Technical Bulletin

BT18A033GB-02

SMARTPACK2

PACKAGED AIR CONDITIONER ROOF TOP
DIRECT EXPANSION HIGH EFFICIENCY

SERIE CKN-XHE2i

AIR-AIR HEAT PUMP

Airflow from 3200 to 10500 m^3/h

- Inverter compressors
- Supply fan EC Brushless
- External axial fan DC Brushless
- Very high seasonal efficiency
- Thermodynamic recovery on exhaust air
- Maximum compactness

Clivet is taking part in the EUROVENT certification programme.
The products concerned appear in the certified products list of the EUROVENT www.eurovent-certification.com site.

Content index

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

A correct air-conditioning is an essential component in the management of various sales areas. Optimum temperature and humidity, air purification and correct ventilation are primary factors that guarantee to users and operators to remain in these spaces independently of outdoor conditions. This is what happens in single shops as well as in outlet villages, automobile showrooms and in modern service stations.

Make-up air becomes even more a determining factor in restaurants, to control odours and vapours.

Ventilation and air conditioning are also fundamental in service rooms for the proper operation of the equipment they contain.



Rooftop units are often the best solution for air conditioning the environments located in a single area

Despite their apparently low costs, split and multisplit direct expansion systems have a lot of limits in these applications. For example, they require a separate system for the treatment of the primary air. The pipes that contain the refrigerant cross the served rooms and therefore they are subject to restrictions and use limitations. From a technical point of view they cannot operate in FREE-COOLING mode, which is very efficient and convenient thanks to the generated energy savings.

On the other hand, the hydronic systems are certainly more complete and versatile. They make it possible to adopt various types of terminals in the served environment, from fan coil units exposed or integrated in the furnishings, up to radiant or induction systems. The cost for medium and small installations is often higher as they are more complex and require more labour for installation, start-up and adjustment.

In this context, many rooftop solutions available on the market help to simplify the installation as they reduce the quantity and quality of operations performed at the worksite. On the other hand, these units are often not very versatile and rather noisy, with limited functions, mediocre energy performance and a not very long lifetime.


Rooftop units are often the best solution for air conditioning the environments located in a single area

With more than twenty years of technological evolution, Clivet rooftop units represent the state of the art in climate control for large commercial and industrial environments.

The specialised ranges for applications with medium to high occupancy are widely used in buildings such as hypermarkets, shopping centres, multiplex cinemas and restaurants.

Their success is based on their high energy efficiency, their compact size and operation and maintenance simplicity as well as the great flexibility in selecting best suited the model for the specific installation.

CLIVETPack series for medium attendance applications

SMARTPACK2
CKN-XHE2i 7.1 - 14.2 reversible heat pump
Nominal airflow: 3200 - 10500 m³/h
Cooling capacity: 20 - 46 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

CLIVETPack²
CSRN-XHE2 15.2 - 44.4 HSE reversible heat pump
Nominal airflow: 9000 - 25000 m³/h
Cooling capacity: 48 - 147 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

Grandezze
15.2 ÷30.4

CLIVETPack²
CSRT/N-XHE2 49.4 - 110.4 solo freddo / pompa di calore reversibile
Portata aria nominale: 22000 - 60000 m³/h
Potenza frigorifera: 155 - 376 kW
Configurazioni:
CAK singola sezione ventilante per tutto ricircolo
CBK singola sezione ventilante per ricircolo ed aria di rinnovo
CCK doppia sezione ventilante per ricircolo, aria di rinnovo,espulsione, recupero termodinamico
CCKP doppia sezione ventilante con aria di rinnovo e recupero termodinamico THOR

CLIVETPack²
CRH-XHE2 14.2 - 110.4 reversible heat pump
Nominal airflow: 8500 - 60000 m³/h
Cooling capacity: 52 - 392 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

Grandezze
14.2 ÷25.4

Clivet series for high attendance applications

CLIVETPack²
CSNX-XHE2 12.2 - 44.4 reversible heat pump
Nominal airflow: 4000 - 20000 m³/h
Fresh airflow up to 80%
Cooling capacity: 47 - 174 kW
Configurations:
CCK double fan section for recirculation, fresh air, exhaust, thermodynamic recovery
CCKP double fan section with fresh air and THOR thermodynamic recovery

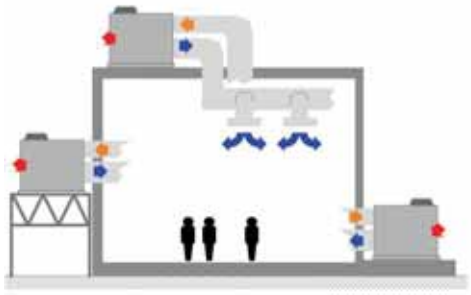
Grandezze
12.4 ÷24.4

Clivet series for full fresh air application

ClivetPACK² FFA
CSRT/N-XHE2 FFA 12.2-24.4 cooling only / reversible heat pump
Nominal airflow: 3000 - 9000 m³/h
Cooling capacity: 33 - 90 kW
Configurations:
CBFFA Configuration for fresh air inlet
CCFFA Configuration for fresh air inlet with outlet

SMARTPACK2 full inverter technology

Implements Clivet's technological evolution in small and medium sized commercial applications



High efficiency Scroll compressors, electronically controlled fans, automatic renewal air management and air quality control through an integrated CO2 probe, FREE-COOLING, thermodynamical energy recovery, variable capacity versions: these are just some of the technologies available with SMARTPACK2, a range of models that are ideal for air conditioning small and medium sized commercial and industrial rooms.

The particular compactness and the resistance to atmospheric agents allows for the external installation of the served area: this is how maximum integration with the furniture is obtained and simplifies the periodical maintenance that can be fully carried out without accessing the ambient.

Advantages

SMARTPACK2 simplifies the system

Thanks to its packaged design, the system components are already enclosed and installed inside the unit. The heating or cooling energy generated by the unit is transferred directly to the served environment. This eliminates all internal units, pipes, cables and technical spaces for their connection, and therefore also their related purchase and installation costs.

SMARTPACK2 frees up precious space

Its very compact design, even in comparison to rooftop units of the same size available on the market, makes it quick and easy to position it on a flat roof, in an attic or on the ground. All of the features are provided by Clivet already assembled and tested onboard, differently then other manufacturers who make numerous additional components available to be installed on site.

SMARTPACK2 reduces consumption and management costs

The high efficiency of the adopted technological solutions considerably reduces the energy required for their proper operation. This results in lower operating costs and CO2 emissions, to the benefit of the environment. The constructive rationality also simplifies the maintenance operations, resulting in a farther reduction in annual expenses for the user.

The system is included into a single unit

CLIVETPACK2 contains all the necessary components for its correct operation.

In the standard configuration (Clivet reference key CAK), the return air is filtered and treated by the direct expansion cooling circuit and then introduced again into the area to be air conditioned.

The configuration with the outdoor air damper (Clivet reference key CBK) allows to introduce a predetermined quantity of renewal air.

Automatic control via microprocessor is based on the conditions detected by the sensor installed in the recovery section (sensor temperature, humidity optional).

R. Air return
S. Treated air supply
FA. Outdoor air
EX. Exhaust

A. Supply fan and air filter
Electronic control, which returns the air to the setting after having taken it in, strained it with G4 efficiency and treated it

B. Internal exchanger
Thermal energy releases (cool or heat) the inlet air

C. External exchanger
It exchanges energy (heating or cooling) with the outdoor air

D. External fan
Axial type with electronically controlled brushless motor based on the condensing temperature, it allows effective heat exchange with the air source.

E. Direct expansion circuit
It produces cooling energy (or heating energy on reversible models) to be introduced in the served area

F. User interface
Easy to use, allows automatic control sensors on-board.

MAIN OPTIONS
1. High-efficiency filtration
Electronic, second stage (equivalent efficiency H10) + F7

2. Electric / hot water heating
It integrates and/or replaces the direct expansion circuit operation

3. Hot gas post-heating
It recovers condensation energy in the summer humidity control

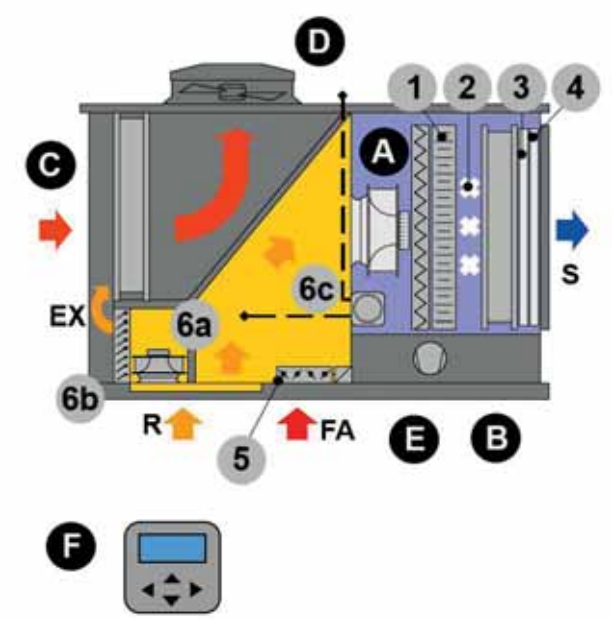
4. Humidification
Immersed electrodes steam type

5. Fresh air Shutter
(CBK/CCK configuration)
It allows to introduce renewed air in the served area. The fresh air damper is manual in the CB construction configuration (optional on off motorized) and modulating motorised version in the CC construction configuration. It is not present in the CA constructive configuration (100% recirculation).

MODEL WITH EXTRACTION AND EXHAUST
(configuration CCK)
6a. Extraction and exhaust fan
Electronically controlled, it extracts the unhealthy air from the served area and it exhausts it outside after the thermodynamic energy recovery. It allows automatic FREE-COOLING operating.

6b. Overpressure damper
It prevents the air inlet in the environment from the extraction/exhaust section with fan stopped

6c. Ambient pressure controller
It calibrates the fresh air damper opening and to balance the ambient pressure.



SMARTPACK2 is also available in the optional configuration equipped with air extraction and exhaust system (Clivet reference key CCK).

This functionality is implemented with an extraction fan, which draws a part of the return air and ejects it on the outdoor finned coil exchanger, performing the thermodynamic energy recovery. This increases the seasonal efficiency of the direct expansion circuit, avoiding the large pressure drops typical of traditional static or rotary recovery units.

This version also includes the automatic control of the modulating fresh air dumper and the FREE-COOLING function, which allows the cooling of the served area without activating the compressors.

Versatile, efficient, encreases the value of your real estate investment

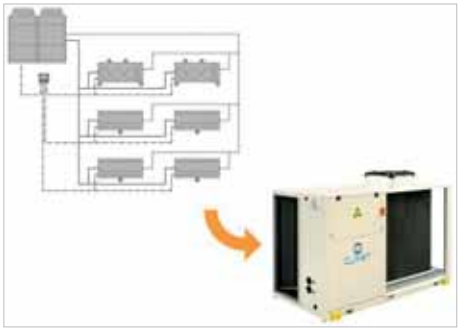
Great system simplification and increase in reliability

SMARTPACK2 significantly reduces the initial system costs in comparison to traditional solutions based on hydronic systems with separate production, for example with chillers and boilers, or on direct expansion systems with renewal of air.

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

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

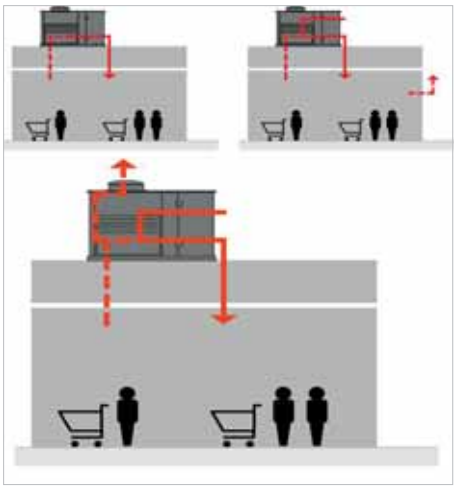
The user simply has to connect the air distribution ducts and power the unit.



Made for comfort and business

The numerous options and accessories that are available make it possible to always select the best solution, based on the following factors:

- Building type and layout of the technical spaces, with possible positioning on the roof, in the attic or on the ground;
- Typical application and operating profile thanks to the version with 100% recirculation, with fresh air intake and also with integrated exhaust system;
- Required comfort level, with high efficiency filtration, air quality control, devices for humidity control;
- Importance of the energy savings for the user, thanks to functions such as FREE-COOLING, energy recovery, modulation of the renewal air, modulation of the flow rate



Increasing the value of the building and reducing operating costs

The numerous technical solutions used in SMARTPACK's cooling circuit and ventilating sections makes it possible to obtain very high overall efficiency levels.

This also reduces seasonal consumption up to 50% in comparison to traditional solutions.

As a result, this also reduces operating costs and the environmental impact of the system, thanks to the lower amount of primary energy needed for its function.

The reduction in the overall requirement for primary energy, in comparison to traditional solutions, improves the building's energy performance and therefore its market value.

Full Inverter technology

The need to adapt the delivered power to the required load becomes a compulsory condition in order to control energy consumption. The variable capacity unit satisfies this request.

Compressor

As maximum power is required only for short periods of time, maximum efficiency at reduced load is essential. Continuous modulating control is obtained by using a compressor with inverter, which adapts to the actual requirements of the room served. The use of energy exchangers dimensioned for the nominal unit power increases the efficiency of the system.

Supply fan and exhaust fan (CCK configuration only)

The fans are the radial type directly coupled to the electronically controlled brushless motor; as well as the high efficiency of the permanent magnet motor, it brings the benefit of not using transmission devices, such as belts and pulleys with relative efficiency.

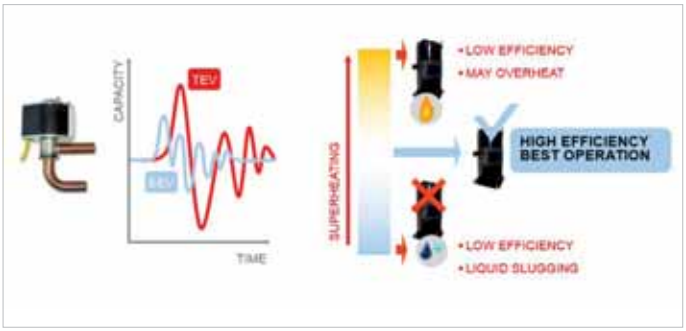
External section fan

The external fan is the axial type directly connected to the electronically controlled brushless motor; speed adjustment is managed by means of the condensing temperature. Modulating the speed based on the actual requirements, maximum energy efficiency of the cooling circuit and simultaneous reduction of the electrical absorption is obtained.

The decrease in air flow has a significant effect on the reduction of sound level, an appreciable aspect in the medium seasons and in nighttime operation when maximum capacity is not required.

Stable and reliable operating

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.



Benefits of full inverter technology (ERP 2021)

The European Union with regulation EU 2281/2016 introduces starting from 1st January 2021 the test method to calculate the seasonal efficiency on air conditioning systems, and define a minimum value to respect.

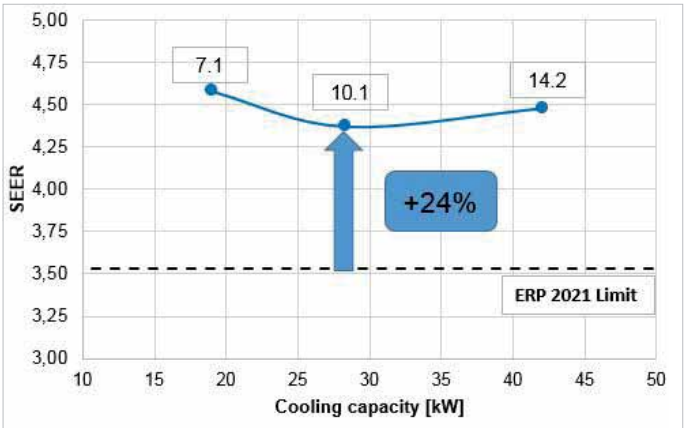
The regulation is implemented in the Directive 2009/125/EC in regard to ECOdesign and ERP (Energy Related Product).

The standard provides an opportunity to the customer to evaluate the air conditioning system throughout the annual cycle.

In fact, the design thermal load, defined for sizing an air-conditioning system, occurs for only a few hours during the entire year.

A timely response to the actual request of the building corresponds to the system optimization, with tangible benefit in the electricity consumption reduction.

SMARTPACK2 is equipped with a controller with logic that optimises the operation in any situation making the system with the highest seasonal efficiency indexes.



The Full Inverter technology of SMARTPACK2 allows a seasonal efficiency of over 24% above the limit introduced by 2021 ERP

Configured for intelligent resource management and for user comfort

Advanced standard electronic control

SMARTPACK2 is also equipped with everything that is required for the automatic control of ambient temperature and humidity and, through their comparison with the outdoor air conditions:

- selects the operating mode (heating or cooling);
- decides which and how many resources to activate depending on the distance from the determined set-point and return air temperature;
- manages the renewal air and the FREE-COOLING activation to maintain the comfort conditions.
- The user interface is standard supplied with the unit, it can be installed in the served area up to a distance of 50m with power supply directly from the unit.
- As an option it can be installed up to 300m away by providing a separate power supply with a voltage of 12V d.c. (Provided by the Customer).

User interface connection with shielded cable of 3 x 0.75mm² for the communication, cable of 2 x 1mm² for power supply

Easy and intuitive user interface

An innovative graphic interface for wall-mounting is supplied standard (wiring and 230V power supply to be provided by the customer) with the possibility of detaching it from its holder and connecting it onboard the unit for maintenance operations.

Its main functions include:

- Daily/weekly programming when the unit is to come on and go off.
- Manually changing the operating mode (hot or cold) and/or the set-point.
- Viewing alarms and the unit status.
- Managing the operating parameters.

Communication with supervisory systems

SMARTPACK2 can easily be integrated into supervisory systems that use Modbus as a communication protocol.

The serial connection is present on the built-in electronic board and is a unit standard. It allows the access to the complete list of operating variables, controls and alarms.

Smart management of defrosts

The automatic defrosting cycles on surfaces of the external exchanger are managed by SMARTPACK2 in a predictive manner, which reduces both the frequency and the duration. The on-board electronic regulation analyses not only the external conditions but also the changes of the evaporating temperature 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.

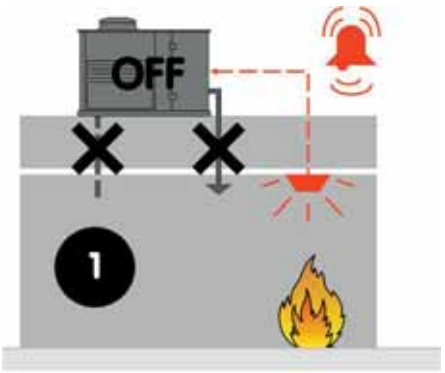
To facilitate the drainage of the condensate water and reduce the defrost time, the aluminum fins of the external exchanger are realized with a special hydrophilic coating.

Prompt feedback in case of fire

The unit logic manages the signal from a fire detection unit, implementing one of the actions shown in the table which can be set as a parameter. If there is an alarm signal and according to the set logic, the compressors are always shut off.

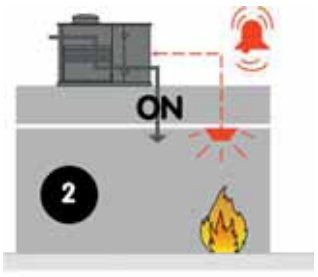
The roof-top units may not be used as smoke extractors.

COMPLETE UNIT SHUTDOWN



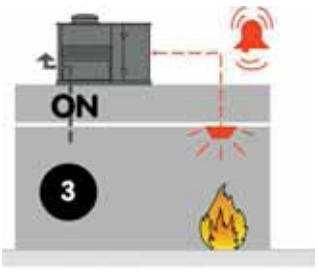
Standard in all configurations

AMBIENT IN HIGH PRESSURE



Only with units in CBK or CCK constructive configuration, thus provided with outdoor air dampers.

AMBIENT IN NEGATIVE PRESSURE



Only with units in CCK constructive configuration thus provided with extraction fans.

If the unit is connected to a supervision system by serial, the fire alarm on free contact is however prioritary. The ventilation stop is immediate.

Efficient and reliable air conditioner also in severe climates

High efficiency heating solutions

The reversible heat pump version of SMARTPACK2 is also able to operate with particularly severe outdoor temperatures. In many areas these conditions only occur for short periods effective use of the system.

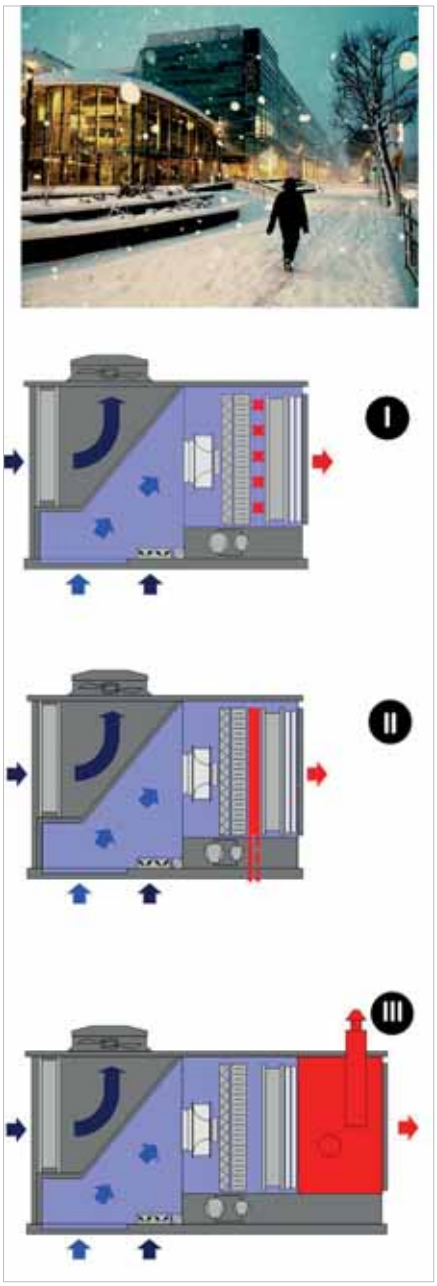
The use of electric heaters (I) makes it possible to maintain the advantages of the packaged solution, both in terms of design simplicity and installation rationality. The electric heaters can turn on automatically as auxiliary elements to preheat the external air before being treated by the heat pump.

Alternatively, the optional hot water coil (II) extends the operating range of the units in even colder climates. It also integrates the heating capacity by preheating the external air before being treated by the heat pump.

It can also take automatically the function of main heating source below an outdoor temperature selected by the user. This can be done, for example, after evaluating the costs associated with the energy sources in the specific cases. The hot water coil is activated automatically in emergency mode in the case of a heat pump failure.

The other available solution is the fuel-operated heating module (III). This is the solution often used in very cold climates. Like the water coil, it serves as a thermal integration on the heat pump's operating range. It can automatically become the only heat source below an outdoor temperature value chosen by the user and is automatically activated in emergency mode.

Unlike systems powered with a central heating plant, it does not require the distribution of hot water outside the building: this simplifies the system, eliminates pumping costs and means there is no need to use antifreeze devices and controls.



Fuel-operated heating modules

The following module is available in different heating capacities:

- gas-operated condensation module with modulating control: extremely efficient solution that, thanks to the condensation and accurate control, always allows for top comfort levels. It is the best choice for the overall cost reduction throughout the lifespan of the system

Criteria to determine the size of the fuel-operated heat generator

The heating capacity that needs to be installed is determined based on the conditions the unit will work under, such as the outdoor air temperature, internal loads and losses of the building.

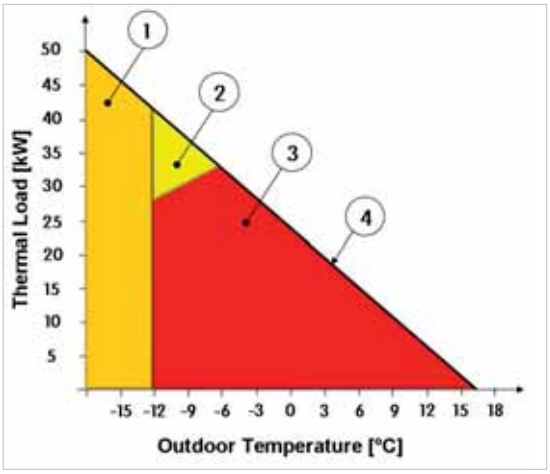
The size of the heat generator is based on one of the modes below:

- hybrid, as an integration for the heat pump to maintain the heating capacity supplied as the outdoor temperature drops.
- bivalent, to fully replace the heat pump when the outdoor temperature drops below the operating limits or the latter is not available.

In hybrid mode, the heating capacity required is met by the heat pump and the additional resource, whose capacity may be smaller than the capacity provided by the heat pump.

In bivalent mode, as well as serving as an additional resource, the thermal resource must fully replace the heat pump. Therefore, the chosen heating capacity must be higher or identical to the one provided by the heat pump..

The unit logic manages the operation of the thermal resource by giving priority to the heat pump, which also carries out the exhaust air thermodynamic recovery whenever required (configuration with exhaust air energy recovery).



The load that needs to be met increases as the outdoor temperature drops.

Es: CKN-XHE2i 14.2

- condensing gas heating with mudulating control 35 kW (hybrid function)
- condensing gas heating with mudulating control 65 kW (bivalent function)

1. Bivalent function
2. Hybrid function
3. Heat pump
4. Thermal load line

Additional benefits of units with extraction and exhaust system

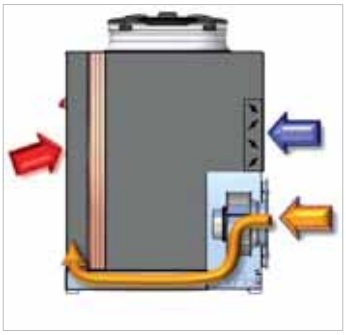
Units equipped with an extraction and exhaust section (Clivet reference CCK) have unique advantages that make SMARTPACK2 the ideal tool for maximizing energy savings.

FREE-COOLING

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

Active energy recovery of expelled air

The energy contained in the exhaust air is recovered by forcing the airflow to pass through the external packaged finned heat exchanger. This makes it possible to reduce the electrical energy absorbed by the compressors, to increase the overall efficiency of the unit and to extend its operating ranges.



This thermodynamic recovery system does not increase electrical energy consumption for ventilation, as instead happens for recovery with crossed or rotating flows. Greater use of electricity, caused by the enormous pressure drops on the air side in recovery systems with crossed or rotating flows, often nullifies the amount of energy recovered and even exceeds it in some cases.

When operating in heat pump mode, the exhaustion of pre-treated air on the external exchanger reduces the possibility of ice formation and consequently the number of defrosting cycles thanks to the external and hot exhaust air mix. The result is a smoother continuous operation and overall unit efficiency improvement.

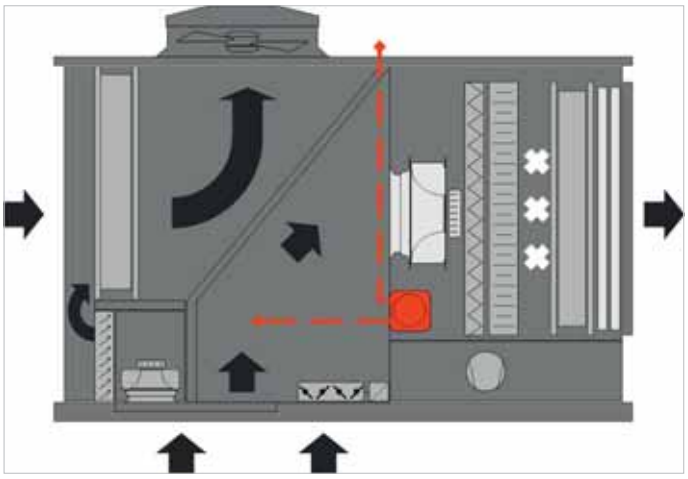
Device for ambient pressure adjustment

The ambient pressure control device, which compares the intake air pressure with the external air pressure, detects if the pressure is too high, too low or if it is balanced whether the served room is in over-pression or under-pression conditions.

During the fresh air phase, operating on the fresh air damper, the unit can compensate the pressures and keep the ambient at the desired pressure.

The pressure is regulated basing on the unit settings defined at the start-up.

(Configuration CCK).



PM - Phase monitor

The phase monitor allows controlling correct connection of the phases and their unbalancing in the units powered with a three-phase system.

The monitor acts on the control circuit and orders the unit to shut down if one of the following cases occur: the phases are incorrectly connected, an unbalance limit value between the phases is exceeded, overvoltage or undervoltage conditions for a certain period of time. As soon as the nominal line conditions are re-established, the unit is automatically reset.

The device is installed and wired onboard the unit.

High efficiency ventilation with electronically controlled fans

How to improve ventilation whilst reducing prime (electric) energy consumption

A significant portion of the running costs of the fresh air systems is due to the consumption for ventilation. To this there should be added the charge for the study of the correct operating conditions, and for the required long and precise calibrations at the worksite.

The SMARTPACK2 ventilation technique allows both of these operational costs to be greatly minimised.

Versatility of reversed blades rotor

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

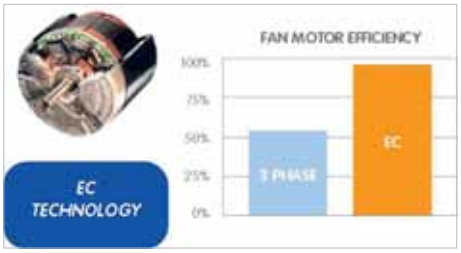
The efficiency of the electronic controlled motor

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

The lack of brushes and the particular power supply increase efficiency by 70%;

Even the life cycle increases, thanks to the elimination of the brushes' natural abrasive erosion effects;

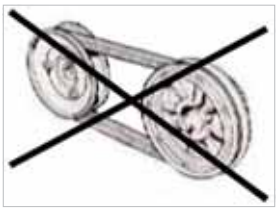
The electronic control also includes a "soft start" solution, which drastically reduces the starting current of the fan and limits even more the system's electrical commitment.



Advantages of direct coupling (plug fan)

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

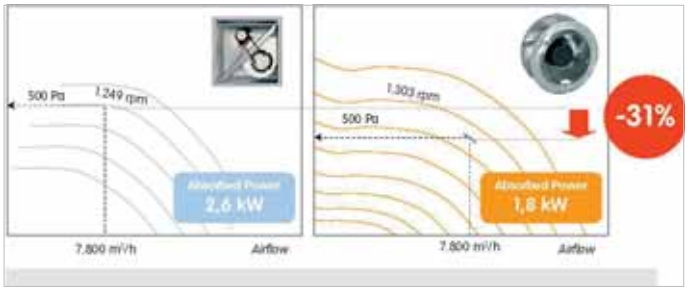
- the transmissions' inefficiencies are eliminated;
- the transmissions' wear and maintenance is eliminated.



Efficiency of the ventilation system increases by 30%

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

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



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

The right airflow for every type of system

By controlling the fan speed, the airflow rate can be varied and the static pressure capacity can be adapted to the system pressure drop, making the unit start-up particularly simple. The setting 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.

High air filtration efficiency

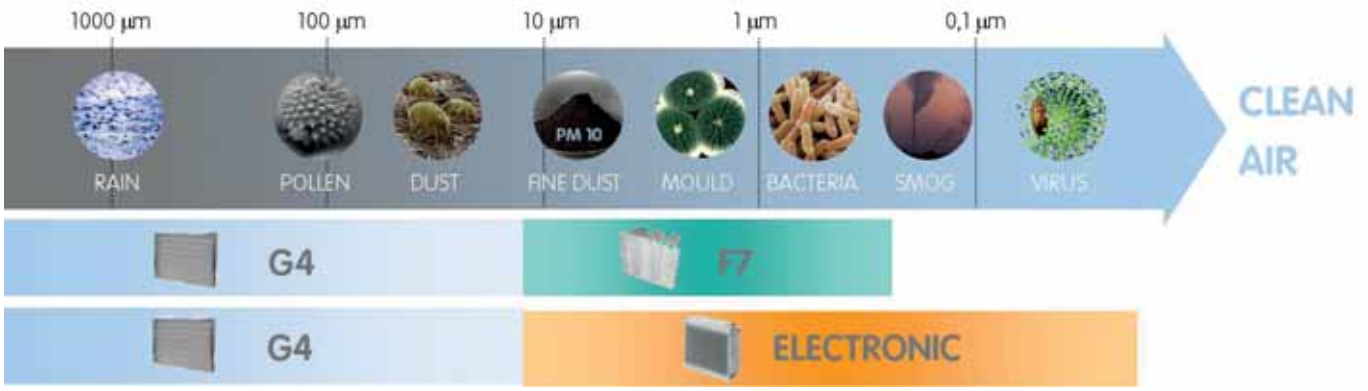
Air quality always under control

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.

How to increase the filtration efficiency whilst minimising its operational costs

High efficiency filters (F7 category) of a traditional system increase the energy spent on ventilation, because of greater loss of pressure. These also require more frequent maintenance, with a significant cost at the end of each year to replace the filters. The electronic filters available for SMARTPACK2 make outdoor air filtering even more efficient and at the same time they reduce costs for ventilation and maintenance compared with traditional systems.

Very high filtration efficiency

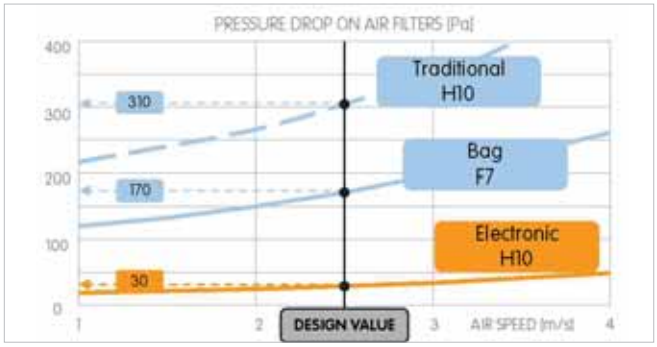


The efficiency of electronic filters is equivalent to classification H10 used in traditional filters, that is the category indicated as "absolute filter". These are effective even against smoke, fine dust, particulates PM10, PM2,5, PM1, bacteria, germs and viruses.

The ventilation energy is reduced

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, distributes the airflow and contributes to the containment of the magnetic field generated during operation.



Return on investment (roi)achieved in second year of operation

The reduction of ventilation consumption is the first item of saving for electronic filters.

Savings on maintenance are even more evident, because electronic filters are washable and do not need to be replaced at regularly as traditional filters.

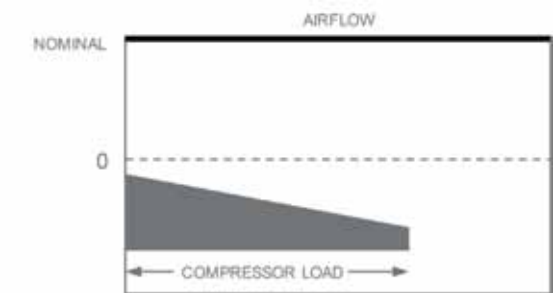
Taking as reference the price of a standard unit, the total yearly running cost is reduced from over 20% for the version with traditional-bag filters to less than 8% thanks to the electronic filters.

The deriving payback is usually less than one and a half years.

Automatic management of the air flow

Standard mode

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



Constant air flow (PCOSM option)

Supply air flow rate remains constant even with the progressive filter pressure drop increased fouling by offsetting

ECO mode (funzione standard)

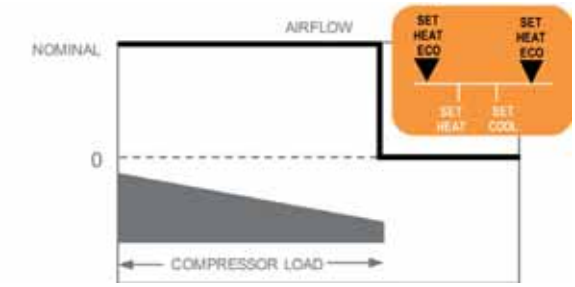
The air flow supply remains constant at varied heat loads and is shutdown when the load is fulfilled.

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 means of the Clivet supervision System.



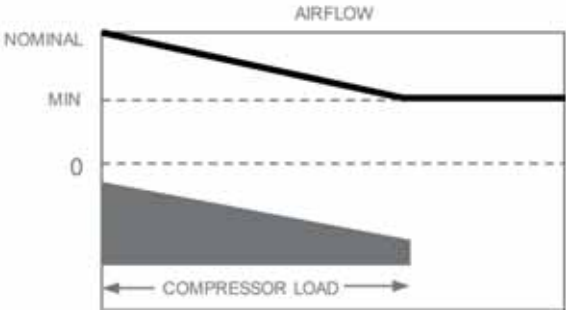
Variable airflow (opzione PVAR)

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.

This option allows a further energy savings

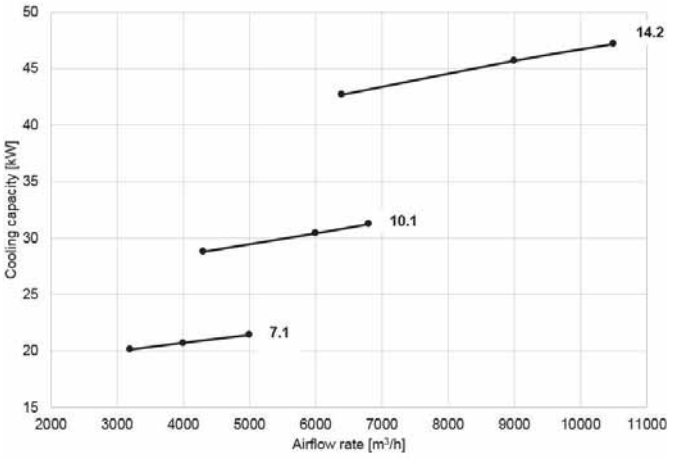
- The movement of the air is always active during the operation of the rooftop unit.
- It determines an annual energy consumption comparable or even greater than the compressors.
- The reduction of 20% of the flow generates a saving of 50% on energy absorbed by the ventilators.
- With a reduction of 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.



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.



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

Clivet rooftop are Eurovent certified products

Clivet participates in the Eurovent Certification Program,, a recognized European authority that tests and certifies the performance of the air-conditioning systems.

An additional guarantee for the Customer, the Eurovent tests in fact confirm the product performance and allow for a thorough analysis of the management costs: "Total Life Cycle Cost".

Eurovent tests are made in certified test Laboratories and follow the European Standards for each type of product. For the rooftop performance are applied the following regulations:

http://www.eurovent-certification.com/

EN 14511: "Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling".

EN 12102: "Air conditioners, liquid chilling packages, heat pumps and dehumidifiers with electrically driven compressors for space heating and cooling - Measurement of airbone noise - Determination of the sound power level".

Eurovent performance (EN 14511-2018)

Size	7.1	10.1	14.2
Total cooling capacity [kW]	19,01	28,35	42,11
Total electrical capacity [kW]	6,17	9,84	14,18
Energy efficiency (EER)	3,08	2,88	2,97
Energy class	A	B	B
Total heating capacity [kW]	20,48	29,12	43,08
Total electrical capacity [kW]	6,28	8,96	13,13
Energy efficiency (COP)	3,26	3,25	3,28
Energy class	B	B	B
At skirt [dBA	83	85	88
At supply mouth [dBA]	78	80	82
Nominal air flow [m^3/h]	4000	6000	9000
Available static pressure [Pa]	100	125	150

Notes: Performance determined by the following conditions:
- Cooling: indoor temperature 27°C DB/19°C WB, outdoor temperature 35°C.
- Heating: indoor temperature 20°C, outdoor temperature 7°C DB/6°C WB.

Seasonal energy efficiency: Directive ErP 2281 (Energy related Products, Eco-design)

For several years now, this is the road the European Union has chosen to take to improve the energy efficiency of products placed on the market in order to improve eco-compatibility and reduce the environmental impact.
The process consists of various parts and is in continuous evolution; ErP 2018 Regulation (EU) 2016/2281 establishes the calculation method and the limits to be respected for heat pumps used in commercial air conditioning.
Full inverter technology effectively responds to the variable air conditioning demand of buildings in the annual cycle: the energy is produced as and when it is needed.

The seasonal efficiency of SMARTPACK2 is indicated by the SEER and SCOP values, among the highest in the category of product currently available.

Cooling

Size			7.1	10.1	14.2
Climatic application			**Average temperature (average)**		
Design temperature	°C		35	35	35
Cooling capacity	kW		19,0	28,4	42,1
Airflow	m^3/h		4000	6000	9000
SEER seasonal efficiency			4,58	4,37	4,48
ηs_c	%		180	171	176

Notes: ambient temperature 27°C D.B. / 19°CW.B.
Performance according to EN 14825: 2016
'Contains fluorinated greenhouse gases'(GWP 2087,5)

Heating

Size			7.1	10.1	14.2
Applicazione climatica			**Average temperature (average)**		
Design temperature	°C		-10	-10	-10
Bivalent temperature	°C		-7,0	-7,0	-7,0
Heatin capacity	kW		12,1	17,2	28,3
Airflow	m3/h		4000	6000	9000
SCOP seasonal efficiency			3,22	3,20	3,27
ηs_h	%		126	125	128

Notes: ambient temperature 20°C D.B. / 15°CW.B.
Performance according to EN 14825: 2016
'Contains fluorinated greenhouse gases'(GWP 2087,5)

Standard unit technical specifications

CKN-XHE2i High efficiency "Roof Top" air source heat pump, full inverter technology. Compliant with ErP 2018 (European Regulation UE 2281/2016)

Compressor

SIZE 7.1

Rotating hermetic compressor controlled by inverter, equipped with motor protection device for over-temperatures, over-currents and excessive temperatures of the supply gas. It is installed on antivibration mounts and it is equipped with oil charge. A guard heater with automatic insertion prevents the refrigerant from diluting the oil when the compressor stops.

SIZE 10.1

Scroll hermetic compressor controlled by inverter, equipped with motor protection device for over-temperatures, over-currents and excessive temperatures of the supply gas. It is installed on anti-vibration mounts and it is equipped with oil charge. A guard heater with automatic insertion prevents the refrigerant from diluting the oil when the compressor stops.

SIZE 14.2

Rotating hermetic compressor controlled by inverter, equipped with motor protection device for over-temperatures, over-currents and excessive temperatures of the supply gas. It is installed on antivibration mounts and it is equipped with oil charge. A guard heater with automatic insertion prevents the refrigerant from diluting the oil when the compressor stops.

The compressors are connected in tandem on a single refrigeration circuit and have a dedicated system for the oil recovery.

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

Panels of the compressor panel in steel sheet metal, painted using polyester powders, colour RAL 9001 and covered on the inside with ashlared sound-absorbent material.

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 30mm 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 exchanger, made from copper pipes in staggered rows and mechanically expanded to the fin collars. 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 hydrophilic treatment that allows the correct evacuation of the condensation water, have a special corrugated surface, suitably spaced to ensure the best thermal exchange efficiency.

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 reinforced plastic blades, directly coupled to DC brushless motor electronically controlled, IP 54 index of protection. Housed inside an aerodinamically shaped nozzles to increase efficiency e minimize noise levels, fitted with safety grills.

CONFIGURATION WITH EXTRACTION AND EXHAUST (CCK)

Standard unit specifications like standard version, and then:

exhaust fan

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

Refrigerant circuit

The refrigeration circuit is complete with:

- refrigerant charge
- high pressure safety pressure switch
- low pressure safety switch
- filter dryer
- electronic expansion valve
- 4-way reverse cycle valve
- liquid separator
- low pressure safety valve

Filtration

Pleated filter for greater filtering surface, made up of galvanized plate frame with 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 class EU4/5 - average efficiency 90.1% ASHRAE 52-76 Atm). Self-extinguishing (resistance to fire class 1 - DIN 53438).

Tray

Internal section

condensate collecting tray in aluminium alloy 1050 H24 with anti-condensate insulation, welded and equipped with discharge coupling

External section

Thermoformed ABS condensate collection tray 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
- phase monitor
- protection fuse for auxiliary circuit
- fan motor thermal protections of internal and external section

THE CONTROL SECTION INCLUDES:

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

WALL ROOM ELECTRONIC CONTROL INCLUDING:

- intuitive graphical interface retro lighted
- modification of the temperature and humidity set point
- unit On/Off and overload reset
- manual changing of the operating mode (hot or cold)
- display of operating status
- display of alarms and failure code
- management of the operating parameters

General technical data

Size			7.1	10.1	14.2
Cooling					
Cooling capacity	1	kW	20,6	30,4	45,7
Sensible capacity	1	kW	16,5	24,6	35,9
Compressor power input	1	kW	5,27	8,28	11,5
EER	1		3,91	3,67	3,97
Heating					
Heating capacity	2	kW	20,9	29,8	43,8
Compressor power input	2	kW	5,08	7,24	9,89
COP	2		4,11	4,12	4,43
Compressor					
Type of compressors	3		Rot	Scroll	Rot
No. of compressors		Nr	1	1	2
Std Capacity control steps		Nr	20-100%	20-100%	20-100%
Refrigerant charge (C1)	4	kg	7,0	10,0	13,0
Refrigeration circuits		Nr	1	1	1
Air Handling Section Fans (Supply)					
Type of supply fan	5		RAD	RAD	RAD
Number of supply fans		Nr	1	1	1
Fan diameter		mm	450	500	560
Type of motor	6		EC Brushless	EC Brushless	EC Brushless
Supply airflow		l/s	1111	1667	2500
Supply airflow		m^3/h	4000	6000	9000
Installed unit power		kW	1,0	2,6	2,9
Max. static pressure supply fan	7	Pa	380	680	510
Fans (Exhaust)					
Type of exhaust fan	5		RAD	RAD	RAD
Number of exhaust fans	8	Nr	1	1	1
Fan diameter	8	mm	355	355	450
Type of motor	6		EC Brushless	EC Brushless	EC Brushless
Installed unit power	8	kW	0,9	0,9	1,0
External Section Fans					
Type of fans	9		AX	AX	AX
Number of fans		Nr	1	1	1
Fan diameter		mm	750	750	780
Fan RPM	6		EC Brushless	EC Brushless	EC Brushless
Standard airflow		l/s	2361	3500	5833
Installed unit power		kW	0,65	0,75	1,5
Connessioni					
Scarico condensa		mm	20	20	20
Power supply					
Standard power supply		V	400/3/50+N	400/3/50+N	400/3/50+N

Performance data are referred to operation with 30% of fresh air intake and same amount of air exhaust. (configuration CCK)

1. Ambient air at 27°C/19°C W.B.. external exchanger entering air temperature 35°C. EER referred only to compressors
2. Ambient air 20°C D.B. Outdoor air 7°C D.B./6°C W.B.. COP referred only to compressors
3. ROT = compressore rotativo; SCROLL = scroll compressor
4. Indicative values for standard units with possible +/-10% variation. The actual data are indicated on the label of the unit
5. RAD = radial fan
6. EC Electronic switching motor
7. Net outside static pressure to win the outlet and intake onboard pressure drops
8. Configuration for fresh air supply with exhaust and extraction
9. AX = axial fan

Electrical data

Full re-circulation (CAK) / Recirculation and renewal air (CBK)

Size			7.1	10.1	14.2
F.L.A. - Full load current at max admissible conditions					
F.L.A. - Compressor		A	14,4	25,8	32,4
F.L.A. - Single External Fan		A	4,7	5,4	11,8
F.L.A. - Single supply fan		A	1,9	4,0	4,4
F.L.A. - Total	1	A	21,0	35,2	48,6
L.R.A. - Locked rotor amperes					
L.R.A. - Compressor		A	14,4	25,8	32,4
F.L.I. - Full load power input at max admissible conditions					
F.L.I. - Compressor		kW	8,4	15,0	19,2
F.L.I. - Single External Fan		kW	0,6	0,7	1,7
F.L.I. - Single supply fan		kW	1,0	2,6	2,9
F.L.I. - Total	2	kW	10,0	18,3	23,8
M.I.C. Maximum inrush current					
M.I.C. - Value		A	21,0	35,2	48,6

Data refer to standard units.
Power supply: 400/3/50+N +/-6%.
Voltage unbalance: 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)

Configuration: recirculation, renewal and exhaust air (CCK)

Size			7.1	10.1	14.2
F.L.A. - Full load current at max admissible conditions					
F.L.A. - Compressor		A	14,4	25,8	32,4
F.L.A. - Single External Fan		A	4,7	5,4	11,8
F.L.A. - Single supply fan		A	1,9	4,0	4,4
F.L.A. - Single exhaust air fan		A	1,7	1,7	1,9
F.L.A. - Total	1	A	22,7	36,9	50,5
L.R.A. - Locked rotor amperes					
L.R.A. - Compressore		A	14,4	25,8	32,4
F.L.I. - Full load power input at max admissible conditions					
F.L.I. - Compressor		kW	8,4	15,0	19,2
F.L.I. - Single External Fan		kW	0,6	0,7	1,7
F.L.I. - Single supply fan		kW	1,0	2,6	2,9
F.L.I. – Single exhaust air fan		kW	0,9	0,9	1,0
F.L.I. - Total	2	kW	10,9	19,2	24,8
M.I.C. Maximum inrush current					
M.I.C. - Value		A	22,7	36,9	50,5

Data refer to standard units.
Power supply: 400/3/50+N +/-6%.
Voltage unbalance: 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)

Electrical input of optional components

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

SIZE		7.1	10.1	14.2
F.L.A. ABSORBED CURRENT				
F.L.A. EH10 - 6 kW electric elements	A	8,7	-	-
F.L.A. EH12 - 9 kW electric elements	A	13,0	13,0	-
F.L.A. EH15 - 13,5 kW electric elements	A	19,5	19,5	19,5
F.L.A. EH17 - 18 kW electric elements	A	-	26,0	26,0
F.L.A. EH20 - 24 kW electric elements	A	-	-	34,7
F.L.A. HSE3 - Immersed electrodes steam humidifier of 3 kg/h	A	3,2	3,2	3,2
F.L.A. HSE5 - Immersed electrodes steam humidifier of 5 kg/h	A	-	-	5,4
F.L.A. HSE8 - Immersed electrodes steam humidifier of 8 kg/h	A	-	-	8,7
F.L.A. VENH - High static pressure	A	2,2	4,4	4,0
F.L.I. POWER INPUT				
F.L.I. EH10 - 6 kW electric elements	kW	6,0	-	-
F.L.I. EH12 - 9 kW electric elements	kW	9,0	9,0	-
F.L.I. EH15 - 13,5 kW electric elements	kW	13,5	13,5	13,5
F.L.I. EH17 - 18 kW electric elements	kW	-	18,0	18,0
F.L.I. EH20 - 24 kW electric elements	kW	-	-	24,0
F.L.I. HSE3 - Immersed electrodes steam humidifier of 3 kg/h	kW	2,3	2,3	2,3
F.L.I. HSE5 - Immersed electrodes steam humidifier of 5 kg/h	kW	-	-	3,8
F.L.I. HSE8 - Immersed electrodes steam humidifier of 8 kg/h	kW	-	-	6,0
F.L.I. VENH - High static pressure	kW	1,6	2,9	2,6

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)
7.1	69	73	76	77	77	75	70	74	82	65
10.1	77	75	77	79	79	77	71	75	84	66
14.2	73	78	79	82	81	79	74	78	86	68

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)
Measures are according to UNI EN ISO 9614-2 regulations, with respect to the EUROVENT 8/1 certication, which provides for a tolerance of 3 dB(A) on the sound power level, which is the only acoustic data to be considered binding.
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.

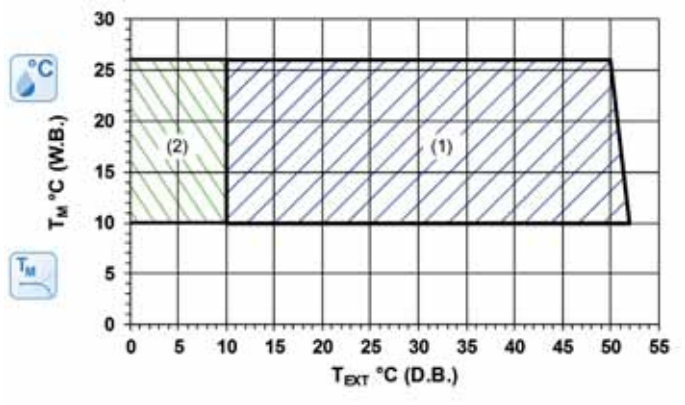
Pressure drops of optional components

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.

Size			7.1	10.1	14.2
CHW2 - Two-row hot water coil		Pa	27	28	27
CPHG - Hot gas post-heating coil		Pa	23	31	28
GC- Heating module		Pa	70	73	73
F7 - High efficiency F7 air filter	1	Pa	168	182	175
FES - Electronic filters		Pa	48	55	56

The values shown are to be considered approximate for units operating power in normal use with standard airflow 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 external air, always calculate the Tm mixing temperature at the internal heat exchanger input.

TM = INTERNAL EXCHANGER ENTERING AIR TEMPERATURE
temperature measured with wet bulb (W.B.=WET BULB)

TEXT = INLET AIR TEMPERATURE IN THE EXTERNAL EXCHANGER
dry bulb measured temperature (D.B.=DRY BULB)

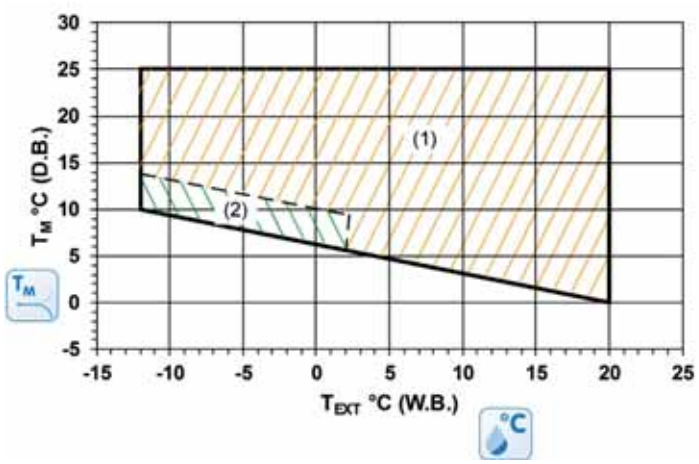
Within the operating range, the unit can operate at a part load to maximaze the energy efficiency

1.Standard operating range

2. Operation field of the unit in FREE-COOLING mode

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 external air, always calculate the Tm mixing temperature at the internal heat exchanger input.

TM = INTERNAL EXCHANGER ENTERING AIR TEMPERATURE
temperature measured with wet bulb (W.B.=WET BULB)

TEXT = INLET AIR TEMPERATURE IN THE EXTERNAL EXCHANGER
dry bulb measured temperature (D.B.=DRY BULB)
Within the operating range, the unit can operate at a part load to maximaze the energy efficiency

1. Standard operating range
2. Range in which the unit operation is allowed only for a limited period (max 1 hour)

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, so as to eliminate the ice that forms on the surfaces of the outside exchanger; in addition, 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 –20°c install the following options:
- 2 rows hot water coil
- Combustion module
- Electrical panel anti-freeze protection

Performance

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

Size 7.1 - CCK version

Cooling performance with 30% of outdoor air

Airflow	Ta °C DB/WB	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
3200 m³/h	22 / 16	19,4	14,3	3,6	5,39	19,5	13,9	4,1	4,76	19,3	13,8	4,6	4,20	18,8	14,2	5,1	3,69	17,9	14,9	5,6	3,20	17,1	15,4	6,3	2,71
	24 / 17	19,9	14,8	3,7	5,38	20	14,5	4,2	4,76	19,8	14,3	4,6	4,30	19,2	14,8	5,1	3,76	18,3	15,4	5,7	3,21	17,4	15,8	6,4	2,72
	26 / 18	20,4	15,3	3,7	5,51	20,5	15	4,2	4,88	20,2	14,9	4,7	4,30	19,5	15,3	5,2	3,75	18,6	15,9	5,8	3,21	17,8	16,3	6,4	2,78
	27 / 19	20,8	15,2	3,7	5,62	20,8	14,9	4,2	4,95	20,5	14,8	4,7	4,36	19,8	15,2	5,3	3,74	18,9	15,8	5,8	3,26	18,1	16,2	6,5	2,78
	28 / 20	21,2	15,1	3,8	5,58	21,2	14,8	4,2	5,05	20,8	14,7	4,8	4,33	20,1	15,2	5,3	3,79	19,2	15,7	5,9	3,25	18,4	16,2	6,5	2,83
	30 / 22	21,9	14,8	3,8	5,76	21,9	14,5	4,3	5,09	21,4	14,4	4,8	4,46	20,7	14,9	5,4	3,83	19,8	15,5	5,9	3,36				
4000 m³/h	22 / 16	20,1	15,7	3,6	5,58	20,2	15,1	4,1	4,93	20,1	14,9	4,6	4,37	19,6	15,4	5,1	3,84	18,7	16,3	5,6	3,34	17,9	16,7	6,2	2,89
	24 / 17	20,6	16,3	3,7	5,57	20,7	15,8	4,2	4,93	20,5	15,6	4,7	4,36	19,9	16,2	5,2	3,83	19,1	16,7	5,7	3,35	18,4	17,1	6,3	2,92
	26 / 18	21,2	16,9	3,8	5,58	21,2	16,4	4,2	5,05	20,9	16,3	4,7	4,45	20,3	16,7	5,2	3,90	19,5	17,2	5,8	3,36	18,8	17,7	6,4	2,94
	27 / 19	21,5	16,7	3,8	5,66	21,6	16,3	4,2	5,14	21,2	16,2	4,8	4,42	20,6	16,5	5,3	3,89	19,8	17,1	5,8	3,41	19,1	17,7	6,5	2,94
	28 / 20	21,9	16,5	3,8	5,76	21,9	16,2	4,3	5,09	21,5	16	4,8	4,48	20,9	16,3	5,3	3,94	20,1	17,1	5,9	3,41	19,4	17,8	6,5	2,98
	30 / 22	22,6	16,2	3,9	5,79	22,6	15,8	4,3	5,26	22,2	15,6	4,9	4,53	21,5	16,1	5,4	3,98	20,7	17,1	5,9	3,51				
5000 m³/h	22 / 16	20,8	17,1	3,7	5,62	20,9	16,4	4,1	5,10	20,7	16,2	4,6	4,50	20,3	16,7	5,1	3,98	19,7	17,7	5,6	3,52	18,9	18,7	6,2	3,05
	24 / 17	21,3	17,8	3,7	5,76	21,4	17,3	4,2	5,10	21,2	17	4,7	4,51	20,7	17,6	5,2	3,98	20	18,6	5,7	3,51	19,4	19,3	6,3	3,08
	26 / 18	21,8	18,6	3,8	5,74	21,9	18	4,3	5,09	21,6	17,8	4,8	4,50	21,1	18,4	5,2	4,06	20,3	19,5	5,8	3,50	19,8	19,7	6,3	3,14
	27 / 19	22,2	18,4	3,8	5,84	22,2	17,8	4,3	5,16	21,9	17,7	4,8	4,56	21,4	18,3	5,3	4,04	20,6	19,4	5,8	3,55	20	19,8	6,4	3,13
	28 / 20	22,6	18,2	3,9	5,79	22,5	17,7	4,3	5,23	22,3	17,5	4,8	4,65	21,7	18,2	5,3	4,09	21	19,3	5,8	3,62	20,3	19,8	6,4	3,17
	30 / 22	23,3	17,7	3,9	5,97	23,2	17,2	4,4	5,27	22,9	17,2	4,9	4,67	22,3	17,9	5,4	4,13	21,5	19	5,9	3,64				

Heating performance with 30% of outdoor and exhaust 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						
3200 m³/h	10	14,2	3,2	4,44	15,1	3,4	4,44	17,5	3,9	4,49	18,5	4,1	4,51	20,6	4,5	4,58	22,7	5	4,54						
	15	14,7	3,6	4,08	15,6	3,8	4,11	17,9	4,3	4,16	18,8	4,5	4,18	20,7	5	4,14	22,7	5,5	4,13						
	18	14,8	3,8	3,89	15,7	4	3,93	18	4,5	4,00	18,8	4,7	4,00	20,7	5,2	3,98	22,6	5,8	3,90						
	20	14,9	4	3,73	15,8	4,1	3,85	18	4,7	3,83	18,8	4,9	3,84	20,6	5,4	3,81	22,5	6	3,75						
	22	15,1	4,1	3,68	16	4,3	3,72	18,1	4,8	3,77	18,8	5	3,76	20,6	5,6	3,68	22,4	6,2	3,61						
	25	15,4	4,4	3,50	16,3	4,6	3,54	18,2	5,1	3,57	18,9	5,3	3,57	20,6	5,8	3,55	22,3	6,5	3,43						
4000 m³/h	10	14,7	3	4,90	15,7	3,2	4,91	18	3,6	5,00	18,9	3,8	4,97	21	4,2	5,00	23	4,7	4,89						
	15	15,2	3,4	4,47	16,1	3,6	4,47	18,2	4	4,55	19,1	4,2	4,55	21,1	4,7	4,49	23,1	5,1	4,53						
	18	15,2	3,6	4,22	16	3,8	4,21	18,2	4,3	4,23	19	4,4	4,32	21	4,9	4,29	23	5,4	4,26						
	20	15,2	3,8	4,00	16,1	4	4,03	18,2	4,4	4,14	19	4,6	4,13	20,9	5,1	4,10	22,9	5,6	4,09						
	22	15,4	4	3,85	16,3	4,1	3,98	18,3	4,6	3,98	19,2	4,8	4,00	21	5,3	3,96	23	5,8	3,97						
	25	15,7	4,2	3,74	16,5	4,4	3,75	18,5	4,8	3,85	19,3	5	3,86	21	5,5	3,82	22,9	6	3,82						
5000 m³/h	10	14,9	2,8	5,32	15,9	2,9	5,48	18,2	3,3	5,52	19	3,4	5,59	21,2	3,8	5,58	23,3	4,2	5,55						
	15	15,6	3,2	4,88	16,5	3,3	5,00	18,6	3,7	5,03	19,4	3,8	5,11	21,4	4,2	5,10	23,3	4,6	5,07						
	18	15,6	3,4	4,59	16,5	3,5	4,71	18,5	3,9	4,74	19,3	4	4,83	21,2	4,4	4,82	23,2	4,9	4,73						
	20	15,7	3,5	4,49	16,5	3,7	4,46	18,5	4	4,63	19,3	4,2	4,60	21,1	4,6	4,59	23,2	5,1	4,55						
	22	15,9	3,7	4,30	16,7	3,8	4,39	18,6	4,2	4,43	19,4	4,4	4,41	21,3	4,8	4,44	23,3	5,2	4,48						
	25	16,2	3,9	4,15	17	4,1	4,15	18,9	4,5	4,20	19,7	4,6	4,28	21,4	5,1	4,20	23,4	5,5	4,25						

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

Integrated heating capacities

Air temperature external exchanger inlet °C (D.B. / W.B.)	-5 / -5.4	0 / -0.6	5 / 3.9	Others
Heating capacity multiplication coefficient	0,89	0,88	0,94	1

The integrated heating capacity represents the real heating capacity considering the defrost cycles too.
To obtain the integrated heating capacity multiply the heating performance value in kWt (shown in the heating performance tables) by the coefficients indicated in the table.
DB = dry bulb
WB = wet bulb
In case of below zero external air temperature with a long period of heat pump operating mode it is necessary to help the evacuation of the water produced during the defrost cycle; this to avoid the formation of ice in the unit basement. Pay attention that the evacuation will not create inconveniences to things or persons.

Size 10.1 - CCK version

Cooling performance with 30% of outdoor air

Airflow	Ta °C DB/WB	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
4300 m³/h	22 / 16	29,2	20,8	5,8	5,03	28,8	20	6,6	4,36	28,2	19,8	7,3	3,86	27,3	20,2	8,1	3,37	26,2	21,1	8,9	2,94	25,1	21,8	9,9	2,54
	24 / 17	29,8	21,4	5,8	5,14	29,4	20,6	6,6	4,45	28,8	20,5	7,4	3,89	27,9	21,1	8,1	3,44	26,6	21,8	9	2,96	25,7	22,5	10	2,57
	26 / 18	30,4	21,9	5,9	5,15	30	21,1	6,7	4,48	29,4	21,2	7,4	3,97	28,4	21,7	8,2	3,46	27,1	22,5	9,1	2,98	26,3	23,2	10,1	2,60
	27 / 19	30,7	21,6	5,9	5,20	30,4	20,9	6,7	4,54	29,8	21	7,5	3,97	28,8	21,5	8,3	3,47	27,5	22,4	9,2	2,99	26,7	23,1	10,2	2,62
	28 / 20	31,1	21,3	6	5,18	30,8	20,8	6,8	4,53	30,2	20,9	7,5	4,03	29,1	21,3	8,3	3,51	27,9	22,2	9,2	3,03	27,2	23	10,2	2,67
	30 / 22	31,9	20,7	6	5,32	31,6	20,5	6,8	4,65	31	20,5	7,6	4,08	29,8	20,9	8,4	3,55	28,6	21,9	9,3	3,08				
6000 m³/h	22 / 16	30,4	23,6	5,8	5,24	30,1	22,6	6,6	4,56	29,8	22,2	7,3	4,08	29,1	22,8	8,1	3,59	28,1	23,9	8,9	3,16	27,1	24,9	9,8	2,77
	24 / 17	31	24,3	5,9	5,25	30,7	23,5	6,7	4,58	30,3	23,3	7,4	4,09	29,6	23,8	8,2	3,61	28,6	24,9	9	3,18	27,7	25,7	10	2,77
	26 / 18	31,6	25,1	6	5,27	31,4	24,4	6,7	4,69	30,8	24,3	7,5	4,11	30,1	24,8	8,2	3,67	29,1	25,8	9,1	3,20	28,4	26,6	10,1	2,81
	27 / 19	32	24,9	6	5,33	31,8	24,2	6,8	4,68	31,2	24,1	7,5	4,16	30,4	24,7	8,3	3,66	29,5	25,7	9,2	3,21	28,9	26,6	10,1	2,86
	28 / 20	32,4	24,6	6	5,40	32,2	24	6,8	4,74	31,5	23,8	7,5	4,20	30,8	24,5	8,3	3,71	29,9	25,5	9,2	3,25	29,4	26,6	10,2	2,88
	30 / 22	33,2	24,1	6,1	5,44	33	23,4	6,9	4,78	32,2	23,3	7,6	4,24	31,5	24,1	8,4	3,75	30,7	25,3	9,4	3,27				
6800 m³/h	22 / 16	30,8	24,6	5,9	5,22	30,6	23,5	6,6	4,64	30,3	23,1	7,3	4,15	29,7	23,9	8	3,71	28,7	25,5	8,8	3,26	27,8	26,6	9,8	2,84
	24 / 17	31,4	25,5	5,9	5,32	31,2	24,6	6,7	4,66	30,8	24,3	7,4	4,16	30,2	25,2	8,1	3,73	29,3	26,5	8,9	3,29	28,6	27,3	9,9	2,89
	26 / 18	32	26,4	6	5,33	31,9	25,5	6,8	4,69	31,4	25,4	7,5	4,19	30,8	26,2	8,2	3,76	29,9	27,4	9,1	3,29	29,3	28,1	10	2,93
	27 / 19	32,5	26,1	6,1	5,33	32,3	25,3	6,8	4,75	31,7	25,2	7,5	4,23	31,2	25,9	8,3	3,76	30,4	27,1	9,1	3,34	29,7	28,2	10,1	2,94
	28 / 20	32,9	25,8	6,1	5,39	32,7	25	6,8	4,81	32,1	24,9	7,6	4,22	31,6	25,6	8,3	3,81	30,8	26,9	9,2	3,35	30,1	28,2	10,2	2,95
	30 / 22	33,7	25,1	6,2	5,44	33,4	24,4	6,9	4,84	32,9	24,3	7,6	4,33	32,4	25	8,4	3,86	31,5	26,5	9,4	3,35				

Heating performance with 30% of outdoor and exhaust 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
4300 m³/h	10	20,5	4,7	4,36	22	5,1	4,31	25,6	6	4,27	26,8	6,3	4,25	29,4	7	4,20	31,6	7,7	4,10
	15	20,9	5,4	3,87	22,2	5,8	3,83	25,4	6,7	3,79	26,6	7	3,80	29,1	7,6	3,83	31,4	8,3	3,78
	18	20,8	5,9	3,53	22,2	6,2	3,58	25,4	7,1	3,58	26,5	7,4	3,58	28,8	8	3,60	31,2	8,7	3,59
	20	20,9	6,1	3,43	22,3	6,5	3,43	25,4	7,3	3,48	26,4	7,6	3,47	28,7	8,2	3,50	31	9	3,44
	22	21,2	6,4	3,31	22,5	6,7	3,36	25,4	7,5	3,39	26,5	7,8	3,40	28,7	8,5	3,38	31	9,3	3,33
	25	21,7	6,8	3,19	22,9	7,1	3,23	25,5	7,9	3,23	26,5	8,2	3,23	28,6	8,9	3,21	30,9	9,8	3,15
6000 m³/h	10	21,1	4	5,28	22,6	4,3	5,26	26,3	5,1	5,16	27,7	5,4	5,13	30,6	6	5,10	32,9	6,6	4,98
	15	21,7	4,7	4,62	23,1	5	4,62	26,5	5,8	4,57	27,8	6,1	4,56	30,3	6,6	4,59	32,5	7,2	4,51
	18	21,6	5,1	4,24	23	5,4	4,26	26,3	6,1	4,31	27,5	6,4	4,30	29,9	7	4,27	32,3	7,5	4,31
	20	21,7	5,3	4,09	23	5,6	4,11	26,1	6,4	4,08	27,3	6,7	4,07	29,8	7,2	4,14	32,2	7,8	4,13
	22	21,9	5,6	3,91	23,2	5,9	3,93	26,2	6,7	3,91	27,3	6,9	3,96	29,7	7,5	3,96	32,2	8	4,03
	25	22,3	6,1	3,66	23,5	6,4	3,67	26,4	7,1	3,72	27,5	7,3	3,77	29,7	7,9	3,76	32,2	8,4	3,83
6800 m³/h	10	21,4	3,8	5,63	22,8	4,1	5,56	26,4	4,8	5,50	27,8	5,1	5,45	30,5	5,7	5,35	32,8	6,3	5,21
	15	21,9	4,5	4,87	23,2	4,8	4,83	26,5	5,5	4,82	27,9	5,8	4,81	30,4	6,4	4,75	32,6	6,9	4,72
	18	21,7	4,8	4,52	23,1	5,1	4,53	26,4	5,9	4,47	27,7	6,2	4,47	30	6,7	4,48	32,5	7,2	4,51
	20	21,8	5,1	4,27	23,1	5,4	4,28	26,4	6,1	4,33	27,7	6,4	4,33	30	6,9	4,35	32,4	7,4	4,38
	22	22,1	5,4	4,09	23,4	5,7	4,11	26,6	6,4	4,16	27,8	6,7	4,15	30,1	7,2	4,18	32,5	7,7	4,22
	25	22,7	5,8	3,91	23,9	6,1	3,92	26,9	6,8	3,96	28	7,1	3,94	30,2	7,5	4,03	32,6	8,1	4,02

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

Integrated heating capacities

Air temperature external exchanger inlet °C (D.B. / W.B.)	-5 / -5.4	0 / -0.6	5 / 3.9	Others
Heating capacity multiplication coefficient	0,89	0,88	0,94	1

The integrated heating capacity represents the real heating capacity considering the defrost cycles too.
To obtain the integrated heating capacity multiply the heating performance value in kWt (shown in the heating performance tables) by the coefficients indicated in the table.
DB = dry bulb
WB = wet bulb
In case of below zero external air temperature with a long period of heat pump operating mode it is necessary to help the evacuation of the water produced during the defrost cycle; this to avoid the formation of ice in the unit basement. Pay attention that the evacuation will not create inconveniences to things or persons.

Size 14.2 - CCK version

Cooling performance with 30% of outdoor air

Airflow	Ta °C DB/WB	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
6400 m³/h	22 / 16	40,2	30,8	8	5,03	40,7	29,8	9	4,52	41	29	10,1	4,06	40,3	29,5	11,2	3,60	39,1	30,2	12,5	3,13	37,3	30,7	13,9	2,68
	24 / 17	41,2	31,8	8	5,15	41,6	30,9	9,1	4,57	41,9	30,1	10,2	4,11	41,3	30,7	11,3	3,65	39,7	31,4	12,6	3,15	37,9	32	14	2,71
	26 / 18	42,2	32,8	8,1	5,21	42,6	31,8	9,2	4,63	42,8	31,3	10,3	4,16	42	31,8	11,4	3,68	40,4	32,6	12,7	3,18	38,6	33,1	14,1	2,74
	27 / 19	43	32,5	8,2	5,24	43,4	31,5	9,2	4,72	43,5	31,1	10,3	4,22	42,7	31,7	11,5	3,71	41	32,4	12,8	3,20	39,3	33	14,2	2,77
	28 / 20	43,9	32,1	8,2	5,35	44,2	31,2	9,3	4,75	44,3	30,9	10,4	4,26	43,3	31,6	11,5	3,77	41,7	32,2	12,9	3,23	40	32,8	14,3	2,80
	30 / 22	45,6	31,4	8,3	5,49	45,8	30,6	9,4	4,87	45,8	30,5	10,4	4,40	44,7	31,1	11,7	3,82	43	31,8	13	3,31				
9000 m³/h	22 / 16	43,2	34,3	8,1	5,33	43,7	33	9,1	4,80	43,8	32,5	10,1	4,34	43,3	33,1	11,2	3,87	41,9	34,5	12,4	3,38	40,2	35,6	13,8	2,91
	24 / 17	44,2	35,7	8,1	5,46	44,7	34,6	9,2	4,86	44,8	33,9	10,2	4,39	44,1	34,6	11,4	3,87	42,6	36	12,6	3,38	41	36,8	14	2,93
	26 / 18	45,4	37	8,2	5,54	45,7	35,9	9,3	4,91	45,7	35,4	10,3	4,44	45,1	36	11,4	3,96	43,4	37,5	12,7	3,42	41,9	37,7	14,1	2,97
	27 / 19	46,1	36,7	8,3	5,55	46,4	35,7	9,3	4,99	46,5	35,1	10,4	4,47	45,7	35,9	11,5	3,97	44,1	37,2	12,8	3,45	42,5	37,6	14,2	2,99
	28 / 20	46,9	36,3	8,3	5,65	47,1	35,4	9,4	5,01	47,3	34,8	10,4	4,55	46,4	35,7	11,6	4,00	44,9	36,8	12,9	3,48	43,1	37,4	14,3	3,01
	30 / 22	48,4	35,5	8,4	5,76	48,8	34,4	9,5	5,14	48,8	34,2	10,5	4,65	48,1	34,8	11,7	4,11	46,5	36,1	13	3,58				
10500 m³/h	22 / 16	44,5	36,2	8,1	5,49	45,1	34,5	9,1	4,96	45,2	33,9	10,1	4,48	44,5	34,8	11,2	3,97	43,2	36,3	12,4	3,48	41,7	37,4	13,8	3,02
	24 / 17	45,5	37,6	8,2	5,55	46	36,2	9,2	5,00	46,1	35,6	10,2	4,52	45,5	36,4	11,3	4,03	44,2	37,8	12,6	3,51	42,7	38,7	14	3,05
	26 / 18	46,5	39,1	8,3	5,60	47,1	37,7	9,3	5,06	47,1	37,2	10,3	4,57	46,5	37,9	11,5	4,04	45,2	39,3	12,8	3,53	43,5	40	14,1	3,09
	27 / 19	47,4	38,6	8,4	5,64	47,9	37,4	9,4	5,10	47,9	36,9	10,4	4,61	47,2	37,6	11,6	4,07	45,8	39	12,8	3,58	44	40	14,2	3,10
	28 / 20	48,2	38,2	8,4	5,74	48,6	37	9,4	5,17	48,7	36,5	10,5	4,64	47,9	37,3	11,6	4,13	46,5	38,8	12,9	3,60	44,6	40,1	14,3	3,12
	30 / 22	49,9	37,2	8,5	5,87	50,1	35,9	9,6	5,22	50,2	35,6	10,6	4,74	49,5	36,3	11,8	4,19	47,7	38,3	13	3,67				

Heating performance with 30% of outdoor and exhaust 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
6400 m³/h	10	30	6,6	4,55	32,2	6,9	4,67	37,3	7,8	4,78	39,2	8,2	4,78	43,8	9,3	4,71	48,2	10,3	4,68
	15	30,7	7,4	4,15	32,7	7,7	4,25	37,5	8,7	4,31	39,4	9,1	4,33	43,7	10,2	4,28	47,9	11,3	4,24
	18	30,7	7,8	3,94	32,6	8,2	3,98	37,4	9,2	4,07	39,3	9,6	4,09	43,4	10,7	4,06	47,5	11,8	4,03
	20	30,7	8,1	3,79	32,6	8,5	3,84	37,4	9,5	3,94	39,3	10	3,93	43,3	11	3,94	47,3	12,2	3,88
	22	31	8,4	3,69	32,9	8,8	3,74	37,6	9,9	3,80	39,3	10,3	3,82	43,2	11,4	3,79	47,1	12,6	3,74
	25	31,4	8,8	3,57	33,2	9,3	3,57	37,6	10,3	3,65	39,3	10,8	3,64	43,1	12	3,59	46,9	13,2	3,55
9000 m³/h	10	30,3	6	5,05	32,4	6,3	5,14	37,5	7	5,36	39,4	7,3	5,40	44,2	8,1	5,46	48,9	9	5,43
	15	31,4	6,8	4,62	33,3	7	4,76	38,1	7,8	4,88	40	8,2	4,88	44,4	9	4,93	48,6	9,9	4,91
	18	31,4	7,2	4,36	33,2	7,5	4,43	37,9	8,3	4,57	39,7	8,6	4,62	43,9	9,5	4,62	48,3	10,5	4,60
	20	31,4	7,4	4,24	33,3	7,7	4,32	37,9	8,6	4,41	39,7	8,9	4,46	43,8	9,9	4,42	48,2	10,9	4,42
	22	31,8	7,7	4,13	33,6	8,1	4,15	38,1	8,9	4,28	39,8	9,3	4,28	43,8	10,3	4,25	48,3	11,2	4,31
	25	32,3	8,2	3,94	34,1	8,5	4,01	38,4	9,4	4,09	40,1	9,8	4,09	43,9	10,8	4,06	48,3	11,8	4,09
10500 m³/h	10	30,4	5,8	5,24	32,2	6	5,37	37,2	6,7	5,55	39,2	7	5,60	44	7,7	5,71	48,6	8,5	5,72
	15	31,5	6,5	4,85	33,4	6,8	4,91	38,2	7,5	5,09	40,1	7,8	5,14	44,4	8,6	5,16	48,8	9,5	5,14
	18	31,5	7	4,50	33,4	7,2	4,64	38,1	8	4,76	39,9	8,3	4,81	44,1	9,1	4,85	48,6	10	4,86
	20	31,6	7,2	4,39	33,5	7,5	4,47	38,2	8,3	4,60	39,9	8,6	4,64	44	9,5	4,63	48,5	10,4	4,66
	22	32,1	7,5	4,28	34	7,8	4,36	38,5	8,6	4,48	40,2	8,9	4,52	44,2	9,8	4,51	48,6	10,8	4,50
	25	32,9	8	4,11	34,6	8,3	4,17	39	9,1	4,29	40,7	9,5	4,28	44,5	10,4	4,28	48,7	11,3	4,31

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

Integrated heating capacities

Air temperature external exchanger inlet °C (D.B. / W.B.)	-5 / -5.4	0 / -0.6	5 / 3.9	Others
Heating capacity multiplication coefficient	0,89	0,88	0,94	1

The integrated heating capacity represents the real heating capacity considering the defrost cycles too.
To obtain the integrated heating capacity multiply the heating performance value in kWt (shown in the heating performance tables) by the coefficients indicated in the table.
DB = dry bulb
WB = wet bulb
In case of below zero external air temperature with a long period of heat pump operating mode it is necessary to help the evacuation of the water produced during the defrost cycle; this to avoid the formation of ice in the unit basement. Pay attention that the evacuation will not create inconveniences to things or persons.

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
7.1	Airflow	m³/h	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	-	-	-	-
	Airflow	l/s	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	1111	-	-	-	-
	Fan RPM	rpm	1203	1217	1243	1281	1317	1353	388	1423	1458	1493	1527	-	-	-	-
	Sound pressure	dB(A)	77,4	77,6	77,3	76,6	77,0	77,4	77,9	78,9	79,7	80,6	81,4	-	-	-	-
	Total input	kW	0,48	0,49	0,53	0,57	0,62	0,67	0,72	0,78	0,83	0,89	0,95	-	-	-	-
10.1	Airflow	m³/h	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
	Airflow	l/s	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667
	Fan RPM	rpm	1157	1166	1185	1213	1240	1268	1295	1322	1349	1375	1401	1427	1453	1479	1529
	Sound pressure	dB(A)	78,7	79,0	79,6	79,1	78,8	78,9	79,1	79,4	79,7	79,9	80,2	80,4	80,6	81,0	81,7
	Total input	kW	0,79	0,81	0,86	0,93	1,00	1,08	1,16	1,23	1,31	1,39	1,47	1,56	1,64	1,72	1,88
14.2	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	1269	1277	1293	1317	1341	1366	1390	1415	1439	1464	1488	1512	1536	1560	1606
	Sound pressure	dB(A)	80,1	80,1	80,9	81,6	81,4	81,1	81,3	81,3	81,3	81,3	81,3	81,4	81,4	81,5	81,8
	Total input	kW	1,24	1,27	1,33	1,42	1,52	1,63	1,73	1,82	1,91	2,01	2,11	2,21	2,31	2,42	2,64

The performance takes into account the pressure drops in the standard 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	570
7.1	Airflow	m³/h	3200	3200	3200	3200	3200	3200	3200	3200	3200	3200	3200	3200	3200	3200		
	Airflow	l/s	889	889	889	889	889	889	889	889	889	889	889	889	889	889		
	Fan RPM	rpm	1031	1046	1076	1120	1163	1206	1249	1291	1332	1372	1411	1449	1486	1522		
	Sound pressure	dB(A)	71,9	72,1	72,5	73,4	74,8	76,1	77,4	78,5	79,6	80,6	81,5	82,4	83,2	84,0		
	Total input	kW	0,33	0,35	0,37	0,41	0,46	0,50	0,55	0,59	0,64	0,69	0,73	0,79	0,84	0,90		
10.1	Airflow	m³/h	4300	4300	4300	4300	4300	4300	4300	4300	4300	4300	4300	4300	4300	4300	4300	4300
	Airflow	l/s	1194	1194	1194	1194	1194	1194	1194	1194	1194	1194	1194	1194	1194	1194	1194	1194
	Fan RPM	rpm	906	919	944	981	1018	1053	1088	1123	1157	1190	1223	1255	1287	1318	1378	1436
	Sound pressure	dB(A)	71,7	71,8	72,1	72,6	73,1	73,6	74,3	75,0	75,6	76,2	76,9	77,6	78,3	79,0	80,3	81,5
	Total input	kW	0,43	0,45	0,49	0,55	0,61	0,67	0,72	0,78	0,84	0,91	0,97	1,04	1,10	1,17	1,31	1,45
14.2	Airflow	m³/h	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400
	Airflow	l/s	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778
	Fan RPM	rpm	970	982	1005	1039	1074	1107	1140	1172	1204	1236	1267	1298	1328	1358	1415	1471
	Sound pressure	dB(A)	73,7	73,9	73,9	73,9	74,0	74,1	74,4	75,0	75,6	76,2	76,7	77,5	78,3	79,0	80,4	81,7
	Total input	kW	0,63	0,66	0,70	0,77	0,84	0,91	0,98	1,06	1,15	1,23	1,32	1,41	1,50	1,60	1,79	2,00

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

Handling electric fan performance - High airflow

Available static pressure (Pa) (supply+return)			90	100	120	150	180	210	240	270	300	330	360	390	420	450	510
7.1	Airflow	m³/h	5000	5000	5000	5000	5000	5000	-	-	-	-	-	-	-	-	-
	Airflow	l/s	1389	1389	1389	1389	1389	1389	-	-	-	-	-	-	-	-	-
	Fan RPM	rpm	1426	1437	1458	1491	1524	1556	-	-	-	-	-	-	-	-	-
	Sound pressure	dB(A)	81,6	81,5	81,4	81,3	81,2	81,2	-	-	-	-	-	-	-	-	-
	Total input	kW	0,74	0,76	0,79	0,85	0,92	0,98	-	-	-	-	-	-	-	-	-
10.1	Airflow	m³/h	6800	6800	6800	6800	6800	6800	6800	6800	6800	6800	6800	6800	6800	6800	6800
	Airflow	l/s	1889	1889	1889	1889	1889	1889	1889	1889	1889	1889	1889	1889	1889	1889	1889
	Fan RPM	rpm	1279	1288	1306	1331	1356	1380	1405	1429	1453	1476	1500	1524	1547	1571	1617
	Sound pressure	dB(A)	81,4	81,4	81,4	81,4	81,5	81,5	81,6	81,6	81,7	81,9	82,1	82,3	82,5	82,7	83,1
	Total input	kW	1,02	1,05	1,10	1,18	1,26	1,34	1,43	1,52	1,60	1,69	1,77	1,86	1,95	2,05	2,24
14.2	Airflow	m³/h	10500	10500	10500	10500	10500	10500	10500	10500	10500	-	-	-	-	-	-
	Airflow	l/s	2917	2917	2917	2917	2917	2917	2917	2917	2917	-	-	-	-	-	-
	Fan RPM	rpm	1449	1456	1470	1491	1511	1532	1553	1573	1594	-	-	-	-	-	-
	Sound pressure	dB(A)	83,4	83,4	83,4	83,5	83,7	83,9	84,0	84,3	84,5	-	-	-	-	-	-
	Total input	kW	1,77	1,80	1,87	1,98	2,09	2,20	2,32	2,44	2,56	-	-	-	-	-	-

The performance takes into account the pressure drops in the standard 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
7.1	Airflow	m³/h	4000	4000	4000	4000	4000	4000	4000	4000	4000	-	-	-	-
	Airflow	l/s	1111	1111	1111	1111	1111	1111	1111	1111	1111	-	-	-	-
	Fan RPM	rpm	1182	1249	1312	1373	1431	1487	1542	1594	1645	-	-	-	-
	Sound pressure	dB(A)	75,9	77,4	78,9	80,2	81,5	82,7	83,8	84,8	85,8	-	-	-	-
	Total input	kW	0,87	1,00	1,13	1,27	1,41	1,56	1,70	1,85	2,01	-	-	-	-
10.1	Airflow	m³/h	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
	Airflow	l/s	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667	1667
	Fan RPM	rpm	1352	1410	1466	1520	1574	1625	1676	1726	1775	1807	1870	1916	1962
	Sound pressure	dB(A)	83,7	84,4	85,2	85,9	86,7	87,5	88,4	89,2	90,1	90,6	91,7	92,5	93,2
	Total input	kW	1,34	1,50	1,66	1,84	2,02	2,20	2,38	2,56	2,76	2,89	3,16	3,38	3,60
14.2	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	1630	1673	1717	1760	1802	1844	1886	1926	1966	1992	2044	2083	2121
	Sound pressure	dB(A)	90,6	90,6	90,6	90,8	91,0	91,3	91,5	91,8	92,1	92,3	92,7	93,0	93,3
	Total input	kW	2,08	2,28	2,49	2,69	2,90	3,12	3,34	3,57	3,81	3,98	4,29	4,53	4,78

The performance takes into account the pressure drops in the standard 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 - Minimum airflow

Available static pressure (Pa) (supply+return)			420	480	540	600	660	720	780	840	900	960	1020	1080
7.1	Airflow	m³/h	3200	3200	3200	3200	3200	3200	3200	3200				
	Airflow	l/s	889	889	889	889	889	889	889	889				
	Fan RPM	rpm	1242	1306	1368	1427	1484	1538	1591	1642				
	Sound pressure	dB(A)	79,2	80,7	82,1	83,4	84,6	85,7	86,7	87,7				
	Total input	kW	0,91	1,03	1,15	1,28	1,42	1,55	1,70	1,84				
10.1	Airflow	m³/h	4300	4300	4300	4300	4300	4300	4300	4300	4300	4300	4300	4300
	Airflow	l/s	1194	1194	1194	1194	1194	1194	1194	1194	1194	1194	1194	1194
	Fan RPM	rpm	1311	1376	1439	1499	1557	1614	1669	1722	1773	1823	1872	1920
	Sound pressure	dB(A)	83,8	85,3	86,8	88,0	89,2	90,4	91,4	92,4	93,3	94,1	95,0	95,7
	Total input	kW	1,19	1,34	1,49	1,64	1,79	1,96	2,12	2,29	2,47	2,65	2,83	3,02
14.2	Airflow	m³/h	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400	6400
	Airflow	l/s	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778	1778
	Fan RPM	rpm	1436	1490	1543	1595	1645	1695	1743	1791	1838	1883	1928	1973
	Sound pressure	dB(A)	85,1	85,7	86,3	87,0	87,6	88,3	89,1	89,8	90,6	91,3	92,0	92,7
	Total input	kW	1,58	1,74	1,92	2,10	2,29	2,45	2,67	2,87	3,07	3,27	3,49	3,71

The performance takes into account the pressure drops in the standard 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 - High airflow

Available static pressure (Pa) (supply+return)			210	240	270	300	330	360	390	420	450	510	570	600	660	720	900	1020
7.1	Airflow	m³/h	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	-	-	-
	Airflow	l/s	1389	1389	1389	1389	1389	1389	1389	1389	1389	1389	1389	1389	1389	-	-	-
	Fan RPM	rpm	1208	1238	1268	1298	1327	1356	1390	1413	1441	1496	1549	1575	1626	-	-	-
	Sound pressure	dB(A)	76,2	76,6	77,1	77,6	78,1	78,6	79,0	79,5	80,0	81,0	82,0	82,5	83,5	-	-	-
	Total input	kW	0,97	1,04	1,10	1,17	1,24	1,32	1,39	1,47	1,54	1,70	1,86	1,94	2,11	-	-	-
10.1	Airflow	m³/h	6800	6800	6800	6800	6800	6800	6800	6800	6800	6800	6800	6800	6800	6800	6800	6800
	Airflow	l/s	1889	1889	1889	1889	1889	1889	1889	1889	1889	1889	1889	1889	1889	1889	1889	1889
	Fan RPM	rpm	1367	1395	1422	1449	1475	1501	1527	1553	1579	1629	1678	1702	1749	1796	1931	2017
	Sound pressure	dB(A)	85,0	85,2	85,4	85,7	85,9	86,2	86,4	86,7	86,9	87,5	88,1	88,4	89,0	89,6	91,6	92,9
	Total input	kW	1,34	1,43	1,51	1,60	1,69	1,78	1,87	1,96	2,05	2,23	2,42	2,52	2,72	2,93	3,55	3,99
14.2	Airflow	m³/h	10500	10500	10500	10500	10500	10500	10500	10500	10500	10500	10500	10500	10500	10500	-	-
	Airflow	l/s	2917	2917	2917	2917	2917	2917	2917	2917	2917	2917	2917	2917	2917	2917	-	-
	Fan RPM	rpm	1770	1789	1808	1827	1846	1865	1883	1901	1920	1957	1994	2012	2049	2086	-	-
	Sound pressure	dB(A)	94,5	94,4	94,3	94,2	94,1	94,1	94,0	94,0	94,0	93,9	93,9	94,0	94,1	94,3	-	-
	Total input	kW	2,49	2,59	2,69	2,79	2,90	3,00	3,11	3,23	3,34	3,58	3,83	3,94	4,18	4,43	-	-

The performance takes into account the pressure drops in the standard 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.

Exhaust electric fan performance

Available static pressure (return) (Pa)			150				
% of exhaust air			10%	20%	30%	40%	50%
7.1	Airflow	m³/h	400	800	1200	1600	2000
	Airflow	l/s	111	222	333	444	556
	Fan RPM	rpm	1030	1050	1092	1180	1277
	Total input	kW	0,09	0,12	0,15	0,18	0,22
10.1	Airflow	m3/h	600	1200	1800	2400	3000
	Airflow	l/s	167	333	500	667	833
	Fan RPM	rpm	1040	1092	1230	1390	1590
	Total input	kW	0,10	0,15	0,20	0,26	0,33
14.2	Airflow	m3/h	900	1800	2700	3600	4500
	Airflow	l/s	250	500	750	1000	1250
	Fan RPM	rpm	852	882	968	1093	1247
	Total input	kW	0,16	0,21	0,28	0,37	0,48

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

Accessories

EH - Electric elements

This option is suggested for cold climates, allows the integration of heating capacity from the heat pump. The electrical heaters are placed before the treatment coil and perform the air preheating function, extending the operating range of the unit and helping quickly to reach the comfort in the room.

Ideal for climate areas in applications with low outside temperature where it is required to active the heaters only for short time in the year. In these cases the resulting system simplification (no water supply) compensates the energy costs.

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

The electrical heating elements are managed by the controller with two power steps.

Matching of the electric elements

Size	7.1	10.1	14.2
6kW	√	-	-
9kW	√	√	
13.5kW	√	√	√
18kW	-	√	√
24kW	-	-	√

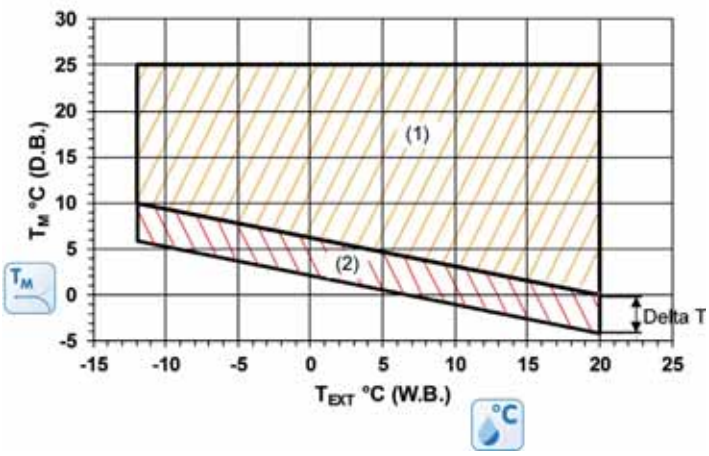
This option involves variation of the main electrical data of the unit.

Water heating coil, electric heaters and fuel-operated heating module can not be installed at the some time.

Operation field extension with electric heater

The minimum work 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 air temperature inlet on exchanger TM(D.M.) for standard unit, at the desired conditions.

Size	Airflow [m³/h]	POWER ELECTRIC HEATERS / DELTA T [°C]				
		6kW	9kW	13.5kW	18kW	24kW
7.1	4000	4,4	6,7	10,0	-	-
10.1	6000	-	4,4	6,7	8,9	-
14.2	9000	-	-	4,4	5,9	7,9



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 external air, always calculate the Tm mixing temperature at the internal heat exchanger input.

TM = INTERNAL EXCHANGER ENTERING AIR TEMPERATURE
dry bulb measured temperature (D.B.=DRY BULB)

TEXT = INLET AIR TEMPERATURE IN THE EXTERNAL EXCHANGER
temperature measured with wet bulb (W.B.=WET BULB)

1. Operation at full load
2. Operation field of the unit equipped with electric elements

With an outdoor air temperature between –10°C and –20°C install the following options:

- 2 rows hot water coil
- Combustion module
- Electrical panel anti-freeze protection

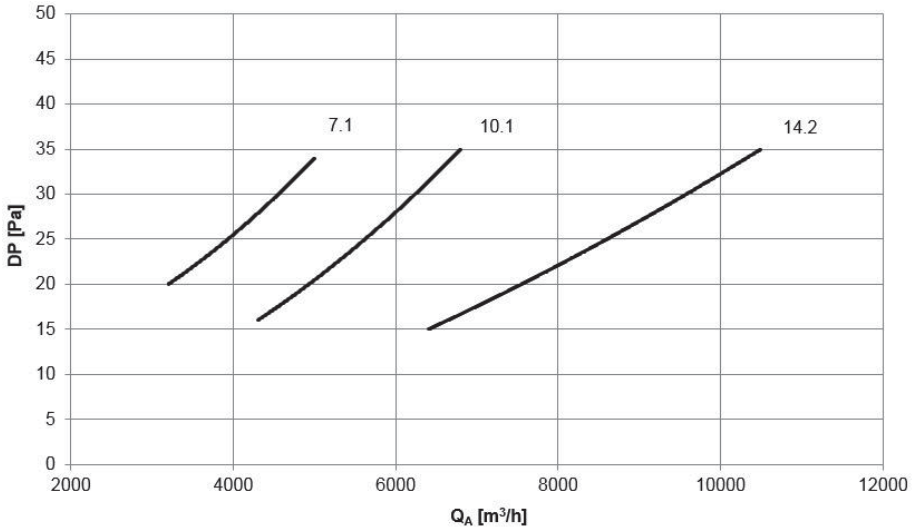
CHW2 - Two-row hot water coil

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 handling coil, it pre-heats the air, extending the operation limits of the unit.

As alternative, it may operate in complete substitution of the heating capacity provided by the compressors. This is possible by setting a turning point, i.e. a temperature limit of the outdoor air below which use of the compressors is blocked, and the water coil is used as the sole resource. If the water coil provides pre-heating of the air, the control logic reduces its power to a preset value, which keeps the compressors from operating with condensation temperatures that are too high. If instead the water coil is used as the main resource (e.g. because the compressors are not available), the maximum power will be provided.

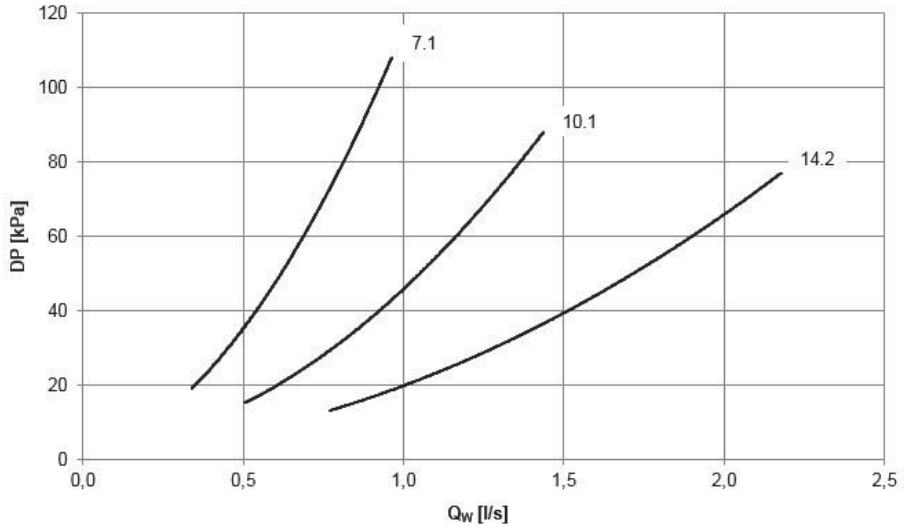
Hot water coil pressure drop: AIR side



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 = pressure drop (Pa)

Hot water coil pressure drop: 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 (Pa)

The water flow rate must be calculated with the following formula

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).

Water heating coil, electric heaters and fuel-operated heating module can not be installed at the some time.

Performances of hot water coil (2 rows)

Size			Ti/To (°C)								
			80/65	70/55	60/40	80/65	70/55	60/40	80/65	70/55	60/40
			kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt
7.1	Qo (m³/h)		3200			4000			5000		
	TM (°C)	5	39,6	33,4	25,1	45,8	38,6	28,9	52,1	43,9	32,8
		10	36,3	30,1	21,9	41,9	34,8	25,2	47,8	39,6	28,6
		14	33,7	27,6	19,4	38,9	31,8	22,3	44,3	36,2	25,3
		16	32,4	26,3	18,1	37,4	30,3	20,8	42,6	34,6	23,6
		18	31,1	25,0	16,9	35,9	28,9	19,4	40,9	32,9	22,0
		20	29,8	23,8	15,6	34,4	27,4	17,9	39,3	31,2	20,3
10.1	Qo (m³/h)		4300			6000			6800		
	TM (°C)	5	54,0	45,5	34,2	67,3	56,7	42,3	73,0	61,4	45,8
		10	49,5	41,0	29,8	61,7	51,1	36,9	66,9	55,4	39,9
		14	45,9	37,5	26,3	57,2	46,7	32,6	62,0	50,6	35,2
		16	44,1	35,8	24,6	55,0	44,6	30,4	59,6	48,3	32,9
		18	42,3	34,1	22,9	52,8	42,4	28,3	57,3	45,9	30,6
		20	40,6	32,3	21,2	50,7	40,3	26,2	54,9	43,6	28,3
14.2	Qo (m³/h)		6400			9000			10500		
	TM (°C)	5	81,4	68,6	51,6	102,2	86,1	64,4	112,8	95,0	70,9
		10	74,6	61,9	45,0	93,6	77,6	56,1	103,3	85,7	61,8
		14	69,2	56,6	39,8	86,9	71,0	49,6	95,9	78,3	54,6
		16	66,4	53,9	37,2	83,5	67,7	46,2	92,2	74,7	50,9
		18	63,8	51,4	34,6	80,2	64,4	43,1	88,5	71,0	47,4
		20	61,2	48,8	32,0	76,9	61,2	39,9	84,9	67,5	43,8

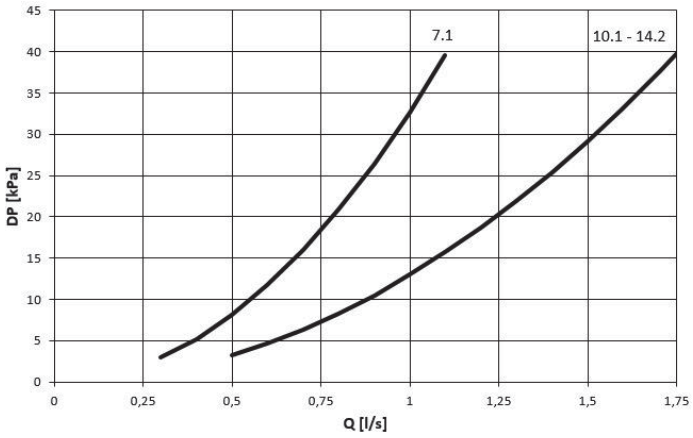
TM = air inlet temperature of water coil (°C)
Ti/To = water temperature inlet/outlet (°C)
Qo = airflow (l/s)
kWt = Provided heating capacity (kW)
Thermal yields referred to the max. water coil capacity. The thermo regulator coke the 3-way modulating valve limiting the inlet air temperature at desired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

This accessoriy has to be combined to the " CHW2 - Two row hot water coil".

GC - Condensing gas heating module and modulating control

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

Thanks to the condensation technology with pre-mix and extremely efficient modulation (up to 105% depending on the lower heat value), consumption is very contained and considerably reduced during operation at partial load. The burner has low polluting emissions (NOx lower than 80mg/kWh) in accordance with Class 5 of European standard EN 676.

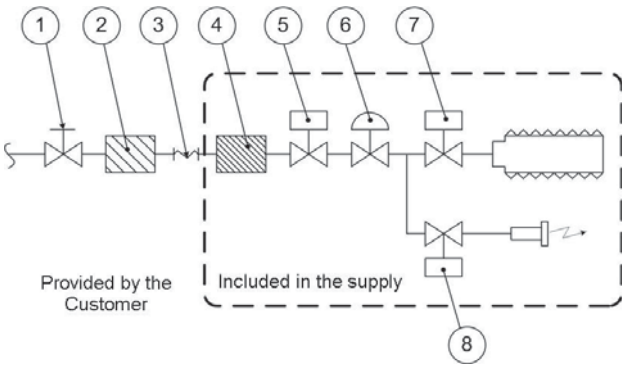
The module is supplied ready for use and is an essential part of the unit.

The gas module presence needs the horizontal supply.

The heating module includes:

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

Gas connection diagram



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

Gas use features

		35kW		44kW		65kW		82kW	
NOx class	Val	5							
		min	max	min	max	min	max	min	max
Nominal heating capacity	kW	7.60	34.85	8.50	42.00	12.40	65.00	16.40	82.00
Efficiency Hi (P.C.I.)	%	106.97	96.30	105.88	96.19	108.06	96.82	108.35	97.60
Efficiency Hs (P.C.S.)	%	96.37	86.76	95.39	86.66	97.36	87.22	97.62	87.93
Max produced condensation	l/h	0.9		1.1		2.1		3.3	
Carbon monoxide CO (0% di O_2)	ppm	<5		<5		<5		<5	
Nitrogen oxide - NOx (0% di O_2)		41 mg / k Wh 23 ppm		35 mg / k Wh 20 ppm		40 mg / k Wh 23 ppm		34 mg / k Wh 19 ppm	
Chimney available pressure	Pa	90		100		120		120	
Gas connection diameter	GAS	UNI ISO 7/1-3/4"		UNI ISO 7/1-3/4"		UNI ISO 7/1-3/4"		UNI ISO 7/1-1"	
Fume chimney diameter	mm	80		80		80		80	

Matching of the condensing gas heating module

Size		7.1	10.1	14.2
GC01	35kW	√	√	√
GC08	44kW	√	√	√
GC09	65kW	-	-	√
GC10	82kW	-	-	√

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

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

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

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

CPHG - Hot gas post-heating coil

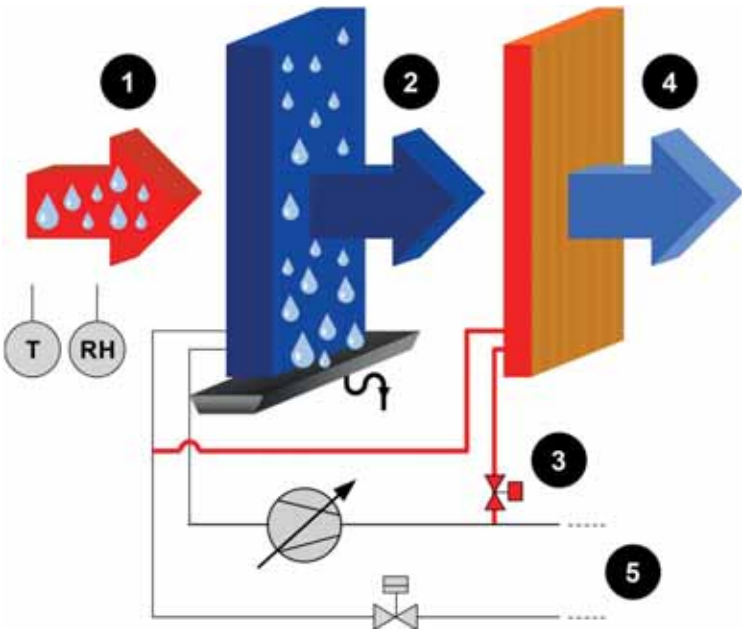
This option is recommended during the summer when the intakr air dehumidification is required.

The airflow to enter the room may contain a higher level of humidity than desired. The dehumidification process is used to reduce it. The airflow 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).



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

Indicative scheme - not in scale

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

Performances of post-heating coil hot gas re-heating

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
7.1	Qo (m^3/h)		3200					4000					5000				
	Ta (°C)	10	8,3	9,0	10,0	10,6	11,6	9,0	9,7	10,8	11,5	12,6	10,7	11,5	12,7	13,6	14,8
		12	7,7	8,3	9,3	10,0	11,0	8,3	9,0	10,1	10,8	11,8	9,8	10,7	11,9	12,7	14,0
		14	7,0	7,7	8,7	9,3	10,3	7,6	8,3	9,3	10,1	11,1	9,0	9,8	11,1	11,9	13,2
		16	6,4	7,0	8,0	8,7	9,6	6,9	7,6	8,6	9,4	10,4	8,2	9,0	10,3	11,1	12,3
		18	5,7	6,4	7,4	8,0	9,0	6,2	6,9	7,9	8,6	9,7	7,4	8,2	9,4	10,3	11,5
		20	5,1	5,7	6,7	7,4	8,3	5,5	6,2	7,2	7,9	9,0	6,6	7,4	8,6	9,5	10,7
10.1	Qo (m^3/h)		4300					6000					6800				
	Ta (°C)	10	13,8	15,0	16,5	17,5	19,1	15,6	16,8	18,6	19,8	21,6	16,3	17,6	19,4	20,7	22,6
		12	12,8	13,9	15,4	16,5	18,1	14,5	15,7	17,4	18,6	20,5	15,1	16,4	18,2	19,5	21,4
		14	11,8	12,8	14,4	15,4	17,0	13,3	14,5	16,3	17,5	19,3	13,9	15,1	17,0	18,3	20,1
		16	10,8	11,8	13,4	14,4	16,0	12,2	13,3	15,1	16,3	18,1	12,7	13,9	15,8	17,0	18,9
		18	9,8	10,8	12,3	13,4	15,0	11,0	12,2	13,9	15,1	16,9	11,5	12,7	14,6	15,8	17,7
		20	8,7	9,8	11,3	12,4	13,9	9,9	11,0	12,8	14,0	15,8	10,3	11,5	13,4	14,6	16,5
14.2	Qo (m^3/h)		6400					9000					10500				
	Ta (°C)	10	19,2	20,6	22,8	24,3	26,5	21,7	23,3	25,8	27,5	30,0	22,9	24,6	27,2	29,0	31,7
		12	17,8	19,2	21,4	22,8	25,1	20,1	21,7	14,2	25,9	28,4	21,2	22,9	25,5	27,3	29,9
		14	16,3	17,8	19,9	21,4	23,6	18,5	20,1	22,6	24,2	26,7	19,5	21,2	23,8	25,5	28,2
		16	14,9	16,3	18,5	20,0	22,2	16,8	18,5	20,9	22,6	25,1	17,7	19,5	22,1	23,8	26,5
		18	13,5	14,9	17,1	18,5	20,7	15,2	16,9	19,3	21,0	23,5	16,0	17,8	20,4	22,1	24,7
		20	12,1	13,5	15,6	17,1	19,3	13,6	15,3	17,7	19,3	21,8	14,4	16,1	18,7	20,4	23,0

Ta = leaving air temperature from the handling coil and entering the post-heating coil
Qo = airflow (l/s)
kWt = Heating capacity (kW)
The post-heating coil is powered by the hot gas, drawn by the supply pipe.
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 outside air temperature.
The performances of the hot gas post-heating coil refer to the cooling operation of the unit at full load.

HSE - Immersed electrodes steam humidifier

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

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

Indoor humidity is measured by the humidity probe on the return air side of the unit.

Matching of the immersed electrode and steam humidification module

Size	7.1	10.1	14.2
3 kg/h	√	√	√
5 kg/h	-	-	√
8 kg/h	-	-	√

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

This accessory requires a water and drain circuit onboard the unit to be provided by the customer.

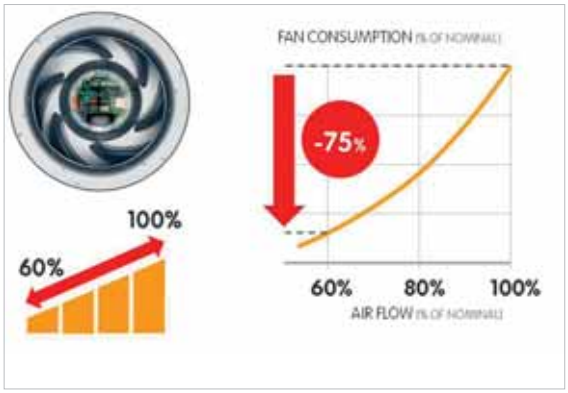
Considers to use antifreeze system on the water drain. Provided for by the customer

PCOSM - Supply constant 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 airflow, 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 'PCOS - 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)

This option can not be matched to the unit in constant capacity version

FCE - Enthalpic FREE-COOLING

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

The measurement of the ambient temperature and humidity is done using the electronic ambient control wall unit with a humidity probe (supplied standard with the unit).

PSAF - Clogged filter differential pressure switch air side

It allows to detect and signal (by an appropriate warning) the reaching of the max. level of air filter clogging. The unit handler receives an indication when to perform the necessary maintenance of the filters. The detecting device is installed in the unit and it is already connected to the unit electrical panel and pre-calibrated in the factory. The calibration can be modified by the qualified assistance centre during the start-up.

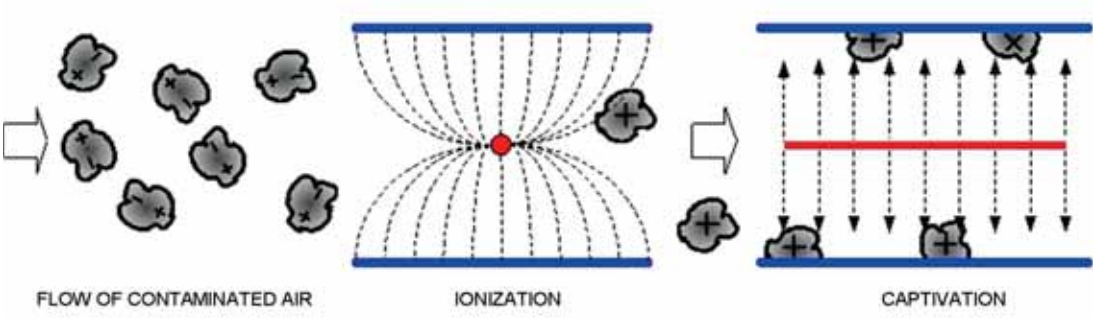
FES - H10 high efficiency electrostatic air filter

Class H10 high-efficiency filters are additional filtering components with an active electrostatic system. Solid or liquid particles contained in the airflow are trapped by an electrical field. The airflow 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.

In sizes 10.1 and 14.2 the electrostatic filters are not compatible with the high static pressure fans option.

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).

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.

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 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.

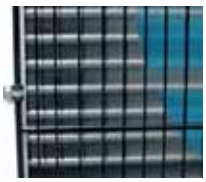
The probe is installed and wired built-in the unit and is located in the return air duct of the unit.

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 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.

PGFC - Finned coil protection grilles



This accessory is used to protect the external coil from the accidental contact with external things or people.

Ideal for installation in places where persons can pass from, such as car parks, terraces, etc.

The device is installed built-in the unit.

CCCA - Copper / aluminium coil with acrylic lining

Coils with copper pipes and aluminium fins with acrylic lacquering. Can be used in settings with moderately low 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

Accessories separately supplied

AMRX - Rubber anti-vibrating dampers

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

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

Option compatibility

This table contains the list o f the configurable accessories and their compatibility with CKN-XHE.

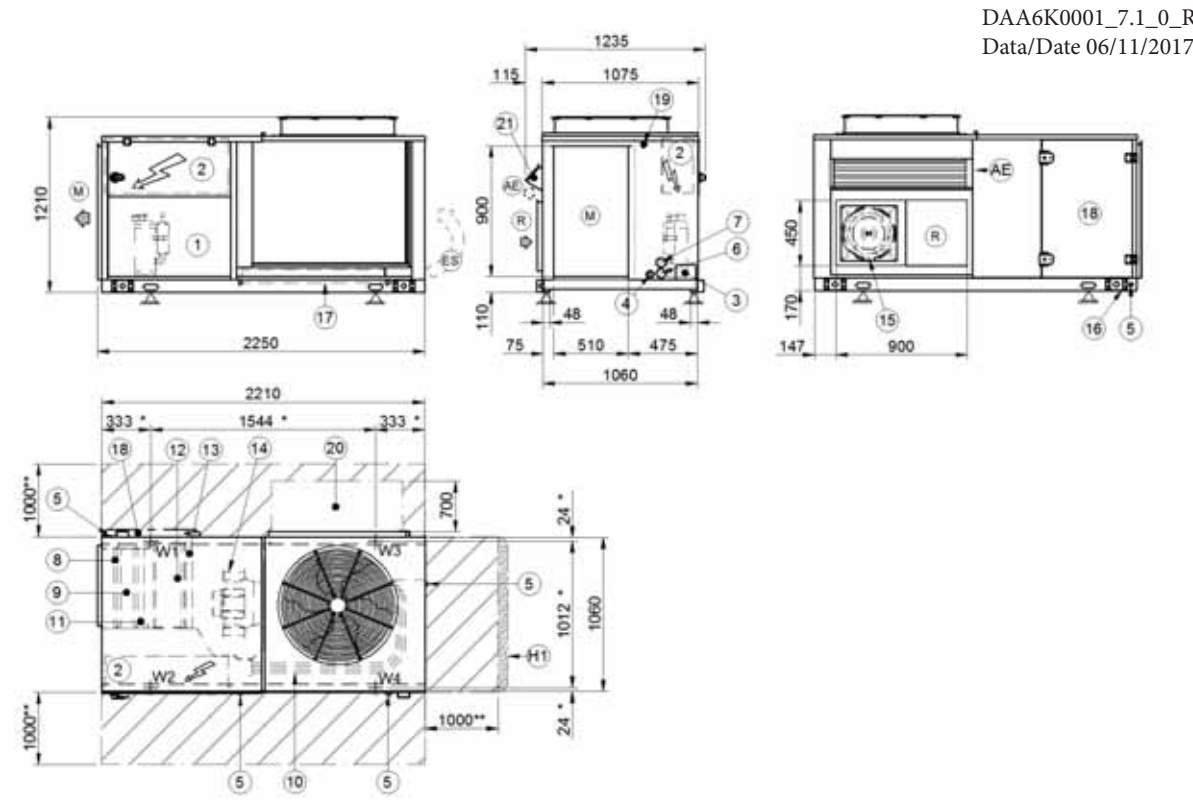
CKN-XHE OPTIONS				
RIF.	**DESCRIPTION**	**CONF. CAK**	**CONF. CBK**	**CONF.CCK**
Versions				
RE1	Exhaust air active energy recovery	-	-	√
FC	Thermal FREE-COOLING	-	-	√
FCE	Enthalpy FREE-COOLING	-	-	O
Configurations				
CREFB	Device for fan consumption reduction of the external section, ECOBREEZE type	√	√	√
CHW2	2 rows hot water coil	O	O	O
3WVM	Modulating 3-way valve	O	O	O
EH	Electric heaters.	O	O	O
GC	Condensing gas heating module and modulating control	O	O	O
PGFC	Finned coil protection grilles	O	O	O
PCM0	Sandwich panels of the handling zone in M0 fire reaction class	O	O	O
Refrigerant circuit				
CINV	Inverter compressor	√	√	√
EVE	Electronic expansion valve	√	√	√
CPHG	hot gas re-heat coil	O	O	O
Aeraulic circuit				
PCOSM	Constant supply airflow	O	O	O
PVAR	Variable airflow	O	O	O
FPG4	Pleated air filter class G4 (EN779 norm)	√	√	√
F7	High efficiency F7 air filter	O	O	O
FES	Electronic filters	O	O	O
PSAF	Clogged filter differential pressure switch air side	O	O	O
VENH	High static pressure fans in outlet	O	O	O
HSE	Immersed electrodes steam humidifier	O	O	O
SERM	On/off motorized air outlet damper	-	O	-
SER	Modulating air outlet damper	-	√	-
SFCM	Modulating motorized FREE-COOLING damper	-	-	√
PAQC	Air quality sensor for CO2 p.p.m. control	-	-	O
PAQCV	Air quality sensor for CO2 and VOC p.p.m. control	-	-	O
Electrical circuit				
CRC	Remote control with user interface	√	√	√
CTEM	Temperature control with on-board probe	√	√	√
CSOND	Ambient humidity and temperature control with built-in probes	O	O	O
CNSC9	Serial communication module for Modbus supervisor	√	√	√
PM	Phase monitor	√	√	√
Installation				
AMRX	Rubber antivibration mounts	◊	◊	◊
Various				
SCO	Shipping by container	O	O	O
LBPF	Packaging with wooden crate + fumigation	O	O	O

√ Standard component
O Optional component
O* Required matching: air quality probe and modulating motorised outdoor air damper
◊ The accessory can be separately supplied (optional)
- Not available

Dimensional drawings

Size 7.1 - Version CAK/CBK/CCK

DAA6K0001_7.1_0_REV00
Data/Date 06/11/2017



1. Compressor compartment
2. Electrical panel
3. Power input
4. Humidifier connections
5. Condensate drain
6. H2O heating coil output Φ 3/4"
7. H2O heating coil input Φ 3/4"
8. Re-heating coil (optional)
9. Internal exchanger
10. External exchanger
11. H2O heating coil (optional) or heating elements (optional)
12. Electrostatic filters or F7 (optional)
13. G4 air filters (standard)
14. Electric fan (supply-return)
15. Exhaust electric fan (version CCK only)
16. Lifting brackets (removable)
17. Over pressure damper exhaust (version CCK only)
18. Access for inspection coil, filters, hesting elements
19. Access for inspection of the bleed valve (hot water coil)
20. Duct section removable for maintenance provided by the customer
21. Fresh air intake cap (only version CBK-CCK)

(R) Air return
(M) Air supply
(AE) Fresh air intake
(ES) Air exhaust (only version CCK)
(H1) Wall with same height as unit on a maximun of three side
(**) Minimun suggested clearance
(*) Vibration mounts position

Weight distribution of full re-circulation (CAK) / Recirculation and renewal air (CBK) configuration

Size		7.1
W1 Supporting Point	kg	98
W2 Supporting Point	kg	122
W3 Supporting Point	kg	96
W4 Supporting Point	kg	100
Shipping weight	kg	452

Weight distribution of full re-circulation, renewal air and exhaust (CCK) configuration

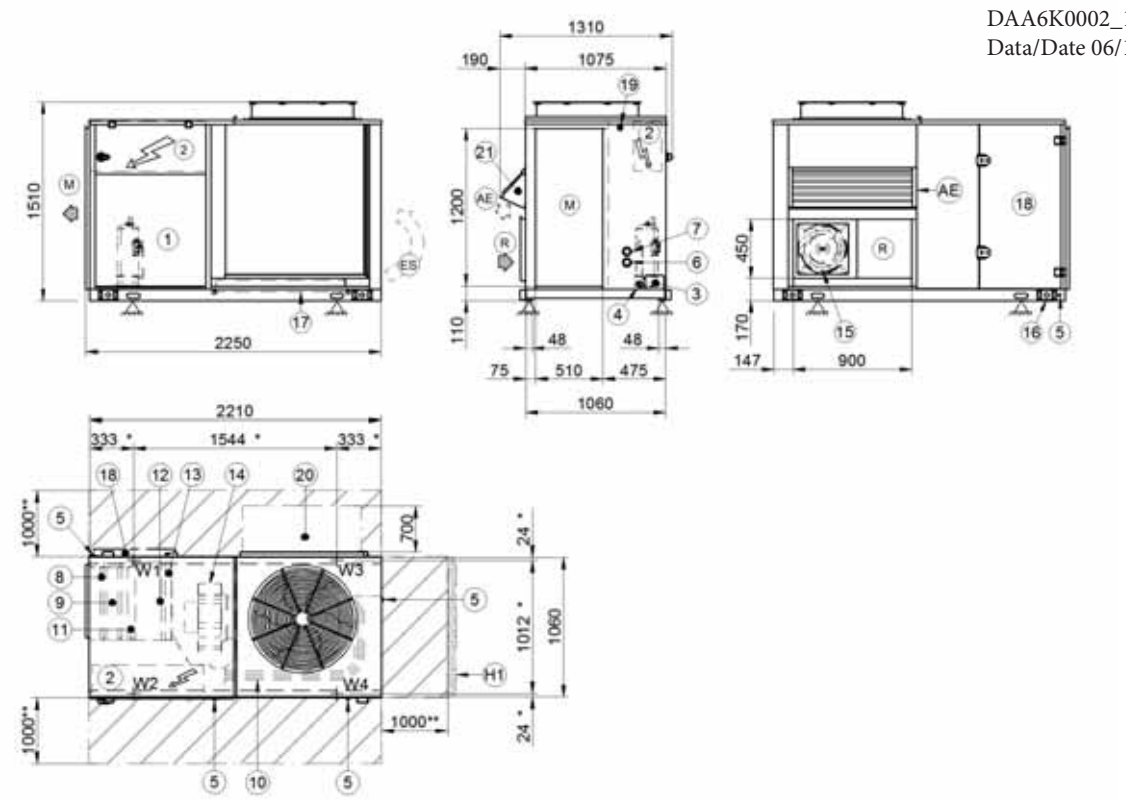
Size		7.1
W1 Supporting Point	kg	102
W2 Supporting Point	kg	126
W3 Supporting Point	kg	101
W4 Supporting Point	kg	105
Shipping weight	kg	470

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

Dimensional drawings

Size 10.1 - Version CAK/CBK/CCK

DAA6K0002_10.1_0_REV00
Data/Date 06/11/2017



1. Compressor compartment
2. Electrical panel
3. Power input
4. Humidifier connections
5. Condensate drain
6. H2O heating coil outpu Φ 1"
7. H2O heating coil input Φ 1"
8. Re-heating coil (optional)
9. Internal exchanger
10. External exchanger
11. H2O heating coil (optional) or heating elements (optional)
12. Electrostatic filters or F7 (optional)
13. G4 air filters (standard)
14. Electric fan (supply-return)
15. Exhaust electric fan (version CCK only)
16. Lifting brackets (removable)
17. Over pressure damper exhaust (version CCK only)
18. Access for inspection coil, filters, hesting elements
19. Access for inspection of the bleed valve (hot water coil)
20. Duct section removable for maintenance provided by the customer
21. Fresh air intake cap (only version CBK-CCK)

(R) Air return
(M) Air supply
(AE) Fresh air intake
(ES) Air exhaust (only version CCK)
(H1) Wall with same height as unit on a maximun of three side
(**) Minimun suggested clearance
(*) Vibration mounts position

Weight distribution of full re-circulation (CAK) / Recirculation and renewal air (CBK) configuration

Size		10.1
W1 Supporting Point	kg	132
W2 Supporting Point	kg	107
W3 Supporting Point	kg	131
W4 Supporting Point	kg	126
Shipping weight	kg	532

Weight distribution of full re-circulation, renewal air and exhaust (CCK) configuration

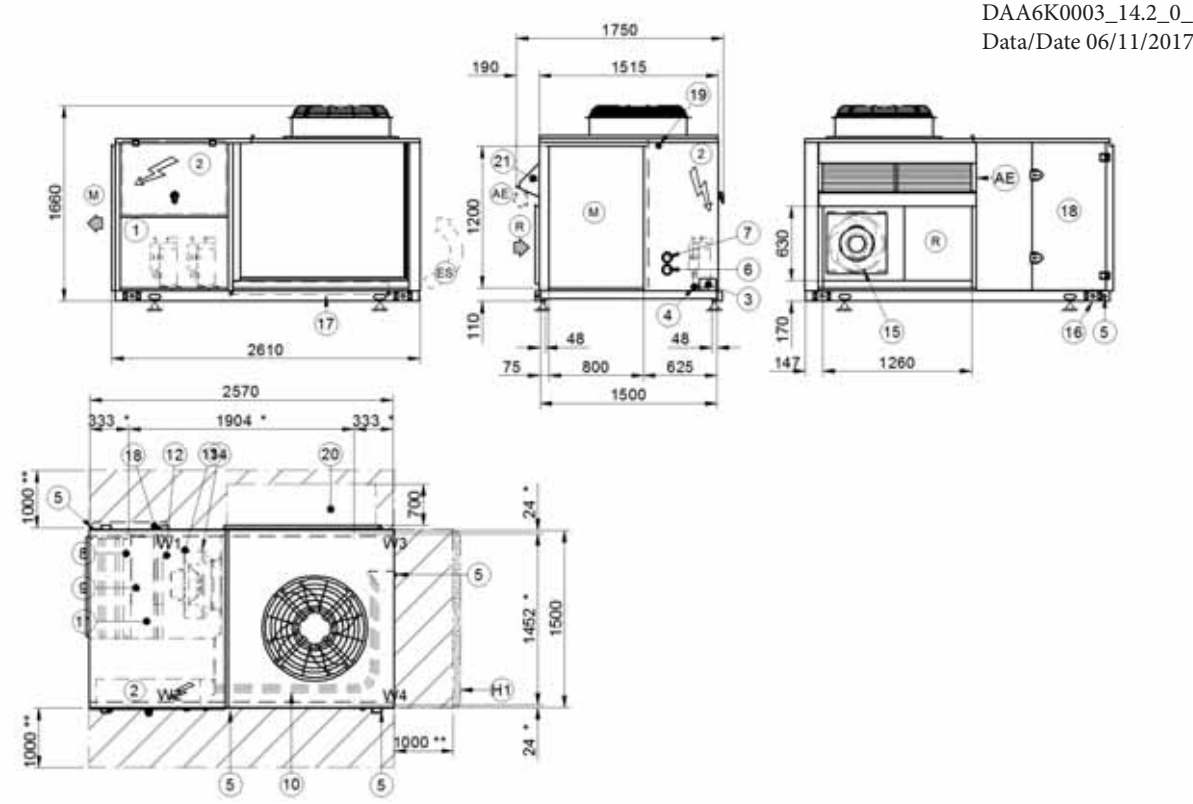
Size		10.1
W1 Supporting Point	kg	138
W2 Supporting Point	kg	113
W3 Supporting Point	kg	137
W4 Supporting Point	kg	132
Shipping weight	kg	556

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

Dimensional drawings

Size 14.2 - Version CAK/CBK/CCK

DAA6K0003_14.2_0_REV00
Data/Date 06/11/2017



1. Compressor compartment
2. Electrical panel
3. Power input
4. Humidifier connections
5. Condensate drain
6. H2O heating coil outpuΦ 1" 1/4
7. H2O heating coil input Φ 1" 1/4
8. Re-heating coil (optional)
9. Internal exchanger
10. External exchanger
11. H2O heating coil (optional) or heating elements (optional)
12. Electrostatic filters or F7 (optional)
13. G4 air filters (standard)
14. Electric fan (supply-return)
15. Exhaust electric fan (version CCK only)
16. Lifting brackets (removable)
17. Over pressure damper exhaust (version CCK only)
18. Access for inspection coil, filters, hesting elements
19. Access for inspection of the bleed valve (hot water coil)
20. Duct section removable for maintenance provided by the customer
21. Fresh air intake cap (only version CBK-CCK)

(R) Air return
(M) Air supply
(AE) Fresh air intake
(ES) Air exhaust (only version CCK)
(H1) Wall with same height as unit on a maximun of three side
(**) Minimun suggested clearance
(*) Vibration mounts position

Weight distribution of full re-circulation (CAK) / Recirculation and renewal air (CBK) configuration

Size		14.2
W1 Supporting Point	kg	175
W2 Supporting Point	kg	127
W3 Supporting Point	kg	171
W4 Supporting Point	kg	162
Shipping weight	kg	685

Weight distribution of full re-circulation, renewal air and exhaust (CCK) configuration

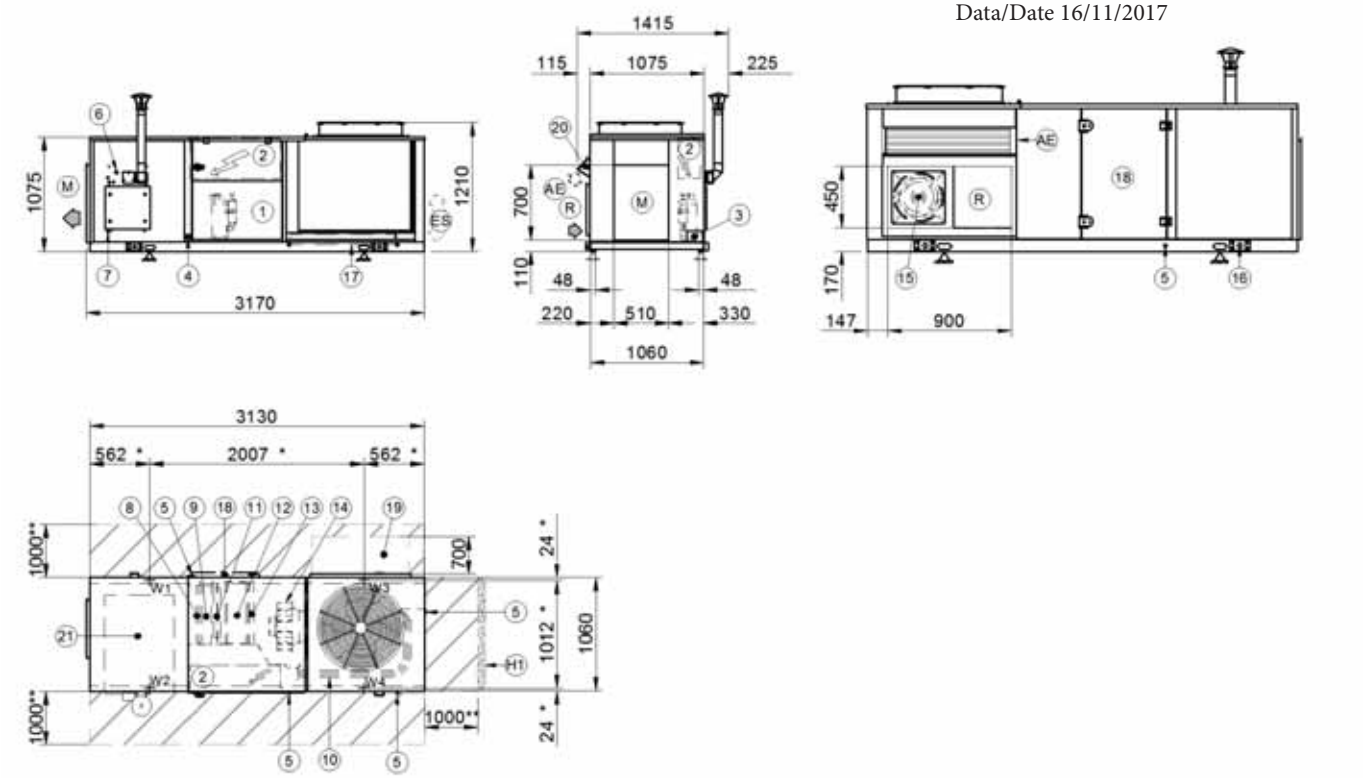
Size		14.2
W1 Supporting Point	kg	183
W2 Supporting Point	kg	137
W3 Supporting Point	kg	180
W4 Supporting Point	kg	170
Shipping weight	kg	720

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

Dimensional drawings

Size 7.1 - Version CAK/CBK/CCK - Gas heating module 35/53 kW

DAA6K0004_7.1_GC01_GD13_0 REV00
Data/Date 16/11/2017



1. Compressor compartment
2. Electrical panel
3. Power input
4. Humidifier connections
5. Condensate drain
6. Gas connection
7. Condensate drain (only for condensation gas heating module)
8. Re-heating coil (optional)
9. Internal exchanger
10. External exchanger
11. Resistenze elettriche (optional)
12. Electrostatic filters or F7 (optional)
13. G4 air filters (standard)
14. Electric fan (supply-return)
15. Exhaust electric fan (version CCK only)
16. Lifting brackets (removable)
17. Over pressure damper exhaust (version CCK only)
18. Access for inspection coil, filters, hesting elements
19. Duct section removable for maintenance provided by the customer
20. Fresh air intake cap (only version CBK-CCK)
21. Gas module

(R) Air return
(M) Air supply
(AE) Fresh air intake
(ES) Air exhaust (only version CCK)
(H1) Wall with same height as unit on a maximun of three side
(**) Minimun suggested clearance
(*) Vibration mounts position

Weight distribution of full re-circulation (CAK) / Recirculation and renewal air (CBK) configuration

Size		7.1
W1 Supporting Point	kg	136
W2 Supporting Point	kg	167
W3 Supporting Point	kg	141
W4 Supporting Point	kg	145
Shipping weight	kg	625

Weight distribution of full re-circulation, renewal air and exhaust (CCK) configuration

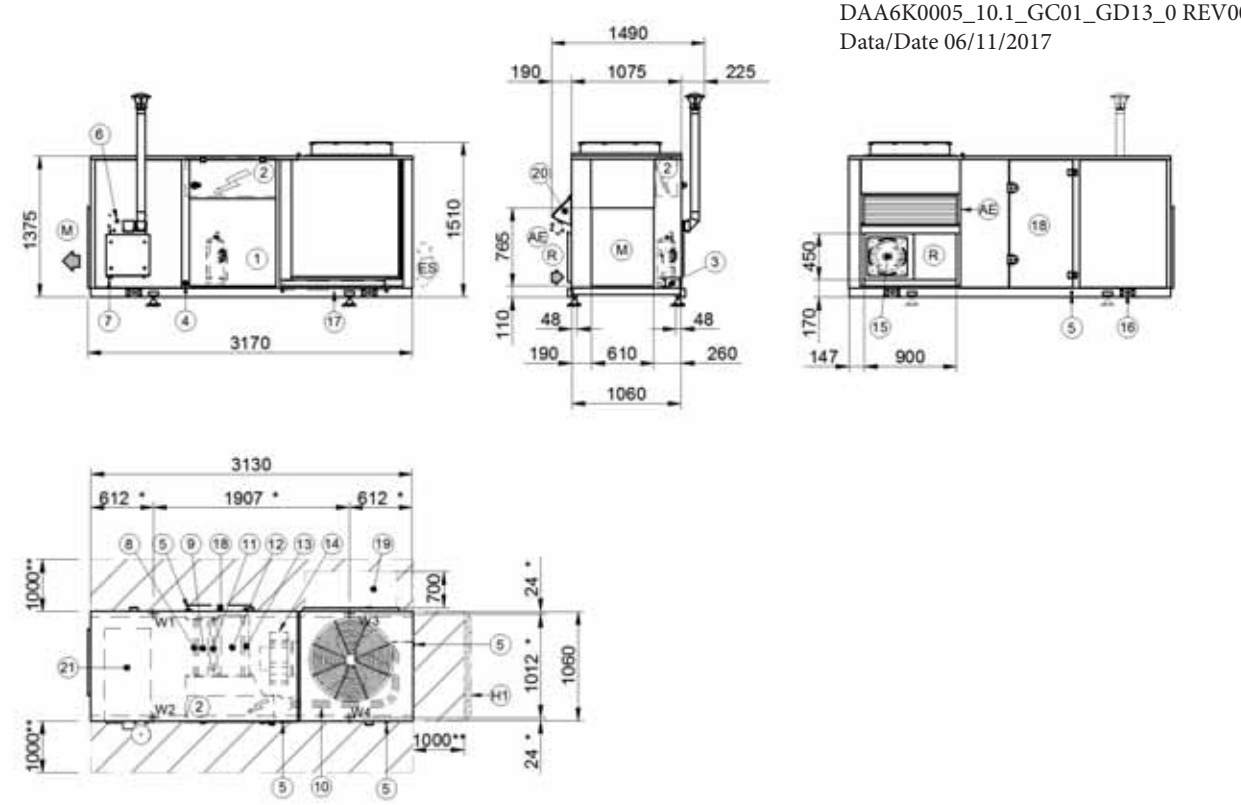
Size		7.1
W1 Supporting Point	kg	140
W2 Supporting Point	kg	172
W3 Supporting Point	kg	145
W4 Supporting Point	kg	150
Shipping weight	kg	643

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

Dimensional drawings

Size 10.1 - Version CAK/CBK/CCK - Gas heating module 35/53 kW

DAA6K0005_10.1_GC01_GD13_0 REV00
Data/Date 06/11/2017



1. Compressor compartment
2. Electrical panel
3. Power input
4. Humidifier connections
5. Condensate drain
6. Gas connection
7. Condensate drain (only for condensation gas heating module)
8. Re-heating coil (optional)
9. Internal exchanger
10. External exchanger
11. Resistenze elettriche (optional)
12. Electrostatic filters or F7 (optional)
13. G4 air filters (standard)
14. Electric fan (supply-return)
15. Exhaust electric fan (version CCK only)
16. Lifting brackets (removable)
17. Over pressure damper exhaust (version CCK only)
18. Access for inspection coil, filters, hesting elements
19. Duct section removable for maintenance provided by the customer
20. Fresh air intake cap (only version CBK-CCK)
21. Gas module

(R) Air return
(M) Air supply
(AE) Fresh air intake
(ES) Air exhaust (only version CCK)
(H1) Wall with same height as unit on a maximun of three side
(**) Minimun suggested clearance
(*) Vibration mounts position

Weight distribution of full re-circulation (CAK) / Recirculation and renewal air (CBK) configuration

Size		10.1
W1 Supporting Point	kg	180
W2 Supporting Point	kg	148
W3 Supporting Point	kg	173
W4 Supporting Point	kg	168
Shipping weight	kg	705

Weight distribution of full re-circulation, renewal air and exhaust (CCK) configuration

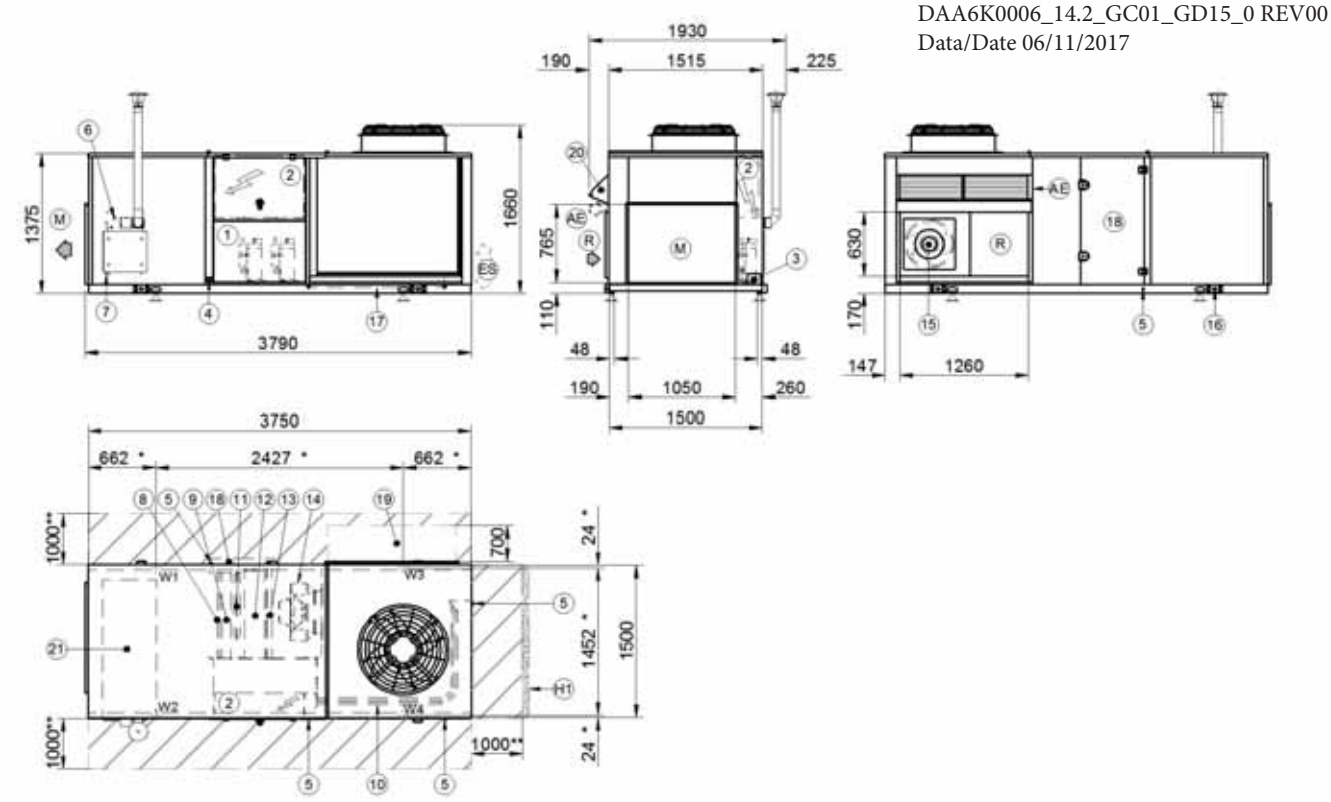
Size		10.1
W1 Supporting Point	kg	186
W2 Supporting Point	kg	154
W3 Supporting Point	kg	179
W4 Supporting Point	kg	174
Shipping weight	kg	729

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

Dimensional drawings

Size 14.2 - Version CAK/CBK/CCK - Gas heating module 35/100 kW

DAA6K0006_14.2_GC01_GD15_0 REV00
Data/Date 06/11/2017



1. Compressor compartment
2. Electrical panel
3. Power input
4. Humidifier connections
5. Condensate drain
6. Gas connection
7. Condensate drain (only for condensation gas heating module)
8. Re-heating coil (optional)
9. Internal exchanger
10. External exchanger
11. Resistenze elettriche (optional)
12. Electrostatic filters or F7 (optional)
13. G4 air filters (standard)
14. Electric fan (supply-return)
15. Exhaust electric fan (version CCK only)
16. Lifting brackets (removable)
17. Over pressure damper exhaust (version CCK only)
18. Access for inspection coil, filters, hesting elements
19. Duct section removable for maintenance provided by the customer
20. Fresh air intake cap (only version CBK-CCK)
21. Gas module

(R) Air return
(M) Air supply
(AE) Fresh air intake
(ES) Air exhaust (only version CCK)
(H1) Wall with same height as unit on a maximun of three side
(**) Minimun suggested clearance
(*) Vibration mounts position

Weight distribution of full re-circulation (CAK) / Recirculation and renewal air (CBK) configuration

Size		14.2
W1 Supporting Point	kg	249
W2 Supporting Point	kg	191
W3 Supporting Point	kg	235
W4 Supporting Point	kg	226
Shipping weight	kg	951

Weight distribution of full re-circulation, renewal air and exhaust (CCK) configuration

Size		14.2
W1 Supporting Point	kg	258
W2 Supporting Point	kg	200
W3 Supporting Point	kg	243
W4 Supporting Point	kg	235
Shipping weight	kg	986

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

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