	3611	3611	3611	3611	3611	3611	-	-	-	-	-	-	-
	Fan RPM	rpm	1183	1189	1203	1224	1243	1263	1284	-	-	-	-	-	-	-
	Total input	kW	1,80	1,84	1,93	2,06	2,19	2,32	2,47	-	-	-	-	-	-	-
24.2	Airflow	m3/h	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000
	Airflow	l/s	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556
	Fan RPM	rpm	1364	1371	1387	1409	1431	1451	1475	1495	1517	1540	1562	1584	1607	1627
	Total input	kW	2,94	3,00	3,14	3,34	3,54	3,74	3,98	4,18	4,42	4,68	4,88	5,08	5,30	5,50
26.2	Airflow	m3/h	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000
	Airflow	l/s	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556
	Fan RPM	rpm	1364	1371	1387	1409	1431	1451	1475	1495	1517	1540	1562	1584	1607	1627
	Total input	kW	2,94	3,00	3,14	3,34	3,54	3,74	3,98	4,18	4,42	4,68	4,88	5,08	5,30	5,50
30.2	Airflow	m3/h	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000
	Airflow	l/s	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556
	Fan RPM	rpm	1364	1371	1387	1409	1431	1451	1475	1495	1517	1540	1562	1584	1607	1627
	Total input	kW	2,94	3,00	3,14	3,34	3,54	3,74	3,98	4,18	4,42	4,68	4,88	5,08	5,30	5,50
35.2	Airflow	m3/h	25000	25000	25000	25000	25000	25000	25000	25000	-	-	-	-	-	-
	Airflow	l/s	6944	6944	6944	6944	6944	6944	6944	6944	-	-	-	-	-	-
	Fan RPM	rpm	1154	1161	1175	1196	1217	1237	1257	1279	-	-	-	-	-	-
	Total input	kW	3,42	3,48	3,64	3,90	4,16	4,42	4,70	5,00	-	-	-	-	-	-
40.2	Airflow	m3/h	25000	25000	25000	25000	25000	25000	25000	25000	-	-	-	-	-	-
	Airflow	l/s	6944	6944	6944	6944	6944	6944	6944	6944	-	-	-	-	-	-
	Fan RPM	rpm	1154	1161	1175	1196	1217	1237	1257	1279	-	-	-	-	-	-
	Total input	kW	3,42	3,48	3,64	3,90	4,16	4,42	4,70	5,00	-	-	-	-	-	-
45.2	Airflow	m3/h	25000	25000	25000	25000	25000	25000	25000	25000	-	-	-	-	-	-
	Airflow	l/s	6944	6944	6944	6944	6944	6944	6944	6944	-	-	-	-	-	-
	Fan RPM	rpm	1154	1161	1175	1196	1217	1237	1257	1279	-	-	-	-	-	-
	Total input	kW	3,42	3,48	3,64	3,90	4,16	4,42	4,70	5,00	-	-	-	-	-	-

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	820	900	960	1020
15.1	Airflow	m3/h	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000	9000
	Airflow	l/s	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
	Fan RPM	rpm	1587	1627	1671	1714	1757	1800	1843	1884	1925	1951	2005	2044	2080
	Total input	kW	1,89	2,06	2,26	2,47	2,68	2,89	3,11	3,33	3,57	3,72	4,06	4,29	4,52
20.1	Airflow	m3/h	11500	11500	11500	11500	11500	11500	11500	11500	11500	11500	-	-	-
	Airflow	l/s	3194	3194	3194	3194	3194	3194	3194	3194	3194	3194	-	-	-
	Fan RPM	rpm	1905	1941	1977	2011	2045	2077	2113	2145	2179	2203	-	-	-
	Total input	kW	3,03	3,24	3,47	3,70	3,94	4,16	4,44	4,69	4,96	5,15	-	-	-
24.2	Airflow	m3/h	13500	13500	13500	13500	13500	13500	13500	13500	13500	13500	13500	13500	13500
	Airflow	l/s	3750	3750	3750	3750	3750	3750	3750	3750	3750	3750	3750	3750	3750
	Fan RPM	rpm	1347	1403	1458	1511	1563	1614	1663	1712	1760	1790	1849	1898	1939
	Total input	kW	2,58	2,92	3,26	3,62	3,98	4,34	4,72	5,12	5,52	5,8	6,32	6,76	7,16
26.2	Airflow	m3/h	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000	15000
	Airflow	l/s	4167	4167	4167	4167	4167	4167	4167	4167	4167	4167	4167	4167	4167
	Fan RPM	rpm	1436	1484	1535	1584	1633	1680	1727	1773	1819	1847	1906	1949	1986
	Total input	kW	3,02	3,34	3,70	4,08	4,48	4,88	5,28	5,68	6,10	6,36	6,96	7,42	7,84
30.2	Airflow	m3/h	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000	17000
	Airflow	l/s	4722	4722	4722	4722	4722	4722	4722	4722	4722	4722	4722	4722	4722
	Fan RPM	rpm	1553	1599	1645	1691	1736	1777	1820	1863	1904	1931	1987	2027	2067
	Total input	kW	3,66	4,04	4,44	4,82	5,24	5,62	6,06	6,52	6,98	7,26	7,88	8,36	8,84
35.2	Airflow	m3/h	18500	18500	18500	18500	18500	18500	18500	18500	18500	18500	18500	18500	18500
	Airflow	l/s	5139	5139	5139	5139	5139	5139	5139	5139	5139	5139	5139	5139	5139
	Fan RPM	rpm	1620	1663	1705	1747	1790	1832	1873	1914	1954	1980	2032	2068	2106
	Total input	kW	4,00	4,38	4,78	5,20	5,62	6,06	6,50	6,96	7,42	7,74	8,42	8,90	9,38
40.2	Airflow	m3/h	21000	21000	21000	21000	21000	21000	21000	21000	21000	21000	21000	21000	-
	Airflow	l/s	5833	5833	5833	5833	5833	5833	5833	5833	5833	5833	5833	5833	-
	Fan RPM	rpm	1780	1818	1856	1893	1931	1965	2003	2040	2077	2100	2150	2185	-
	Total input	kW	5,08	5,48	5,92	6,36	6,82	7,26	7,76	8,24	8,72	9,06	9,76	10,3	-
45.2	Airflow	m3/h	23000	23000	23000	23000	23000	23000	23000	23000	23000	23000	-	-	-
	Airflow	l/s	6389	6389	6389	6389	6389	6389	6389	6389	6389	6389	-	-	-
	Fan RPM	rpm	1910	1938	1974	2009	2043	2077	2108	2145	2176	2198	-	-	-
	Total input	kW	6,12	6,46	6,90	7,36	7,84	8,32	8,80	9,38	9,88	10,24	-	-	-

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 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
15.1	Airflow	m3/h	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500
	Airflow	l/s	2361	2361	2361	2361	2361	2361	2361	2361	2361	2361	2361
	Fan RPM	rpm	1616	1662	1707	1752	1769	1835	1878	1919	1961	1998	2038
	Total input	kW	2,09	2,28	2,48	2,69	2,91	3,11	3,34	3,57	3,80	4,01	4,25
20.1	Airflow	m3/h	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500
	Airflow	l/s	2361	2361	2361	2361	2361	2361	2361	2361	2361	2361	2361
	Fan RPM	rpm	1616	1662	1707	1752	1769	1835	1878	1919	1961	1998	2038
	Total input	kW	2,09	2,28	2,48	2,69	2,91	3,11	3,34	3,57	3,80	4,01	4,25
24.2	Airflow	m3/h	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000
	Airflow	l/s	3333	3333	3333	3333	3333	3333	3333	3333	3333	3333	3333
	Fan RPM	rpm	1391	1444	1500	1554	1607	1658	1709	1758	1807	1858	1898
	Total input	kW	2,90	3,20	3,54	3,90	4,26	4,62	5,00	5,38	5,78	6,22	6,58
26.2	Airflow	m3/h	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000
	Airflow	l/s	3333	3333	3333	3333	3333	3333	3333	3333	3333	3333	3333
	Fan RPM	rpm	1391	1444	1500	1554	1607	1658	1709	1758	1807	1858	1898
	Total input	kW	2,90	3,20	3,54	3,90	4,26	4,62	5,00	5,38	5,78	6,22	6,58
30.2	Airflow	m3/h	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000	12000
	Airflow	l/s	3333	3333	3333	3333	3333	3333	3333	3333	3333	3333	3333
	Fan RPM	rpm	1391	1444	1500	1554	1607	1658	1709	1758	1807	1858	1898
	Total input	kW	2,90	3,20	3,54	3,90	4,26	4,62	5,00	5,38	5,78	6,22	6,58
35.2	Airflow	m3/h	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000
	Airflow	l/s	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444
	Fan RPM	rpm	1568	1617	1664	1710	1755	1796	1840	1884	1926	1971	2009
	Total input	kW	3,90	4,28	4,66	5,08	5,50	5,90	6,32	6,74	7,20	7,68	8,12
40.2	Airflow	m3/h	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000
	Airflow	l/s	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444
	Fan RPM	rpm	1568	1617	1664	1710	1755	1796	1840	1884	1926	1971	2009
	Total input	kW	3,90	4,28	4,66	5,08	5,50	5,90	6,32	6,74	7,20	7,68	8,12
45.2	Airflow	m3/h	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000
	Airflow	l/s	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444
	Fan RPM	rpm	1568	1617	1664	1710	1755	1796	1840	1884	1926	1971	2009
	Total input	kW	3,90	4,28	4,66	5,08	5,50	5,90	6,32	6,74	7,20	7,68	8,12

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 fans" option

High static pressure electric fan performance - High airflow

Available static pressure (Pa) (supply+return)			240	270	300	330	360	390	420	450	510	570	600	720	900	1020
15.1	Airflow	m3/h	13000	13000	13000	13000	13000	13000	13000	13000	13000	-	-	-	-	-
	Airflow	l/s	3611	3611	3611	3611	3611	3611	3611	3611	3611	-	-	-	-	-
	Fan RPM	rpm	2069	2085	2101	2117	2132	2148	2164	2180	2210	-	-	-	-	-
	Total input	kW	3,75	3,85	3,97	4,08	4,19	4,31	4,43	4,56	4,79	-	-	-	-	-
20.1	Airflow	m3/h	13000	13000	13000	13000	13000	13000	13000	13000	13000	-	-	-	-	-
	Airflow	l/s	3611	3611	3611	3611	3611	3611	3611	3611	3611	-	-	-	-	-
	Fan RPM	rpm	2069	2085	2101	2117	2132	2148	2164	2180	2210	-	-	-	-	-
	Total input	kW	3,75	3,85	3,97	4,08	4,19	4,31	4,43	4,56	4,79	-	-	-	-	-
24.2	Airflow	m3/h	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000
	Airflow	l/s	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556
	Fan RPM	rpm	1698	1721	1738	1758	1780	1797	1817	1836	1875	1915	1934	2009	2124	2199
	Total input	kW	4,44	4,66	4,84	5,04	5,28	5,46	5,68	5,90	6,36	6,82	7,04	7,94	9,52	10,64
26.2	Airflow	m3/h	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000
	Airflow	l/s	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556
	Fan RPM	rpm	1698	1721	1738	1758	1780	1797	1817	1836	1875	1915	1934	2009	2124	2199
	Total input	kW	4,44	4,66	4,84	5,04	5,28	5,46	5,68	5,90	6,36	6,82	7,04	7,94	9,52	10,64
30.2	Airflow	m3/h	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000
	Airflow	l/s	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556
	Fan RPM	rpm	1698	1721	1738	1758	1780	1797	1817	1836	1875	1915	1934	2009	2124	2199
	Total input	kW	4,44	4,66	4,84	5,04	5,28	5,46	5,68	5,90	6,36	6,82	7,04	7,94	9,52	10,64
35.2	Airflow	m3/h	25000	25000	25000	25000	25000	25000	25000	25000	25000	25000	25000	-	-	-
	Airflow	l/s	6944	6944	6944	6944	6944	6944	6944	6944	6944	6944	6944	-	-	-
	Fan RPM	rpm	2008	2024	2040	2057	2073	2090	2109	2123	2156	2188	2203	-	-	-
	Total input	kW	6,90	7,12	7,34	7,56	7,78	8,02	8,30	8,50	9,00	9,50	9,76	-	-	-
40.2	Airflow	m3/h	25000	25000	25000	25000	25000	25000	25000	25000	25000	25000	25000	-	-	-
	Airflow	l/s	6944	6944	6944	6944	6944	6944	6944	6944	6944	6944	6944	-	-	-
	Fan RPM	rpm	2008	2024	2040	2057	2073	2090	2109	2123	2156	2188	2203	-	-	-
	Total input	kW	6,90	7,12	7,34	7,56	7,78	8,02	8,30	8,50	9,00	9,50	9,76	-	-	-
45.2	Airflow	m3/h	25000	25000	25000	25000	25000	25000	25000	25000	25000	25000	25000	-	-	-
	Airflow	l/s	6944	6944	6944	6944	6944	6944	6944	6944	6944	6944	6944	-	-	-
	Fan RPM	rpm	2008	2024	2040	2057	2073	2090	2109	2123	2156	2188	2203	-	-	-
	Total input	kW	6,90	7,12	7,34	7,56	7,78	8,02	8,30	8,50	9,00	9,50	9,76	-	-	-

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 fans" option

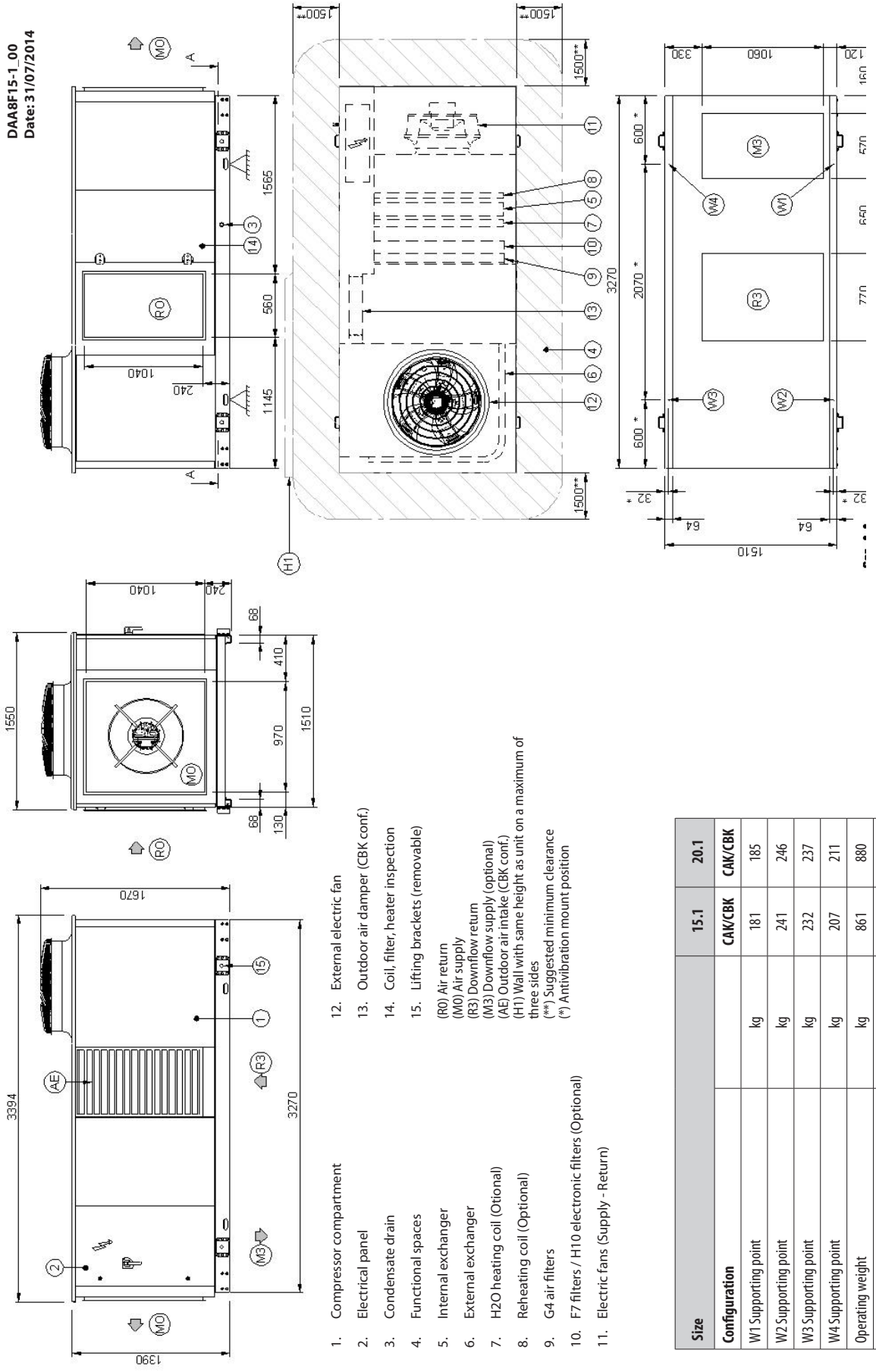
Option compatibility

REF.	DESCRIPTION	CAK	CBK
	Configurations		
CREF0	Device for fan consumption reduction of the external section type on/off	√	√
CREFB	Device for consumption reduction of the external section ECOBREEZE fans	0	0
CHW2	two-rows hot water coil	0	0
3WVM	Modulating 3-way valve	0	0
2WVM	Modulating 2-way valve	0	0
EH	Electric heaters.	0	0
AMRX	Rubber antivibration mounts	◊	◊
RCX	Roof curb	0	0
PCM0	Sandwich panels of the handling zone in M0 fire reaction class	0	0
	Refrigeration circuit		
EVE	Electronic expansion valve	√	√
MHP	High and low pressure gauges	0	0
CPHG	hot gas re-heating coil	0	0
	Aeraulic circuit		
MF	Front air outlet	√	√
M3	Downflow supply	0	0
R0	Horizontal return	√	√
R3	Downflow return	0	0
PCOSM	Constant supply airflow	0	0
PVAR	Variable airflow	0	0
FPG4	Pleated air filter class G4 (EN779 norm)	√	√
F7	High efficiency F7 air filter	0	0
FES	Electronic filters	0	0
PSAF	Clogged filter differential pressure switch air side	0	0
HSE	Immersed electrodes steam humidifier	0	0
HWS	Steam humidifier with disposable water	0	0
LTEMP1	Application for low outdoor temperature	0	0
VENH	High static pressure fans	0	0
PAQC	Air quality probe for CO2 rate check	0	0
PAQCV	Air quality sensor for CO2 and VOC rate check	0	0
SER	Outdoor air damper manually set	-	√
SERM	Outdoor air motorized on/off damper	-	0
SERMD	Modulating motorized outdoor air damper	-	0
	Electric circuit		
THTUNE	Wall mounted electronic room control	√	√
CMSC9	Serial communication module to Modbus supervisor	0	0
CMSC10	Serial communication module to LonWorks supervisor	0	0
CMSC11	Serial communication module for BACnet-IP supervisor	0	0
CLMX	Clivet Master System	◊	◊
DESM	Smoke detector	0	0
PM	Phase monitor	0	0
PFCP	Power factor correction capacitors (cosfi > 0.9)	0	0
SFSTC	Progressive compressor start-up device	0	0
	Various		
PTC0	Set up for shipping via container	0	0

√ Standard component
0 Optional component
◊ Separately supplied accessory (optional)
- Not available

Dimensional drawings

Size 15.1 - 20.1



1. Compressor compartment
2. Electrical panel
3. Condensate drain
4. Functional spaces
5. Internal exchanger
6. External exchanger
7. H2O heating coil (Otional)
8. Reheating coil (Optional)
9. G4 air filters
10. F7 filters / H10 electronic filters (Optional)
11. Electric fans (Supply - Return)
12. External electric fan
13. Outdoor air damper (CBK conf.)
14. Coil, filter, heater inspection
15. Lifting brackets (removable)

(R0) Air return
(M0) Air supply
(R3) Downflow return
(M3) Downflow supply (optional)
(AE) Outdoor air intake (CBK conf.)
(H1) Wall with same height as unit on a maximum of three sides
(***) Suggested minimum clearance
(*) Antivibration mount position

Size		15.1	20.1
Configuration		**CAK/CBK**	**CAK/CBK**
W1 Supporting point	kg	181	185
W2 Supporting point	kg	241	246
W3 Supporting point	kg	232	237
W4 Supporting point	kg	207	211
Operating weight	kg	861	880
Shipping weight	kg	861	880

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

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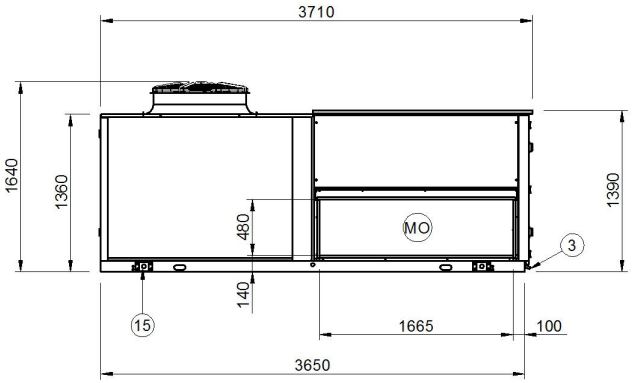
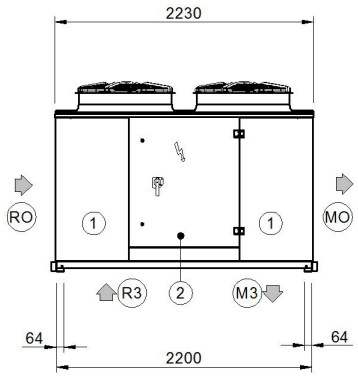
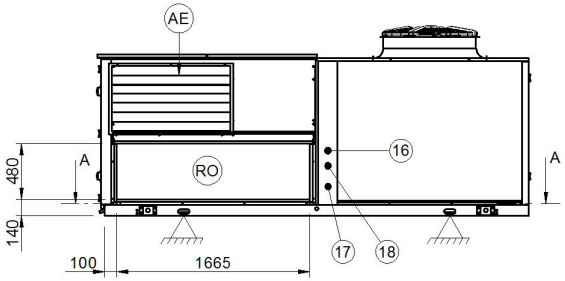
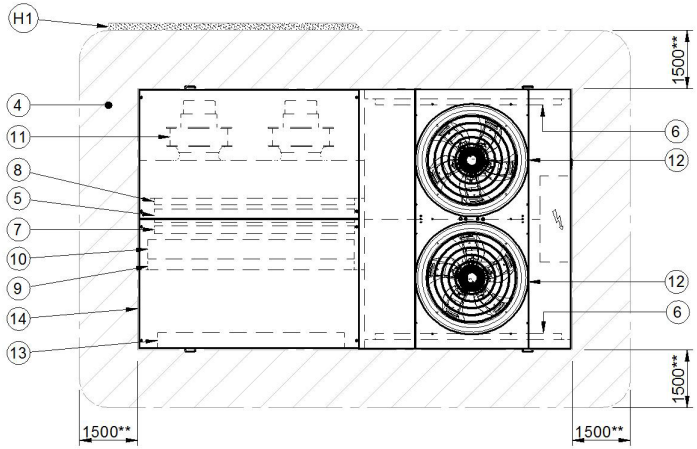
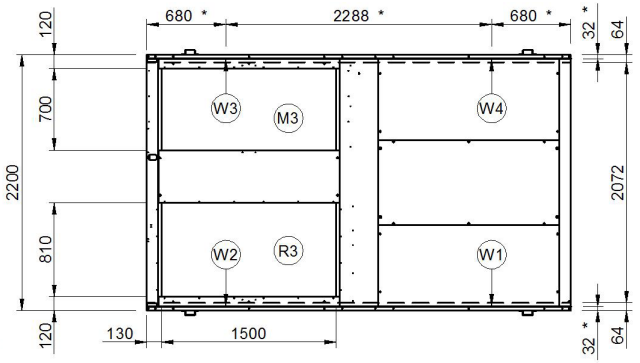
Date: 31/07/2014











Sez. A-A

1. Compressor compartment
2. Electrical panel
3. Condensate drain
4. Functional spaces
5. Internal exchanger
6. External exchanger
7. H2O heating coil (Otional)
8. Reheating coil (Optional)
9. G4 air filters
10. F7 filters / H10 electronic filters (Optional)
11. Electric fans (Supply - Return)
12. External electric fan
13. Outdoor air damper (CBK conf.)
14. Coil, filter, heater inspection
15. Lifting brackets (removable)

(R0) Air return
(M0) Air supply
(R3) Downflow return
(M3) Downflow supply (optional)
(AE) Outdoor air intake (CBK conf.)
(H1) Wall with same height as unit on a maximum of three sides
(**) Suggested minimum clearance
(*) Antivibration mount position

Size		24.2	26.2	30.2
Configuration		**CAK/CBK**	**CAK/CBK**	**CAK/CBK**
W1 Supporting point	kg	376	385	386
W2 Supporting point	kg	292	299	300
W3 Supporting point	kg	334	342	343
W4 Supporting point	kg	390	399	400
Operating weight	kg	1393	1425	1429
Shipping weight	kg	1393	1425	1429

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

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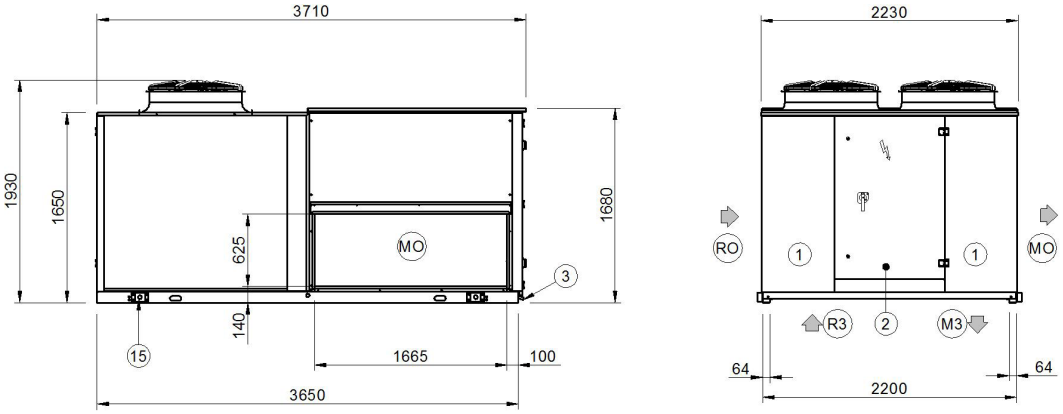

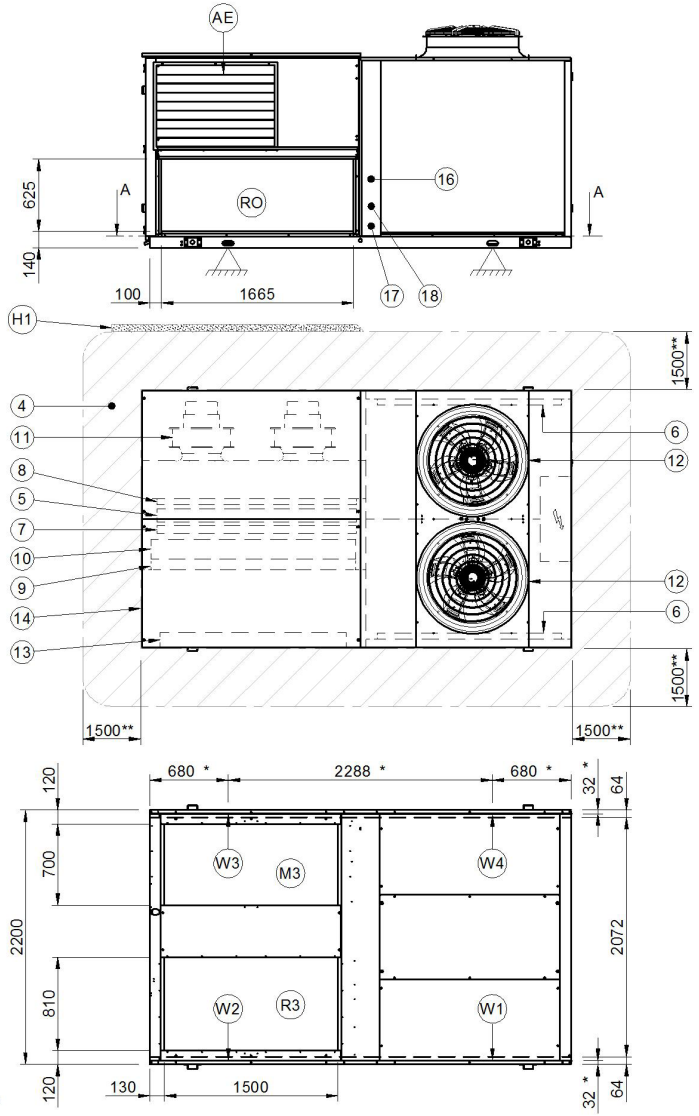

Sez. A-A

1. Compressor compartment
2. Electrical panel
3. Condensate drain
4. Functional spaces
5. Internal exchanger
6. External exchanger
7. H2O heating coil (Otional)
8. Reheating coil (Optional)
9. G4 air filters
10. F7 filters / H10 electronic filters (Optional)
11. Electric fans (Supply - Return)
12. External electric fan
13. Outdoor air damper (CBK conf.)
14. Coil, filter, heater inspection
15. Lifting brackets (removable)

(R0) Air return
(M0) Air supply
(R3) Downflow return
(M3) Downflow supply (optional)
(AE) Outdoor air intake (CBK conf.)
(H1) Wall with same height as unit on a maximum of three sides
(**) Suggested minimum clearance
(*) Antivibration mount position

Size		36.2	40.2	45.2
Configuration		**CAK/CBK**	**CAK/CBK**	**CAK/CBK**
W1 Supporting point	kg	411	421	422
W2 Supporting point	kg	319	327	329
W3 Supporting point	kg	365	374	375
W4 Supporting point	kg	426	437	438
Operating weight	kg	1521	1559	1564
Shipping weight	kg	1521	1559	1564

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

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