Packaged air conditioner
roof top direct expansion
high efficiency.
Full Inverter technology

SMARTPACK2

CKN-XHE2i 7.1 - 14.2 RANGE

TECHNICAL BULLETIN

R-410A

ErP 2021 COMPLIANT

SIZE	7.1	10.1	14.2
COOLING CAPACITY kW	20.6	30.4	45.7
HEATING CAPACITY kW	20.9	29.8	43.8

Page

Clivet participates in the ECP Programme for “Rooftop”.
Check ongoing validity of certificate on www.eurovent-certification.com

Features

SMARTPack2 for medium attendance applications

The CKN-XHE2i units are high-efficiency stand-alone air conditioners designed for small to medium commercial areas. They are specific for use in medium crowded environments such as: single stores, outlet villages, show room and in modern service stations. The series uses full inverter technology, meaning that compressors and ventilators can modulate their speed continuously to adapt to the actual demands of the environment served.
This solution makes it possible to follow the trend of the thermal load even in mid-seasons, reaching very high seasonal performance as required by the ErP 2021 regulations.

Clivet rooftop are Eurovent certified products

The SMARTPack2 series has the Eurovent Certified Performance quality mark, which means it has been tested strictly in accordance with the European standards. This provides an additional guarantee for the customer; in fact, the Eurovent tests confirm the performance of the product and permit accurate analysis of the running costs: “Total Life Cycle Cost”.

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

Three configurations available, from the full recirculation version, with minimum fresh air, to versions with renewal and energy recovery on the exhaust air. Each one can be integrated with a broad range of accessories that customise the product according to the application.

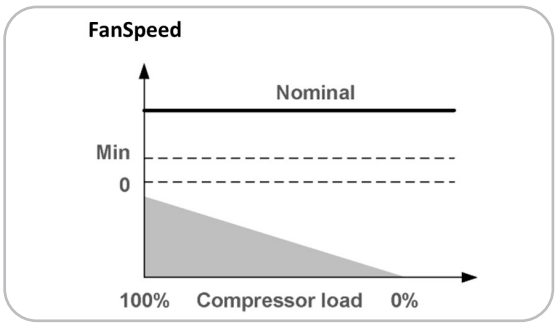
- ✓ Single refrigeration circuit with inverter-controlled compressor, for continuous capacity partialization following the thermal load of the building.
- ✓ Radial fans directly coupled to EC brushless motors (plug fans) permit control of the airflow for adapting to the characteristics of the aeraulic system. On both the supply and the exhaust section.
- ✓ Ventilatore assiale esterno direttamente accoppiato a motore DC con regolazione di velocità per ottimizzare la condensazione.
- ✓ Filtration of air in several stages, from coarse particles (G4 filters) to classes of absolute filtration (electronic filters).
- ✓ UV-C lamps with active germicidal action against fungal spores, bacteria and viruses, for maximum air quality, effective against Covid-19.
- ✓ Constant or variable control of the flow of supply air.
- ✓ Automatic and variable control of the amount of fresh air based on the actual requirement of occupants, with air quality probe.
- ✓ Freecooling function when it is possible to use outdoor air directly to meet the internal loads.
- ✓ Summer dehumidification function with hot-gas post-heating to increase comfort even with high latent loads.
- ✓ Heating solutions that can be used together with or instead of the heat pump: electric heaters, hot water coil, modulating gas module with condensation technology.
- ✓ Humidification systems integrated in the unit.
- ✓ Possibility of connection to the main supervision systems wtih Modbus communication protocol

All the accessories are cabled and supplied on board the unit unless specified otherwise.

Automatic management of the air flow

Standard mode

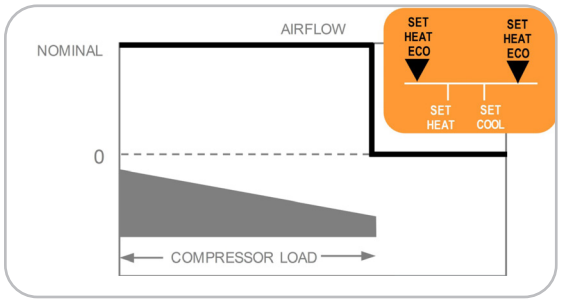
The supply airflow is managed with 0-10V signal.
The signal remains constant and keeps the fan speed consistent in all thermal load conditions and operating mode.



ECO mode (standard function)

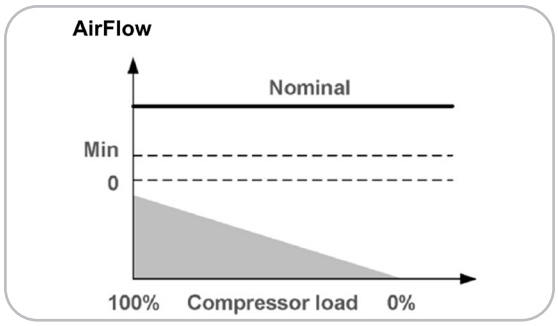
The air flow supply remains constant at varied heat loads and is shut-down when the load is fulfilled.
To further increase the energy savings in this condition, it is also possible to set less demanding operation setpoints for the unit in respect to the standard mode.
This function is indicated for the 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.



Constant air flow (PCOSM option)

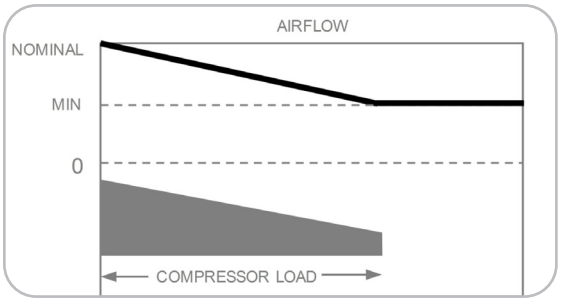
Supply air flow rate remains constant even with the progressive filter pressure drop increased fouling by offsetting.



Variable airflow (PVAR option)

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.



Features

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.

Filter nomenclature in accordance with EN ISO 16890

The classification of air filters is based on the ability to retain airborne particulate matter.
To make it possible and easier to select appropriate filters according to different applications, a new global standard for filtration has been recently introduced: EN ISO 16890.
It defines a new and alternative classification for air filters based on their ability to retain dispersed airborne particulate matter (PM10, PM2.5 and PM1) through new, more stringent and specific test methods.
The previous standards in force, such as EN 779-2012, ASHRAE 52.2 and other local standards, are thus unified for all countries worldwide.
Below, the correlation between the traditional nomenclature and the new standard for filters used in Clivet units. For easier reading, both names have been kept in the text.

1st stage of filtration (standard)	G4	ISO 16890 Coarse 60%
2st stage of filtration (optional)	F7	ISO 16890 ePM1 55%
2st stage of filtration (optional)	F9	ISO 16890 ePM1 80%
2st stage of filtration (optional)	FES (electronic filters)	ISO 16890 ePM1 90%

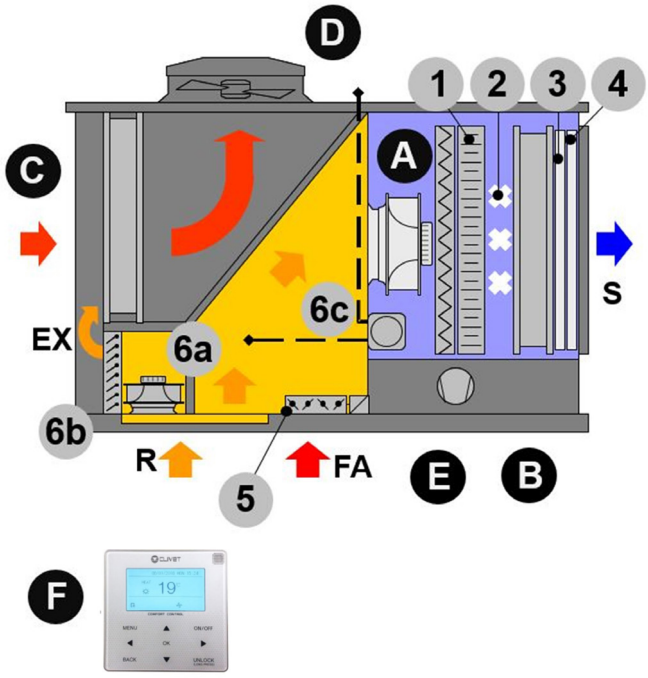
The system is included into a single unit

SMARTPack2 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. 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 (ISO 16890 Coarse 60%) 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
Second filtration stage available with F7 (ISO 16890 ePM1 55%), F9 (ISO 16890 ePM1 80%), electronic (ISO 16890 ePM1 90%) filter.
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).



Simplified drawing

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 version 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.

Features

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 0.75 mm^2 for the communication, cable of 2 x 1 mm^2 for power supply

Main functions:

- 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.
- temperature measuring through in-built probe

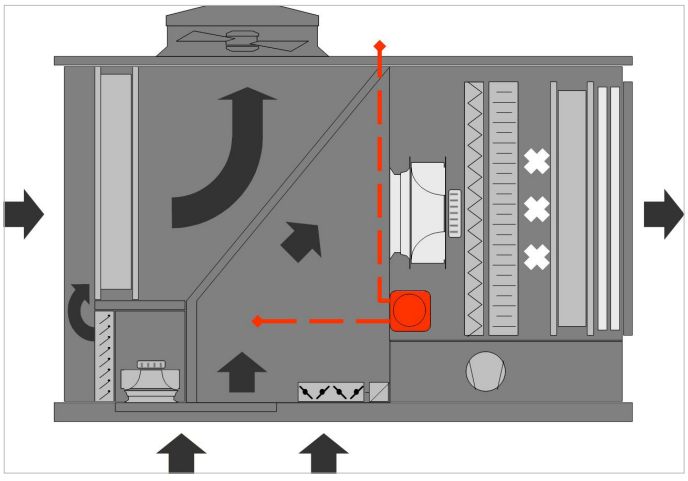
With separate power supply the connection can be extended up to 300m.

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.

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).



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 Zn-Mg alloy improves the characteristics in terms of corrosion resistance thanks to the galvanic protection typical of the Zinc-Magnesium combination.

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

Outdoor air inlet side and environment return side

Pleated filter for greater filtering surface, made of a galvanized sheet frame with a galvanized and electric-welded protective mesh, and regenerable filtering media made from polyester fibre sized with synthetic resins. Efficiency G4 (ISO 16890 Coarse 60%). Self-extinguishing type (flame resistant 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

Standard unit technical specifications

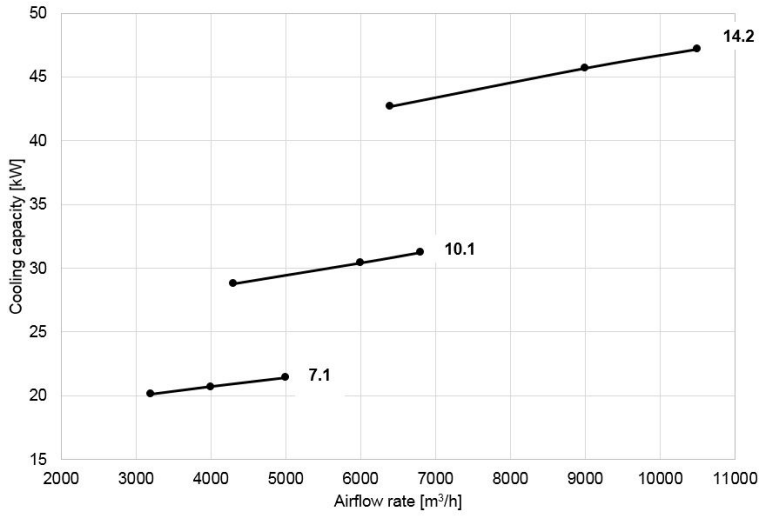
Wall room electronic control including:
- intuitive graphical interface retro lighted
- modification of the temperature and humidity set point
- unit On/Off and overload reset
- manual changing of the operating mode (hot or cold)
- display of operating status
- display of alarms and failure code
- management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

IoT integration (optional):
Connectivity to the Clivet Eye IoT platform to avail of the cloud based services related to remote control, maintenance and optimization.
Remote accessibility available via smartphone, tablet and PC by means of responsive interface

Accessories
- VENH - High static pressure fans
- F7 - F7 high efficiency air filter (ISO 16890 ePM1 55%)
- F9 - F9 high efficiency air filter (ISO 16890 ePM1 80%)
- FES - Electronic filters (ISO 16890 ePM1 90%)
- UVC - UV-C germicidal lamps
- PSAF - Clogged filter differential pressure switch air side
- PCOSM - Supply constant airflow
- PVAR - Variable airflow
- FCE - Enthalpic FREE-COOLING
- CSOND - Temperature and humidity ambient control with built-in probes
- CTT - Temperature control with thermostat
- PAQC - Air quality probe for the CO_2 rate check
- PAQCV - Air quality probe for the CO_2 and VOC rate check
- CPHG - Hot gas post-heating coil
- EH - Electric elements
- CHW2 - Two-rows hot water coil
- GC - Condensing gas heating module and modulating control
- PGFC - Finned coil protection grilles
- PCM0 - Sandwich panels of the handling zone in M0 fire reaction class
- 3WVM - Modulating 3-way valve
- HSE - Immersed electrodes steam humidifier
- CCCA - Copper / aluminium coil with acrylic lining
- CCCA1 - Copper/aluminum coil with Fin Guard (Silver) treatment
- CCCC - Copper / copper coil

Accessories separately supplied
- AMRX - Rubber anti-vibrating dampers
- CLMX - Clivet Master System
- IOTX - IoT industrial module for cloud based interoperability & services
- PTAAX - Remote ambient air temperature sensor

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.

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
Cooling capacity (EN 14511:2018)	10	kW	19,0	28,4	42,1
EER (EN 14511:2018)	10		3,08	2,88	2,97
SEER	11		4,58	4,37	4,48
ηsc	11	%	180,2	171,9	176,2
Eurovent seasonal efficiency class			B	B	B
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
Heating capacity (EN 14511:2018)	12	kW	20,5	29,1	43,1
COP (EN 14511:2018)	12		3,26	3,25	3,28
SCOP	11		3,22	3,20	3,27
ηsh	11	%	125,8	125,0	127,8
Eurovent seasonal efficiency class			B	B	B
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
Type of motor	6		EC Brushless	EC Brushless	EC Brushless
Standard airflow		l/s	2361	3500	5833
Installed unit power		kW	0,65	0,75	1,5
Connections					
Condensate drain		mm	20	20	20
Power supply					
Standard power supply		V	400/3~/50+N	400/3~/50+N	400/3~/50+N

The Product is compliant with the Erp (Energy Related Products) European Directive. It includes the Commission delegated Regulation (EU) No 2016/2281, also known as Ecodesign Lot21.
Contains fluorinated greenhouse gases (GWP 2087,5)
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 = rotary compressor; 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
10. Capacity in total recirculation according to EN 14511-2018, indoor air temperature 27°C D.B./19°CW.B.; outdoor temperature 35°C. EER according to EN 14511-2018
11. Data calculated in accordance with EN 14825: 2018
12. Capacity in total recirculation according to EN 14511-2018, indoor air temperature 20°C; outdoor temperature 7°CD.B./6°CW.B.. COP according to EN 14511-2018

Electrical data

Full recirculation (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. - 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. – 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

L'opzione 'FES - Filtri elettronici' non comporta variazione dei dati elettrici standard di macchina

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 9614-1)
Measures are according to UNI EN ISO 9614-1 regulations, with respect to the EUROVENT 8/1 certication, which provides for a tolerance of 2 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.

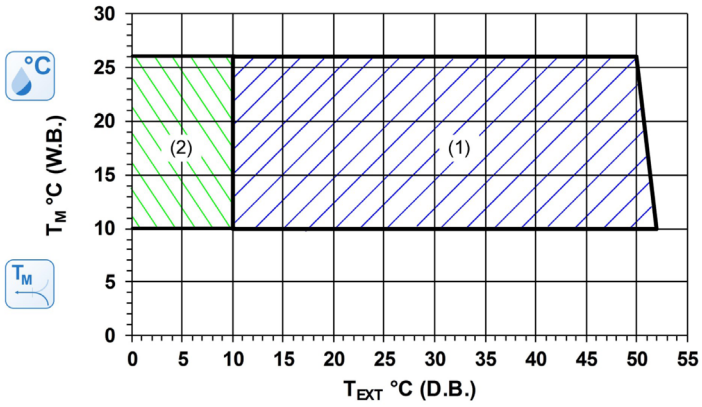
Sound levels referred to ESP as per EN 14511:2018

SIZE		7.1	10.1	14.2
Sound power level outside	dB(A)	83	85	88
Sound power level in supply duct	dB(A)	78	80	82
Available static pressure	Pa	100	124	150

Data referred to nominal air flow rate
Data according 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"

General technical data

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

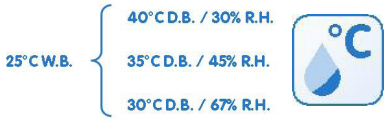
To verify the operation field of the operating units with percentages of external air, always calculate the Tm mixing temperature at the internal heat exchanger input.

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

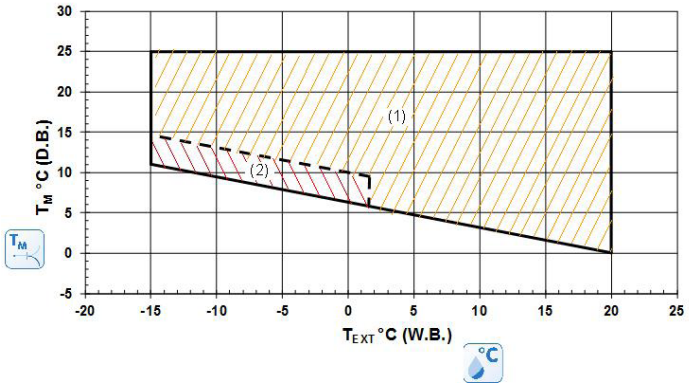
TEXT = Inlet air temperature in the external exchanger
dry bulb measured temperature (D.B.=DRY BULB)

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 dry bulb (D.B.=DRY BULB)

Text = entering internal exchanger air temperature,
temperature measured with wet bulb (W.B.=WET 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:
- Two-rows hot water coil
- Combustion module
- Electrical panel anti-freeze protection

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-rows 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 (ISO 16890 ePM1 55%)	1	Pa	168	182	175
F9 - High efficiency F9 air filter (ISO 16890 ePM1 80%)	1	Pa	208	222	215
FES - Electronic filters (ISO 16890 ePM1 90%)		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

Option compatibility

This table contains the list of the configurable accessories and their compatibility with CKN-XHE2i

CKN-XHE2i OPTIONS				
RIF.	**DESCRIPTION**	**CAK**	**CBK**	**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	Two-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
PCMO	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 (SO 16890 Coarse 60%)	√	√	√
F7	High efficiency F7 air filter (ISO 16890 ePM1 55%)	O	O	O
F9	High efficiency F9 air filter (ISO 16890 ePM1 80%)	O	O	O
FES	Electronic filters (ISO 16890 ePM1 90%)	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
CTT	Temperature control with thermostat	O	O	O
CMSC9	Serial communication module for Modbus supervisor	√	√	√
PM	Phase monitor	√	√	√
PTAAX	Remote ambient air temperature sensor	◊	◊	◊
CLMX	Clivet Master System	◊	◊	◊
IOTX	IoT industrial module for cloud based interoperability & services	◊	◊	◊
	Installation			
AMRX	Rubber antivibration mounts	◊	◊	◊
	Various			
PTCO	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

Accessories

CSOND

Temperature and humidity ambient control with built-in probes

This option makes it possible to measure the temperature and humidity of the ambient directly on the airflow entering the unit. The automatic thermal regulation is done using the on-board probes, whereas the probes on the remote control are inhibited.

CTT

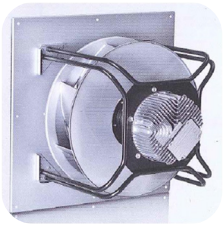
Temperature control with thermostat

This option makes it possible to directly measure the temperature of the ambient. The automatic thermal regulation is done on the temperature probe in the thermostat installed in ambient.

⚠ This solution is not available when one or more of these option are configured: FCE (Enthalpic FREE-COOLING), CPHG (Hot gas post-heating coil) and HSE (Immersed electrodes steam humidifier)

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.

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.

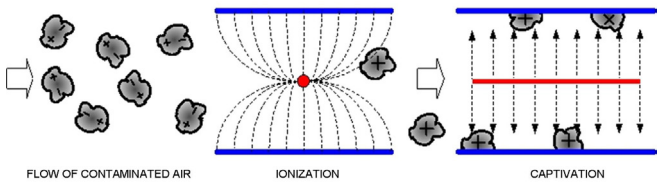
FES

Electronic filters (ISO 16890 ePM1 90%)

The high efficiency filters with active electrostatic system are additional filtration components of the standard G4 filters. They are active on a wide range of pollutants, including pollen, dust, micro-dust and nano powders, toners, mould, smog, bacteria and viruses with a 98.5% to 99.9% typical efficiency.
The air filtration process follows three main steps defined as “electrostatic precipitation”::

- transfer of a positive electrical charge to particles (ionisation)
- particle capture (uptake)
- removal of captured particles (without filter replacement)

Electronic filters have very high filtration efficiency with very low load drops, and therefore reduced ventilation consumption. Clivet units’ typical air crossing speeds ensure filtration efficiencies higher than ISO 16890, and PM1 90% (equivalent to class E10 of absolute filters in accordance with EN 1822).
The normal service lives of electronic filters are as long as that of the whole unit. For this result to be guaranteed and the microbicidal action against bacteria and viruses kept steady over time while ensuring minimum load drops, the filters require proper maintenance.
Filters must be cleaned at least every six months; we recommend quarterly or more frequent cleaning if the units are located in excessively polluted areas. Servicing the filters during the unit’s routine maintenance includes washing the electronic cells on site and replacing any damaged ionising wires. The Customer should make an area with suitable equipment available for washing near the unit.
The higher initial cost, compared to a traditional pocket filter, can be amortized in a short time; the electrostatic filters’ lifespan is indeed the same as that of the unit, whereas pocket filters need periodic replacement.
This option determines a reduction in the available static head (air side).



⚠ The clogging of an electronic filter is signalled by a sensor, thus making it possible to schedule periodic maintenance.
⚠ Electronic filters are not suitable for filtering water vapours even in low concentrations, oily vapours, large quantities of dust, shavings and iron filing dust, residues in general and gases.
⚠ All the following substances must be absolutely avoided with electronic filters: metallic material dust, even very fine; fumes produced by the combustion of organic and non-organic materials; flour dust; dust and vapours from potentially explosive atmospheres.

F7
F9

F7 high efficiency air filter (ISO 16890 ePM1 55%)
F9 high efficiency air filter ((ISO 16890 ePM1 80%)

The class F7/F9 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/F9 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/F9 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).

UV-C

UV-C germicidal lamps

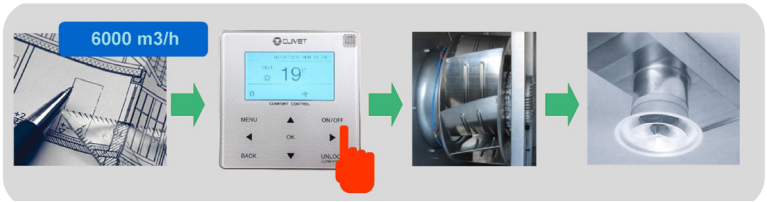
UV-C lamps use ultraviolet radiation to purify the air from the development of bacteria, moulds, fungi and viruses. For this reason they are called germicidal lamps.
Their effectiveness is proven by many years of scientific experimentation and use in the world of HVAC. Recent Italian and Japanese studies have demonstrated the effectiveness on Coronavirus SARS CoV2 (known as Covid-19) by defining the dose of UV-C rays required to deactivate it.
The bactericidal and virucidal action is achieved with low pressure mercury lamps through the direct radiation of the air flow with a wavelength of 254 mm.
The radiating power is sized to be effective on viruses like SARS-COV2 and main bacteria like Legionella, etc.
The option is installed and wired inside a dedicated module that is supplied already connected downstream of the supply section.
The module allows access to the lamp for routine maintenance.
The lamps are active when the supply fans are in operation.
Exposure to rays without proper safety devices can cause skin burns and damage eyesight

⚠ This option entails changing the weight and length of the unit.
⚠ Supply section dimensions unchanged compared to a standard unit
⚠ Duct the unit's supply properly to avoid accidental irradiation of people in the roomsi
⚠ Option available on request

PCOSM

Supply constant airflow

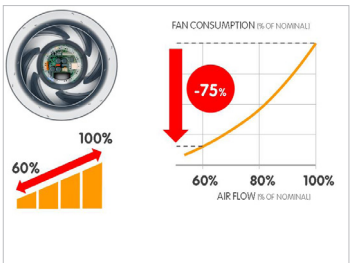
The original technology used eliminates the need for on-site calibration of traditional fans, as well as the time that would be required and the associated costs. The required flow rate is set on the display and maintained automatically by the unit, which controls the speed of the ventilating sections. 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 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, represented by the minimum admitted air flow rate for each size. flow (at partial load)

Accessories

PAQC

Air quality probe for the CO_2 rate check

This option is recommended for areas with highly variable crowding. The probe measure the amount of CO_2 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 CO_2 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 CO_2 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..

FCE

Enthalpic FREE-COOLING

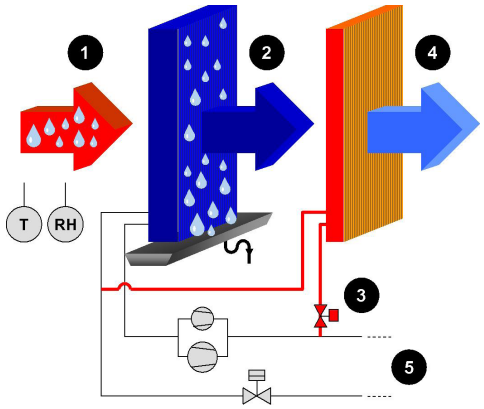
This option is used to reduce energy consumption and compressor wear by using the outdoor air as an energy source to lower the thermal loads and ambient humidity. The temperature control compares the temperature and the humidity between the outdoor environment and the served environment and decides the 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).

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).

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



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

Indicative scheme - not in scale

CPHG

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 (m³/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 (m³/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 (m³/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

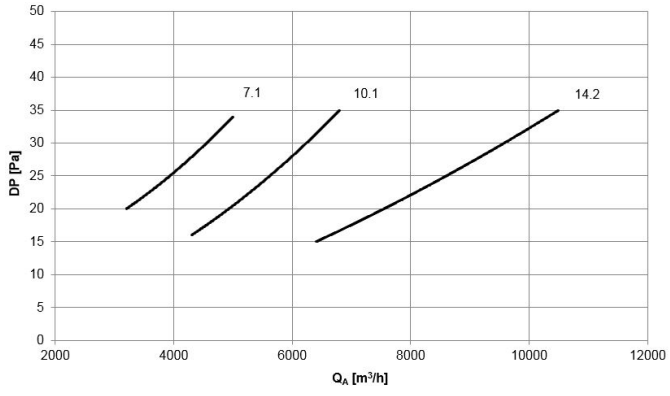
Ta = leaving air temperature from the handling coil and entering the post-heating coil
Qo = airflow (l/s)
kWt = Heating capacity (kW)
The post-heating coil is powered by the hot gas, drawn by the supply pipe.
As the condensation hot gas temperature is linked to the outdoor air temperature, the indicative 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.

CHW2

Two-rows 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

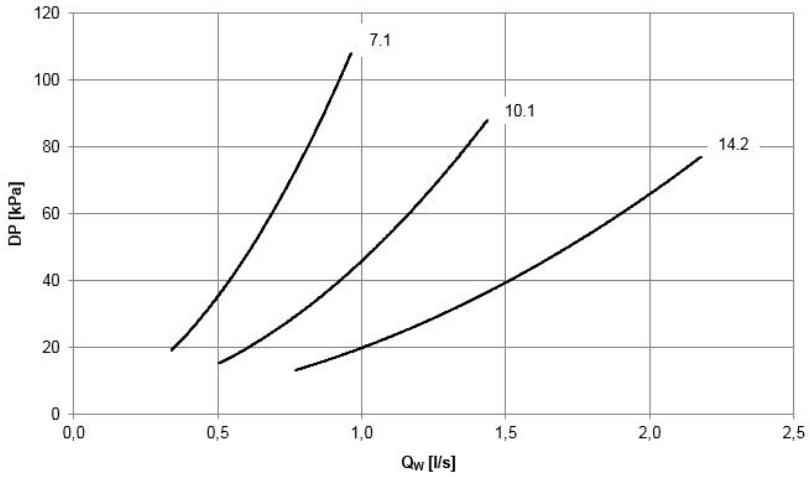


The air side pressure drops are relative to the medium air temperature of 20°C and are to be added to the pressure drops due to ducts, terminal devices and any other component that causes a drop in working discharge head.

QA [m3/h] = airflow
Dp = pressure drop (Pa)

CHW2

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 (Two-rows)

			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
	Qo (m³/h)			3200			4000			5000	
7.1	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
	Qo (m³/h)			4300			6000			6800	
10.1	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
	Qo (m³/h)			6400			9000			10500	
14.2	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.

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 DT (C°)

SIZE	Airflow [m³/h]	6kW	9kW	13,5kW	18kW	24kW
15.2	4000	4,4	6,7	10,0	-	-
18.2	6000	-	4,4	6,7	8,9	-
20.4	9000	-	-	4,4	5,9	7,9

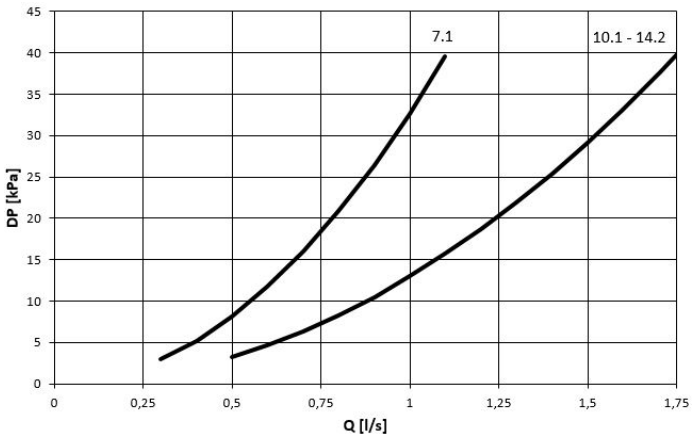
The minimum operation temperature of the unit with electric heaters varies according to the size considered and the capacity chosen for the resistenze. heaters. It can easily be obtained by subtracting the DT value (shown in the table below) from the lower temperature limit of the air entering the internal exchanger TM (D.B.) in the operation range of the standard unit, under the desired conditions.

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-rows hot water coil".

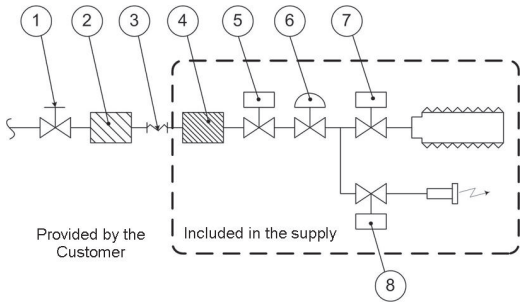
GC

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 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 shut-off valve
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	7,6	34,8	8,50	42,0	12,4	65,0	16,4	82,0
Efficiency Hi (P.C.I.)	%	107,0	96,3	105,9	96,2	108,1	96,8	108,4	97,6
Efficiency Hs (P.C.S.)	%	96,4	86,8	95,4	86,7	97,4	87,2	97,6	87,9
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 / kWh 23 ppm		35 mg / kWh 20 ppm		40 mg / kWh 23 ppm		34 mg / kWh 19 ppm	
Available flue pressure	Pa	90		90		120		120	
Gas connection diameter	GAS	UNI ISO 228/1 - G 3/4"		UNI ISO 228/1 - G 3/4"		UNI ISO 228/1 - G 3/4"		UNI ISO 228/1 - G 3/4"	
Exhaust pipe diameter	mm	80		80		80		80	
Seasonal space heating energy efficiency [EU Reg./2281/2016] [ηs, h]	%	92,1		90,8		93,2		93,2	
Emission efficiency [EU Reg./2281/2016] [ηsflow]	%	97,3		97,0		97,4		97,1	
Power supply pressure (for gas G20)	mbar	20 [min 17-max 25]							
Gas consumption @15°C - 1013 mbar (for G20 gas)	m3/h	0,8	3,69	0,9	4,44	1,31	6,88	1,74	8,68

Matching of the condensing gas heating module

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

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

- ⚠ The component requires gas supply (gas connections to be made by the Customer). The location of the unit and the fume drain mode must comply with laws and standards in force in the Country of use.
- ⚠ The assembly of the chimney kit must be performed on site by the Customer. According to specific requirements of installation, the chimney length can be increased by means of appropriate joints and fittings (not supplied by Clivet). For further details, refer to the Installation, use and maintenance manual.
- ⚠ Electric elements', 'Two-row hot water coil' and 'Combustion heating module' cannot be assembled simultaneously.

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.
With the option is available a potential-free contact for the water emptying during the period in which the unit is not used (connection provided by the Customer).

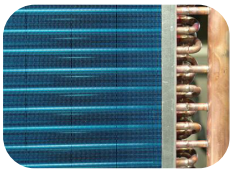
Matching of the immersed electrode and steam humidification module

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.
⚠ Operation is available in heating mode

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

⚠ Configurable coating for all the coils of the refrigerant circuit (Treatment, Source, Hot gas post-heating - CPHG).
⚠ Water coil treatment (CHW2) available on request

CCCA1

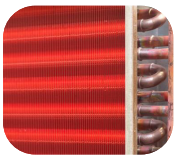
Copper/aluminum coil with Fin Guard (Silver) treatment

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.

⚠ Option available on request.

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.

PGFC

Finned coil protection grilles

Protection grilles on the external exchangers (source side) are provided.
The grilles have a protective and safety functions, in order to prevent vandalism and accidental impacts without altering the heat exchange.
It consists of a rigid wire mesh with 25 mm mesh pitch and grey RAL7073 protective coating.

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)

⚠ Installation provided by the Customer.

CLMX **Clivet Master System**

CLIVET MASTER SYSTEM is the ideal system for the remote and centralised control of the CLIVETPack and SMARTPack2 climate control units. It can manage up to 10 units connected with a serial connection.
It includes a box for wall installation, as well as the electronic power supply and serial communication devices, a controller with a touch-screen display and a USB port at the front used to export the alarm log.
The device allows to easily and intuitively access all the information on the status of the system and the climate control units. It also provides:

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

⚠ The component must be combined with the RS485 serial port option with Modbus protocol built-in of each rooftop.
⚠ Operating temperature from 0°C to 50°C with relative humidity lower than 90% without condensate.
⚠ Installation provided by the Customer.

IOTX **IoT industrial module for cloud based interoperability & services**

This device allows the monitoring and the remote control the unit via Clivet Eye, the supervision cloud system for Clivet units.
With IoT module (i-LINK) it will be possible to monitor and manage the unit through the mobile app Clivet Eye and the dedicated web page.
Among the main functions, for all monitored units they allow to:

- display the main working parameters
- display the alarms
- switch on/off the unit
- change the setpoint
- change the operating mode
- set the daily/weekly start-up or power-off programming of the unit
- create charts of main system parameters trend (via web interface)
- display in a map the units monitored by Clivet Eye (via web interface)

Web interface at www.cliveteye.com.
Clivet Eye app available in Google Play and App Store.

⚠ IoT module to be provided for each unit to be remote monitored
⚠ Internet ethernet connection in charge of customer
⚠ Clivet Eye management is alternative to an external BMS supervision system
⚠ Installation provided by the Customer.

PTAAX **Remote ambient air temperature sensor**

Option that allows the unit to be adjusted with a temperature probe placed in a significant point in the room to detect quiet air conditions.
The solution is an alternative to the use of the probes present in the user interface, which can be placed in a technical compartment other than the room to be air-conditioned, or to the probes placed on the unit.
The probe can be placed at a maximum distance of 200m from the unit (cables not included).

⚠ Option supplied separately, electrical connection in charge of the Customer (suggested cable: for power of 24 VPUR/PVC 2 x 0.75mm² double fireproof insulation to be laid separately to other signal/power cables and twisted pair and shielded cable for serial 485).

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	Altri
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	Altri
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	Altri
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.

Performance

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	m^3/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 power	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	m^3/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 power	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	m^3/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 power	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	m^3/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 power	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	m^3/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 power	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	m^3/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 power	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	m^3/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 power	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	m^3/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 power	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	m^3/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 power	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	m^3/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 power	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	m^3/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 power	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	m^3/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 power	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	m^3/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 power	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	m^3/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 power	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	m^3/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 power	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	m^3/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 power	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	m^3/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 power	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	m^3/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 power	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	m^3/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.

Size 7.1 - Version CAK/CBK/CCK

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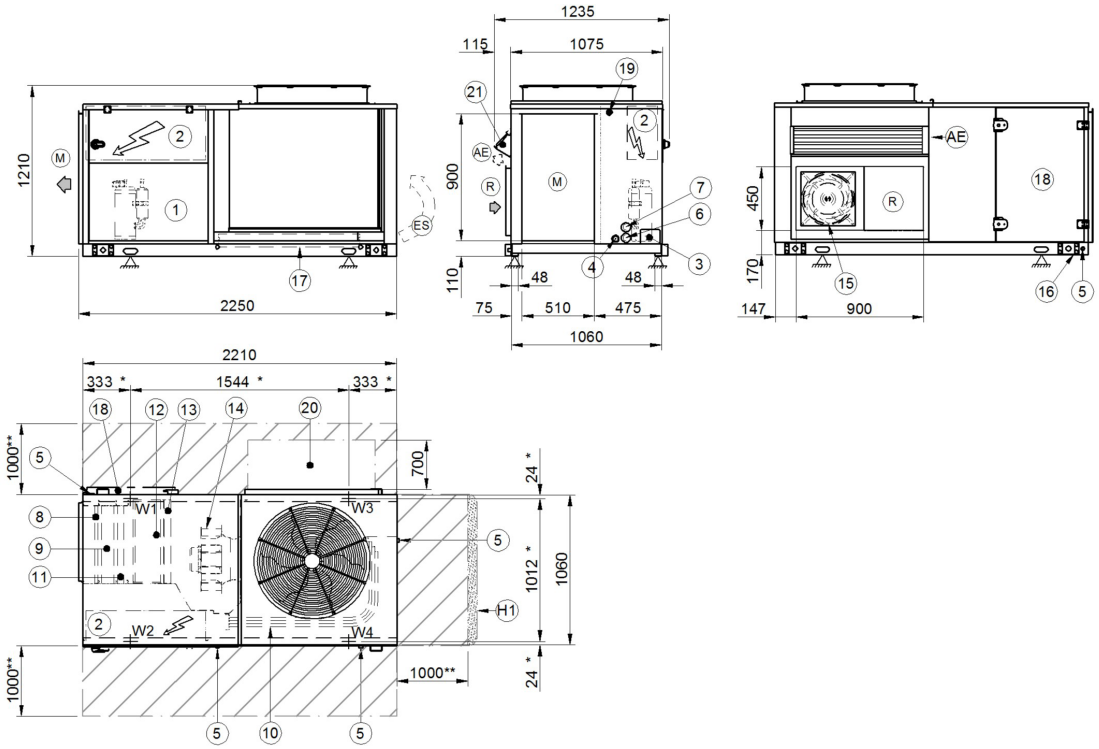
Data/Date 06/11/2017



1. Compressor compartment
2. Electrical panel
3. Power input
4. Humidifier connections
5. Condensate drain
6. H_2O heating coil output Φ 3/4”
7. H_2O heating coil input Φ 3/4”
8. Re-heating coil (optional)
9. Internal exchanger
10. External exchanger
11. H_2O heating coil (optional) or heating elements (optional)
12. F7/F9 / electronic filters (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

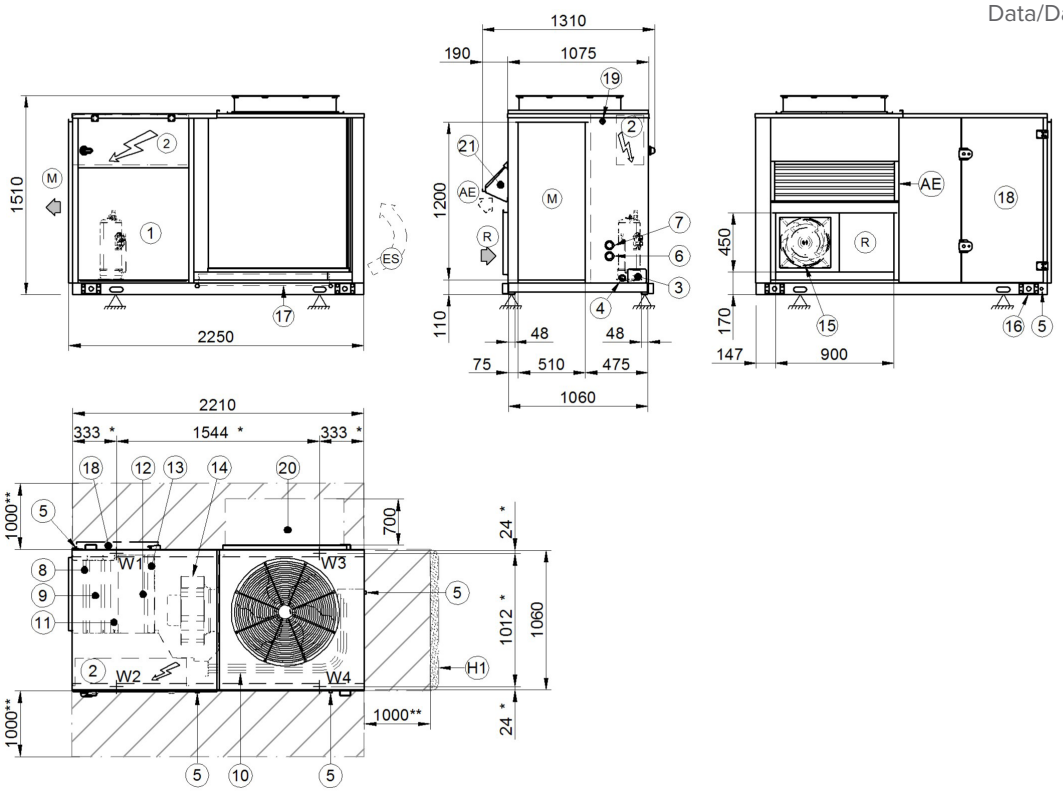
Size		7.1
W1 Supporting Point	kg	102
W2 Supporting Point	kg	126
W3 Supporting Point	kg	101
W4 Supporting Point	kg	105
Shipping weight	kg	470

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. H_2O heating coil outpu Φ 1”
7. H_2O heating coil input Φ 1”
8. Re-heating coil (optional)
9. Internal exchanger
10. External exchanger
11. H_2O heating coil (optional) or heating elements (optional)
12. F7/F9 / electronic filters (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.

Size 14.2 - Version CAK/CBK/CCK

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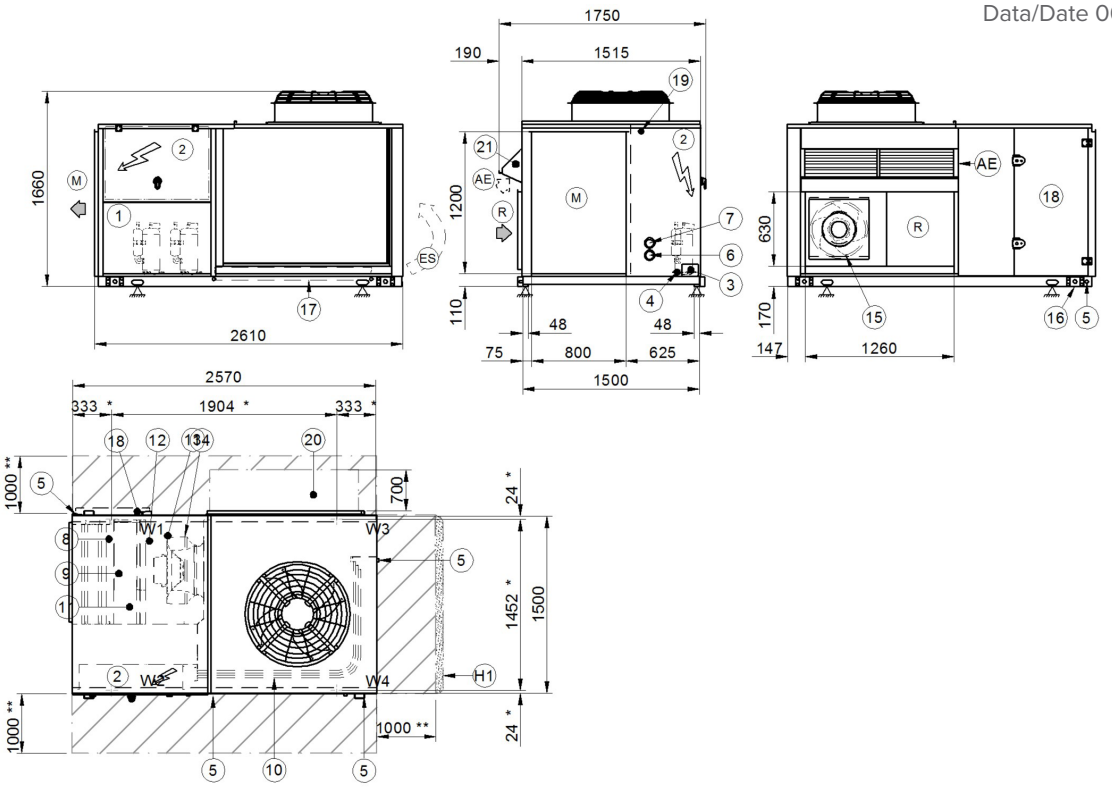
Data/Date 06/11/2017



1. Compressor compartment
2. Electrical panel
3. Power input
4. Humidifier connections
5. Condensate drain
6. H_2O heating coil outpuΦ 1" 1/4
7. H_2O heating coil input Φ 1" 1/4
8. Re-heating coil (optional)
9. Internal exchanger
10. External exchanger
11. H_2O heating coil (optional) or heating elements (optional)
12. F7/F9 / electronic filters (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

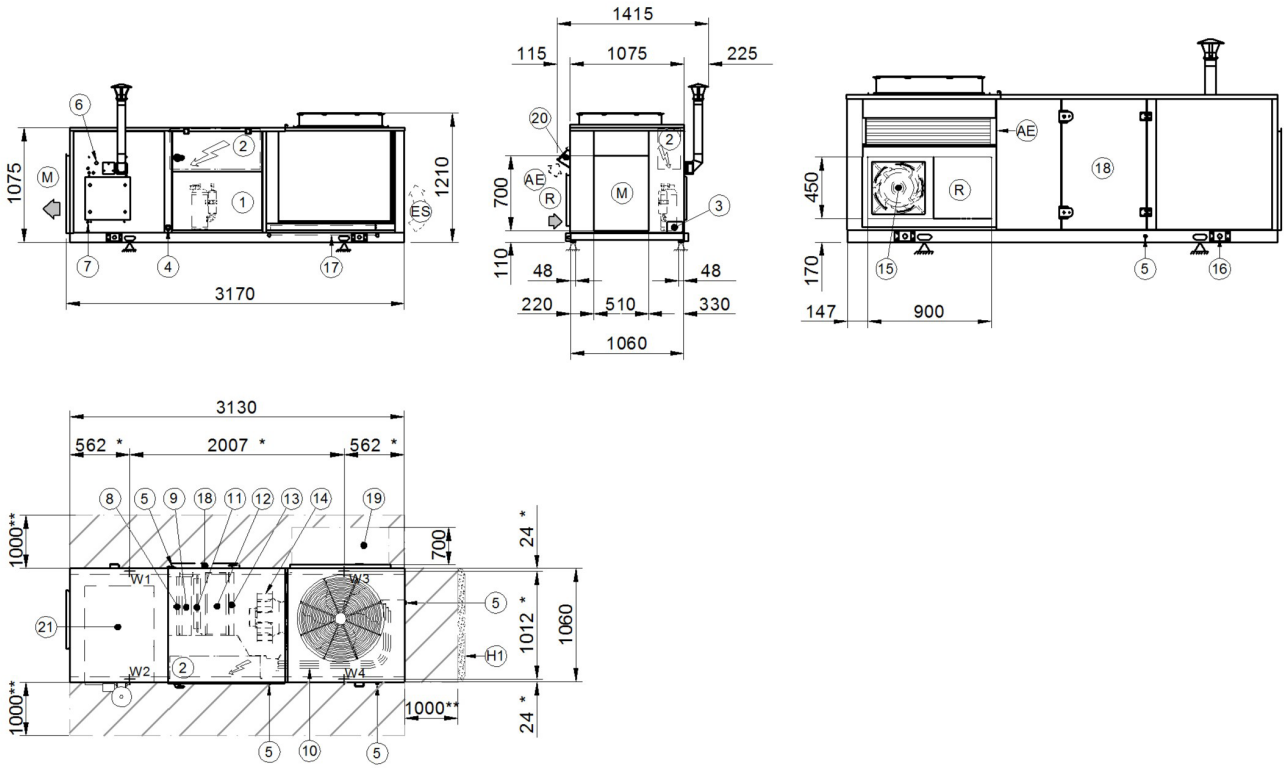
Size		14.2
W1 Supporting Point	kg	183
W2 Supporting Point	kg	137
W3 Supporting Point	kg	180
W4 Supporting Point	kg	170
Shipping weight	kg	720

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 (UNI ISO 228/1 - G 3/4")
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. F7/F9 / electronic filters (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

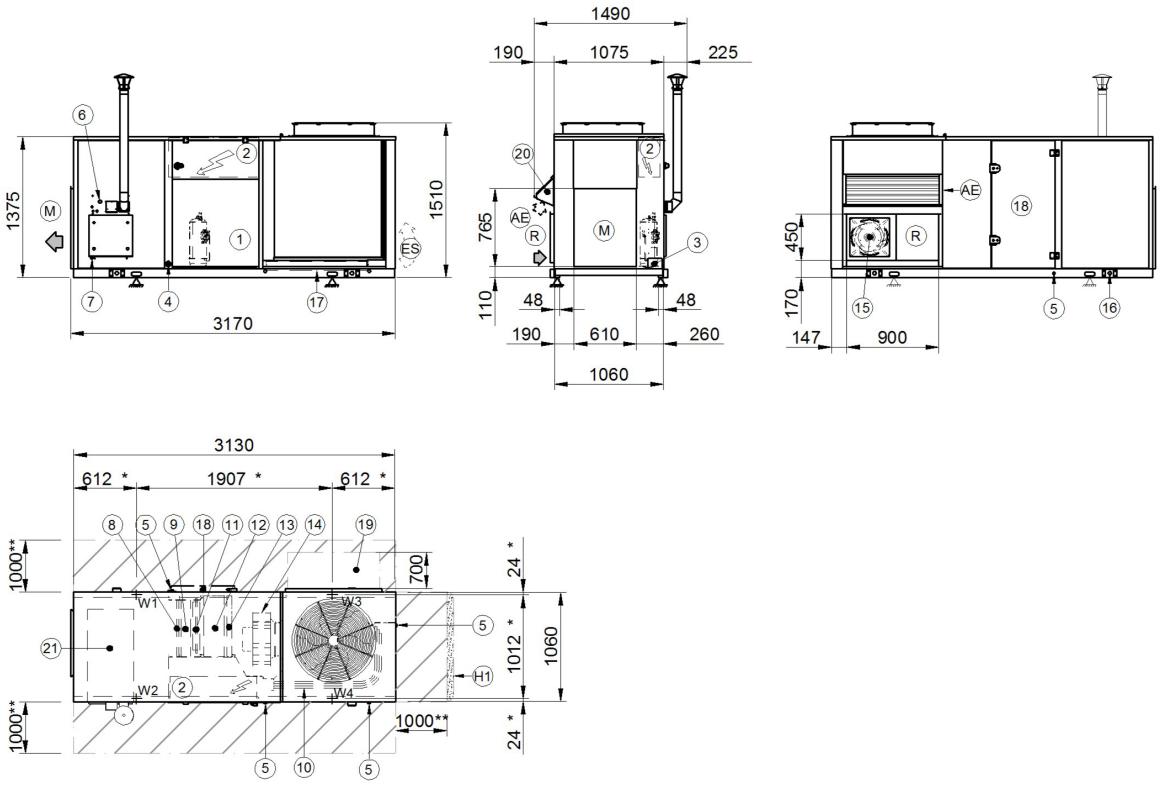
Weight distribution of full re-circulation, renewal air and exhaust (CCK) configuration

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.

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 (UNI ISO 228/1 - G 3/4")
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. F7/F9 / electronic filters (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

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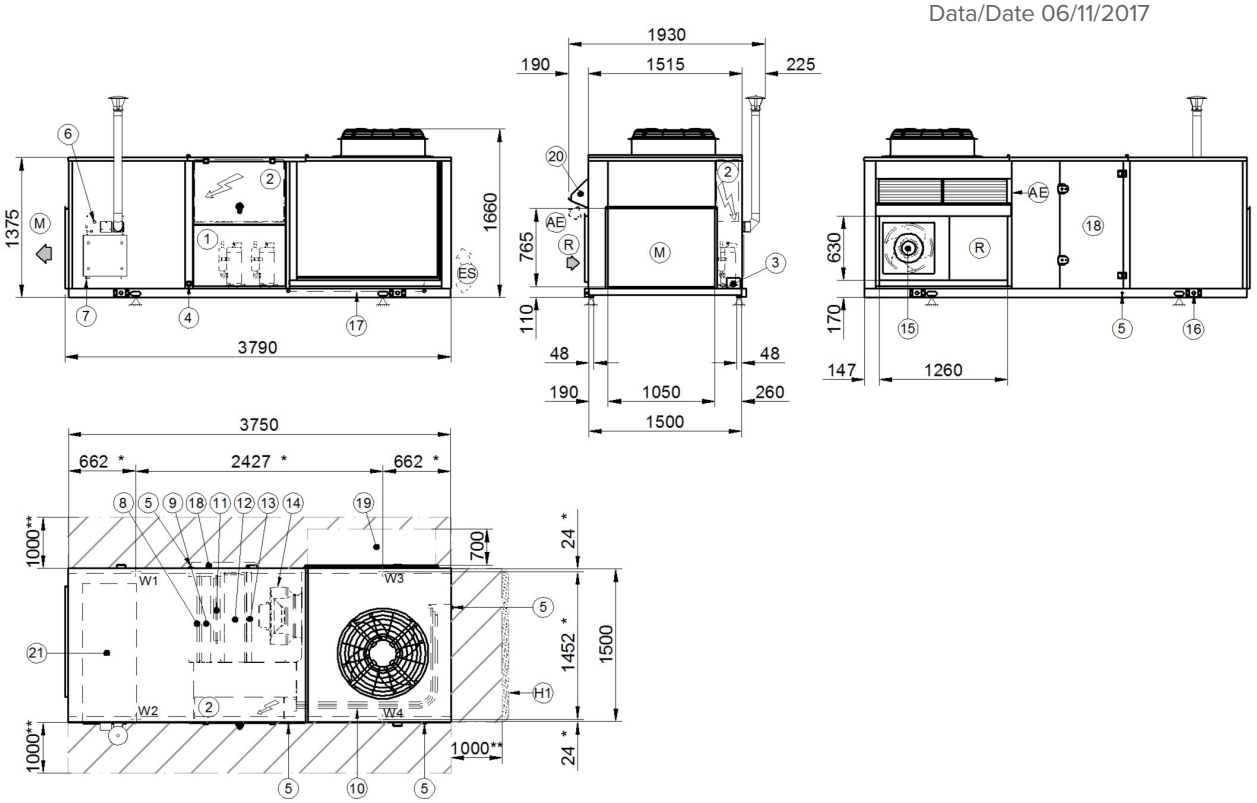
Data/Date 06/11/2017



1. Compressor compartment
2. Electrical panel
3. Power input
4. Humidifier connections
5. Condensate drain
6. Gas connection (UNI ISO 228/1 - G 3/4")
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. F7/F9 / electronic filters (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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