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

CLIVETPack^2

CSNX-XHE2 12.3-44.4 RANGE

TECHNICAL BULLETIN

R-410A

ErP 2021 COMPLIANT

SIZE	12.3	15.3	16.4	20.4	24.4	33.4	40.4	44.4
COOLING CAPACITY kW	46,3	57,1	75,4	87,6	106,7	134,4	158,3	173,9
HEATING CAPACITY kW	44,2	54,8	71,5	81,1	99,2	121,1	149,5	165,7

EUROVENT CERTIFIED PERFORMANCE
www.eurovent-certification.com

Page

Clivet is taking part in the EUROVENT certification programme up to 1.500 kW. The products concerned appear in the certified products list of the EUROVENT www.eurovent-certification.com site.

Features

CLIVETPack for medium attendance applications

The CSNX-XHE2 units are high performance stand-alone air conditioners designed to treat large volumes of external air, used specifically in high occupancy venues such as: multiplex cinemas, convention rooms, restaurants and performance venues in general.
The entire series is characterised by a dual refrigeration circuit with scroll compressors connected in tandem to the single circuit. 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 ClivetPack2 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.
There are two main configurations with the recovery of energy from exhaust air which both permit the integration of a vast range of accessories to customise the product according to the application.

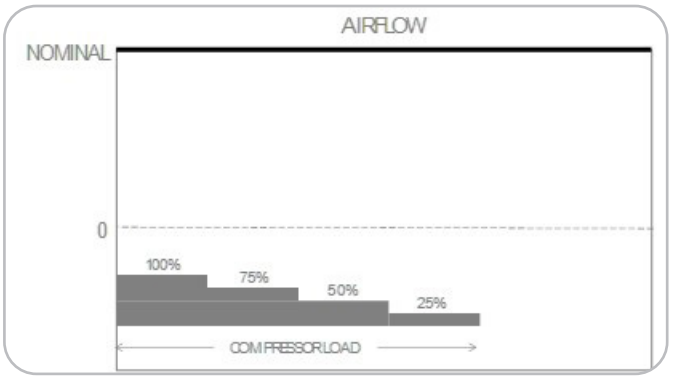
- ✓ Independent dual refrigeration circuit with two scroll compressors connected in parallel that allow for up to 3 partialisation steps per circuit.
- ✓ Radial fans directly coupled to EC brushless motors (plug fans) permit control of the airflow for adapting to the characteristics of the aeraulic system. On both the supply and the exhaust section.
- ✓ Filtration of air in several stages, from coarse particles (G4 filters) to classes of absolute filtration (electronic filters).
- ✓ 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.
- ✓ Great flexibility of the distribution of air, with the possibility of connecting a roofcurb for supply and/or return from below.
- ✓ 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.
- ✓ Winter humidification systems integrated in the unit.
- ✓ Possibility of integration in the main supervisory systems with communication protocol: ModBus, LonWorks, Bacnet.

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

Automatic management of the air flow

Constant airflow (PCOSM) (standard function)

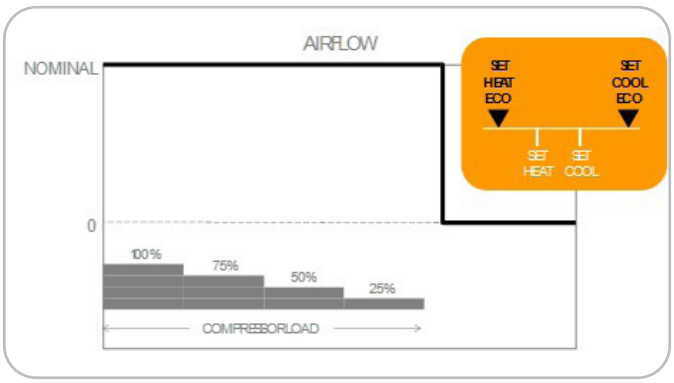
The supply airflow remains constant even if the filters get progressively clogged, thus compensating for the increased load drops.



ECO mode (standard function)

The air flow supply remains constant at varied heat loads and is shutdown when the load is fulfilled (dead zone).
To further increase the energy savings in this condition, it is also possible to set less demanding operation setpoints for the unit in respect to the standard mode.
This function is indicated for the thermal maintenance of the served area in case it is temporarily not used, which can for example occur at night.
The ECO mode can be activated:

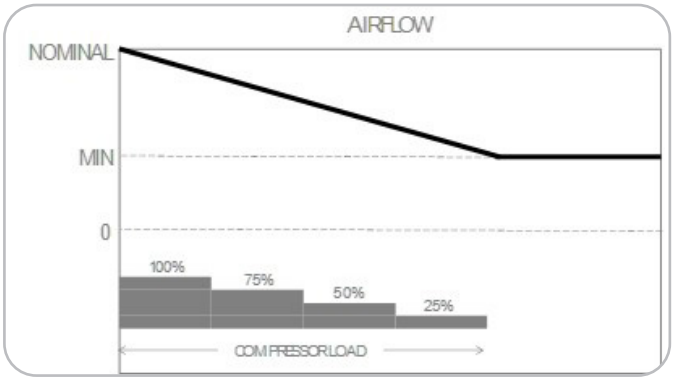
- manually
- automatically from supervisor input signal



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 (dead zone).
This option allows a further energy savings.

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

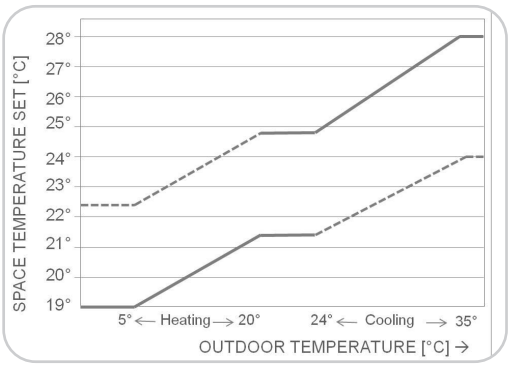
The automatic defrost cycles on the remaining external exchanger surface are managed in predictive mode, reducing both the frequency and the duration. The built-in electronics analyses not only the external conditions, but also the evaporation pressure variation in the exchanger.

The standard management of the defrosting cycles enables one circuit at a time without stopping ventilation. This reduces the time required for defrosting while preventing excessively cold air from being introduced into the room, thus maintaining comfort conditions for users.

Set-point automatic compensation

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

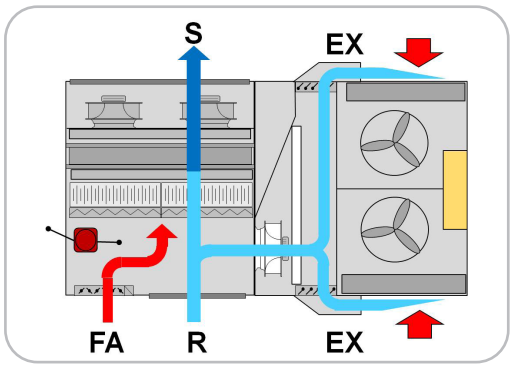
- further increases the energy saving;
- reduces the temperature difference between the outside and the served area, increasing the user comfort.



Ambient pressure control

The ambient pressure control device compares the return pressure with the external pressure and compensates any variations by acting on the outdoor air damper.
This way, the unit maintains the relevant ambient pressure desired by the user, who can choose between the overpressure, depression or equal-pressure.

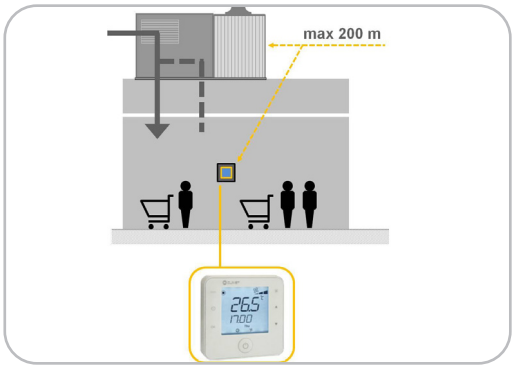
The room pressure control device is fitted as standard in the units with extraction and exhaust (Clivet reference code CCK and CCKP)



Simple and intuitive user interface

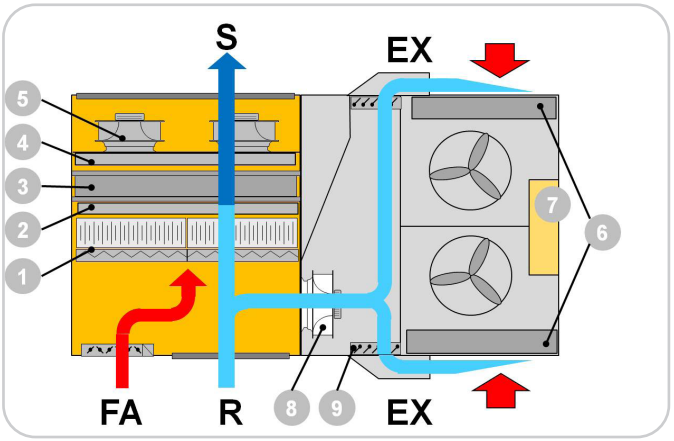
An innovative graphic interface prepared for wall-installation (with 230V power supply and wiring at the customer's care) is supplied as standard, with the option to be removed from the support and connected on-board for maintenance operations.
Among the main functions it allows to:

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



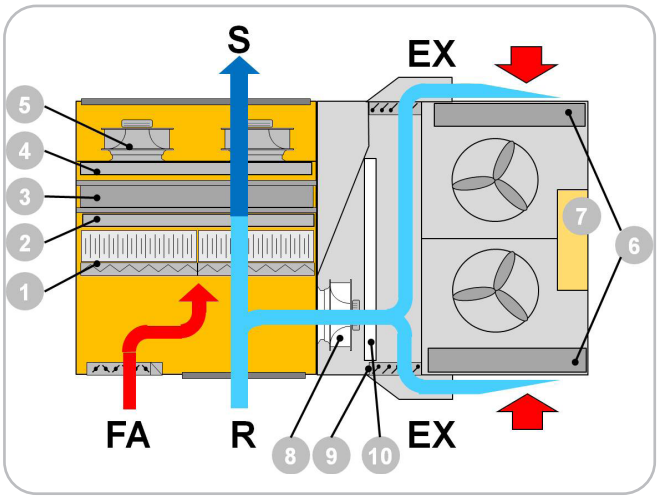
CCK - double fan section for recirculation, fresh air, exhaust, thermodynamic recovery

For applications with automatic air renewal and free-cooling function control. The unit is equipped with an exhaust section with thermodynamic energy recovery of the exhaust air.
This air, which is still rich in energy, is mixed with the outdoor air, favouring the temperature conditions on the source side of the exchanger and improving the heating and cooling capacity.
Thermodynamic recovery is also included in the CCK configuration and uses the technology of refrigeration circuit with direct expansion.
The unit is equipped with an electronically controlled exhaust fan section that automatically controls the amount of air to reject.
The exhaust air flow is, in fact, directed onto the external finned coil exchanger which is accordingly thermally favoured in its operation cycle. The recovered energy is transferred by the handling exchanger and therefore transferred directly to the supply air.



CCKP - double fan section with fresh air and THOR thermodynamic recovery

For applications with automatic air renewal and free-cooling function control. In addition to the parts contained in the CCK configuration, the unit is equipped with an exhaust section with innovative thermodynamic energy recovery of the exhaust air through a dedicated THOR (THermodynamic Overboost Recovery) exchanger.
The energy contained in the exhaust air is recovered and transferred to handling through the refrigeration circuit.
The innovative THOR recovery (THermodynamic Overboost Recovery) is always included in the CCKP configuration and uses direct expansion refrigeration circuit technology.
The unit is equipped with an electronically controlled exhaust fan section that automatically adjusts the amount of air to reject.
The exhaust air flow is directed by the exchanger dedicated to recovery, which is an integral part of the refrigeration circuit. The amount of recovered energy is easily measurable like the static heat recovery.
Winter and summer energy recovery provides a dual positive effect: it increases the capacity and offers a significant energy savings.
The main benefits of the energy recovery:



- it increases the total unit efficiency;
- it eliminates the greater part of electrical power consumption for the ventilation of passive recovery devices, which also significantly reduce the effective amount of recovered energy;
- in terms of heat pump operation, it reduces the formation of ice on the exchanger and therefore the number of defrost cycles. Thereby increasing operation continuity and overall system efficiency;
- it is also effective for cooling operations, especially in continental and temperate climates where passive recovery device output is essentially negligible due to a low outdoor and indoor temperature difference and enthalpy;
- it keeps the unit compact and simplifies its positioning

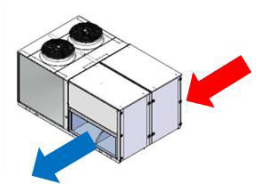
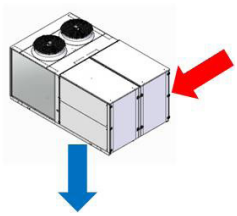
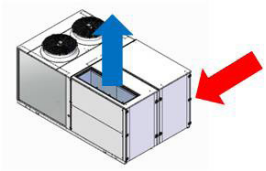
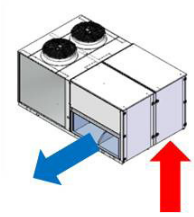
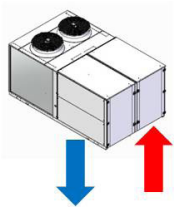
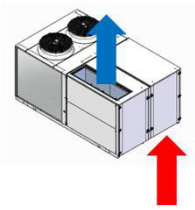
R. Return air
S. Supply air
FA. Fresh air
EX. Exhaust air

1. First and second filtration stage (opt.)
2. Hot water exchanger or electric heaters
3. Handling exchanger
4. Hot gas reheating exchanger
5. Return + supply fan section
6. Source side exchanger
7. Electrical panel
8. Exhaust fan
9. Overpressure damper
10. Thermodynamic recovery exchanger, THOR

Configurations

Supply and return configurations

Air supply and return

M0 - R0	M3 - R0	M5 - R0
Standard unit	Option	Option
		
M0 - R3	**M3 - R3**	**M5-R3**
Option	Option	Option
		

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)	FES (electronic filters)	ISO 16890 ePM1 90%

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

Compressor
Hermetic orbiting scroll compressor complete with motor over-temperature and over-current devices and protection against excessive gas discharge temperature. Fitted on rubber antivibration mounts and complete with oil charge. The oil heater is automatically activated to prevent the oil from being diluted by the refrigerant when the compressor stops. The compressors are connected in TANDEM on a single refrigeration circuit and have a biphasic oil equalisation.
Sizes 12.3-15.3 a cooling circuit is supplied with a single compressor.

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

Panelling
Sandwich panels in the air treatment section with dual walls in steel sheet metal with polyurethane insulation (40 kg/m3), thickness of outer sheet metal 6/10 mm galvanized and painted using polyester powders colour RAL 9001, polyurethane thickness 30 mm with thermal conductivity coefficient 0.022W/mK, thickness of internal sheet metal 5/10 mm hot galvanized. The access door panels for the routine maintenance are 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.

Air renewal management
The unit is supplied with an outdoor air modulating damper to manage air renewal and free cooling.
The damper is made of aluminium and has sealing gaskets at the ends of the fins; the actuator proportionally adjusts the opening by moving the pin connected to the plastic gears.

Internal exchanger
Direct expansion finned coil exchanger made with copper pipes placed on staggered rows mechanically expanded to better adhere to the fin collar. The fins are made from aluminium with a corrugated surface and adequately distanced to ensure the maximum heat exchange efficiency.

External exchanger
Direct expansion finned coil exchanger made with copper pipes placed on staggered rows mechanically expanded to better adhere to the fin collar. The fins are made from aluminium with a corrugated surface and adequately distanced to ensure the maximum heat exchange efficiency.
A correct power supply to the expansion valve is ensured by the subcooling circuit; this circuit also prevents the formation of ice at the base of the heat exchanger during winter operation.

Fan
Internal section
Plug fans without scroll with reverse blades driven by electronically-controlled “brushless” dc motors with direct coupling. No transmission sizing is needed. The motor is in compliance with ErP 2015according to Regulation UE 640/2009. Class IE4.
Exhaust fan
Plug fans without scroll with reverse blades driven by electronically-controlled “brushless” DC motors with direct coupling. No drive sizing is required. The motor is in compliance with ErP 2015according to Regulation UE 640/2009. Class IE4.
External section
Helical fans with die-cast aluminium blades, directly coupled to a three-phase electric motor with external rotor, with built-in thermal overload protection, IP 54 index of protection. Housed inside an aerodinamically shaped nozzles to increase efficiency and minimise noise levels; fitted with safety grills. The motor is in compliance with ErP 2015according to Regulation UE 640/2009.

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

Refrigeration circuit
Refrigeration circuit with:
- refrigerant charge;
- liquid flow and moisture indicator;
- safety high pressure switch;
- filter dryer;
- electronic expansion valve;
- non-return valve;
- 4-way reverse cycle valve;
- liquid receiver;
- liquid separator;
- high pressure safety valve;
- low pressure safety valve.

Filtration
Outdoor air inlet side and environment return side
Pleated filter for greater filtering surface, made of a galvanized sheet frame with a galvanized and electric-welded protective mesh, and regenerable filtering media made from polyester fibre sized with synthetic resins. Efficiency G4 (ISO 16890 Coarse 60%). Self-extinguishing type (flame resistant class 1 - DIN 53438).

Drain pan
Internal section
Inox steel AISI 304 condensate collection tray with anti-condensate insulation, welded, fitted with sleeve for the drain pipe.

Electrical panel
The electrical panel is situated inside the units and is accessed through a hinged door that is opened by a special key.
The capacity section includes:
- main door lock isolator switch;
- compressor circuit breaker;
- compressor power supply remote control switch;
- fan motor thermal protections of internal and external section;
- circuit breaker to protect auxiliary circuit.

The microprocessor control section includes:
- compressor overload protection and timer;
- potential-free contacts for remote ON-OFF, cumulative alarm, fire alarm inlet, fan status, compressor status, summer/winter mode.

Standard unit technical features

Remote control with user interface:
- intuitive graphical interface retro lighted;
- daily/weekly start-up or power-off programming of the unit;
- manual selection of the Comfort or ECO (energy saving) or Ventilation-only mode;
- modification of the temperature and humidity set point;
- unit On/Off and overload reset;
- heating/cooling operating mode manual change;
- display of operating status
- display of alarms and failure code
- display and modification of the operating parameters

Accessories
- VENH - High static pressure fans
- CREFB - Device for fan consumption reduction of the external section, ECOBREEZE type
- F7 - High efficiency F7 air filter (ISO 16890 ePM1 55%)
- FES - Electronic filters (ISO 16890 ePM1 90%)
- UVC - UV-C germicidal lamps
- PSAF - Differential pressure switch for dirty air filters
- PVAR - Variable airflow
- PCOSM - Constant supply airflow
- EXFLOWC - Application in spaces with forced air exhaust at variable flow and exhaust section
- FCE - Enthalpy FREE-COOLING
- PAQC - Air quality probe for CO2 rate check
- PAQCV - Air quality probe for CO2 and VOC rate check
- PVMEV- 4-20mA signal for exhaust and supply airflow modulation
- MHP - High and low pressure gauges
- CPHG - Hot gas re-heating coil
- CTEM - Temperature ambient control with built-in probe
- CTERM - Remote keypad for indoor temperature and humidity control
- CSOND - Temperature and humidity ambient control with built-in probes
- EH - Electric heaters
- CHW2 - Two-rows hot water coil
- 3WVM - Modulating 2-way valve
- 2WVM - Modulating 3-way valve
- GC - Condensig gas heating module with modulating control
- HSE - Immersed electrodes steam humidifier
- LTEMP1 - Application for low outdoor temperature
- PCM0 - Sandwich panels of the handling zone M10 fire reaction class
- CMSC9 - Serial communication module for Modbus supervisor
- CMSC10 - Serial communication module for LonWorks spervisor
- CMSC11 - Serial communication module for BACnet-IP supervior
- DML - Demand limit
- DESM - Smoke detector
- PM - Phase monitor
- PFCC - Power factor correction capacitors (cosfi > 0.95)
- SFSTC - Progressive compressor start-up Soft starter
- PTCO - Set up for shipping via container
- M3 - Downflow supply
- M5 - Upward supply air
- R3 - Floor air inlet

Accessories separately supplied
- PTAAX - Remote ambient air temperature sensor
- PTUAX - Remote ambient air temperature and humidity probe
- CLMX - Clivet Master System
- RCX - Roof curb
- AMRX - Rubber antivibration mounts
- AMRMX - Rubber antivibration mounts for unit and gas module

All the handling coils can be provided with coated aluminium - Fin Guard - copper/copper.

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

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

Technical features like the CCK configuration with recirculation, renewal, exhaust air and thermodynamic recovery, modulating motorized outdoor air damper for renewal and e FREE-COOLING and moreover:

- **Exchanger for thermodynamic recovery - THOR**
  The energy content of the exhaust air is recovered by a dedicated exchanger, as integral part of the refrigeration circuit. It is a direct expansion finned coil exchanger made with copper pipes placed on staggered rows mechanically expanded to better adhere to the fin collar. The fins are made from aluminium with a corrugated surface and adequately distanced to ensure the maximum heat exchange efficiency.

CSNX-XHE2	33.4	CCK	M0	R3	SERMD	CHW2	PCOSM	CREFO
		(1)	(2)	(3)	(4)	(5)	(6)	(7)

1. Configuration
CCK - Configuration with double fan section for recirculation, fresh and exhaust air
CCKP - Configuration with double fan section with fresh air and THOR thermodynamic recovery

2. Air supply
M0 - Horizontal air supply
M3 - Downward air supply
M5 - Upflow air supply

3. Air return
R0 - Horizontal air return
R3 - Downward air return

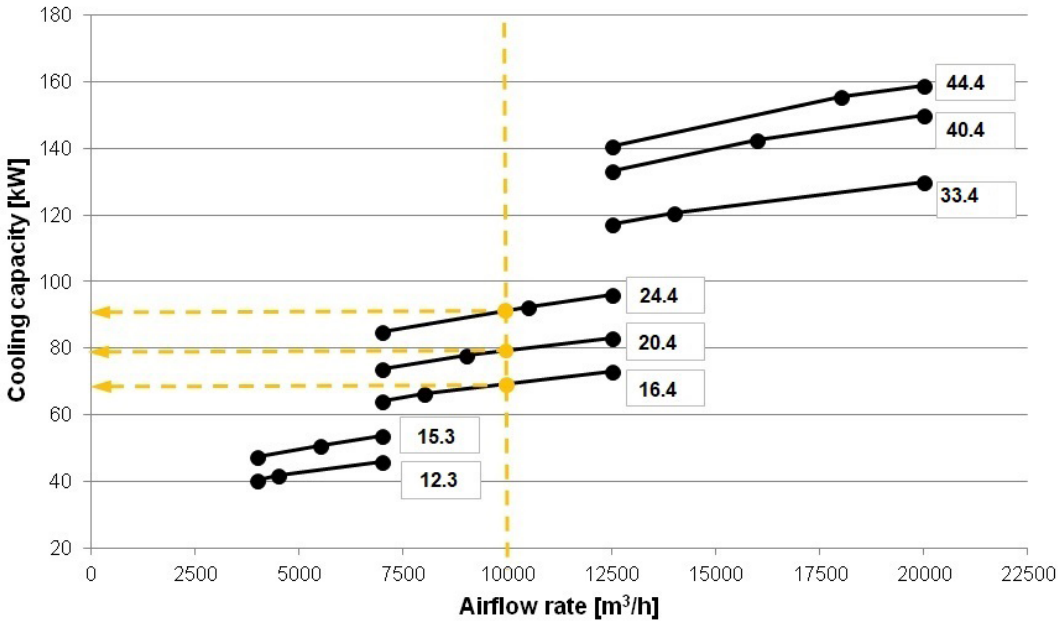
4. Outdoor air damper
SERMD - Modulating motorized fresh air damper

5. Auxiliary heating
- not required (Std)
EH - Electric elements
CHW2 - 2row hot water coil
GC - Gas heating module

6. Airflow
PCOSM - Supply constant airflow
PVAR - Variable airflow

7. External section fan
CREFO - Device for fan consumption reduction of the external section, on/off type
CREFB - Device for fan consumption reduction of the external section, ECOBREEZE type

How choosing the unit
The selection of the most appropriate size for an installation can be performed starting from the supply airflow value, established this value it is possible to choose among different available thermo-refrigerant treatments.
It is well-known that buildings built with modern technologies, that improve efficiency, have different needs than the previous buildings. In this case, the designer has to design systems with different potentialities.
Example: with airflow at 10000 m3/h, 3 possible cooling capacities are highlighted to do a different treatment, allowing to the designer to have a wide choice.



Standard airflow

SIZE				12.3	15.3	16.4	20.4	24.4	33.4	40.4	44.4
COOLING											
Cooling capacity	CCK	1	kW	40,9	50,6	66,3	77,9	95,4	120	143	156
Sensible capacity	CCK	1	kW	26,8	35,0	45,4	50,2	62,7	82,4	98,4	109
Compressor power input	CCK	1	kW	9,2	12,2	15,5	19,3	22,5	27,4	34,2	38,1
EER	CCK	1	-	4,45	4,15	4,29	4,03	4,23	4,40	4,17	4,09
Cooling capacity (EN14511:2018)	CCK	9	kW	35,7	41	58	70,1	76,8	102,1	126,9	138,0
EER (EN14511:2018)	CCK	9	-	3,17	2,81	3	2,98	2,79	3,14	3,25	3,14
SEER	CCK	8		3,80	3,74	4,29	4,30	4,21	3,97	4,37	4,47
ηsc	CCK	8	%	149	147	169	169	165	156	172	176
Cooling capacity	CCKP	1	kW	46,3	57,1	75,4	87,6	107	134	158	174
Sensible capacity	CCKP	1	kW	30,5	39,5	51,4	57,2	71,2	92,7	110	120
Compressor power input	CCKP	1	kW	9,2	12,3	15,5	19,4	22,8	28,0	35,2	39,5
EER	CCKP	1	-	5,03	4,64	4,86	4,52	4,68	4,80	4,50	4,40
HEATING											
Heating capacity	CCK	1	kW	41,8	52,6	68,1	77,5	95,9	117	147	165
Compressor power input	CCK	1	kW	8,7	10,8	13,5	14,9	17,0	20,6	25,3	30,0
COP	CCK	1	-	4,80	4,87	5,05	5,21	5,66	5,69	5,79	5,50
Heating capacity (EN14511:2018)	CCK	10	kW	36,1	45,2	60,0	69,4	84,2	101,7	123,2	135,0
COP (EN14511:2018)	CCK	10	-	2,99	3,10	2,64	2,74	3,01	3,36	3,43	3,47
SCOP	CCK	8		3,22	3,23	3,20	3,27	3,50	3,73	3,84	3,79
ηsh	CCK	8	%	126	127	125	128	137	146	151	149
Heating capacity	CCKP	1	kW	44,2	54,8	71,5	81,1	99,2	121	150	166
Compressor power input	CCKP	1	kW	8,9	10,8	13,7	15,0	17,0	20,6	25,3	29,4
COP	CCKP	1	-	4,97	5,07	5,22	5,41	5,84	5,88	5,91	5,64
THOR recovery efficiency	CCKP	2	%	83	81	84	83	81	85	82	81
COMPRESSOR											
Type of compressors		3		Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
No. of compressors			Nr	3	3	4	4	4	4	4	4
Std Capacity control steps			Nr	4	4	4	4	4	4	4	4
Refrigerant charge (C1)	CCK	4	kg	14,5	14,5	10,5	9,0	14,0	20,5	25,5	25,5
Refrigerant charge (C2)	CCK	4	kg	14,5	14,5	11,0	9,0	14,0	20,5	25,5	25,5
Refrigerant charge (C1)	CCKP	4	kg	17,0	17,5	15,5	16,0	17,0	25,5	31,0	31,0
Refrigerant charge (C2)	CCKP	4	kg	17,0	17,5	15,5	16,0	17,0	31,0	31,0	31,0
Refrigeration circuits			Nr	2	2	2	2	2	2	2	2
AIR HANDLING SECTION FANS (SUPPLY)											
Type of supply fan		5		RAD	RAD	RAD	RAD	RAD	RAD	RAD	RAD
No. of supply fans			Nr	1	1	1	1	1	2	2	2
Fan diameter			mm	500	500	630	630	630	630	630	630
Supply airflow			l/s	1250	1806	2222	2500	3333	3889	4444	5000
Supply airflow			m^3/h	4500	6500	8000	9000	12000	14000	16000	18000
Installed unit power			kW	2,6	2,6	2,75	2,75	2,75	2,75	2,75	2,75
Max. static pressure supply fan		6	Pa	830	690	585	515	300	610	565	515
HIGH STATIC PRESSURE AIR HANDLING SECTION FANS (OPTIONAL)											
Type of supply fan				RAD	RAD	RAD	RAD	RAD	RAD	RAD	RAD
Number of supply fans			Nr	1	1	1	1	1	2	2	2
Fan diameter			mm	500	500	500	500	500	500	500	500
Supply airflow			l/s	1250	1806	2222	2500	3333	3889	4444	5000
Supply airflow			m^3/h	4500	6500	8000	9000	12000	14000	16000	18000
Installed unit power			kW	5,5	5,5	5,5	5,5	5,5	5,5	5,5	5,5
Max. static pressure supply fan			Pa	1020	1020	1020	1020	660	1020	1020	1020
FANS (EXHAUST)											
Type of fans		5		RAD	RAD	RAD	RAD	RAD	RAD	RAD	RAD
No. of fans				1	1	1	1	1	2	2	2
Fan diameter			mm	400	400	500	500	500	500	500	500
Installed unit power			kW	1,32	1,32	2,68	2,68	2,68	2,68	2,68	2,68

SIZE			12.3	15.3	16.4	20.4	24.4	33.4	40.4	44.4
EXTERNAL SECTION FANS										
Type of fans	7		AX	AX	AX	AX	AX	AX	AX	AX
No. of fans		Nr	2	2	2	2	2	2	2	2
Fan diameter		mm	630	630	800	800	800	800	800	800
Standard airflow		l/s	6944	6944	11389	11389	11389	11389	11389	11389
Single power input		kW	1,05	1,05	1,5	1,5	1,5	1,5	1,5	1,5
CONNECTIONS										
Condensate drain		mm	20	20	20	20	20	20	20	20
POWER SUPPLY										
Standard power supply		V	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50	400/3/50

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)

CCK = Return with fan and mixing chamber
CCKP = Return with fan and chamber with THOR thermodynamic recovery
Performance in Heating: Indoor air temp. 20°C D.B./12°C W.B. entering air to the external exchanger 7°C/6°C W.B. COP referred only to compressors
Performances in cooling: Indoor air temp. 27°C/19°C W.B. Entering external exchanger air temperature 35°C D.B./24°C W.B. EER referred only to compressors

1. Performance with 80% of outdoor air including the energy recovery on the exhaust air
2. Energy recovery efficiency determinated on the exhaust air. Indoor temperature 20°C D.B./12°C W.B., outdoor temperature 7°C D.B./6°C W.B.
3. 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 electronically controlled
6. Net outside static pressure to win the outlet and intake onboard pressure drops
7. AX = Axial fan
8. Data calculated in accordance with EN 14825: 2018
9. 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
10. 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

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)
12.3	77	80	75	77	77	74	72	69	81	63
15.3	80	81	79	81	80	77	74	70	85	66
16.4	92	82	80	81	79	77	74	75	84	67
20.4	92	83	81	82	80	78	75	73	85	68
24.4	92	84	82	84	82	79	76	76	87	69
33.4	92	89	90	86	84	82	74	71	89	70
40.4	93	90	91	86	84	82	75	72	90	71
44.4	94	91	92	88	85	82	77	73	91	72

The sound levels are referred to unit operating at full load in nominal conditions. The sound pressure level is referred at a distance of 1 m. from the ducted unit surface operating in free field conditions. External static pressure 50 Pa. (standard UNI EN ISO 9614-2) Measurements are performed in accordance with the UNI EN 9614-2 standard, in compliance with the requirements of Eurovent 8/1 certification, which provides for a 3dB (A) tolerance on the sound power level - the only data to be considered quite challenging. Please note that when the unit is installed in conditions different from nominal test conditions (e.g. near walls or obstacles in general), the sound levels may undergo substantial variations.

Electrical data

Configuration: return with fan and mixing chamber

SIZE			12.3	15.3	16.4	20.4	24.4	33.4	40.4	44.4
F.L.A. FULL LOAD CURRENT AT MAX ADMISSIBLE CONDITIONS										
FLA Compressor 1		A	7,5	7,5	10,1	10,1	14,3	14,6	15,4	15,4
FLA Compressor 2		A	7,5	7,5	10,4	14,3	14,3	14,6	23	30,9
FLA Compressor 3		A	10,4	16,6	10,1	10,1	14,3	15,4	15,4	15,4
FLA Compressor 4		A	-	-	10,4	14,3	14,3	23	30,9	30,9
FLA Single External Fan		A	2,5	2,5	3,9	3,9	3,9	3,9	3,9	3,9
FLA Single supply fan		A	4,0	4,0	4,2	4,2	4,2	4,2	4,2	4,2
FLA Single exhaust fan		A	2,1	2,1	4	4	4	4	4	4
FLA Total	1	A	36,4	42,6	57,4	65,2	72,9	92,3	109,2	117,1
L.R.A. LOCKED ROTOR AMPERES										
LRA Compressor 1		A	43,0	43,0	64	64	101	101	95	95
LRA Compressor 2		A	43,0	43,0	64	101	101	101	118	174
LRA Compressor 3		A	64,0	111,0	64	64	101	95	95	95
LRA Compressor 4		A	-	-	64	101	101	118	174	174
F.L.I. FULL LOAD POWER INPUT AT MAX ADMISSIBLE CONDITIONS										
FLI Compressor 1		kW	6,7	6,7	6,1	6,1	8,3	8,6	9,1	9,1
FLI Compressor 2		kW	6,7	6,7	6,1	8,3	8,3	8,6	13,5	17,2
FLI Compressor 3		kW	6,4	10,2	6,1	6,1	8,3	9,1	9,1	9,1
FLI Compressor 4		kW	-	-	6,1	8,3	8,3	13,5	17,2	17,2
FLI Single External Fan		kW	1,3	1,3	1,9	1,9	1,9	1,9	1,9	1,9
FLI Single supply fan		kW	2,6	2,6	2,8	2,8	2,8	2,8	2,8	2,8
FLI Single exhaust fan		kW	1,3	1,3	2,6	2,6	2,6	2,6	2,6	2,6
FLI Totale	2	kW	26,3	30,1	33,9	38,2	42,6	54,5	63,7	67,4
M.I.C. MAXIMUM INRUSH CURRENT										
MIC		A	90,1	137,1	111	151,9	160,3	187,2	252,4	260,2

Data refer to standard units.
Power supply: 400/3/50 Hz. Voltage variation: max. +/-10%
Voltage unbalance between phases: max 2 %
Values not including accessories.
1. Values not including the accessories. To obtain the value of F.L.A. including accessories, add to the total F.L.A. value that of any accessories (see electrical data of accessories))
2. Values not including the accessories. To obtain the value of F.L.I. including accessories, add to the total F.L.I. value that of any accessories (see electrical data of accessories)

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			12.3	15.3	16.4	20.4	24.4	33.4	40.4	44.4
F.L.A. ABSORBED CURRENT										
FLA EH10 - 6 kW electric elements		A	8,7	8,7	-	-	-	-	-	-
FLA EH12 - 9 kW electric elements		A	13	13	-	-	-	-	-	-
FLA EH15 - 13.5 kW electric elements		A	19,5	19,5	19,5	19,5	19,5	-	-	-
FLA EH17 - 8 kW electric elements		A	-	-	26	26	26	26	26	26
FLA EH22 - 27 kW electric elements		A	-	-	39	39	39	39	39	39
FLA EH24 - 36 kW electric elements		A	-	-	-	-	-	52	52	52
FLA HSE5 - 5 kg/h immersed electrodes steam humidifier		A	8,7	8,7	8,7	8,7	8,7	8,7	8,7	8,7
FLA HSE8 - 8 kg/h immersed electrodes steam humidifier		A	8,7	8,7	8,7	8,7	8,7	8,7	8,7	8,7
FLA HSE9 - 15 kg/h immersed electrodes steam humidifier		A	16,2	16,2	16,2	16,2	16,2	16,2	16,2	16,2
FLA LTEMP1 - Application for low outdoor temperature		A	1	1	1	1	1	1	1	1
FLA VENH - High static pressure fans	1	A	4,4	4,4	4,1	4,1	4,1	8,2	8,2	8,2
F.L.I. POWER INPUT										
FLI EH10 - 6 kW electric elements		kW	6	6	-	-	-	-	-	-
FLI EH12 - 9 kW electric elements		kW	9	9	-	-	-	-	-	-
FLI EH15 - 13.5 kW electric elements		kW	13,5	13,5	13,5	13,5	13,5	-	-	-
FLI EH17 - 18 kW electric elements		kW	-	-	18	18	18	18	18	18
FLI EH22 - 27 kW electric elements		kW	-	-	27	27	27	27	27	27
FLI EH24 - 36 kW electric elements		kW	-	-	-	-	-	36	36	36
FLI HSE5 - 5 kg/h immersed electrodes steam humidifier		kW	6	6	6	6	6	6	6	6
FLI HSE8 - 8 kg/h immersed electrodes steam humidifier		kW	6	6	6	6	6	6	6	6
FLI HSE9 - 15 kg/h immersed electrodes steam humidifier		kW	11,3	11,3	11,3	11,3	11,3	11,3	11,3	11,3
FLI LTEMP1 - Application for low outdoor temperature		kW	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3
FLI VENH - High static pressure fans	1	kW	2,9	2,9	2,7	2,7	2,7	5,4	5,4	5,4

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

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.

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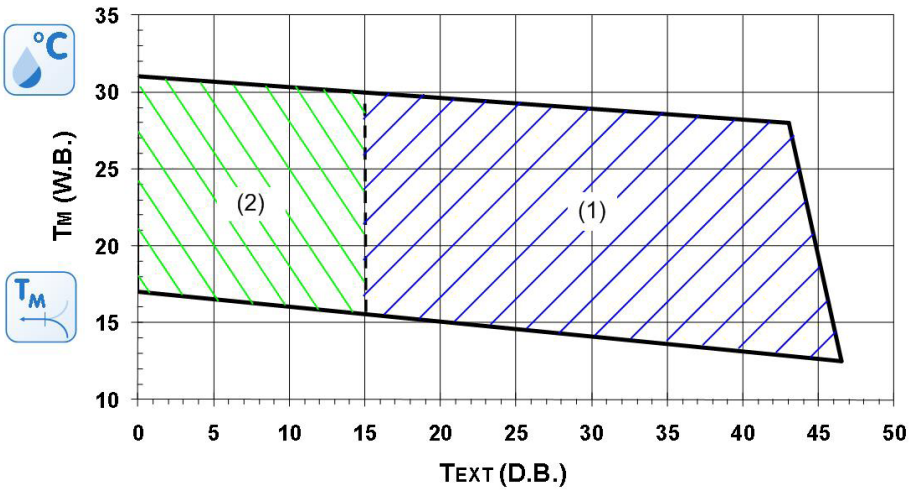
SIZE			12.3	15.3	16.4	20.4	24.4	33.4	40.4	44.4
CHW2 - Two-row hot water coil		Pa	24	37	25	29	40	13	18	23
CPHG - Hot gas re-heating coil		Pa	14	21	14	16	21	10	11	12
GC - Gas heating module		Pa	67	103	81	95	136	55	59	64
F7 - F7 high efficiency air filter (ISO 16890 ePM1 55%)	1	Pa	145	180	137	145	171	138	146	154
FES - High efficiency electronic filters (ISO 16890 ePM1 90%)		Pa	30	51	24	28	42	19	28	37

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

1. Pressure drops with filters with average dirtiness

Operating range (Cooling)



The limits are meant as a guide. Please note that they have been calculated by considering
- general and non specific sizes
- standard airflow
- non-critical positioning and correct use of the unit
- operation at full load

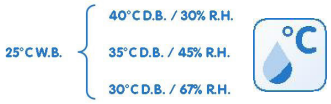
To verify the operating range of the operating units with percentages of fresh air, always calculate the Tm mixing temperature at the internal heat exchanger input.

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

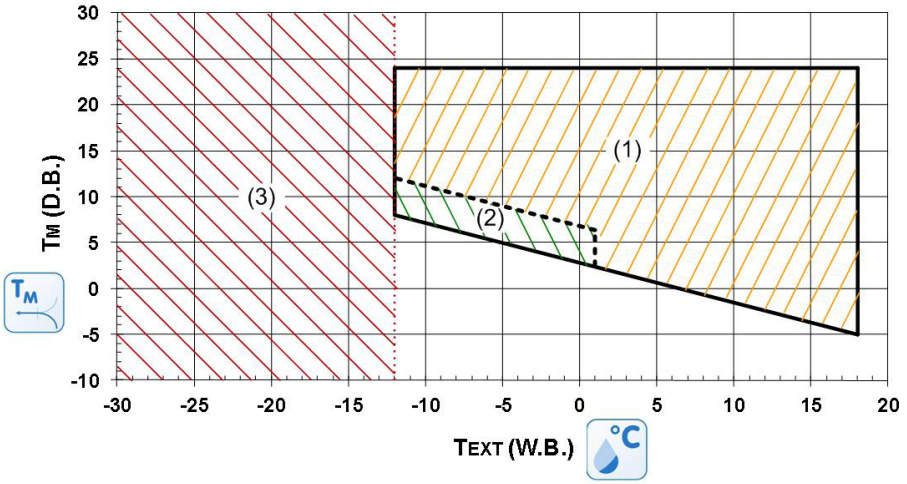
Text = inlet air temperature in the external exchanger
Dry bulb measured temperature (D.B.=DRY BULB)

1. Standard operating range
2. Operatiing range of the unit in FREE-COOLING mode or with automatic distribution of the outdoor ventilation (ECOBREEZE)

WET BULB TEMPERATURE - EXAMPLE



Operating range (Heating)



The limits are meant as a guide. Please note that they have been calculated by considering:
- general and non specific sizes
- standard airflow
- non-critical positioning and correct use of the unit
- operation at full load

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

Tm = internal exchanger entering air temperatur
Dry bulb measured temperature (D.B.=DRY BULB))

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

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

In extended operating mode, in heat pump operation with an fresh 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 fresh air temperature within -10°C and -30 °C, the following options will be required: hot water coil or gas heating module and outdoor low temperature set-up.

REF.	DESCRIPTION	CCK	CCKP
	VERSIONS		
THR	Exhaust air THOR thermodynamic energy recovery	-	√
REC	Exhaust air thermodynamic energy recovery	√	-
FC	Thermal FREE-COOLING	√	√
FCE	Enthalpy FREE-COOLING	O	O
	CONFIGURATIONS		
PCM0	Sandwich panels of the handling zone in M0 fire reaction class	O	O
CREFO	Device for fan consumption reduction of the external section, on/off type	√	√
CREFB	Device for fan consumption reduction of the external section, ECOBREEZE type	O	O
CHW2	Two-rows hot water coil	O	O
GC	Condensing gas heating module with modulating control	O	O
	HYDRAULIC CIRCUIT		
3WVM	Modulating 3-way valve	O	O
2WVM	Modulating 2-way valve	O	O
	REFRIGERATION CIRCUIT		
LTEMP1	Application for low outdoor temperature	O	O
MHP	High and low pressure gauges	O	O
EVE	Electronic expansion valve	√	√
CPHG	Hot gas re-heating coil	O	O
	AERAULIC CIRCUIT		
M3	Dowflow supply	O	O
M5	Upward supply air	O	O
M0	Horizontal air supply	√	√
RO	Horizontal return	√	√
R3	Floor air inlet	O	O
PCOSM	Constant supply airflow	√	√
PVAR	Variable airflow	O	O
PVMEV	4-20mA signal for exhaust and supply airflow modulating	O	O
F7	High efficiency F7 air filter (ISO 16890 ePM1 55%)	O	O
FES	Electronic filters (ISO 16890 ePM1 90%)	O	O
FPG4	Pleated air filter class G4 (ISO 16890 Coarse 60%)	√	√
UVC	UV-C germicidal lamps	O	O
EXFLOWC	Application in spaces with forced air exhaust at variable flow and exhaust section	O	O
PSAF	Differential pressure switch for dirty air filters	O	O
PAQC	Air quality probe for CO2 rate check	O	O
PAQCV	Air quality sensor for CO2 and VOC rate check	O	O
HSE	Immersed electrodes steam humidifier	O	O
VENH	High static pressure fans	O	O
SERMD	Modulating motorized outdoor air damper	√	√
	INSTALLATION		
RCX	Roof curb	◊	◊
AMRX	Rubber antivibration mounts	◊	◊
AMRMX	Rubber antivibration mounts for unit and gas module	◊	◊

√ Standard component
O Optional component
◊ Separately supplied accessory (optional))

Option compatibility

RIF.	DESCRIPTION	CCK	CCKP
	ELECTRIC CIRCUIT		
CLMX	Clivet Master System	◊	◊
CTEM	Ambient temperature control with built-in probes	√	√
CTERM	Remote keypad for indoor temperature and humidity control	O	O
CSOND	Temperature and humidity ambient control with built-in probes	O	O
PTAAX	Remote ambient air temperature sensor	O	O
PTUAX	Remote ambient air temperature and humidity probe	O	O
EH	Electric heaters	O	O
THTUNE	Wall mounted electronic room control	√	√
DML	Demand Limit	O	O
DESM	Smoke detector	O	O
PM	Phase monitor	O	O
PFCC	Power factor correction capacitors (cosfi > 0.95)	O	O
	SYSTEM MANAGERS		
CMSC9	Serial communication module to Modbus supervisor	O	O
CMSC10	Serial communication module to LonWorks supervisor	O	O
CMSC11	Serial communication module for BACnet-IP supervisor	O	O
SFSTC	Progressive compressor start-up device	O	O
	VARIOUS		
PTCO	Set up for shipping via container	O	O

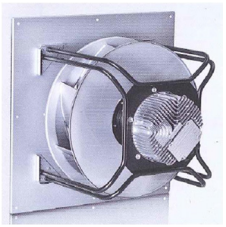
√ Standard component

O Optional component

◊ Separately supplied accessory (optional)

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.

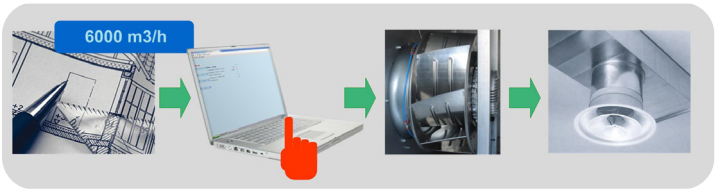


CREFB **Device for fan consumption reduction of the external section, ECOBREEZE type**

Option indicated to reduce the ventilation electric energy consumption considerably and limit sound emissions inside the external section of the unit. ECOBREEZE logic allows the external axial fans to operate at a variable rotation speed, according to the operation conditions of the cooling circuit. Reducing the speed when the heat load is reduced, benefits the sound emissions, especially during the night, when sensitivity to noise is enhanced.
During summer operation, fans can further increase their speed, to respond to situations in which operation limits are temporarily exceeded. ECOBREEZE option uses special fans powered by brushless electrical motors, with complete electronic control, and distinguished by a very high efficiency.
To ensure the continuous cooling operation even at temperatures lower than 15°C, the option is necessary to maintain a proper condensation on the external exchanger..

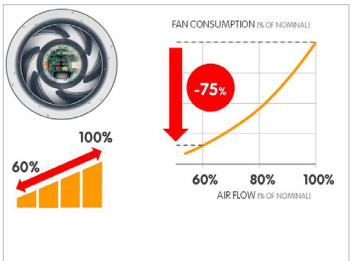
PCOSM **Constant supply airflow (standard)**

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



PVAR **Variable airflow**

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



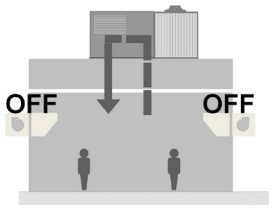
⚠ This option already includes the device for controlling the airflow, called 'PCOSM - Supply constant airflow', which must not be selected

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

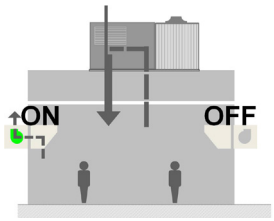
Accessories

EXFLOWC **Application in spaces with forced air exhaust at variable flow and exhaust section**

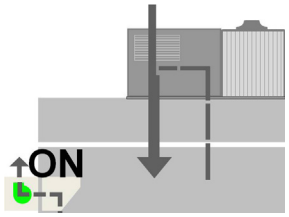
Option indicated for conditioning buildings with hoods or active air exhaust systems, for example the cinema projection rooms, catering kitchens, labs with suction hoods, where the fresh airflow is variable in function of the number of active extractors.
The option involves an electronic device installed built-in the unit that receives the activation status of the extractors on appropriate potential-free contacts or one 0-10V signal and modulates the fresh air quantity.
The unit is equipped with an exhaust fan section to allow the air renewal also with suction hoods off. The exhaust section is equipped with a plug-fan electronically controlled and managed by the unit logic according to the active suction hoods and the fresh air damper opening. To dimension the unit consider as max. exhaust airflow of the hoods the 80% of the nominal airflow.
The air quality probe for controlling the rate of CO2 / CO2 and VOC, and the EXFLOWC can be simultaneously selected.
Where necessary, the unit will be integrated with further heating options of which 'Electrical heating resistance', 'two-rows hot water coil' or 'Gas heating module' to guarantee the operation of the unit with 80% of the fresh air in every operating situation, even in low fresh air temperature.



Exhaust and all extractors off



Exhaust and some extractors on



Exhaust and all extractors on

- The electronic device is installed and wired built-in the unit.
- The option allows to manage up to 4 ON-OFF contacts from the exhaust devices or one 0-10V signal (by Customer)
- The connection cables for the 0-10V signal or the ON-OFF status do not require shielding.
- Variable airflow' and EXFLOWC cannot be simultaneously selected.
- With minimum fresh air temperatures between 0°C and –8°C foresees the option 'Electrical heating resistance' or 'two-rows hot water coil' whereas for minimum temperatures between –8°C e –30°C foresees the '2 range hot water coil' or 'Gas heating module' option.

PVMEV **4-20mA signal for the supply and exhaust airflow modulation**

Through this option, the supply and exhaust airflow can be adjusted through two external 4-20mA signals, each dedicated to manage the respective ventilation sections and to keep proper pressures in the rooms.
It is a suitable solution in systems serving several rooms having similar heat load profiles, but separated from each other and occupied in a discontinuous way.
In periods of sanitary emergency, it is suitable for managing a lower airflow than the nominal one, as well as keeping the system on at night, thereby ensuring that internal pollutants are continuously diluted.
The airflow can linearly vary according to the signal received between two airflow levels set in the unit; these values must be selected within the range of the airflow rates allowed for the selected model (values shown in the fans section of the respective technical leaflets).
The PVMEV option disables the 'PCOSM Constant supply airflow' and 'PVAR Variable airflow' options, when configured.

PSAF **Clogged filter differential pressure switch air side**

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

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

The class F7 are filtering components that are in addition to the standard G4 filters, for more effective filtering. They are widely used in air conditioning systems and industrial applications that require suitable performance concerning fine dusts and particles with dimensions greater than 1 µm. Class F7 filters are made of fibreglass paper, pleated with constant calibrated spacing, mounted on a metallic frame; the ample filtering surface reduces air side pressure drops. Class F7 filters must be replaced after reaching their limits of dirtiness with scheduled periodic maintenance. An optional accessory, dirty filter differential switch, can be fitted to signal when admissible limit of fouling has been reached so as not to excessively reduce the airflow with respect to the nominal value.

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

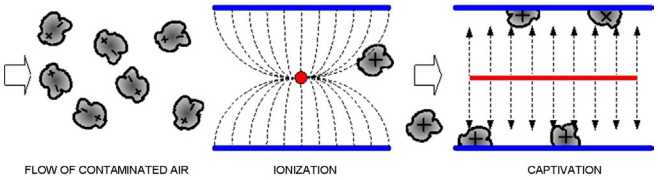
FES

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.

UVC

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.
In rooftop systems, UV-C lamps are installed downstream of the handling coil and act directly in the air flow and on the irradiated surfaces, such as the handling coil and the drain pan. 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 on the unit and is active when the supply ventilators are working. The radiation is completely contained and shielded inside the unit to avoid accidental contact with people; in fact, exposure to the rays without the necessary safety devices can cause skin burns and damage vision.

FCE

Enthalpy FREE-COOLING

This option is used to reduce energy consumption and compressor wear by using the outdoor air as an energy source to lower the thermal loads and ambient humidity. The temperature control compares the temperature and the humidity between the outdoor environment and the served environment and decides the amount of fresh air needed to guarantee the correct temperature and humidity set-points in the environment, keeping the compressors shut off.
The air humidity, both outside and inside the environment, is measured by means of humidity probes on the outdoor and return air intake, which are provided already installed and wired on the unit.

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 0/10V proportional signal. Based on the received signal, the controller regulates amount of outdoor air necessary for IAQ ventilation and thus minimises energy used for treatment.
The probe is installed and wired built-in the unit and is located in the return air duct of the unit.

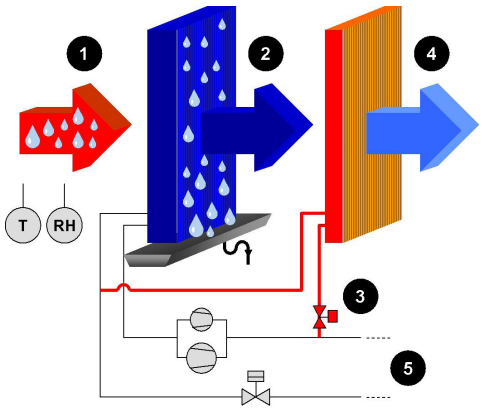
PAQCV **Air quality probe for the CO_2 and VOC rate check**

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 0/10V proportional signal. Based on the received signal, the controller regulates amount of outdoor air necessary for IAQ ventilation and thus minimises energy used for treatment.
The probe is installed and wired built-in the unit and is located in the return air duct of the unit.

CPHG **Hot gas re-heating coil**

This option is recommended during the summer when the intakr air dehumidification is required.
The air flow to enter the room may contain a higher level of humidity than desired. The dehumidification process is used to reduce it. The air flow is first cooled in the handling coil with separation of condensation. It is then freely re-heated to maintain the desired condition of comfort in the served room.
The re-heat coil is located behind the handling coil and is activated by diverting a flow of hot refrigerant gas downstream from the compressors through the action of a dedicated solenoid valve.
The process starts operating based on the humidity set-point established by the user.
With respect to traditional devices, such as electrical electric elements or hot water coils, use of the re-heat coil does not consume any extra energy. It also lowers refrigerant condensation temperature, which provides two positive effects: power absorbed by the compressors is considerably reduced, and at the same time, cooling capacity is increased, resulting in greater efficiency (EER).
Ambient humidity is measured by means of a return humidity probe, which is provided already assembled and wired built-in the unit.

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



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

Indicative scheme - not in scale

CPHG Performances of hot gas re-heating coil

			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
12.3	Qo (m³ / h)		4000					4500					7000				
	Qo (l / s)		1111					1250					1944				
	Ta (°C)	10	9,8	10,5	11,6	12,8	13,9	10,5	11,3	12,5	13,7	15,0	13,7	14,7	16,3	17,9	19,5
		12	9,0	9,8	10,9	12,0	13,2	9,7	10,5	11,7	12,9	14,2	12,6	13,7	15,2	16,8	18,4
		14	8,3	9,0	10,1	11,3	12,4	8,9	9,7	10,9	12,1	13,3	11,6	12,6	14,2	15,8	17,4
		16	7,6	8,3	9,4	10,5	11,6	8,1	8,9	10,1	11,3	12,5	10,6	11,6	13,1	14,7	16,3
		18	6,8	7,6	8,7	9,8	10,9	7,3	8,1	9,3	10,5	11,7	9,5	10,6	12,1	13,7	15,3
		20	6,1	6,8	7,9	9,0	10,1	6,6	7,4	8,5	9,7	10,9	8,5	9,5	11,1	12,6	14,2
15.3	Qo (m³ / h)		4000					6500					7000				
	Qo (l / s)		1111					1806					1944				
	Ta (°C)	10	9,8	10,5	11,6	12,8	13,9	13,1	14,1	15,6	17,1	18,7	13,7	14,7	16,3	17,9	19,5
		12	9,0	9,8	10,9	12,0	13,2	12,1	13,1	14,6	16,1	17,7	12,6	13,7	15,2	16,8	18,4
		14	8,3	9,0	10,1	11,3	12,4	11,1	12,1	13,6	15,1	16,6	11,6	12,6	14,2	15,8	17,4
		16	7,6	8,3	9,4	10,5	11,6	10,1	11,1	12,6	14,1	15,6	10,6	11,6	13,1	14,7	16,3
		18	6,8	7,6	8,7	9,8	10,9	9,1	10,1	11,6	13,1	14,6	9,5	10,6	12,1	13,7	15,3
		20	6,1	6,8	7,9	9,0	10,1	8,2	9,1	10,6	12,1	13,6	8,5	9,5	11,1	12,6	14,2
16.4	Qo (m³ / h)		7000					8000					12500				
	Qo (l / s)		1944					2222					3472				
	Ta (°C)	10	16,8	18,1	20,0	21,9	23,9	18,2	19,6	21,6	23,8	25,9	23,6	25,4	28,1	30,8	33,6
		12	15,6	16,8	18,7	20,6	22,6	16,9	18,2	20,3	22,4	24,5	21,9	23,7	26,3	29,1	31,8
		14	14,3	15,6	17,4	19,3	21,3	15,5	16,9	18,9	21,0	23,1	20,1	21,9	24,6	27,3	30,1
		16	13,1	14,3	16,2	18,1	20,0	14,2	15,5	17,6	19,6	21,7	18,4	20,2	22,8	25,5	28,3
		18	11,9	13,1	14,9	16,8	18,8	12,9	14,2	16,2	18,3	20,4	16,7	18,4	21,1	23,8	26,5
		20	10,6	11,9	13,7	15,6	17,5	11,5	12,9	14,9	16,9	19,0	15,0	16,7	19,3	22,0	24,7
20.4	Qo (m³ / h)		7000					9000					12500				
	Qo (l / s)		1944					2500					3472				
	Ta (°C)	10	16,8	18,1	20,0	21,9	23,9	19,5	21,0	23,2	25,5	27,8	23,6	25,4	28,1	30,8	33,6
		12	15,6	16,8	18,7	20,6	22,6	18,1	19,6	21,8	24,0	26,3	21,9	23,7	26,3	29,1	31,8
		14	14,3	15,6	17,4	19,3	21,3	16,7	18,1	20,3	22,5	24,8	20,1	21,9	24,6	27,3	30,1
		16	13,1	14,3	16,2	18,1	20,0	15,2	16,7	18,9	21,1	23,3	18,4	20,2	22,8	25,5	28,3
		18	11,9	13,1	14,9	16,8	18,8	13,8	15,2	17,4	19,6	21,9	16,7	18,4	21,1	23,8	26,5
		20	10,6	11,9	13,7	15,6	17,5	12,4	13,8	16,0	18,2	20,4	15,0	16,7	19,3	22,0	24,7
24.4	Qo (m³ / h)		7000					12000					12500				
	Qo (l / s)		1944					3333					3472				
	Ta (°C)	10	16,8	18,1	20,0	21,9	23,9	23,1	24,9	27,5	30,1	32,9	23,6	25,4	28,1	30,8	33,6
		12	15,6	16,8	18,7	20,6	22,6	21,4	23,1	25,7	28,4	31,1	21,9	23,7	26,3	29,1	31,8
		14	14,3	15,6	17,4	19,3	21,3	19,7	21,4	24,0	26,7	29,4	20,1	21,9	24,6	27,3	30,1
		16	13,1	14,3	16,2	18,1	20,0	18,0	19,7	22,3	24,9	27,6	18,4	20,2	22,8	25,5	28,3
		18	11,9	13,1	14,9	16,8	18,8	16,3	18,0	20,6	23,2	25,9	16,7	18,4	21,1	23,8	26,5
		20	10,6	11,9	13,7	15,6	17,5	14,6	16,3	18,9	21,5	24,2	15,0	16,7	19,3	22,0	24,7
33.4	Qo (m³ / h)		12500					14000					20000				
	Qo (l / s)		3472					3889					5556				
	Ta (°C)	10	29,1	31,3	34,7	38,2	41,6	31,2	33,6	37,2	40,9	44,7	38,6	41,7	46,2	50,8	55,5
		12	26,8	29,1	32,4	35,8	39,3	28,7	31,2	34,8	38,4	42,2	35,6	38,6	43,1	47,7	52,3
		14	24,5	26,8	30,1	33,5	37,0	26,3	28,7	32,3	36,0	39,7	32,6	35,5	40,0	44,6	49,2
		16	22,3	24,5	27,9	31,2	34,7	23,9	26,3	29,9	33,5	37,2	29,6	32,5	37,0	41,5	46,1
		18	20,1	22,3	25,6	28,9	32,4	21,5	23,9	27,5	31,0	34,7	26,6	29,5	34,0	38,5	43,0
		20	17,9	20,1	23,4	26,7	30,1	19,2	21,5	25,0	28,6	32,3	23,6	26,6	31,0	35,4	40,0

Accessories

CPHG **Performances of hot gas re-heating coil**

			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
40.4	Qo (m³ / h)		12500					16000					20000				
	Qo (l / s)		3472					4444					5556				
	Ta (°C)	10	29,1	31,3	34,7	38,2	41,6	33,8	36,5	44,4	40,4	48,5	38,6	41,7	46,2	50,8	55,5
		12	26,8	29,1	32,4	35,8	39,3	31,2	33,8	41,7	37,7	45,8	35,6	38,6	43,1	47,7	52,3
		14	24,5	26,8	30,1	33,5	37,0	28,5	31,1	39,0	35,0	43,0	32,6	35,5	40,0	44,6	49,2
		16	22,3	24,5	27,9	31,2	34,7	25,9	28,5	36,3	32,4	40,3	29,6	32,5	37,0	41,5	46,1
		18	20,1	22,3	25,6	28,9	32,4	23,3	25,9	33,7	29,8	37,7	26,6	29,5	34,0	38,5	43,0
		20	17,9	20,1	23,4	26,7	30,1	20,7	23,3	31,0	27,2	35,0	23,6	26,6	31,0	35,4	40,0
44.4	Qo (m³ / h)		12500					18000					20000				
	Qo (l / s)		3472					5000					5556				
	Ta (°C)	10	29,1	31,3	34,7	38,2	41,6	36,3	39,2	43,4	47,7	52,1	38,6	41,7	46,2	50,8	55,5
		12	26,8	29,1	32,4	35,8	39,3	33,4	36,3	40,5	44,8	49,1	35,6	38,6	43,1	47,7	52,3
		14	24,5	26,8	30,1	33,5	37,0	30,6	33,4	37,6	41,9	46,2	32,6	35,5	40,0	44,6	49,2
		16	22,3	24,5	27,9	31,2	34,7	27,8	30,6	34,8	39,0	43,3	29,6	32,5	37,0	41,5	46,1
		18	20,1	22,3	25,6	28,9	32,4	25,0	27,8	31,9	36,1	40,4	26,6	29,5	34,0	38,5	43,0
		20	17,9	20,1	23,4	26,7	30,1	22,2	25,0	29,1	33,3	37,6	23,6	26,6	31,0	35,4	40,0

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

MHP **High and low pressure gauges**

Allows the pressure measurement of the refrigerant to the compressor intake and supply, making the inspection of these parameters easier for the technicians involved in the management of the unit.
The two liquid pressure gauges and corresponding pressure sockets are installed built-in the unit in an easily accessible location.

CTERM **Humidity and temperature control with remote thermostat**

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

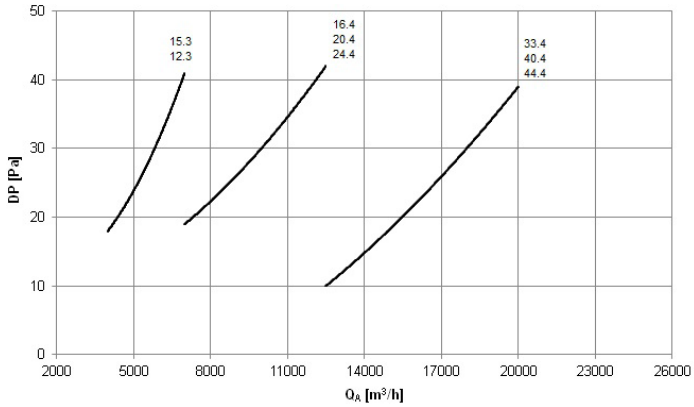
CSOND **Humidity and temperature control with built-in probes**

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.

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 treating coil, it pre-heats the air, extending the operation limits of the unit. If the water coil operates as integration to the heat pump, the control logic reduces the potential at a pre-determined limit value, which prevents to make the compressors work at too high condensation temperatures. On the other hand, if the water coil is used as main resource (i.e. availability of the compressors) the potential supplied will be the highest.
In the event laws or local standards encourage the use of the district heating, and so the use of hot water coil heating with the obligation to recover the energy contained inside the exhaust air flow, a turning point can be set, that is an outside air temperature, below which the unit uses the water coil as main resource and operates also as thermodynamic recuperator at very high efficiency, using the nominal capacity of the heat pump circuit only partially.
With the option is available a potential-free contact for the water circulator start-up (provided by the Installer).

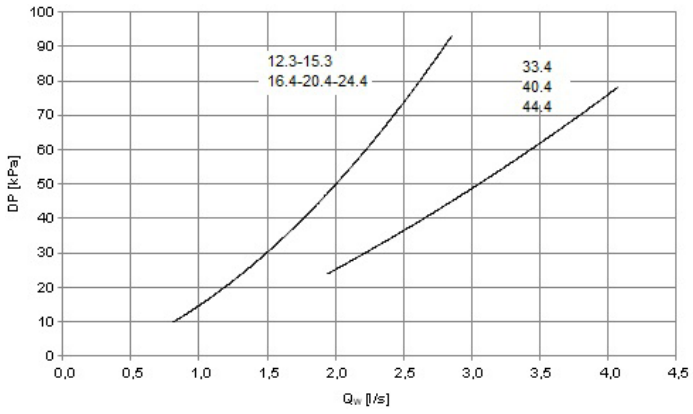
Hot water coil pressure drops: AIR side



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

QA [m^3/h] = Airflow
DP[Pa] = Pressure drops

Hot water coil pressure drops: WATER side



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

Qw [l/s] = Water flow-rate
DP = Pressure drop [kPa]
Qw [l/s] =P / (4.186 x DT)
P = Water coil heating capacity in KW
DT = Temperature difference between inlet / outlet water

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

⚠ The component requires connection to the hot water plumbing system (to be provided for by the client).
⚠ "'2 range hot water coil' , 'Electric elements' and gas module cannot be assembled simultaneously.

Performances of hot water coil (two-row)

			Ti/To (°C)											
			80 / 65	70 / 55	70 / 60	60 / 40	80 / 65	70 / 55	70 / 60	60 / 40	80 / 65	70 / 55	70 / 60	60 / 40
			kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt	kWt
	Qo (m³ / h)		4000				5500				7000			
	Qo (l / s)		1111				1528				1944			
12.3 15.3	TM (°C)	-10	68,0	59,1	61,9	47,3	84,3	73,3	77,0	58,3	98,7	85,7	90,2	68,0
		-5	63,1	54,4	57,1	42,6	78,3	67,4	71,0	52,6	91,7	78,9	83,2	61,4
		0	58,3	49,7	52,5	38,1	72,4	61,6	65,2	47,0	84,8	72,1	76,4	54,8
		5	53,6	45,1	47,9	33,6	66,6	56,0	59,5	41,5	78,1	65,5	69,8	48,4
		10	49,1	40,6	43,3	29,2	61,0	50,4	53,9	36,0	71,4	59,0	63,2	42,0
		15	44,6	36,3	38,9	24,9	55,4	45,0	48,4	30,7	64,9	52,6	56,8	35,7
	Qo (m³ / h)		7000				9750				12500			
	Qo (l / s)		1944				2708				3472			
16.4 20.4 24.4	TM (°C)	-10	119,2	104,2	108,7	84,3	148,9	130,0	135,9	104,9	174,8	152,5	159,6	122,7
		-5	111,1	96,3	100,7	76,5	139,0	120,1	126,0	95,2	163,2	141,0	148,0	111,3
		0	103,3	88,5	92,8	68,9	129,0	110,4	116,2	85,5	151,5	129,6	136,6	100,1
		5	95,5	80,7	85,1	61,2	119,3	100,8	106,5	76,0	140,2	118,3	125,3	88,8
		10	87,7	73,1	77,4	53,6	109,7	91,3	97,0	66,6	128,9	107,2	114,0	77,7
		15	80,1	65,6	69,8	46,1	100,2	81,9	87,5	57,1	117,8	96,1	102,9	66,7
	Qo (m³ / h)		12500				16000				20000			
	Qo (l / s)		3472				4444				5556			
33.4 40.4 44.4	TM (°C)	-10	221,6	193,8	201,8	157,5	262,5	229,4	239,2	185,8	304,3	265,9	277,5	214,9
		-5	206,7	179,1	187,0	143,0	244,9	211,9	221,7	168,8	284,0	245,8	257,3	194,9
		0	192,0	164,6	172,4	128,7	227,5	194,8	204,4	151,7	264,0	225,8	237,4	175,4
		5	177,4	150,3	158,0	114,5	210,3	177,9	187,4	135,0	244,1	206,2	217,7	155,9
		10	163,1	136,0	143,8	100,4	193,3	161,1	170,6	118,4	224,3	186,8	198,2	136,6
		15	149,0	122,1	129,7	86,4	176,6	144,6	154,0	101,8	205,0	167,6	178,9	117,5

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

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.

Matching of the electric elements

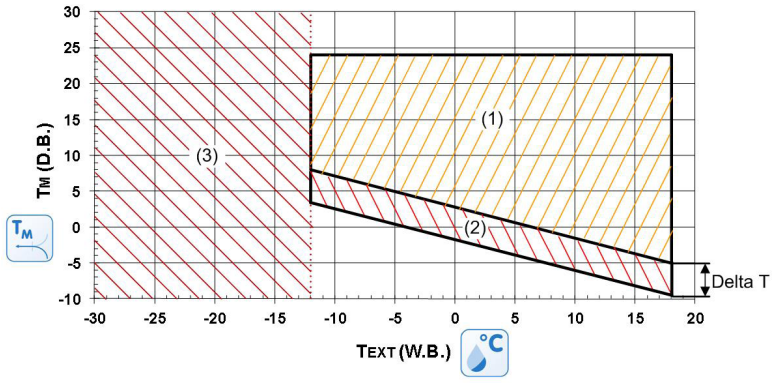
SIZE	12.3	15.3	16.4	20.4	24.4	33.4	40.4	44.4
6kW	√	√	-	-	-	-	-	-
9kW	√	√	-	-	-	-	-	-
13.5kW	√	√	√	√	√	-	-	-
18kW	-	-	√	√	√	√	√	√
27kW	-	-	√	√	√	√	√	√
36kW	-	-	-	-	-	√	√	√

⚠ This option involves variation of the main electrical data of the unit.
⚠ Electric elements', '2-row hot water coil' and 'Combustion heating module' cannot be assembled simultaneously

Operation field extension with electric heaters DT (°C)

SIZE	Portata aria [m³/h]	6kW	9kW	13.5kW	18kW	27kW	36kW
12.3	4500	4,0	5,9	8,9	-	-	-
15.3	6500	2,7	4,1	6,2	-	-	-
16.4	8000	-	-	5,0	6,7	10,0	-
20.4	9000	-	-	4,4	5,9	8,9	-
24.4	12000	-	-	3,3	4,4	6,7	-
33.4	14000	-	-	-	3,8	5,7	7,6
40.4	16000	-	-	-	3,3	5,0	6,7
44.4	18000	-	-	-	3,0	4,4	5,9

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



The limits are meant as a guide. Please note that they have been calculated by considering:
- general and non specific sizes
- standard airflow
- non-critical positioning and correct use of the unit
- operation at full load

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

Tm = internal exchanger entering air temperatur
Dry bulb measured temperature (D.B.=DRY BULB)

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

1. Operation at full load
2. Operating range of the unit equipped with electric elements
3. Operating range of the unit equipped with "Application for low outdoor temperature" and "hot water coil or gas heating module" options. The heat pump circuit is not active.

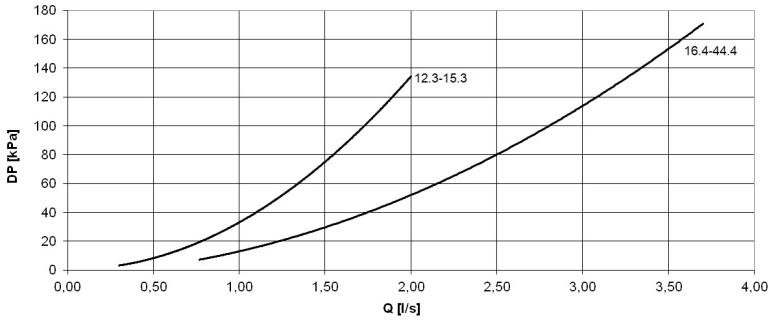
With fresh air temperature within -10°C and -30 °C, the following options will be required: hot water coil and outdoor low temperature set-up.

Accessories

2WVM **Modulating 2-way valve**
3WVM **Modulating 3-way valve**

To be combined with hot water coil (optional). It is managed by the built-in microprocessor via a 0-10V signal and allows the fully automatic control of the water coil. The valve with modulating actuator is provided already assembled and wired built-in the unit.

Valve pressure drops



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

⚠ This accessory has to be coupled to the “CHW2 - Two-row hot water coil” option.

HSE **Immersed electrodes steam humidifier**

This device is suitable for winter operation when humidity is required for the ambient without cooling the air flow.
The automatic modulating control allows you to adjust the steam production and its relative management costs to the actual requirements.
Available in different capacities, the device is suitable for using soften water having medium conductivity and is equipped with: water load solenoid valve, disposable cylinder, water drainage solenoid valve, distribution nozzle, control electronic board to verify the water level, conductivity, anti-foam device, water drainage manual forcing. To ensure maximum hygiene, the cylinder can automatically empty after a determined period of stand-by.
The accessory is installed inside the unit and is connected to the electrical panel of the unit.
Ambient humidity is measured by means of a return humidity probe, which is provided already assembled and wired built-in the unit.
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 immersed electrode and steam humidification module

SIZE	12.3	15.3	16.4	20.4	24.4	33.4	40.4	44.4
3 kg/h	√	√	-	-	-	-	-	-
5 kg/h	√	√	√	√	√	-	-	-
8 kg/h	√	√	√	√	√	√	√	√
15 kg/h	-	-	√	√	√	√	√	√

⚠ This option involves variation of the main electrical data of the unit.
⚠ This accessory requires connection to a water supply network and discharge water circuit with adeguate frost protection. Installation provided by the Customer.
⚠ Operation is available in heating mode

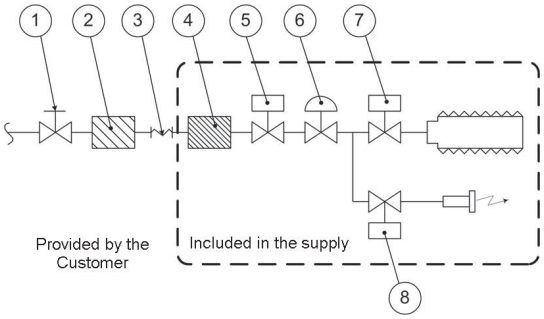
GC

Modulating condensation gas heating module

Option consisting of a combustion chamber and condensation burner with modulating control. It is available in various capacities and heats the environment served. The module can be chosen to integrate the heat pump or as an alternative to it. In this case, its heating capacity must be at least equal to the capacity envisioned in the project.
Thanks to the condensation technology with pre-mix and extremely efficient modulation (up to 105% depending on the lower heat value), consumption is very contained and considerably reduced during operation at partial load. The burner with low polluting emissions (NOx lower than 80mg/kWh) in accordance with Class 5 of European standard EN 676.
The option is supplied on a separate module, easy to connect to the unit during installation. Power, control and alarm signals are directly managed by the unit.
The gas module presence needs the horizontal supply.
The heating module includes:

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

Gas Connection Diagram



1. gas shut-off valve
2. gas filter (large section)
3. anti-vibration joint
4. gas filter (small section)
5. safety 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		100kW		130kW	
		min	max	min	max	min	max	min	max	min	max	min	max
Rated thermal input	kW	7,6	34,8	8,5	42,0	12,4	65,0	16,4	82,0	21,0	100,0	12,4	130,0
Efficiency Hi (P.C.I.)	%	107,0	96,3	105,9	96,2	108,1	96,8	108,4	97,6	108,6	97,2	108,1	96,8
Efficiency Hs (P.C.S.)	%	96,4	86,8	95,4	86,7	97,4	87,2	97,6	87,9	97,8	87,5	97,4	87,2
Max condensation produced	l/h	0,9		1,1		2,1		3,3		2,7		4,2	
Carbon monoxide CO (0% di O_2)	ppm	<5		<5		<5		<5		<5		<5	
Nitrogen oxides - NOx (0% di O_2)		42 mg / kWh 24 ppm		33 mg / kWh 19 ppm		39 mg / kWh 22 ppm		41 mg / kWh 23 ppm		39 mg / kWh 22 ppm		39 mg / kWh 23 ppm	
Available flue pressure	Pa	90		90		120		120		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"		UNI ISO 228/1 - G 3/4"		UNI ISO 228/1 - G 1 1/2"	
Exhaust pipe diameter	mm	80		80		80		80		80		2 X 80	
Seasonal space heating energy efficiency [EU Reg./2281/2016] [ηs, h]	%	92,1		90,8		93,2		93,2		93,1		93,9	
Emission efficiency [EU Reg./2281/2016] [ηsflow]	%	97,3		97,0		97,4		97,1		97,0		98,1	
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	2,22	10,58	2,62	13,76

Matching of the condensing gas heating module

	CAPACITY	12.3	15.3	16.4	20.4	24.4	33.4	40.4	44.4
GC01X	35 kW	√	√	√	√	√	-	-	-
GC08X	44 kW	√	√	√	√	√	-	-	-
GC09X	65 kW	-	-	√	√	√	√	√	√
GC10X	82 kW	-	-	√	√	√	√	√	√
GC11X	100 kW	-	-	-	-	-	√	√	√
GC12X	130 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', '2-row hot water coil' and 'Combustion heating module' cannot be assembled simultaneously.

Accessories

LTEMP1

Application for low outdoor temperature

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

A. The option includes self-regulating heaters with thermostats that can protect the electrical panel from freezing to make sure it operates correctly.
B. The special version of the outdoor air damper for the application for low outdoor temperature is made of anti-seize devices that facilitate the correct control of the fresh air in every climatic situation, thanks to the teflon supporting bushings, aluminium flaps, PVC end gaskets and steel leverages to compensate expansions.
C. The motorised actuator is suitable for operating with low outdoor temperatures.
D. Electrical connection cables suitable for outdoor low temperatures

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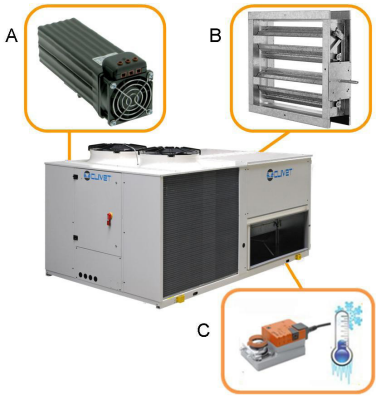
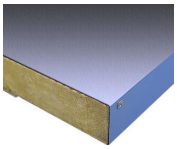


⚠ This operation involves variation of the main electrical data of the unit.
⚠ This accessory operates even when the unit is switched off provided that the power supply is maintained active and the unit continues to be connected.
⚠ It is necessary to make precautions against build up of snow and ice in front of the exhaust and outdoor air inlet locations.

PCM0

Sandwich panels of the handling zone in M0 fire reaction class

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



CMSC9

Serial communication module for Modbus supervisor

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

⚠ The total length of each serial line do not exceed 1000 meters and the line must be connected in bus typology (in/out).

CMSC10

Serial communication module for LonWorks supervisor

It allows the serial connection to supervision systems, using LonWorks as the communication protocol. It allows access to a list of operating variables, control and alarms compliant with the Echelon standard.
The device is installed and wired built-in the unit.

⚠ The configuration and management activities for the LonWorks networks are the responsibility of the client.
⚠ LonWorks technology uses the LonTalk® protocol for communicating between the network nodes. Contact the service supplier for further information.
⚠ The total length of each serial line do not exceed 1000 meters and the line must be connected in bus typology (in/out).

CMSC11

Serial communication module for BACnet-IP supervisor

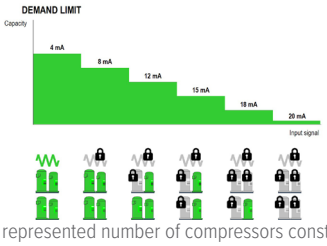
Allows the serial connection to supervision systems by using BACnet-IP as a communication protocol. It allows the access to the entire list of operating variables, controls and alarms. With this accessory every unit can communicate with the main supervision systems.
The device is installed and wired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

⚠ The configuration and management activities for the BACnet networks are the responsibility of the client.
⚠ The total length of each serial line do not exceed 1000 meters and the line must be connected in bus typology (in/out).

DML

Demand Limit

The partial or total activation of the compressors - and the heating electric resistance where present - can be disabled to limit the overall electric capacity absorbed. The external signal is of analogical type 4-20 mA. The greater the signal, the lower the capacity that the unit is enabled to deliver, activating the compressors and the electric elements. The Demand Limit function does not act on the control or on the ventilation, which are therefore always guaranteed, nor on the remaining resources such as hot water coil or the gas heating module.



The represented number of compressors constitutes an indicative example

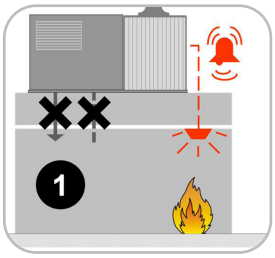
DESM

Smoke detector

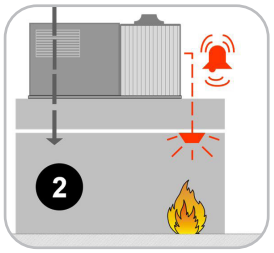
This option allows detection of smoke in the room by analyzing the return air. The Tyndal-effect increased sensitivity smoke detector is perfect for ventilation ducts since it is able to detect rarefied smoke in high-speed air flows. Smoke detection occurs using a photo-optical system with a labyrinth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

Control logics in the event of alarm signal

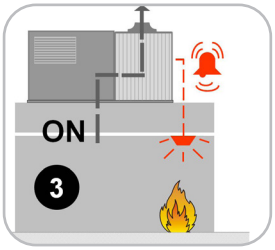
COMPLETE UNIT SHUTDOWN



SPACE IN OVERPRESSURE



SPACE IN UNDER PRESSURE



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

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

PM

Phase monitor

The phase monitor allows verifying the proper phase connection and their unbalance in the units, which are powered by a three-phase system.
The monitor communicates with the control circuit and orders the switch-off of the unit, should one of the following cases occur: improper phase connection, the limit value referring to the unbalance between the phases is exceeded, over/undervoltage for a certain amount of time. Once the line conditions are restored, the unit is reactivated manually.
The device is installed and wired built-in the unit.

PFCC

Power factor correction capacitors (cosfi > 0.95)

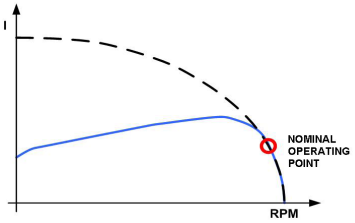
The component is necessary to lower the phase difference between current and voltage in the electromagnetic components of the unit, such as asynchronous motors. By re-phasing it is possible to reduce the intensity of the line current by reducing a part of the power of the mains (reactive power). This leads to an economic benefit which the energy provider grants to the final user. The component makes it possible to bring the cosfi power factor to values which on average are greater than 0.95.
The device is installed and wired built-in the unit.

Accessories

SFSTC

Progressive compressor start-up Soft starter

This option is also known as “Soft starter”. An electronic device which automatically starts up the compressors gradually, reducing the starting current for the unit by around 40% in comparison with the nominal value. This results in the electrical capacity system and the related protection devices being sized with lower parameters, thus having a lower initial investment cost.
The device is installed and wired built-in the unit.



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

PTCO

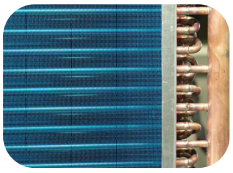
Set up for shipping via container

Option that allows shipping via container.
It includes the sheet steel slide application for an easy unit scrolling, packaging with protective angle brackets and nylons, anchoring systems. If necessary the lateral lifting brackets and the main isolator switch handle can be removed to avoid damages during transport (components removed and put inside the unit).
For particular requirements, please contact Clivet Shipping Department.

CCCA

Copper / aluminium coil with acrylic lining

Coils with copper pipes and aluminium fins with acrylic lacquering. Can be used in settings with moderately aggressive low saline concentrations and other chemical agents. Attention!
- Cooling capacity variation -2.7%.
- Variation in compressor power input +4.2%.
- Operating range reduction -2.1°C.



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

CCCA1

Copper/aluminum coil with Fin Guard (Silver) treatment

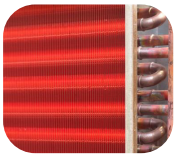
A treatment which offers an optimal thermal exchange and guarantees and protects the finned coil exchangers from corrosion over time. Can be used in settings with very aggressive saline concentrations and other chemical agents in the air thus maintaining the performance of the coils over time.

⚠ 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.

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 in the supply).

⚠ Option supplied separately, electrical connection in charge of the Customer (suggested cable: for 24V PUR/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).

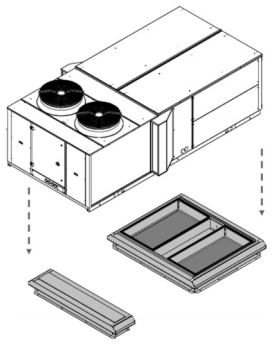
PTUAX **Remote ambient air temperature and humidity probe**

Option that allows the unit to be adjusted with a temperature and humidity 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 in the supply).

⚠ Option supplied separately, electrical connection by the Customer (suggested cable: for 24V PUR/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).

RCX **Roof curb**

Option that allows to connect the unit to the building roof, ideal with downflow supply and return.
It is made up of two part, a solid steel frame for the air duct connection and a adjustment support in height. Both parts are made of galvanized steel with a steel rain cover profile painted in the same unit colour. it has an adequate support and a duct connection semplification. It is supplied not assembled and it has to be assembled directly in the construction site, to facilitate the transport and installation.
It is complete with adjusting screws to adapt to any slopes or difference in height of the cover. Once the frame is assembled, it will be necessary to insulate and seal the roof curb to the roof to guarantee the resistance to atmospheric agents, later it will be necessary only to place the unit.

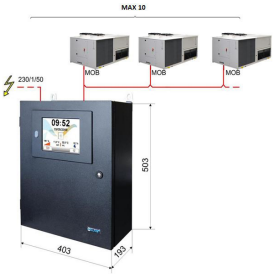


⚠ If the gas module is selected, provide for an appropriate support structure, the supply air can only be horizontal
⚠ Installation provided by the Custormer.

CLMX **Clivet Master System**

CLIVET MASTER SYSTEM is the ideal system for the remote and centralised control of the CLIVETPack and SMARTPack climate control units. It can manage up to 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.

Accessories separately supplied

AMRX **Rubber antivibration mounts**

AMRMX **Rubber antivibration mounts for unit and gas module**

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..

On the web site www.clivet.com are available the performances of the CCK configuration.

Size 12.3 CCKP Configuration

Cooling performance with 80% of outdoor and exhaust air

AIRFLOW	Ta °C DB/ WB	OUTDOOR AIR TEMPERATURE °C D.B/W.B.																							
		25 / 18				30 / 22				32 / 23.5				35 / 24				38 / 24.5				40 / 25			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
4000 m³/h	22 / 16	41,0	25,2	7,3	5,62	44,1	26,1	8,2	5,38	43,6	25,6	8,7	5,01	44,4	28,5	9,2	4,83	42,5	30,1	10,1	4,21	41,8	31,2	10,5	3,98
	24 / 17	40,9	25,1	7,3	5,60	43,9	26,1	8,2	5,35	43,6	25,7	8,7	5,01	44,6	28,7	9,3	4,80	42,4	30,2	10,1	4,20	41,9	31,4	10,5	3,99
	26 / 18	40,7	25,1	7,3	5,58	43,7	26,0	8,2	5,33	43,5	25,8	8,7	5,00	44,9	29,0	9,3	4,83	42,3	30,2	10,1	4,19	41,9	31,6	10,6	3,95
	27 / 19	40,7	24,9	7,3	5,58	43,6	25,9	8,2	5,32	43,6	25,7	8,7	5,01	44,9	28,9	9,3	4,83	42,4	30,1	10,1	4,20	42,1	31,5	10,6	3,97
	28 / 20	40,7	24,8	7,3	5,58	43,6	25,7	8,3	5,25	43,6	25,6	8,7	5,01	44,9	28,7	9,3	4,83	42,4	30,0	10,1	4,20	42,2	31,4	10,6	3,98
	30 / 22	40,7	24,4	7,3	5,58	43,5	25,4	8,3	5,24	43,7	25,3	8,7	5,02	44,8	28,4	9,3	4,82	42,6	29,8	10,1	4,22	42,4	31,3	10,6	4,00
4500 m³/h	22 / 16	42,2	26,4	7,3	5,78	45,4	27,4	8,2	5,54	44,8	26,9	8,7	5,15	45,7	30,1	9,2	4,97	43,9	31,7	10,1	4,35	43,0	32,9	10,5	4,10
	24 / 17	42,0	26,4	7,3	5,75	45,2	27,4	8,2	5,51	44,7	27,0	8,7	5,14	46,0	30,3	9,2	5,00	43,8	31,8	10,1	4,34	43,0	33,1	10,5	4,10
	26 / 18	41,8	26,4	7,3	5,73	44,9	27,3	8,2	5,48	44,7	27,1	8,7	5,14	46,3	30,6	9,2	5,03	43,7	31,9	10,1	4,33	43,0	33,3	10,6	4,06
	27 / 19	41,8	26,2	7,3	5,73	44,9	27,2	8,2	5,48	44,7	27,0	8,7	5,14	46,3	30,5	9,2	5,03	43,7	31,7	10,1	4,33	43,1	33,2	10,6	4,07
	28 / 20	41,8	26,0	7,3	5,73	44,8	27,0	8,2	5,46	44,8	26,8	8,7	5,15	46,2	30,3	9,3	4,97	43,7	31,6	10,1	4,33	43,2	33,1	10,6	4,08
	30 / 22	41,8	25,6	7,3	5,73	44,7	26,6	8,3	5,39	44,9	26,6	8,7	5,16	46,1	29,9	9,3	4,96	43,8	31,3	10,1	4,34	43,5	33,0	10,6	4,10
7000 m³/h	22 / 16	46,1	31,5	7,3	6,32	49,5	32,4	8,2	6,04	49,0	31,7	8,7	5,63	50,4	36,1	9,3	5,42	48,4	38,7	10,1	4,79	47,6	40,2	10,6	4,49
	24 / 17	45,9	31,5	7,3	6,29	49,3	32,5	8,2	6,01	49,0	31,9	8,7	5,63	50,6	36,5	9,3	5,44	48,3	38,8	10,1	4,78	47,7	40,5	10,6	4,50
	26 / 18	45,7	31,5	7,3	6,26	49,0	32,5	8,3	5,90	49,0	32,1	8,7	5,63	50,9	36,9	9,3	5,47	48,2	39,0	10,1	4,77	47,7	40,8	10,6	4,50
	27 / 19	45,7	31,3	7,4	6,18	49,0	32,3	8,3	5,90	49,0	31,9	8,7	5,63	51,0	36,8	9,3	5,48	48,2	38,8	10,1	4,77	47,8	40,7	10,6	4,51
	28 / 20	45,7	31,0	7,4	6,18	48,9	32,1	8,3	5,89	49,0	31,8	8,7	5,63	50,9	36,6	9,3	5,47	48,3	38,7	10,1	4,78	47,9	40,6	10,6	4,52
	30 / 22	45,6	30,5	7,4	6,16	48,8	31,6	8,3	5,88	49,1	31,5	8,8	5,58	50,7	36,1	9,3	5,45	48,4	38,4	10,1	4,79	48,1	40,4	10,6	4,54

Cooling performance with 80% of outdoor and exhaust air

AIRFLOW	Ta (°C) DB	OUTDOOR AIR TEMPERATURE °C D.B/W.B.																		
		-5 / -6			0 / -1			2 /1			7 / 6			12 / 11			15 / 13		
		kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
4000 m³/h	10	30,5	5,7	5,35	34,6	6,9	5,01	36,3	7,4	4,91	40,3	8,8	4,58	43,8	10,3	4,25	45,3	11,3	4,01
	15	30,4	5,8	5,24	34,6	7,1	4,87	36,2	7,6	4,76	40,2	9,0	4,47	43,5	10,5	4,14	45,1	11,6	3,89
	18	30,4	5,9	5,15	34,6	7,2	4,81	36,2	7,7	4,70	40,2	9,1	4,42	43,4	10,7	4,06	45,1	11,8	3,82
	20	30,4	6,0	5,07	34,5	7,3	4,73	36,2	7,8	4,64	40,1	9,2	4,36	43,3	10,8	4,01	45,1	12,0	3,76
	22	30,4	6,0	5,07	34,5	7,3	4,73	36,1	7,9	4,57	40,1	9,3	4,31	43,2	10,9	3,96	45,1	12,1	3,73
	25	30,4	6,1	4,98	34,5	7,4	4,66	36,1	8,0	4,51	40,0	9,4	4,26	43,1	11,0	3,92	45,1	12,3	3,67
4500 m³/h	10	34,8	5,6	6,21	37,8	6,5	5,82	39,6	7,1	5,58	43,6	8,4	5,19	46,8	9,7	4,82	52,3	10,4	5,03
	15	34,8	5,8	6,00	38,1	6,7	5,69	40,0	7,3	5,48	43,9	8,6	5,10	48,0	10,0	4,80	53,6	10,6	5,06
	18	34,8	5,9	5,90	38,3	6,9	5,55	40,2	7,5	5,36	44,0	8,8	5,00	48,8	10,2	4,78	53,7	10,8	4,97
	20	34,9	6,0	5,82	38,4	7,0	5,49	40,4	7,6	5,32	44,2	8,9	4,97	49,3	10,3	4,79	53,6	10,9	4,92
	22	34,9	6,0	5,82	38,5	7,0	5,50	40,5	7,6	5,33	44,3	8,9	4,98	49,8	10,4	4,79	53,6	11,1	4,83
	25	34,9	6,1	5,72	38,7	7,2	5,38	40,8	7,8	5,23	44,5	9,1	4,89	50,5	10,6	4,76	53,6	11,2	4,79
7000 m³/h	10	35,2	4,6	7,65	38,1	5,4	7,06	40,1	5,8	6,91	44,5	6,8	6,54	48,5	7,8	6,22	55,0	8,3	6,63
	15	35,2	4,8	7,33	38,4	5,5	6,98	40,5	6,0	6,75	44,9	7,0	6,41	49,9	8,0	6,24	56,5	8,5	6,65
	18	35,2	4,9	7,18	38,6	5,7	6,77	40,7	6,1	6,67	45,0	7,1	6,34	50,8	8,2	6,20	56,6	8,7	6,51
	20	35,3	4,9	7,20	38,7	5,7	6,79	40,9	6,2	6,60	45,2	7,2	6,28	51,3	8,3	6,18	56,6	8,7	6,51
	22	35,3	5,0	7,06	38,9	5,8	6,71	41,1	6,3	6,52	45,3	7,3	6,21	51,9	8,4	6,18	56,5	8,8	6,42
	25	35,3	5,1	6,92	39,0	5,9	6,61	41,3	6,4	6,45	45,6	7,4	6,16	52,7	8,5	6,20	56,5	8,9	6,35

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 15.3 Configurazione CCKP

Cooling performance with 80% of outdoor and exhaust air

AIRFLOW	Ta °C DB/WB	OUTDOOR AIR TEMPERATURE °C D.B/W.B.																							
		25 / 18				30 / 22				32 / 23.5				35 / 24				38 / 24.5				40 / 25			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
4000 m³/h	22 / 16	46,4	29,1	9,4	4,94	49,8	30,0	10,6	4,70	49,2	29,2	11,3	4,35	50,2	32,1	12,1	4,15	48,1	33,4	13,2	3,64	47,2	34,3	13,8	3,42
	24 / 17	46,1	29,0	9,4	4,90	49,5	29,9	10,7	4,63	49,1	29,3	11,3	4,35	50,5	32,3	12,1	4,17	48,0	33,4	13,2	3,64	47,3	34,4	13,9	3,40
	26 / 18	45,9	28,9	9,4	4,88	49,2	29,9	10,7	4,60	49,1	29,4	11,3	4,35	50,8	32,6	12,1	4,20	47,8	33,4	13,2	3,62	47,3	34,5	13,9	3,40
	27 / 19	45,9	28,7	9,5	4,83	49,1	29,7	10,7	4,59	49,1	29,3	11,3	4,35	50,8	32,5	12,1	4,20	47,9	33,3	13,2	3,63	47,4	34,4	13,9	3,41
	28 / 20	45,9	28,6	9,5	4,83	49,0	29,5	10,7	4,58	49,1	29,1	11,4	4,31	50,8	32,3	12,1	4,20	47,9	33,2	13,2	3,63	47,5	34,4	13,9	3,42
	30 / 22	45,8	28,2	9,5	4,82	48,9	29,1	10,8	4,53	49,2	28,9	11,4	4,32	50,6	31,9	12,2	4,15	48,0	32,9	13,3	3,61	47,7	34,2	13,9	3,43
6500 m³/h	22 / 16	52,1	35,1	9,5	5,48	55,9	35,8	10,8	5,18	55,2	34,7	11,5	4,80	56,5	38,9	12,3	4,59	54,6	41,0	13,5	4,04	54,0	42,4	14,2	3,80
	24 / 17	51,8	35,1	9,6	5,40	55,6	35,8	10,9	5,10	55,1	34,9	11,5	4,79	56,8	39,3	12,3	4,62	54,4	41,1	13,5	4,03	54,0	42,7	14,2	3,80
	26 / 18	51,6	35,0	9,6	5,38	55,3	35,7	10,9	5,07	55,1	35,0	11,6	4,75	57,1	39,7	12,3	4,64	54,3	41,3	13,5	4,02	54,1	42,9	14,2	3,81
	27 / 19	51,6	34,8	9,6	5,38	55,2	35,5	10,9	5,06	55,1	34,9	11,6	4,75	57,1	39,5	12,3	4,64	54,4	41,1	13,5	4,03	54,2	42,8	14,2	3,82
	28 / 20	51,5	34,5	9,7	5,31	55,1	35,3	11,0	5,01	55,1	34,7	11,6	4,75	57,0	39,3	12,4	4,60	54,4	40,9	13,6	4,00	54,3	42,6	14,2	3,82
	30 / 22	51,4	34,0	9,7	5,30	54,9	34,8	11,0	4,99	55,2	34,4	11,6	4,76	56,9	38,7	12,4	4,59	54,5	40,5	13,6	4,01	54,6	42,3	14,2	3,85
7000 m³/h	22 / 16	53,0	36,0	9,6	5,52	56,8	36,7	10,9	5,21	56,2	35,5	11,5	4,89	58,1	39,4	12,4	4,69	55,8	42,1	13,5	4,13	54,9	43,9	14,2	3,87
	24 / 17	52,7	36,0	9,6	5,49	56,4	36,7	10,9	5,17	56,2	35,6	11,6	4,84	58,4	39,7	12,4	4,71	55,6	42,3	13,5	4,12	54,9	44,2	14,2	3,87
	26 / 18	52,5	35,9	9,7	5,41	56,1	36,7	10,9	5,15	56,1	35,8	11,6	4,84	58,8	40,1	12,5	4,70	55,5	42,4	13,6	4,08	55,0	44,4	14,2	3,87
	27 / 19	52,5	35,6	9,7	5,41	56,0	36,4	11,0	5,09	56,1	35,6	11,6	4,84	58,8	39,9	12,5	4,70	55,5	42,3	13,6	4,08	55,1	44,3	14,2	3,88
	28 / 20	52,4	35,4	9,7	5,40	56,0	36,2	11,0	5,09	56,2	35,4	11,7	4,80	58,7	39,7	12,5	4,70	55,5	42,1	13,6	4,08	55,2	44,2	14,2	3,89
	30 / 22	52,3	34,8	9,7	5,39	55,8	35,6	11,0	5,07	56,2	35,1	11,7	4,80	58,5	39,1	12,6	4,64	55,6	41,7	13,6	4,09	55,5	43,9	14,2	3,91

Cooling performance with 80% of outdoor and exhaust air

AIRFLOW	Ta (°C) DB	OUTDOOR AIR TEMPERATURE °C D.B/W.B.																		
		-5 / -6			0 / -1			2 /1			7 / 6			12 / 11			15 / 13		
		kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
4000 m³/h	10	43,1	8,8	4,90	46,2	10,5	4,40	48,1	11,4	4,22	52,0	13,6	3,82	55,4	16,9	3,28	63,2	19,8	3,19
	15	43,2	9,1	4,75	46,6	10,8	4,31	48,5	11,7	4,15	52,3	13,8	3,79	56,9	17,6	3,23	65,0	20,5	3,17
	18	43,3	9,2	4,71	46,8	11,0	4,25	48,8	11,9	4,10	52,4	14,0	3,74	57,9	18,0	3,22	65,2	21,1	3,09
	20	43,3	9,3	4,66	46,9	11,1	4,23	48,9	12,0	4,08	52,5	14,1	3,72	58,5	18,2	3,21	65,2	21,4	3,05
	22	43,3	9,4	4,61	47,0	11,3	4,16	49,1	12,1	4,06	52,6	14,3	3,68	59,0	18,5	3,19	65,2	21,8	2,99
	25	43,4	9,6	4,52	47,2	11,5	4,10	49,4	12,3	4,02	52,9	14,5	3,65	59,9	18,9	3,17	65,2	22,3	2,92
6500 m³/h	10	43,3	6,9	6,28	46,8	8,0	5,85	49,0	8,7	5,63	54,1	10,3	5,25	58,1	11,9	4,88	65,3	12,9	5,06
	15	43,4	7,1	6,11	47,2	8,2	5,76	49,6	9,0	5,51	54,5	10,6	5,14	59,8	12,3	4,86	66,9	13,2	5,07
	18	43,4	7,2	6,03	47,4	8,4	5,64	49,9	9,1	5,48	54,7	10,7	5,11	60,7	12,5	4,86	67,0	13,4	5,00
	20	43,5	7,3	5,96	47,6	8,5	5,60	50,1	9,2	5,45	54,8	10,8	5,07	61,4	12,7	4,83	67,0	13,5	4,96
	22	43,5	7,4	5,88	47,7	8,6	5,55	50,3	9,3	5,41	55,0	10,9	5,05	62,0	12,8	4,84	67,0	13,7	4,89
	25	43,5	7,5	5,80	48,0	8,7	5,52	50,6	9,5	5,33	55,3	11,1	4,98	62,9	13,1	4,80	66,9	13,9	4,81
7000 m³/h	10	43,3	6,7	6,46	46,9	7,6	6,17	49,2	8,3	5,93	54,2	9,9	5,47	58,4	11,5	5,08	65,6	12,4	5,29
	15	43,4	6,9	6,29	47,4	7,8	6,08	49,7	8,5	5,85	54,6	10,2	5,35	60,0	11,9	5,04	67,2	12,7	5,29
	18	43,5	7,0	6,21	47,6	7,9	6,03	50,0	8,6	5,81	54,8	10,3	5,32	61,0	12,1	5,04	67,4	12,9	5,22
	20	43,5	7,1	6,13	47,8	8,0	5,98	50,2	8,7	5,77	54,9	10,4	5,28	61,6	12,2	5,05	67,4	13,0	5,18
	22	43,5	7,2	6,04	47,9	8,1	5,91	50,4	8,8	5,73	55,1	10,5	5,25	62,3	12,4	5,02	67,3	13,1	5,14
	25	43,6	7,3	5,97	48,1	8,2	5,87	50,7	8,9	5,70	55,4	10,7	5,18	63,2	12,6	5,02	67,3	13,3	5,06

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 16.4 Configurazione CCKP

Prestazioni in raffreddamento con 80% di aria esterna ed espulsa

AIRFLOW	Ta °C DB/ WB	OUTDOOR AIR TEMPERATURE °C D.B/W.B.																							
		25 / 18				30 / 22				32 / 23.5				35 / 24				38 / 24.5				40 / 25			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
7000 m³/h	22 / 16	66,1	44,2	12,1	5,5	71,4	44,7	13,6	5,3	70,6	43,4	14,4	4,9	71,9	48,6	15,4	4,7	70,0	50,5	16,7	4,2	69,7	51,8	17,5	4,0
	24 / 17	65,7	44,1	12,1	5,4	71,0	44,7	13,7	5,2	70,4	43,6	14,5	4,9	72,2	49,1	15,4	4,7	69,9	50,6	16,7	4,2	69,8	52,0	17,5	4,0
	26 / 18	65,4	44,0	12,2	5,4	70,5	44,7	13,7	5,1	70,3	43,8	14,5	4,8	72,5	49,6	15,4	4,7	69,8	50,7	16,7	4,2	69,9	52,3	17,5	4,0
	27 / 19	65,4	43,7	12,2	5,4	70,4	44,4	13,7	5,1	70,3	43,6	14,5	4,8	72,6	49,4	15,4	4,7	69,9	50,5	16,8	4,2	70,1	52,1	17,5	4,0
	28 / 20	65,3	43,4	12,2	5,4	70,3	44,0	13,8	5,1	70,4	43,4	14,5	4,9	72,5	49,0	15,4	4,7	70,0	50,2	16,8	4,2	70,3	51,9	17,5	4,0
	30 / 22	65,2	42,7	12,3	5,3	70,2	43,4	13,8	5,1	70,5	43,0	14,6	4,8	72,4	48,3	15,5	4,7	70,2	49,6	16,8	4,2	70,7	51,5	17,5	4,0
8000 m³/h	22 / 16	67,8	46,4	12,1	5,6	73,0	47,0	13,7	5,3	72,5	45,3	14,5	5,0	74,6	50,5	15,4	4,8	72,1	53,1	16,7	4,3	71,4	53,9	17,5	4,1
	24 / 17	67,4	46,4	12,2	5,5	72,6	47,0	13,7	5,3	72,4	45,5	14,5	5,0	74,9	51,0	15,5	4,8	72,0	53,1	16,8	4,3	71,5	54,0	17,5	4,1
	26 / 18	67,1	46,3	12,2	5,5	72,2	46,9	13,8	5,2	72,3	45,7	14,6	5,0	75,3	51,6	15,5	4,9	71,8	53,1	16,8	4,3	71,6	54,1	17,6	4,1
	27 / 19	67,1	46,0	12,2	5,5	72,1	46,6	13,8	5,2	72,3	45,5	14,6	5,0	75,4	51,4	15,5	4,9	71,9	52,8	16,8	4,3	71,8	53,9	17,6	4,1
	28 / 20	67,0	45,6	12,2	5,5	72,0	46,3	13,8	5,2	72,4	45,3	14,6	5,0	75,2	51,0	15,5	4,9	72,0	52,5	16,9	4,3	72,0	53,6	17,6	4,1
	30 / 22	66,9	44,8	12,3	5,4	71,8	45,5	13,9	5,2	72,5	44,8	14,7	4,9	75,0	50,3	15,6	4,8	72,2	51,8	16,9	4,3	72,4	53,0	17,6	4,1
12500 m³/h	22 / 16	73,9	53,2	12,3	6,0	80,0	53,0	13,9	5,8	78,9	51,5	14,7	5,4	81,5	59,0	15,7	5,2	79,3	63,1	17,0	4,7	78,2	65,5	17,7	4,4
	24 / 17	73,5	53,3	12,3	6,0	79,5	53,2	14,0	5,7	78,8	51,9	14,7	5,4	82,0	59,7	15,7	5,2	79,1	63,3	17,0	4,7	78,2	66,0	17,7	4,4
	26 / 18	73,2	53,4	12,4	5,9	79,1	53,3	14,0	5,7	78,7	52,3	14,8	5,3	82,5	60,4	15,7	5,3	78,9	63,6	17,1	4,6	78,2	66,4	17,8	4,4
	27 / 19	73,1	52,9	12,4	5,9	78,9	52,9	14,0	5,6	78,7	52,1	14,8	5,3	82,6	60,1	15,7	5,3	78,9	63,3	17,1	4,6	78,3	66,3	17,8	4,4
	28 / 20	73,0	52,5	12,4	5,9	78,8	52,5	14,1	5,6	78,7	51,8	14,8	5,3	82,4	59,7	15,8	5,2	78,8	63,1	17,1	4,6	78,4	66,2	17,8	4,4
	30 / 22	72,8	51,5	12,5	5,8	78,4	51,7	14,1	5,6	78,7	51,2	14,9	5,3	82,0	58,8	15,8	5,2	78,9	62,5	17,1	4,6	78,6	65,8	17,8	4,4

Cooling performance with 80% of outdoor and exhaust air

AIRFLOW	Ta (°C) DB	OUTDOOR AIR TEMPERATURE °C D.B/W.B.																		
		-5 / -6			0 / -1			2 /1			7 / 6			12 / 11			15 / 13		
		kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
7000 m³/h	10	57,1	9,4	6,07	61,3	10,9	5,62	64,0	11,8	5,42	69,7	13,8	5,05	74,2	15,7	4,73	83,0	16,9	4,91
	15	57,3	9,7	5,91	61,8	11,2	5,52	64,7	12,1	5,35	70,2	14,2	4,94	76,3	16,2	4,71	85,0	17,2	4,94
	18	57,3	9,9	5,79	62,1	11,4	5,45	65,1	12,3	5,29	70,5	14,3	4,93	77,6	16,5	4,70	85,2	17,5	4,87
	20	57,4	10,0	5,74	62,3	11,5	5,42	65,3	12,5	5,22	70,6	14,5	4,87	78,4	16,7	4,69	85,1	17,6	4,84
	22	57,4	10,1	5,68	62,5	11,7	5,34	65,6	12,6	5,21	70,8	14,6	4,85	79,2	16,9	4,69	85,1	17,8	4,78
	25	57,5	10,3	5,58	62,8	11,9	5,28	65,9	12,8	5,15	71,2	14,8	4,81	80,4	17,2	4,67	85,1	18,0	4,73
8000 m³/h	10	57,4	8,8	6,52	61,7	10,3	5,99	64,4	11,1	5,80	70,5	13,0	5,42	75,2	14,8	5,08	84,8	15,9	5,33
	15	57,5	9,1	6,32	62,2	10,6	5,87	65,1	11,5	5,66	71,0	13,4	5,30	77,4	15,2	5,09	87,0	16,2	5,37
	18	57,6	9,3	6,19	62,5	10,8	5,79	65,5	11,6	5,65	71,3	13,5	5,28	78,6	15,5	5,07	87,0	16,4	5,30
	20	57,6	9,4	6,13	62,7	10,9	5,75	65,7	11,8	5,57	71,5	13,7	5,22	79,5	15,7	5,06	86,9	16,5	5,27
	22	57,6	9,5	6,06	62,9	11,0	5,72	66,0	11,9	5,55	71,7	13,8	5,20	80,3	15,9	5,05	86,8	16,7	5,20
	25	57,7	9,7	5,95	63,2	11,2	5,64	66,4	12,1	5,49	72,1	14,0	5,15	81,5	16,1	5,06	86,6	16,9	5,12
12500 m³/h	10	57,9	7,3	7,93	62,1	8,6	7,22	64,9	9,3	6,98	71,2	10,9	6,53	76,9	12,4	6,20	87,7	13,4	6,54
	15	57,9	7,6	7,62	62,6	8,9	7,03	65,5	9,6	6,82	71,7	11,2	6,40	79,3	12,8	6,20	90,1	13,7	6,58
	18	58,0	7,8	7,44	62,9	9,1	6,91	65,9	9,8	6,72	72,0	11,4	6,32	80,6	13,1	6,15	90,3	13,8	6,54
	20	58,0	7,9	7,34	63,1	9,2	6,86	66,2	9,9	6,69	72,2	11,5	6,28	81,5	13,2	6,17	90,3	13,9	6,50
	22	58,0	8,0	7,25	63,3	9,3	6,81	66,5	10,1	6,58	72,4	11,6	6,24	82,4	13,4	6,15	90,3	14,1	6,40
	25	58,1	8,1	7,17	63,6	9,5	6,69	66,9	10,2	6,56	72,9	11,8	6,18	83,8	13,6	6,16	90,3	14,2	6,36

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 20.4 Configurazione CCKP

Cooling performance with 80% of outdoor and exhaust air

AIRFLOW	Ta °C DB/ WB	OUTDOOR AIR TEMPERATURE °C D.B/W.B.																							
		25 / 18				30 / 22				32 / 23.5				35 / 24				38 / 24.5				40 / 25			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
7000 m³/h	22 / 16	78,3	44,8	14,7	5,3	82,9	46,2	16,7	5,0	81,3	45,4	17,8	4,6	82,4	50,3	19,0	4,3	78,9	52,9	20,7	3,8	77,3	54,9	21,6	3,6
	24 / 17	77,9	44,7	14,7	5,3	82,4	46,2	16,8	4,9	81,2	45,5	17,8	4,6	82,8	50,7	19,0	4,4	78,6	53,0	20,7	3,8	77,3	55,1	21,7	3,6
	26 / 18	77,6	44,6	14,8	5,2	82,0	46,1	16,9	4,9	81,0	45,6	17,9	4,5	83,3	51,1	19,1	4,4	78,4	53,1	20,8	3,8	77,4	55,4	21,7	3,6
	27 / 19	77,5	44,3	14,8	5,2	81,9	45,8	16,9	4,8	81,1	45,5	17,9	4,5	83,3	51,0	19,1	4,4	78,5	52,9	20,8	3,8	77,5	55,2	21,7	3,6
	28 / 20	77,4	43,9	14,9	5,2	81,7	45,5	16,9	4,8	81,1	45,3	18,0	4,5	83,2	50,7	19,2	4,3	78,5	52,7	20,9	3,8	77,7	55,1	21,7	3,6
	30 / 22	77,3	43,3	15,0	5,2	81,5	44,9	17,0	4,8	81,2	44,9	18,0	4,5	82,8	50,0	19,3	4,3	78,6	52,2	20,9	3,8	78,0	54,8	21,8	3,6
9000 m³/h	22 / 16	82,2	49,7	14,9	5,5	86,8	51,3	17,0	5,1	85,2	50,2	18,0	4,7	86,6	56,3	19,3	4,5	83,7	59,2	21,0	4,0	82,6	61,5	22,0	3,8
	24 / 17	81,8	49,7	15,0	5,5	86,3	51,3	17,0	5,1	85,0	50,4	18,1	4,7	87,1	56,8	19,3	4,5	83,5	59,4	21,1	4,0	82,6	61,8	22,1	3,7
	26 / 18	81,4	49,6	15,0	5,4	85,8	51,2	17,1	5,0	84,9	50,6	18,2	4,7	87,5	57,4	19,3	4,5	83,3	59,6	21,2	3,9	82,7	62,2	22,1	3,7
	27 / 19	81,3	49,2	15,1	5,4	85,7	50,9	17,2	5,0	84,9	50,4	18,2	4,7	87,6	57,1	19,4	4,5	83,4	59,3	21,2	3,9	82,9	62,0	22,1	3,8
	28 / 20	81,3	48,9	15,1	5,4	85,5	50,6	17,2	5,0	84,9	50,2	18,2	4,7	87,4	56,8	19,4	4,5	83,5	59,1	21,2	3,9	83,1	61,8	22,2	3,7
	30 / 22	81,1	48,1	15,2	5,3	85,2	49,9	17,3	4,9	85,0	49,7	18,3	4,6	87,1	56,0	19,6	4,4	83,6	58,4	21,3	3,9	83,5	61,4	22,2	3,8
12500 m³/h	22 / 16	86,8	56,7	15,2	5,7	91,4	58,3	17,3	5,3	89,7	56,6	18,4	4,9	90,0	64,5	19,7	4,6	88,7	68,7	21,5	4,1	88,2	71,5	22,5	3,9
	24 / 17	86,4	56,7	15,2	5,7	91,0	58,4	17,3	5,3	89,5	57,0	18,4	4,9	90,3	65,2	19,8	4,6	88,5	68,9	21,5	4,1	88,2	72,0	22,5	3,9
	26 / 18	86,0	56,7	15,3	5,6	90,5	58,5	17,4	5,2	89,3	57,3	18,5	4,8	90,5	66,0	19,8	4,6	88,3	69,2	21,6	4,1	88,2	72,5	22,5	3,9
	27 / 19	85,9	56,3	15,4	5,6	90,3	58,1	17,5	5,2	89,3	57,1	18,6	4,8	90,6	65,8	19,8	4,6	88,4	68,9	21,6	4,1	88,4	72,3	22,6	3,9
	28 / 20	85,8	55,8	15,4	5,6	90,2	57,7	17,5	5,2	89,3	56,8	18,6	4,8	90,5	65,3	19,9	4,5	88,5	68,6	21,6	4,1	88,5	72,2	22,6	3,9
	30 / 22	85,5	54,9	15,5	5,5	89,8	56,8	17,6	5,1	89,2	56,2	18,7	4,8	90,3	64,4	20,0	4,5	88,6	68,0	21,7	4,1	88,9	71,8	22,6	3,9

Cooling performance with 80% of outdoor and exhaust air

AIRFLOW	Ta (°C) DB	OUTDOOR AIR TEMPERATURE °C D.B/W.B.																		
		-5 / -6			0 / -1			2 /1			7 / 6			12 / 11			15 / 13		
		kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
7000 m³/h	10	65,4	10,6	6,17	69,9	12,5	5,59	72,8	13,7	5,31	78,8	16,4	4,80	83,6	19,2	4,35	94,3	21,1	4,47
	15	65,5	10,9	6,01	70,5	12,9	5,47	73,5	14,1	5,21	79,3	16,9	4,69	86,0	19,8	4,34	96,7	21,7	4,46
	18	65,5	11,1	5,90	70,8	13,2	5,36	73,9	14,4	5,13	79,6	17,1	4,65	87,4	20,2	4,33	97,0	22,1	4,39
	20	65,6	11,2	5,86	71,1	13,3	5,35	74,2	14,6	5,08	79,8	17,3	4,61	88,3	20,5	4,31	97,0	22,3	4,35
	22	65,6	11,4	5,75	71,3	13,5	5,28	74,5	14,7	5,07	80,0	17,4	4,60	89,2	20,7	4,31	97,1	22,6	4,30
	25	65,7	11,6	5,66	71,6	13,7	5,23	74,9	15,0	4,99	80,4	17,7	4,54	90,6	21,1	4,29	97,2	23,0	4,23
9000 m³/h	10	65,7	9,2	7,14	70,4	10,9	6,46	73,4	11,9	6,17	80,0	14,2	5,63	85,6	16,4	5,22	96,0	17,9	5,36
	15	65,8	9,5	6,93	71,0	11,2	6,34	74,1	12,2	6,07	80,5	14,6	5,51	88,1	17,0	5,18	98,5	18,3	5,38
	18	65,8	9,7	6,78	71,4	11,5	6,21	74,6	12,5	5,97	80,9	14,8	5,47	89,6	17,3	5,18	98,7	18,6	5,31
	20	65,8	9,9	6,65	71,6	11,6	6,17	74,9	12,6	5,94	81,1	15,0	5,41	90,6	17,5	5,18	98,7	18,8	5,25
	22	65,9	10,0	6,59	71,8	11,8	6,08	75,2	12,8	5,88	81,3	15,1	5,38	91,6	17,8	5,15	98,7	18,9	5,22
	25	66,0	10,2	6,47	72,2	12,0	6,02	75,6	13,0	5,82	81,8	15,4	5,31	93,0	18,1	5,14	98,6	19,2	5,14
12500 m³/h	10	66,5	7,9	8,42	70,8	9,4	7,53	74,1	10,2	7,26	81,1	12,1	6,70	86,8	14,0	6,20	99,4	15,2	6,54
	15	66,5	8,3	8,01	71,5	9,7	7,37	74,9	10,5	7,13	81,7	12,4	6,59	89,6	14,4	6,22	102,4	15,6	6,56
	18	66,5	8,4	7,92	71,9	9,9	7,26	75,4	10,7	7,05	82,1	12,6	6,52	91,2	14,7	6,20	102,7	15,8	6,50
	20	66,5	8,6	7,73	72,1	10,0	7,21	75,7	10,9	6,94	82,3	12,8	6,43	92,3	14,9	6,19	102,6	15,9	6,45
	22	66,5	8,7	7,64	72,4	10,2	7,10	76,0	11,0	6,91	82,6	12,9	6,40	93,3	15,1	6,18	102,6	16,1	6,37
	25	66,5	8,8	7,56	72,8	10,4	7,00	76,5	11,2	6,83	83,1	13,1	6,34	94,9	15,4	6,16	102,6	16,3	6,29

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 24.4 Configurazione CCKP

Cooling performance with 80% of outdoor and exhaust air

AIRFLOW	Ta °C DB/ WB	OUTDOOR AIR TEMPERATURE °C D.B/W.B.																							
		25 / 18				30 / 22				32 / 23.5				35 / 24				38 / 24.5				40 / 25			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
7000 m³/h	22 / 16	89,9	49,4	17,0	5,3	95,3	51,1	19,3	4,9	93,4	50,2	20,5	4,6	94,9	55,3	21,9	4,3	91,1	58,0	23,8	3,8	89,3	60,0	24,9	3,6
	24 / 17	89,5	49,3	17,1	5,2	94,7	51,0	19,4	4,9	93,2	50,3	20,6	4,5	95,4	55,7	22,0	4,3	90,9	58,1	23,9	3,8	89,4	60,2	24,9	3,6
	26 / 18	89,1	49,1	17,2	5,2	94,2	50,9	19,5	4,8	93,1	50,4	20,6	4,5	95,9	56,1	22,0	4,4	90,7	58,1	23,9	3,8	89,4	60,4	25,0	3,6
	27 / 19	89,0	48,8	17,2	5,2	94,0	50,6	19,5	4,8	93,1	50,2	20,7	4,5	96,0	55,9	22,1	4,3	90,7	57,9	24,0	3,8	89,6	60,3	25,0	3,6
	28 / 20	88,9	48,5	17,3	5,1	93,9	50,3	19,6	4,8	93,1	50,0	20,7	4,5	95,8	55,6	22,1	4,3	90,8	57,7	24,0	3,8	89,7	60,1	25,0	3,6
	30 / 22	88,7	47,8	17,4	5,1	93,6	49,6	19,7	4,8	93,2	49,6	20,8	4,5	95,5	54,9	22,2	4,3	90,8	57,2	24,1	3,8	90,1	59,8	25,1	3,6
12000 m³/h	22 / 16	99,5	61,9	17,5	5,7	104,5	63,7	20,0	5,2	102,6	62,2	21,2	4,8	105,4	70,0	22,7	4,6	102,3	74,4	24,7	4,1	101,1	77,4	25,9	3,9
	24 / 17	99,0	61,8	17,6	5,6	104,0	63,7	20,1	5,2	102,6	62,5	21,3	4,8	106,1	70,8	22,7	4,7	102,1	74,6	24,7	4,1	101,2	77,9	25,9	3,9
	26 / 18	98,6	61,8	17,7	5,6	103,5	63,7	20,2	5,1	102,5	62,7	21,3	4,8	106,7	71,4	22,8	4,7	101,9	74,9	24,8	4,1	101,3	78,4	26,0	3,9
	27 / 19	98,4	61,3	17,8	5,5	103,3	63,3	20,2	5,1	102,5	62,5	21,4	4,8	106,7	71,2	22,8	4,7	101,9	74,5	24,9	4,1	101,5	78,2	26,0	3,9
	28 / 20	98,3	60,8	17,8	5,5	103,1	62,8	20,3	5,1	102,6	62,2	21,4	4,8	106,5	70,7	22,9	4,7	102,0	74,2	24,9	4,1	101,7	77,9	26,0	3,9
	30 / 22	98,0	59,8	17,9	5,5	102,6	61,9	20,4	5,0	102,6	61,5	21,5	4,8	106,1	69,7	23,0	4,6	102,1	73,5	25,0	4,1	102,2	77,4	26,1	3,9
12500 m³/h	22 / 16	100,1	62,9	17,6	5,7	105,3	64,7	20,0	5,3	103,7	62,9	21,2	4,9	106,2	71,3	22,7	4,7	102,7	76,1	24,7	4,2	101,4	79,2	25,9	3,9
	24 / 17	99,6	62,8	17,7	5,6	104,8	64,7	20,1	5,2	103,5	63,3	21,3	4,9	106,8	72,1	22,7	4,7	102,5	76,3	24,8	4,1	101,5	79,6	25,9	3,9
	26 / 18	99,1	62,8	17,8	5,6	104,3	64,7	20,2	5,2	103,4	63,6	21,4	4,8	107,4	72,8	22,8	4,7	102,3	76,5	24,8	4,1	101,5	80,1	26,0	3,9
	27 / 19	99,0	62,3	17,9	5,5	104,1	64,2	20,2	5,2	103,4	63,3	21,4	4,8	107,5	72,5	22,8	4,7	102,4	76,2	24,9	4,1	101,7	79,9	26,0	3,9
	28 / 20	98,8	61,8	17,9	5,5	103,9	63,8	20,3	5,1	103,5	63,0	21,5	4,8	107,3	72,1	22,9	4,7	102,4	75,8	24,9	4,1	101,9	79,7	26,1	3,9
	30 / 22	98,5	60,8	18,0	5,5	103,5	62,8	20,4	5,1	103,5	62,4	21,6	4,8	106,8	71,0	23,0	4,6	102,5	75,0	25,0	4,1	102,4	79,2	26,1	3,9

Cooling performance with 80% of outdoor and exhaust air

AIRFLOW	Ta (°C) DB	OUTDOOR AIR TEMPERATURE °C D.B/W.B.																		
		-5 / -6			0 / -1			2 /1			7 / 6			12 / 11			15 / 13		
		kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
7000 m³/h	10	78,1	13,8	5,66	83,7	16,6	5,04	87,0	18,1	4,81	93,9	22,0	4,27	99,8	26,3	3,79	116,2	30,0	3,87
	15	78,3	14,2	5,51	84,4	17,1	4,94	87,8	18,7	4,70	94,4	22,5	4,20	103,1	27,3	3,78	120,3	30,9	3,89
	18	78,4	14,5	5,41	84,7	17,4	4,87	88,3	19,0	4,65	94,7	22,8	4,15	105,1	27,9	3,77	120,4	31,4	3,83
	20	78,4	14,6	5,37	85,0	17,6	4,83	88,6	19,2	4,61	94,9	23,0	4,13	106,4	28,3	3,76	120,1	31,7	3,79
	22	78,5	14,8	5,30	85,2	17,8	4,79	88,9	19,4	4,58	95,1	23,3	4,08	107,6	28,7	3,75	119,9	32,1	3,74
	25	78,5	15,1	5,20	85,6	18,1	4,73	89,4	19,7	4,54	95,6	23,7	4,03	109,5	29,3	3,74	119,5	32,5	3,68
12000 m³/h	10	80,0	10,4	7,69	85,5	12,4	6,90	89,2	13,5	6,61	97,9	16,1	6,08	105,4	18,7	5,64	119,5	20,4	5,86
	15	80,0	10,8	7,41	86,2	12,8	6,73	90,1	13,9	6,48	98,5	16,5	5,97	108,5	19,3	5,62	122,6	20,8	5,89
	18	80,0	11,0	7,27	86,6	13,0	6,66	90,7	14,2	6,39	99,0	16,8	5,89	110,3	19,7	5,60	122,8	21,1	5,82
	20	80,0	11,1	7,21	86,8	13,2	6,58	91,0	14,3	6,36	99,2	17,0	5,84	111,5	19,9	5,60	122,8	21,3	5,77
	22	80,0	11,3	7,08	87,1	13,3	6,55	91,4	14,5	6,30	99,5	17,1	5,82	112,7	20,1	5,61	122,7	21,5	5,71
	25	80,1	11,5	6,97	87,5	13,6	6,43	91,9	14,7	6,25	100,1	17,4	5,75	114,4	20,5	5,58	122,6	21,8	5,62
12500 m³/h	10	80,2	10,2	7,86	85,5	12,2	7,01	89,2	13,3	6,71	98,1	15,8	6,21	106,0	18,4	5,76	119,6	20,0	5,98
	15	80,2	10,6	7,57	86,2	12,6	6,84	90,2	13,7	6,58	98,8	16,2	6,10	109,0	19,0	5,74	122,7	20,5	5,99
	18	80,2	10,8	7,43	86,6	12,8	6,77	90,7	13,9	6,53	99,3	16,5	6,02	110,8	19,4	5,71	123,0	20,7	5,94
	20	80,2	10,9	7,36	86,9	13,0	6,68	91,1	14,1	6,46	99,5	16,6	5,99	111,9	19,6	5,71	123,0	20,9	5,89
	22	80,2	11,1	7,23	87,1	13,1	6,65	91,4	14,2	6,44	99,8	16,8	5,94	113,1	19,9	5,68	122,9	21,1	5,82
	25	80,3	11,3	7,11	87,5	13,4	6,53	92,0	14,5	6,34	100,4	17,1	5,87	114,8	20,2	5,68	122,9	21,4	5,74

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 33.4 Configurazione CCKP

Cooling performance with 80% of outdoor and exhaust air

AIRFLOW	Ta °C DB/ WB	OUTDOOR AIR TEMPERATURE °C D.B/W.B.																							
		25 / 18				30 / 22				32 / 23.5				35 / 24				38 / 24.5				40 / 25			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
12500 m³/h	22 / 16	120,6	80,5	21,5	5,6	129,5	81,3	24,3	5,3	127,7	78,9	25,8	4,9	129,5	87,9	27,5	4,7	124,6	91,7	30,1	4,1	122,8	94,6	31,6	3,9
	24 / 17	119,9	80,4	21,6	5,6	128,7	81,3	24,4	5,3	127,5	79,3	25,9	4,9	130,1	88,7	27,5	4,7	124,3	92,0	30,1	4,1	122,8	95,2	31,6	3,9
	26 / 18	119,3	80,3	21,7	5,5	128,0	81,2	24,5	5,2	127,2	79,6	26,0	4,9	130,8	89,5	27,6	4,7	123,9	92,3	30,2	4,1	122,8	95,8	31,6	3,9
	27 / 19	119,2	79,7	21,8	5,5	127,8	80,7	24,6	5,2	127,3	79,2	26,0	4,9	130,9	89,1	27,7	4,7	124,0	91,9	30,2	4,1	123,1	95,6	31,6	3,9
	28 / 20	119,2	79,1	21,8	5,5	127,6	80,1	24,7	5,2	127,4	78,9	26,1	4,9	130,7	88,5	27,7	4,7	124,1	91,5	30,3	4,1	123,4	95,4	31,7	3,9
	30 / 22	119,1	77,9	22,0	5,4	127,4	78,9	24,8	5,1	127,6	78,1	26,2	4,9	130,3	87,3	27,9	4,7	124,4	90,7	30,4	4,1	124,0	94,8	31,7	3,9
14000 m³/h	22 / 16	123,8	83,6	21,7	5,7	132,2	84,9	24,5	5,4	130,2	82,5	26,0	5,0	132,7	91,6	27,8	4,8	127,7	96,3	30,2	4,2	125,5	99,6	31,7	4,0
	24 / 17	123,1	83,6	21,8	5,6	131,4	85,0	24,6	5,3	130,0	82,9	26,1	5,0	133,5	92,3	27,8	4,8	127,3	96,7	30,3	4,2	125,5	100,2	31,8	3,9
	26 / 18	122,4	83,5	21,9	5,6	130,6	85,0	24,7	5,3	129,8	83,2	26,1	5,0	134,3	93,0	27,9	4,8	126,9	97,0	30,4	4,2	125,6	100,9	31,8	3,9
	27 / 19	122,3	82,9	22,0	5,6	130,4	84,4	24,8	5,3	129,9	82,8	26,2	5,0	134,4	92,7	27,9	4,8	127,0	96,7	30,4	4,2	125,9	100,7	31,9	3,9
	28 / 20	122,2	82,3	22,0	5,6	130,3	83,8	24,8	5,3	130,0	82,4	26,3	4,9	134,1	92,1	28,0	4,8	127,1	96,3	30,5	4,2	126,2	100,5	31,9	4,0
	30 / 22	122,1	80,9	22,1	5,5	130,0	82,5	25,0	5,2	130,2	81,5	26,4	4,9	133,6	90,9	28,2	4,7	127,3	95,4	30,6	4,2	126,9	99,9	32	4,0
20000 m³/h	22 / 16	132,6	94,6	22,1	6,0	142,0	95,2	25,0	5,7	139,7	92,3	26,5	5,3	142,1	105,4	28,3	5,0	136,5	113,1	30,9	4,4	135,4	116,0	32,5	4,2
	24 / 17	132,0	94,6	22,2	5,9	141,1	95,4	25,1	5,6	139,4	93,0	26,6	5,2	142,8	106,8	28,4	5,0	136,3	113,3	31,0	4,4	135,7	116,5	32,5	4,2
	26 / 18	131,4	94,6	22,4	5,9	140,3	95,7	25,2	5,6	139,2	93,7	26,7	5,2	143,4	108,1	28,4	5,0	136,1	113,5	31,1	4,4	135,9	117,0	32,6	4,2
	27 / 19	131,3	93,8	22,4	5,9	140,1	95,0	25,3	5,5	139,2	93,3	26,8	5,2	143,5	107,7	28,5	5,0	136,2	113,1	31,1	4,4	136,2	116,8	32,6	4,2
	28 / 20	131,2	93,0	22,5	5,8	139,8	94,3	25,4	5,5	139,3	92,8	26,8	5,2	143,2	107,0	28,5	5,0	136,2	112,6	31,2	4,4	136,5	116,5	32,7	4,2
	30 / 22	131,1	91,2	22,6	5,8	139,4	92,9	25,5	5,5	139,4	91,8	26,9	5,2	142,6	105,5	28,7	5,0	136,5	111,6	31,3	4,4	137,2	115,8	32,8	4,2

Cooling performance with 80% of outdoor and exhaust air

AIRFLOW	Ta (°C) DB	OUTDOOR AIR TEMPERATURE °C D.B/W.B.																		
		-5 / -6			0 / -1			2 /1			7 / 6			12 / 11			15 / 13		
		kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
12500 m³/h	10	97,4	14,4	6,76	103,4	16,3	6,34	108,2	17,5	6,18	119,0	20,4	5,83	128,3	23,4	5,48	143,8	25,1	5,73
	15	97,5	14,8	6,59	104,3	16,7	6,25	109,3	18,0	6,07	119,8	20,9	5,73	131,9	24,1	5,47	147,5	25,7	5,74
	18	97,5	15,0	6,50	104,8	17,0	6,16	110,0	18,3	6,01	120,3	21,2	5,67	134,1	24,5	5,47	147,8	26,0	5,68
	20	97,6	15,2	6,42	105,1	17,2	6,11	110,4	18,5	5,97	120,6	21,4	5,64	135,5	24,8	5,46	147,7	26,2	5,64
	22	97,6	15,4	6,34	105,4	17,4	6,06	110,8	18,6	5,96	120,9	21,5	5,62	136,9	25,1	5,45	147,6	26,4	5,59
	25	97,7	15,6	6,26	105,9	17,6	6,02	111,4	18,9	5,89	121,6	21,9	5,55	138,9	25,5	5,45	147,4	26,7	5,52
14000 m³/h	10	97,7	13,9	7,03	103,8	15,8	6,57	108,6	17,0	6,39	119,5	19,7	6,07	129,0	22,5	5,73	145,4	24,2	6,01
	15	97,7	14,3	6,83	104,7	16,2	6,46	109,8	17,4	6,31	120,3	20,2	5,96	132,8	23,2	5,72	149,3	24,7	6,04
	18	97,7	14,6	6,69	105,2	16,5	6,38	110,4	17,7	6,24	120,8	20,5	5,89	135,0	23,6	5,72	149,5	25,0	5,98
	20	97,7	14,7	6,65	105,5	16,7	6,32	110,9	17,9	6,20	121,1	20,6	5,88	136,5	23,9	5,71	149,3	25,2	5,92
	22	97,8	14,9	6,56	105,9	16,8	6,30	111,3	18,1	6,15	121,4	20,8	5,84	137,9	24,2	5,70	149,1	25,4	5,87
	25	97,8	15,1	6,48	106,3	17,1	6,22	112,0	18,3	6,12	122,2	21,1	5,79	140,1	24,5	5,72	148,8	25,7	5,79
20000 m³/h	10	99,0	12,4	7,98	104,9	14,1	7,44	109,8	15,1	7,27	120,9	17,4	6,95	131,4	19,7	6,67	148,9	21,1	7,06
	15	99,0	12,8	7,73	105,7	14,5	7,29	110,8	15,5	7,15	121,7	17,9	6,80	135,4	20,3	6,67	153,0	21,6	7,08
	18	99,0	13,0	7,62	106,2	14,8	7,18	111,5	15,8	7,06	122,1	18,1	6,75	137,7	20,7	6,65	153,3	21,9	7,00
	20	99,0	13,2	7,50	106,5	14,9	7,15	111,9	16,0	6,99	122,4	18,3	6,69	139,3	20,9	6,67	153,3	22,0	6,97
	22	99,0	13,3	7,44	106,8	15,1	7,07	112,3	16,1	6,98	122,7	18,4	6,67	140,8	21,2	6,64	153,2	22,2	6,90
	25	99,0	13,5	7,33	107,2	15,3	7,01	112,9	16,4	6,88	123,5	18,7	6,60	143,1	21,5	6,66	153,1	22,5	6,80

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 40.4 Configurazione CCKP

Cooling performance with 80% of outdoor and exhaust air

AIRFLOW	Ta °C DB/ WB	OUTDOOR AIR TEMPERATURE °C D.B/W.B.																							
		25 / 18				30 / 22				32 / 23.5				35 / 24				38 / 24.5				40 / 25			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
12500 m³/h	22 / 16	139,5	91,6	26,8	5,2	149,1	92,5	30,3	4,9	146,8	89,5	32,2	4,6	148,2	99,3	34,3	4,3	143,3	102,8	37,8	3,8	141,5	105,5	39,9	3,5
	24 / 17	138,8	91,5	27,0	5,1	148,0	92,5	30,4	4,9	146,3	89,9	32,3	4,5	148,7	100,3	34,4	4,3	142,9	103,1	37,9	3,8	141,4	106,2	39,9	3,5
	26 / 18	138,0	91,3	27,1	5,1	147,1	92,4	30,6	4,8	145,9	90,2	32,4	4,5	149,2	101,3	34,5	4,3	142,5	103,3	38,0	3,8	141,4	106,8	40,0	3,5
	27 / 19	137,9	90,6	27,2	5,1	146,8	91,8	30,7	4,8	146,0	89,9	32,5	4,5	149,3	100,9	34,5	4,3	142,7	102,9	38,1	3,7	141,7	106,5	40,0	3,5
	28 / 20	137,7	90,0	27,2	5,1	146,6	91,2	30,7	4,8	146,0	89,5	32,5	4,5	149,1	100,2	34,6	4,3	142,8	102,4	38,1	3,7	142,0	106,2	40,1	3,5
	30 / 22	137,5	88,6	27,4	5,0	146,1	89,9	30,9	4,7	146,1	88,6	32,7	4,5	148,8	98,7	34,8	4,3	143,1	101,3	38,3	3,7	142,7	105,6	40,2	3,5
16000 m³/h	22 / 16	147,1	100,1	27,3	5,4	157,2	100,2	30,8	5,1	154,5	97,1	32,7	4,7	156,8	108,7	34,9	4,5	151,4	114,3	38,4	3,9	149,5	118,4	40,4	3,7
	24 / 17	146,3	100,0	27,4	5,3	156,3	100,3	30,9	5,1	154,2	97,6	32,8	4,7	157,5	109,8	35,0	4,5	151,1	114,7	38,5	3,9	149,6	119,3	40,5	3,7
	26 / 18	145,6	99,9	27,6	5,3	155,4	100,3	31,1	5,0	154,0	98,0	32,9	4,7	158,2	110,9	35,1	4,5	150,8	115,0	38,6	3,9	149,7	120,1	40,6	3,7
	27 / 19	145,5	99,1	27,6	5,3	155,1	99,6	31,2	5,0	154,0	97,6	33,0	4,7	158,3	110,4	35,2	4,5	150,9	114,5	38,7	3,9	150,0	119,8	40,6	3,7
	28 / 20	145,3	98,3	27,7	5,2	154,9	98,9	31,3	4,9	154,1	97,1	33,1	4,7	158,0	109,7	35,3	4,5	151,0	114,0	38,8	3,9	150,4	119,5	40,7	3,7
	30 / 22	145,1	96,6	27,9	5,2	154,5	97,3	31,4	4,9	154,2	96,1	33,2	4,6	157,5	108,0	35,5	4,4	151,4	112,8	39,0	3,9	-	-	-	-
20000 m³/h	22 / 16	154,0	107,6	27,7	5,6	164,3	107,5	31,2	5,3	161,0	104,2	33,2	4,8	164,9	117,1	35,6	4,6	159,5	125,1	39,0	4,1	157,7	129,6	41,0	3,8
	24 / 17	153,1	107,7	27,8	5,5	163,0	108,0	31,4	5,2	160,7	105,0	33,3	4,8	165,7	118,4	35,7	4,6	159,1	125,6	39,1	4,1	157,8	130,5	41,1	3,8
	26 / 18	152,4	107,6	28,0	5,4	161,9	108,3	31,5	5,1	160,3	105,7	33,4	4,8	166,6	119,7	35,8	4,7	158,7	126,0	39,2	4,0	158,0	131,3	41,2	3,8
	27 / 19	152,2	106,8	28,0	5,4	161,5	107,6	31,6	5,1	160,3	105,2	33,5	4,8	166,7	119,2	35,8	4,7	158,8	125,5	39,3	4,0	158,3	131,0	41,3	3,8
	28 / 20	152,1	105,8	28,1	5,4	161,2	106,8	31,7	5,1	160,4	104,7	33,6	4,8	166,3	118,4	35,9	4,6	158,9	125,0	39,4	4,0	158,6	130,7	41,3	3,8
	30 / 22	151,8	103,9	28,3	5,4	160,6	105,2	31,8	5,1	160,4	103,6	33,7	4,8	165,6	116,7	36,2	4,6	159,2	123,8	39,6	4,0	-	-	-	-

Cooling performance with 80% of outdoor and exhaust air

AIRFLOW	Ta (°C) DB	OUTDOOR AIR TEMPERATURE °C D.B/W.B.																		
		-5 / -6			0 / -1			2 /1			7 / 6			12 / 11			15 / 13		
		kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
12500 m³/h	10	119,7	18,9	6,33	127,9	21,3	6,00	133,4	22,9	5,83	145,6	26,9	5,41	155,6	30,9	5,04	174,0	33,1	5,26
	15	119,8	19,4	6,18	128,8	21,9	5,88	134,6	23,6	5,70	146,4	27,5	5,32	160,0	31,8	5,03	178,5	33,8	5,28
	18	119,8	19,7	6,08	129,4	22,2	5,83	135,4	23,9	5,67	146,9	27,8	5,28	162,5	32,4	5,02	178,7	34,3	5,21
	20	119,9	19,9	6,03	129,8	22,5	5,77	135,9	24,2	5,62	147,2	28,1	5,24	164,2	32,7	5,02	178,6	34,6	5,16
	22	119,9	20,1	5,97	130,1	22,7	5,73	136,4	24,4	5,59	147,6	28,3	5,22	165,9	33,1	5,01	178,4	34,9	5,11
	25	120,0	20,4	5,88	130,7	23,0	5,68	137,1	24,7	5,55	148,4	28,7	5,17	168,4	33,6	5,01	178,1	35,4	5,03
16000 m³/h	10	121,1	17,4	6,96	129,1	19,5	6,62	134,8	20,9	6,45	147,7	24,2	6,10	158,9	27,5	5,78	179,0	29,5	6,07
	15	121,1	17,9	6,77	130,0	20,0	6,50	136,1	21,5	6,33	148,7	24,7	6,02	163,5	28,3	5,78	183,7	30,1	6,10
	18	121,1	18,1	6,69	130,6	20,4	6,40	136,9	21,8	6,28	149,2	25,1	5,94	166,2	28,8	5,77	183,9	30,5	6,03
	20	121,1	18,3	6,62	131,0	20,6	6,36	137,4	22,0	6,25	149,5	25,3	5,91	167,9	29,1	5,77	183,8	30,7	5,99
	22	121,1	18,5	6,55	131,3	20,8	6,31	137,9	22,2	6,21	149,9	25,5	5,88	169,7	29,5	5,75	183,6	31,0	5,92
	25	121,2	18,8	6,45	131,9	21,1	6,25	138,6	22,6	6,13	150,7	25,9	5,82	172,2	29,9	5,76	183,4	31,4	5,84
20000 m³/h	10	122,2	16,2	7,54	130,2	18,2	7,15	136,0	19,5	6,97	149,2	22,4	6,66	161,4	25,4	6,35	181,9	27,2	6,69
	15	122,2	16,7	7,32	131,1	18,7	7,01	137,2	20,0	6,86	150,1	22,9	6,55	166,0	26,1	6,36	186,5	27,7	6,73
	18	122,2	17,0	7,19	131,6	19,0	6,93	137,9	20,3	6,79	150,6	23,2	6,49	168,7	26,6	6,34	186,9	28,1	6,65
	20	122,2	17,1	7,15	132,0	19,2	6,88	138,4	20,5	6,75	150,9	23,4	6,45	170,5	26,9	6,34	186,9	28,3	6,60
	22	122,2	17,3	7,06	132,3	19,4	6,82	138,8	20,7	6,71	151,3	23,6	6,41	172,3	27,2	6,33	186,9	28,5	6,56
	25	122,2	17,6	6,94	132,8	19,7	6,74	139,5	21,0	6,64	152,2	34,6	4,40	174,9	27,6	6,34	186,8	28,9	6,46

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 44.4 Configurazione CCKP

Cooling performance with 80% of outdoor and exhaust air

AIRFLOW	Ta °C DB/ WB	OUTDOOR AIR TEMPERATURE °C D.B/W.B.																							
		25 / 18				30 / 22				32 / 23.5				35 / 24				38 / 24.5				40 / 25			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
12500 m³/h	22 / 16	146,0	99,5	29,6	4,9	158,9	97,8	33,5	4,7	155,8	94,7	35,5	4,4	156,6	105,5	37,8	4,1	151,2	109,4	41,5	3,6	149,0	112,5	43,9	3,4
	24 / 17	145,3	99,2	29,7	4,9	157,7	97,8	33,6	4,7	155,2	95,2	35,7	4,3	157,2	106,6	37,9	4,1	150,8	109,7	41,6	3,6	149,0	113,1	44,0	3,4
	26 / 18	144,7	98,9	29,9	4,8	156,6	97,8	33,8	4,6	154,7	95,7	35,8	4,3	157,8	107,6	37,9	4,2	150,4	110,0	41,8	3,6	148,9	113,8	44,1	3,4
	27 / 19	144,6	98,1	30,0	4,8	156,2	97,2	33,9	4,6	154,6	95,3	35,8	4,3	157,9	107,2	38,0	4,2	150,5	109,5	41,9	3,6	149,2	113,5	44,2	3,4
	28 / 20	144,5	97,4	30,1	4,8	155,9	96,5	34,0	4,6	154,6	94,9	35,9	4,3	157,6	106,5	38,1	4,1	150,7	109,0	42,0	3,6	149,5	113,2	44,3	3,4
	30 / 22	144,3	95,8	30,2	4,8	155,4	95,2	34,2	4,5	154,6	94,1	36,1	4,3	157,2	104,9	38,3	4,1	150,9	107,8	42,1	3,6	150,1	112,5	44,4	3,4
18000 m³/h	22 / 16	159,6	111,1	30,6	5,2	170,2	110,4	34,5	4,9	167,5	106,3	36,6	4,6	171,9	117,9	39,2	4,4	166,0	126,1	43,0	3,9	163,1	131,5	45,1	3,6
	24 / 17	158,9	110,9	30,7	5,2	169,2	110,6	34,6	4,9	167,3	106,9	36,7	4,6	172,9	119,1	39,3	4,4	165,4	126,7	43,1	3,8	163,1	132,4	45,1	3,6
	26 / 18	158,2	110,7	30,9	5,1	168,2	110,6	34,8	4,8	167,0	107,4	36,9	4,5	173,8	120,3	39,4	4,4	164,9	127,3	43,2	3,8	163,0	133,2	45,2	3,6
	27 / 19	158,1	109,8	31,0	5,1	167,9	109,9	34,9	4,8	167,1	106,9	37,0	4,5	173,9	119,8	39,5	4,4	164,9	126,8	43,3	3,8	163,3	132,9	45,3	3,6
	28 / 20	158,0	108,8	31,1	5,1	167,7	109,0	35,0	4,8	167,2	106,3	37,0	4,5	173,5	119,0	39,7	4,4	165,0	126,2	43,4	3,8	163,6	132,6	45,3	3,6
	30 / 22	157,8	106,7	31,2	5,1	167,2	107,2	35,2	4,8	167,3	105,1	37,2	4,5	172,8	117,3	39,9	4,3	165,2	125,0	43,6	3,8	-	-	-	-
20000 m³/h	22 / 16	163,5	114,9	30,6	5,3	174,9	113,2	34,7	5,0	170,9	109,7	36,9	4,6	174,2	124,1	39,4	4,4	169,4	132,3	43,3	3,9	169,0	136,6	45,7	3,7
	24 / 17	162,6	114,9	30,8	5,3	173,6	113,5	34,9	5,0	170,5	110,5	37,0	4,6	175,1	125,5	39,4	4,4	169,1	132,7	43,4	3,9	169,3	137,4	45,7	3,7
	26 / 18	161,7	114,9	31,0	5,2	172,4	113,8	35,0	4,9	170,2	111,2	37,2	4,6	176,0	126,9	39,5	4,5	168,8	133,1	43,6	3,9	169,5	138,1	45,8	3,7
	27 / 19	161,5	113,9	31,1	5,2	172,0	113,0	35,2	4,9	170,2	110,7	37,3	4,6	176,1	126,4	39,6	4,4	169,0	132,5	43,7	3,9	169,9	137,8	45,9	3,7
	28 / 20	161,4	112,9	31,2	5,2	171,7	112,2	35,3	4,9	170,2	110,1	37,3	4,6	175,7	125,5	39,8	4,4	169,2	131,9	43,8	3,9	170,3	137,5	46,0	3,7
	30 / 22	161,1	110,7	31,3	5,1	171,0	110,4	35,5	4,8	170,2	108,8	37,5	4,5	174,9	123,7	40,0	4,4	169,5	130,6	44,0	3,9	-	-	-	-

Cooling performance with 80% of outdoor and exhaust air

AIRFLOW	Ta (°C) DB	OUTDOOR AIR TEMPERATURE °C D.B/W.B.																							
		-5 / -6				0 / -1				2 /1				7 / 6				12 / 11				15 / 13			
		kWt	kWe	COP		kWt	kWe	COP		kWt	kWe	COP		kWt	kWe	COP		kWt	kWe	COP		kWt	kWe	COP	
12500 m³/h	10	132,8	23,2	5,72		141,6	26,2	5,40		147,1	28,2	5,22		159,0	33,0	4,82		167,4	37,6	4,45		186,8	40,5	4,61	
	15	132,9	23,8	5,58		142,5	26,9	5,30		148,4	29,0	5,12		159,8	33,7	4,74		171,9	38,7	4,44		191,3	41,2	4,64	
	18	133,0	24,1	5,52		143,1	27,3	5,24		149,1	29,4	5,07		160,2	34,1	4,70		174,5	39,3	4,44		192,0	41,7	4,60	
	20	133,0	24,3	5,47		143,4	27,5	5,21		149,6	29,7	5,04		160,5	34,4	4,67		176,2	39,7	4,44		192,2	42,0	4,58	
	22	133,1	24,6	5,41		143,8	27,8	5,17		150,1	29,9	5,02		160,8	34,6	4,65		178,0	40,1	4,44		192,4	42,3	4,55	
	25	133,1	24,9	5,35		144,3	28,2	5,12		150,8	30,3	4,98		161,6	35,1	4,60		180,5	40,7	4,43		192,7	42,8	4,50	
18000 m³/h	10	135,2	20,5	6,60		144,2	22,8	6,32		150,4	24,4	6,16		163,9	28,2	5,81		175,1	32,0	5,47		197,5	34,3	5,76	
	15	135,2	21,0	6,44		145,3	23,4	6,21		151,8	25,0	6,07		164,8	28,8	5,72		180,1	32,9	5,47		202,7	34,9	5,81	
	18	135,2	21,3	6,35		145,9	23,7	6,16		152,6	25,4	6,01		165,4	29,2	5,66		183,0	33,5	5,46		202,8	35,3	5,75	
	20	135,2	21,5	6,29		146,3	24,0	6,10		153,1	25,6	5,98		165,7	29,4	5,64		184,9	33,8	5,47		202,5	35,6	5,69	
	22	135,3	21,7	6,24		146,7	24,2	6,06		153,6	25,8	5,95		166,1	29,6	5,61		186,8	34,2	5,46		202,3	35,8	5,65	
	25	135,3	22,0	6,15		147,3	24,5	6,01		154,4	26,2	5,89		166,9	30,1	5,54		189,6	34,7	5,46		201,9	36,2	5,58	
20000 m³/h	10	135,8	19,8	6,86		144,9	22,1	6,56		151,1	23,6	6,40		165,2	27,2	6,07		177,2	30,7	5,77		199,0	32,9	6,05	
	15	135,9	20,3	6,69		145,9	22,6	6,46		152,5	24,2	6,30		166,2	27,8	5,98		182,2	31,5	5,78		203,8	33,5	6,08	
	18	135,9	20,6	6,60		146,5	23,0	6,37		153,4	24,5	6,26		166,8	28,1	5,94		185,1	32,0	5,78		204,1	33,9	6,02	
	20	135,9	20,8	6,53		146,9	23,2	6,33		153,9	24,7	6,23		167,2	28,3	5,91		187,0	32,3	5,79		203,9	34,2	5,96	
	22	135,9	21,0	6,47		147,3	23,4	6,29		154,5	25,0	6,18		167,5	28,6	5,86		188,9	32,7	5,78		203,7	34,4	5,92	
	25	136,0	21,3	6,38		147,9	23,7	6,24		155,3	25,3	6,14		168,5	29,0	5,81		191,7	33,2	5,77		203,5	34,8	5,85	

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.

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
12.3	Airflow	m^3/h	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
	Airflow	l/s	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250
	Sound pressure	dB(A)	72,3	72,4	72,6	72,8	73,1	73,4	74,1	74,7	75,3	75,9	76,5	77	77,6	78,3	79,8
	Total power input	kW	0,48	0,50	0,53	0,59	0,65	0,71	0,76	0,82	0,88	0,94	1,01	1,07	1,14	1,20	1,33
15.3	Airflow	m^3/h	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500
	Airflow	l/s	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806
	Sound pressure	dB(A)	80,7	80,7	80,7	80,7	80,8	80,9	81	81,2	81,3	81,4	81,6	81,7	81,9	82	82,5
	Total power input	kW	0,96	0,98	1,03	1,10	1,18	1,25	1,32	1,39	1,47	1,55	1,63	1,71	1,79	1,88	2,04
16.4	Airflow	m^3/h	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000
	Airflow	l/s	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222
	Sound pressure	dB(A)	73,4	73,5	73,8	74,4	74,9	75,5	76,4	77,1	77,9	78,6	79,3	80,1	80,8	81,5	82,9
	Total power input	kW	0,69	0,73	0,78	0,88	0,977	1,08	1,18	1,29	1,4	1,51	1,63	1,75	1,87	1,98	2,24
20.4	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
	Sound pressure	dB(A)	76,0	76,0	76,1	76,6	77,0	77,4	77,8	78,5	79,1	79,7	80,3	80,9	81,5	82,0	83,2
	Total power input	kW	0,93	0,96	1,03	1,12	1,23	1,35	1,46	1,58	1,69	1,81	1,94	2,07	2,20	2,33	2,61
24.4	Airflow	m^3/h	12000	12000	12000	12000	12000	12000	12000	12000	12000	-	-	-	-	-	-
	Airflow	l/s	3333	3333	3333	3333	3333	3333	3333	3333	3333	-	-	-	-	-	-
	Sound pressure	dB(A)	82,6	82,5	82,4	82,3	82,2	82,2	82,4	82,6	82,8	-	-	-	-	-	-
	Total power input	kW	1,68	1,72	1,81	1,92	2,06	2,21	2,34	2,47	2,61	-	-	-	-	-	-
33.4	Airflow	m^3/h	14000	14000	14000	14000	14000	14000	14000	14000	14000	14000	14000	14000	14000	14000	14000
	Airflow	l/s	3889	3889	3889	3889	3889	3889	3889	3889	3889	3889	3889	3889	3889	3889	3889
	Sound pressure	dB(A)	74,3	74,5	75,0	75,9	76,9	78,0	78,9	79,9	80,8	81,7	82,7	83,5	84,4	85,2	86,7
	Total power input	kW	1,20	1,24	1,36	1,55	1,71	1,91	2,12	2,32	2,52	2,72	2,94	3,16	3,40	3,64	4,12
40.4	Airflow	m^3/h	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000
	Airflow	l/s	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444
	Sound pressure	dB(A)	76,6	76,8	77,1	77,6	78,2	79,0	79,7	80,6	81,3	82,0	82,8	83,5	84,2	84,9	86,3
	Total power input	kW	1,48	1,54	1,67	1,86	2,06	2,26	2,46	2,70	2,92	3,16	3,38	3,62	3,86	4,10	4,62
44.4	Airflow	m^3/h	18000	18000	18000	18000	18000	18000	18000	18000	18000	18000	18000	18000	18000	18000	18000
	Airflow	l/s	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
	Sound pressure	dB(A)	79,0	79,0	79,1	79,6	80,0	80,4	80,8	81,5	82,1	82,7	83,3	83,9	84,5	85,1	86,2
	Total power input	kW	1,86	1,91	2,06	2,24	2,46	2,68	2,92	3,16	3,38	3,62	3,88	4,14	4,40	4,68	5,22

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

Prerformance

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
12.3	Airflow	m^3/h	4000	4000	4000	4000	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	1111	1111	1111	1111
	Sound pressure	dB(A)	70,8	71,0	71,3	71,9	72,5	73,3	74,0	74,7	75,5	76,3	77,1	77,9	78,7	79,4	80,8
	Total power input	kW	0,38	0,40	0,43	0,49	0,54	0,60	0,65	0,71	0,77	0,83	0,89	0,95	1,02	1,08	1,22
15.3	Airflow	m^3/h	4000	4000	4000	4000	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	1111	1111	1111	1111
	Sound pressure	dB(A)	70,8	71,0	71,3	71,9	72,5	73,3	74,0	74,7	75,5	76,3	77,1	77,9	78,7	79,4	80,8
	Total power input	kW	0,38	0,40	0,43	0,49	0,54	0,60	0,65	0,71	0,77	0,83	0,89	0,95	1,02	1,08	1,22
16.4	Airflow	m^3/h	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000
	Airflow	l/s	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944
	Sound pressure	dB(A)	71,0	71,3	71,7	72,4	73,5	74,5	75,5	76,4	77,4	78,3	79,2	80,1	81,0	81,8	83,4
	Total power input	kW	0,56	0,59	0,64	0,73	0,82	0,92	1,01	1,11	1,22	1,32	1,42	1,53	1,65	1,76	2,01
20.4	Airflow	m^3/h	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000
	Airflow	l/s	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944
	Sound pressure	dB(A)	71,3	71,5	72,0	72,9	74,0	74,9	75,9	76,9	77,8	78,7	79,7	80,5	81,3	82,2	83,7
	Total power input	kW	0,59	0,62	0,68	0,77	0,86	0,95	1,05	1,16	1,26	1,36	1,47	1,58	1,70	1,82	2,06
24.4	Airflow	m^3/h	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000
	Airflow	l/s	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944
	Sound pressure	dB(A)	71,3	71,5	72,0	72,9	74,0	74,9	75,9	76,9	77,8	78,7	79,7	80,5	81,3	82,2	83,7
	Total power input	kW	0,59	0,62	0,68	0,77	0,86	0,95	1,05	1,16	1,26	1,36	1,47	1,58	1,70	1,82	2,06
33.4	Airflow	m^3/h	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500
	Airflow	l/s	3472	3472	3472	3472	3472	3472	3472	3472	3472	3472	3472	3472	3472	3472	3472
	Sound pressure	dB(A)	72,5	72,7	73,6	74,9	76,1	77,3	78,5	79,7	80,9	81,9	82,9	83,8	84,8	85,6	87,2
	Total power input	kW	0,99	1,04	1,16	1,32	1,49	1,68	1,86	2,06	2,26	2,46	2,66	2,88	3,10	3,30	3,76
40.4	Airflow	m^3/h	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500
	Airflow	l/s	3472	3472	3472	3472	3472	3472	3472	3472	3472	3472	3472	3472	3472	3472	3472
	Sound pressure	dB(A)	72,5	72,7	73,6	74,9	76,1	77,3	78,5	79,7	80,9	81,9	82,9	83,8	84,8	85,6	87,2
	Total power input	kW	0,99	1,04	1,16	1,32	1,49	1,68	1,86	2,06	2,26	2,46	2,66	2,88	3,10	3,30	3,76
44.4	Airflow	m^3/h	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500
	Airflow	l/s	3472	3472	3472	3472	3472	3472	3472	3472	3472	3472	3472	3472	3472	3472	3472
	Sound pressure	dB(A)	72,5	72,7	73,6	74,9	76,1	77,3	78,5	79,7	80,9	81,9	82,9	83,8	84,8	85,6	87,2
	Total power input	kW	0,99	1,04	1,16	1,32	1,49	1,68	1,86	2,06	2,26	2,46	2,66	2,88	3,10	3,30	3,76

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

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
12.3	Airflow	m^3/h	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000
	Airflow	l/s	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944
	Sound pressure	dB(A)	82,4	82,4	82,4	82,4	82,5	82,5	82,6	82,7	82,9	83	83,1	83,2	83,3	83,5
	Total power input	kW	1,12	1,15	1,20	1,27	1,35	1,37	1,51	1,59	1,67	1,75	1,83	1,91	2,00	2,09
15.3	Airflow	m^3/h	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000
	Airflow	l/s	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944
	Sound pressure	dB(A)	82,4	82,4	82,4	82,4	82,5	82,5	82,6	82,7	82,9	83	83,1	83,2	83,3	83,5
	Total power input	kW	1,12	1,15	1,20	1,27	1,35	1,37	1,51	1,59	1,67	1,75	1,83	1,91	2,00	2,09
16.4	Airflow	m^3/h	12500	12500	12500	12500	12500	12500	12500	12500	-	-	-	-	-	-
	Airflow	l/s	3472	3472	3472	3472	3472	3472	3472	3472	-	-	-	-	-	-
	Sound pressure	dB(A)	83,7	83,7	83,6	83,5	83,3	83,2	83,2	83,1	-	-	-	-	-	-
	Total power input	kW	1,74	1,78	1,86	1,98	2,11	2,25	2,39	2,54	-	-	-	-	-	-
20.4	Airflow	m^3/h	12500	12500	12500	12500	12500	12500	12500	-	-	-	-	-	-	-
	Airflow	l/s	3472	3472	3472	3472	3472	3472	3472	-	-	-	-	-	-	-
	Sound pressure	dB(A)	83,6	83,6	83,5	83,4	83,3	83,2	83,1	-	-	-	-	-	-	-
	Total power input	kW	1,83	1,88	1,96	2,09	2,23	2,37	2,51	-	-	-	-	-	-	-
24.4	Airflow	m^3/h	12500	12500	12500	12500	12500	12500	12500	-	-	-	-	-	-	-
	Airflow	l/s	3472	3472	3472	3472	3472	3472	3472	-	-	-	-	-	-	-
	Sound pressure	dB(A)	83,6	83,6	83,5	83,4	83,3	83,2	83,1	-	-	-	-	-	-	-
	Total power input	kW	1,83	1,88	1,96	2,09	2,23	2,37	2,51	-	-	-	-	-	-	-
33.4	Airflow	m^3/h	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	-
	Airflow	l/s	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	-
	Sound pressure	dB(A)	81,3	81,2	81,4	81,7	82,1	82,4	82,8	81,9	82,4	84,1	84,6	85,1	85,6	-
	Total power input	kW	2,52	2,58	2,74	2,96	3,20	3,42	3,70	3,94	4,20	4,46	4,74	5,00	5,28	-
40.4	Airflow	m^3/h	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	-
	Airflow	l/s	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	-
	Sound pressure	dB(A)	81,3	81,2	81,4	81,7	82,1	82,4	82,8	81,9	82,4	84,1	84,6	85,1	85,6	-
	Total power input	kW	2,52	2,58	2,74	2,96	3,20	3,42	3,70	3,94	4,20	4,46	4,74	5,00	5,28	-
44.4	Airflow	m^3/h	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	-
	Airflow	l/s	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	-
	Sound pressure	dB(A)	81,3	81,2	81,4	81,7	82,1	82,4	82,8	81,9	82,4	84,1	84,6	85,1	85,6	-
	Total power input	kW	2,52	2,58	2,74	2,96	3,20	3,42	3,70	3,94	4,20	4,46	4,74	5,00	5,28	-

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

Prerformance

High static pressure electric fan performance - Standard airflow

	Available static pressure (Pa) (supply+return)		420	480	540	600	660	720	780	840	900	960	1020
12.3	Airflow	m^3/h	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500	4500
	Airflow	l/s	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250
	Sound pressure	dB(A)	84,6	85,3	86,7	88,1	89,3	90,5	91,5	92,5	93,5	94,3	95,2
	Total power input	kW	1,22	1,30	1,45	1,61	1,76	1,93	2,09	2,26	2,44	2,61	2,80
15.3	Airflow	m^3/h	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500	6500
	Airflow	l/s	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806	1806
	Sound pressure	dB(A)	87,0	87,6	88,3	88,9	89,6	90,2	91,0	91,8	92,5	93,2	93,8
	Total power input	kW	1,81	1,99	2,18	2,36	2,57	2,76	2,96	3,18	3,38	3,59	3,80
16.4	Airflow	m^3/h	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000	8000
	Airflow	l/s	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222	2222
	Sound pressure	dB(A)	89,2	89,5	89,9	90,2	90,6	90,9	91,3	91,7	92,1	92,5	92,9
	Total power input	kW	1,94	2,12	2,32	2,53	2,73	2,95	3,15	3,37	3,60	3,80	4,04
20.4	Airflow	m^3/h	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
	Sound pressure	dB(A)	91,6	91,7	91,9	92,1	92.4.	92,7	92,9	93,2	93,5	93,8	94,1
	Total power input	kW	2,37	2,56	2,77	2,98	3,21	3,44	3,67	3,92	4,17	4,40	4,64
24.4	Airflow	m^3/h	12000	12000	12000	12000	12000	-	-	-	-	-	-
	Airflow	l/s	3333	3333	3333	3333	3333	-	-	-	-	-	-
	Sound pressure	dB(A)	98,3	98,1	98,1	98,0	97,9	-	-	-	-	-	-
	Total power input	kW	3,94	4,19	4,42	4,68	4,94	-	-	-	-	-	-
33.4	Airflow	m^3/h	14000	14000	14000	14000	14000	14000	14000	14000	14000	14000	14000
	Airflow	l/s	3889	3889	3889	3889	3889	3889	3889	3889	3889	3889	3889
	Sound pressure	dB(A)	90,2	90,7	91,1	91,6	92,1	92,7	93,2	93,8	94,3	95,0	95,6
	Total power input	kW	3,36	3,74	4,10	4,46	4,84	5,24	5,62	6,06	6,48	6,92	7,32
40.4	Airflow	m^3/h	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000	16000
	Airflow	l/s	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444	4444
	Sound pressure	dB(A)	92,3	92,6	93,0	93,3	93,7	94,0	94,4	94,8	95,2	95,7	96,1
	Total power input	kW	3,96	4,36	4,74	5,16	5,58	6,00	6,40	6,86	7,30	7,78	8,26
44.4	Airflow	m^3/h	18000	18000	18000	18000	18000	18000	18000	18000	18000	18000	18000
	Airflow	l/s	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000	5000
	Sound pressure	dB(A)	94,6	94,7	94,9	95,1	95,4	95,7	95,9	96,2	96,5	96,8	97,1
	Total power input	kW	4,74	5,12	5,54	5,96	6,42	6,88	7,34	7,84	8,34	8,80	9,28

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

High static pressure electric fan performance - Minimum airflow

Available static pressure (Pa) (supply+return)			420	480	540	600	660	720	780	840	900	960	1020
12.3	Airflow	m^3/h	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
	Airflow	l/s	1111,1	1111,1	1111,1	1111,1	1111,1	1111,1	1111,1	1111,1	1111,1	1111,1	1111,1
	Sound pressure	dB(A)	84,8	86,5	87,9	89,3	90,5	91,6	92,7	93,7	94,6	95,5	96,3
	Total power input	kW	1,11	1,26	1,39	1,54	1,70	1,85	2,02	2,18	2,35	2,53	2,70
15.3	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
	Sound pressure	dB(A)	84,8	86,5	87,9	89,3	90,5	91,6	92,7	93,7	94,6	95,5	96,3
	Total power input	kW	1,11	1,26	1,39	1,54	1,70	1,85	2,02	2,18	2,35	2,53	2,70
16.4	Airflow	m^3/h	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000
	Airflow	l/s	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944
	Sound pressure	dB(A)	87,1	87,5	88,0	88,5	89,0	89,6	90,1	90,7	91,2	91,8	92,5
	Total power input	kW	1,63	1,82	2,00	2,19	2,37	2,57	2,77	2,97	3,20	3,40	3,62
20.4	Airflow	m^3/h	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000
	Airflow	l/s	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944
	Sound pressure	dB(A)	87,2	87,6	88,1	88,6	89,1	89,7	90,2	90,8	91,3	92,0	92,6
	Total power input	kW	1,68	1,86	2,05	2,22	2,42	2,62	2,81	3,03	3,24	3,47	3,66
24.4	Airflow	m^3/h	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000
	Airflow	l/s	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944
	Sound pressure	dB(A)	87,2	87,6	88,1	88,6	89,1	89,7	90,2	90,8	91,3	92,0	92,6
	Total power input	kW	1,68	1,86	2,05	2,22	2,42	2,62	2,81	3,03	3,24	3,47	3,66
33.4	Airflow	m^3/h	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500
	Airflow	l/s	3472	3472	3472	3472	3472	3472	3472	3472	3472	3472	3472
	Sound pressure	dB(A)	88,6	89,2	89,9	90,6	91,3	91,9	92,8	93,5	94,3	95,2	95,8
	Total power input	kW	2,94	3,28	3,64	3,98	4,36	4,72	5,10	5,48	5,88	6,32	6,70
40.4	Airflow	m^3/h	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500
	Airflow	l/s	3472	3472	3472	3472	3472	3472	3472	3472	3472	3472	3472
	Sound pressure	dB(A)	88,6	89,2	89,9	90,6	91,3	91,9	92,8	93,5	94,3	95,2	95,8
	Total power input	kW	2,94	3,28	3,64	3,98	4,36	4,72	5,10	5,48	5,88	6,32	6,70
44.4	Airflow	m^3/h	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500
	Airflow	l/s	3472	3472	3472	3472	3472	3472	3472	3472	3472	3472	3472
	Sound pressure	dB(A)	88,6	89,2	89,9	90,6	91,3	91,9	92,8	93,5	94,3	95,2	95,8
	Total power input	kW	2,94	3,28	3,64	3,98	4,36	4,72	5,10	5,48	5,88	6,32	6,70

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

Prerformance

High static pressure electric fan performance - High airflow

Available static pressure (Pa) (supply+return)			420	480	540	600	660	720	780	840	900	960	1020
12.3	Airflow	m^3/h	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000
	Airflow	l/s	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944
	Sound pressure	dB(A)	88,0	88,5	89,0	89,6	90,1	90,7	91,3	91,8	92,5	93,2	93,7
	Total power input	kW	2,01	2,19	2,38	2,58	2,77	2,99	3,21	3,40	3,62	3,86	4,06
15.3	Airflow	m^3/h	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000
	Airflow	l/s	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944
	Sound pressure	dB(A)	88,0	88,5	89,0	89,6	90,1	90,7	91,3	91,8	92,5	93,2	93,7
	Total power input	kW	2,01	2,19	2,38	2,58	2,77	2,99	3,21	3,40	3,62	3,86	4,06
16.4	Airflow	m^3/h	12500	12500	12500	12500	-	-	-	-	-	-	-
	Airflow	l/s	3472	3472	3472	3472	-	-	-	-	-	-	-
	Sound pressure	dB(A)	99,3	99,2	99,1	99,0	-	-	-	-	-	-	-
	Total power input	kW	4,16	4,42	4,65	4,92	-	-	-	-	-	-	-
20.4	Airflow	m^3/h	12500	12500	12500	12500	-	-	-	-	-	-	-
	Airflow	l/s	3472	3472	3472	3472	-	-	-	-	-	-	-
	Sound pressure	dB(A)	99,3	99,1	99,0	98,9	-	-	-	-	-	-	-
	Total power input	kW	4,27	4,51	4,77	5,02	-	-	-	-	-	-	-
24.4	Airflow	m^3/h	12500	12500	12500	12500	-	-	-	-	-	-	-
	Airflow	l/s	3472	3472	3472	3472	-	-	-	-	-	-	-
	Sound pressure	dB(A)	99,3	99,1	99,0	98,9	-	-	-	-	-	-	-
	Total power input	kW	4,27	4,51	4,77	5,02	-	-	-	-	-	-	-
33.4	Airflow	m^3/h	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	-
	Airflow	l/s	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	-
	Sound pressure	dB(A)	96,9	96,8	96,9	97,0	97,2	97,4	97,6	97,9	98,1	98,3	-
	Total power input	kW	5,82	6,28	6,72	7,20	7,64	8,14	8,64	9,16	9,70	10,20	-
40.4	Airflow	m^3/h	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	-
	Airflow	l/s	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	-
	Sound pressure	dB(A)	96,9	96,8	96,9	97,0	97,2	97,4	97,6	97,9	98,1	98,3	-
	Total power input	kW	5,82	6,28	6,72	7,20	7,64	8,14	8,64	9,16	9,70	10,20	-
44.4	Airflow	m^3/h	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	-
	Airflow	l/s	5556	5556	5556	5556	5556	5556	5556	5556	5556	5556	-
	Sound pressure	dB(A)	96,9	96,8	96,9	97,0	97,2	97,4	97,6	97,9	98,1	98,3	-
	Total power input	kW	5,82	6,28	6,72	7,20	7,64	8,14	8,64	9,16	9,70	10,20	-

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

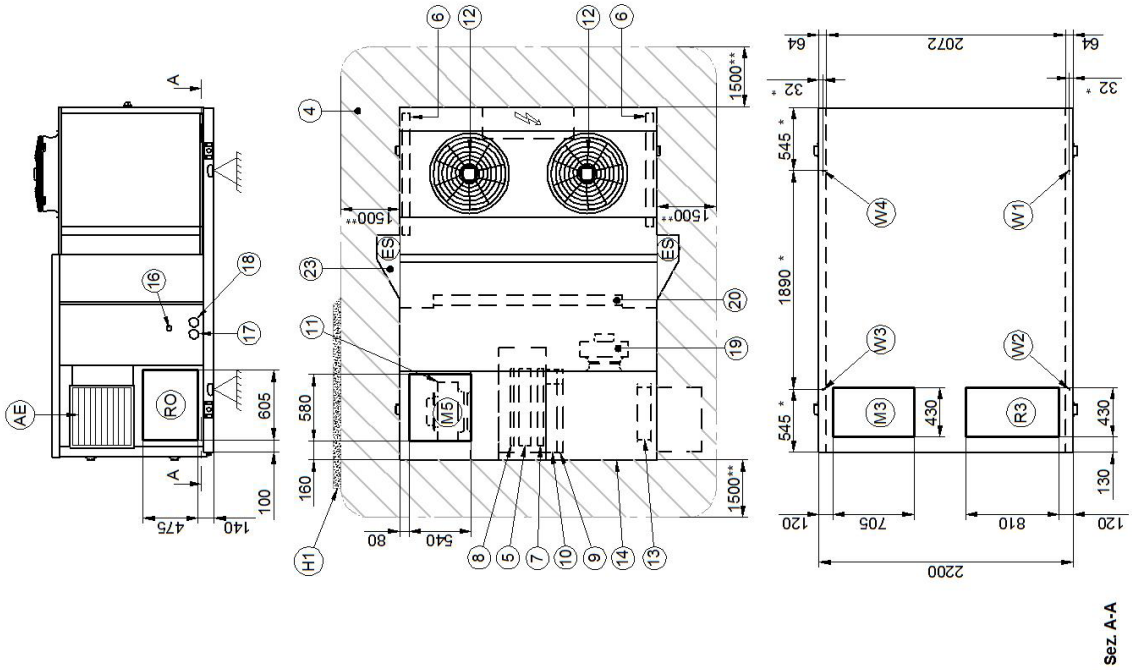
Exhaust electric fan performance

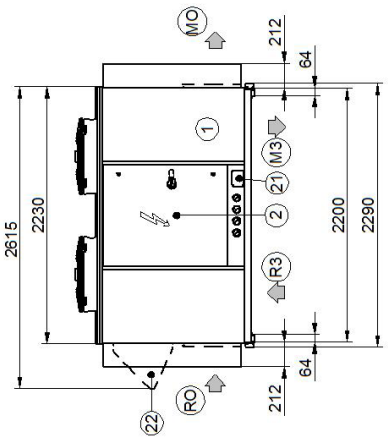
AVAILABLE STATIC PRESSURE (RETURN) (Pa)			150					
% OF EXHAUST AIR			30%	40%	50%	60%	70%	80%
12.3	Airflow	m^3/h	1350	1800	2250	2700	3150	3600
	Airflow	l/s	375	500	625	750	875	1000
	Fan RPM	rpm	952	1004	1073	1159	1255	1363
	Power input	kW	0,18	0,21	0,25	0,30	0,35	0,41
15.3	Airflow	m^3/h	1950	2600	3250	3900	4550	5200
	Airflow	l/s	542	722	903	1083	1264	1444
	Fan RPM	rpm	1026	1138	1279	1438	1604	1780
	Power input	kW	0,23	0,29	0,36	0,45	0,57	0,72
16.4	Airflow	m^3/h	2400	3200	4000	4800	5600	6400
	Airflow	l/s	667	889	1111	1333	1556	1778
	Fan RPM	rpm	739	788	857	942	1033	1128
	Power input	kW	0,25	0,31	0,38	0,46	0,57	0,71
20.4	Airflow	m^3/h	2700	3600	4500	5400	6300	7200
	Airflow	l/s	750	1000	1250	1500	1750	2000
	Fan RPM	rpm	754	820	909	1010	1114	1225
	Power input	kW	0,27	0,34	0,43	0,53	0,69	0,89
24.4	Airflow	m^3/h	3600	4800	6000	7200	8400	9600
	Airflow	l/s	1000	1333	1667	2000	2333	2667
	Fan RPM	rpm	820	942	1079	1225	1377	1534
	Power input	kW	0,34	0,46	0,63	0,89	1,19	1,57
33.4	Airflow	m^3/h	4200	5600	7000	8400	9800	11200
	Airflow	l/s	1167	1556	1944	2333	2722	3111
	Fan RPM	rpm	726	459	812	877	954	1033
	Power input	kW	0,46	0,55	0,67	0,79	0,94	1,13
40.4	Airflow	m^3/h	4800	6400	8000	9600	11200	12800
	Airflow	l/s	1333	1778	2222	2667	3111	3556
	Fan RPM	rpm	739	788	857	942	1033	1128
	Power input	kW	0,50	0,62	0,76	0,92	1,13	1,42
44.4	Airflow	m^3/h	5400	7200	9000	10800	12600	14400
	Airflow	l/s	1500	2000	2500	3000	3500	4000
	Fan RPM	rpm	754	820	909	1010	1114	1225
	Power input	kW	0,54	0,68	0,85	1,07	1,38	1,78

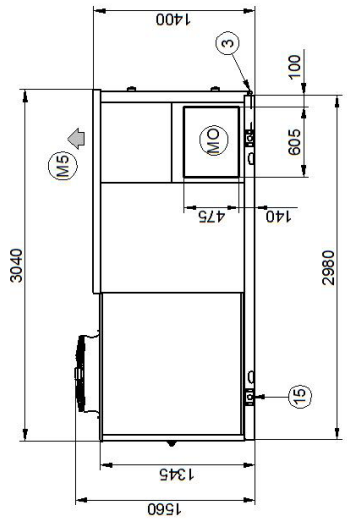
The percentage of exhaust air refers to the unit rated flow.
Exhaust electric fans collect from the environment only the quantity of air that will be exhausted.
The data refer to the return static pressure of 150 Pa, which usually occurs in the systems.

Dimensional drawings

Size 12.3 - 15.3 - CCK and CCKP Configuration







1. Compressor compartment
2. Electrical panel
3. Condensate drain
4. Functional clearances
5. Internal exchanger
6. External exchanger
7. H2O heating coil / Electric heaters (Optional)
8. Re-heating coil (Optional)
9. G4 air filters (Standard)
10. F7 bag filters / electronic air filters (Optional)
11. Electric fan (Supply - return)
12. External electric fan
13. Outdoor air damper
14. Access for inspection of coils, filters, heating elements
15. Lifting brackets (removable)
16. Humidifier connections
17. H2O heating coil input Ø 3/4" (Optional)
18. H2O heating coil output Ø 3/4" (Optional)
19. Exhaust electric fan
20. Exhaust air recovery coil (CCKP version)
21. Power input
22. Fresh air cap (accessory separately supplied)
23. Air exhaust caps (accessory separately supplied)

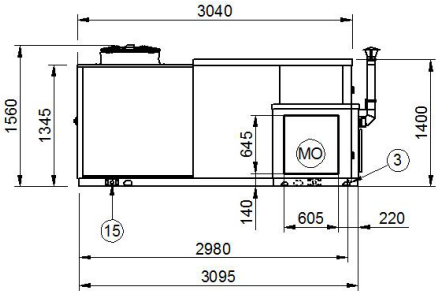
(ES) Air exhaust
(RO) Horizontal air return
(R3) Downward air return (optional)
(MO) Horizontal air supply
(M3) Downward air supply (Optional)
(M5) Upflow air supply (Optional)
(AE) Fresh air inlet
(H1) Wall with same height as unit on a maximum of three sides
(**) Suggested clearance
(*) Vibration mounts position

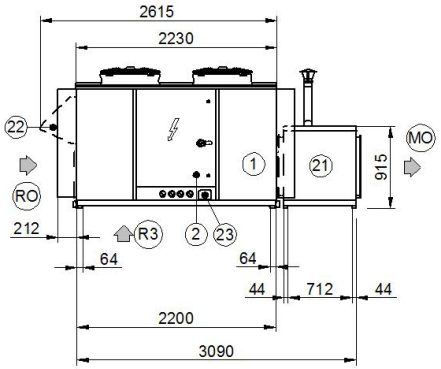
SIZE		12.3	15.3	12.3	15.3
Configuration		CCK	CCK	CCKP	CCKP
W1 Supporting point	kg	394	403	407	416
W2 Supporting point	kg	290	292	300	302
W3 Supporting point	kg	319	321	330	332
W4 Supporting point	kg	414	423	427	436
Operating weight	kg	1417	1439	1464	1486
Shipping weight	kg	1417	1439	1464	1486

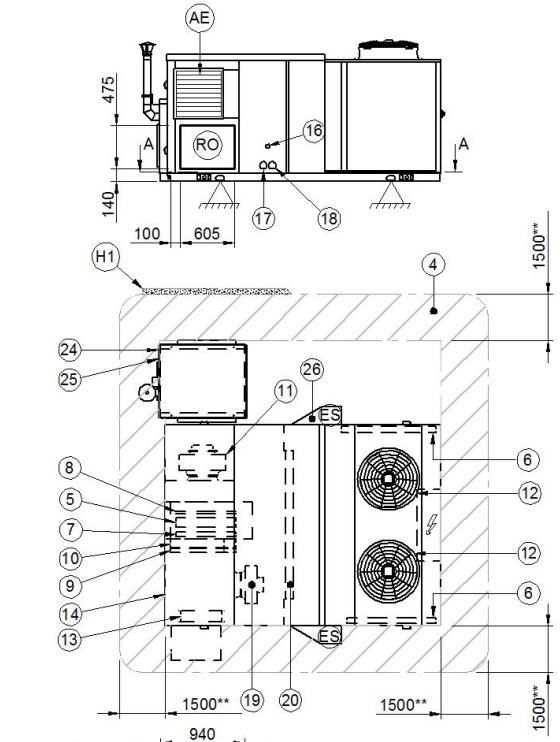
The presence of optional accessories may result in a substantial variation of the weights shown in the table.

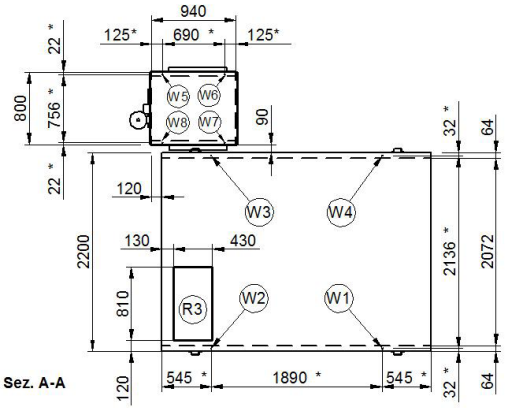
Dimensional drawings

Size 12.3 - 15.3 Combustion module - CCK and CCPK Configuration









1. Compressor compartment
2. Electrical panel
3. Condensate drain
4. Functional clearances
5. Internal exchanger
6. External exchanger
7. H2O heating coil / Electric heaters (Optional)
8. Re-heating coil (Optional)
9. G4 air filters (Standard)
10. F7 bag filters / electronic air filters (Optional)
11. Electric fan (Supply - return)
12. External electric fan
13. Outdoor air damper
14. Access for inspection of coils, filters, heating elements
15. Lifting brackets (removable)
16. Humidifier connections
17. H2O heating coil input Ø 1" (Optional)
18. H2O heating coil output Ø 1" (Optional)
19. Exhaust electric fan
20. Exhaust air recovery coil (CCKP version)
21. Gas module (accessory separately supplied)
22. Fresh air cap (accessory separately supplied)
23. Power input
24. Gas connection (UNI ISO 228/1 - G 3/4")
25. Condensate drain (only for condensation gas heating module)
26. Air exhaust caps (accessory separately supplied)

(ES) Air exhaust
(RO) Horizontal air return
(R3) Downward air return (optional)
(MO) Horizontal air supply
(AE) Fresh air onlet
(H1) Wall with same height as unit on a maximum of three sides
(**) Suggested clearance
(*) Vibration mounts position

SIZE		12.3	15.3	12.3	15.3
Configuration		CCK	CCK	CCKP	CCKP
W1 Supporting point	kg	394	403	407	416
W2 Supporting point	kg	290	292	300	302
W3 Supporting point	kg	319	321	330	332
W4 Supporting point	kg	414	423	427	436
Operating weight	kg	1417	1439	1464	1486
Shipping weight	kg	1417	1439	1464	1486

GAS MODULE WEIGHT DISTRIBUTION

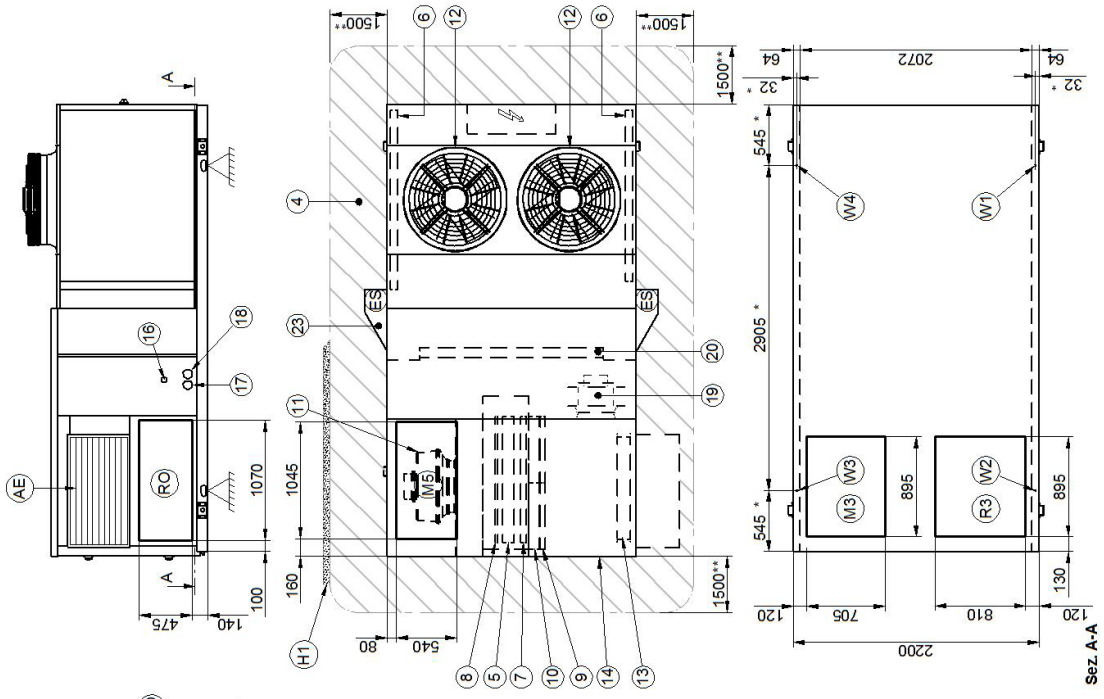
SIZE		12.3 - 15.3
Configuration		CCK/CCKP
W5 Supporting point	kg	46
W6 Supporting point	kg	34
W7 Supporting point	kg	34
W8 Supporting point	kg	46
Operating weight	kg	160
Shipping weight	kg	160

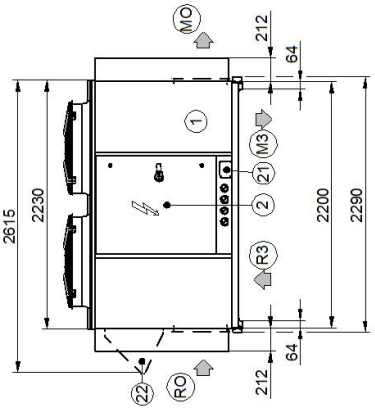
The presence of optional accessories may result in a substantial variation of the weights shown in the table.

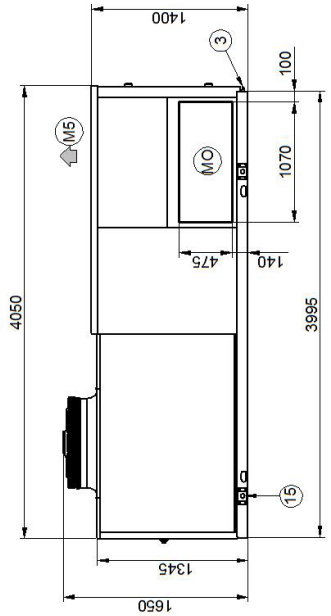
Dimensional drawings

Size 16.4 - 20.4 - 24.4 - CCK and CCKP Configuration

DAA7X16.4_20.2_24.4_CCK-CCKP_01
Date: 09/02/2017







1. Compressor compartment
2. Electrical panel
3. Condensate drain
4. Functional clearances
5. Internal exchanger
6. External exchanger
7. H2O heating coil / Electric heaters (Optional)
8. Re-heating coil (Optional)
9. G4 air filters (Standard)
10. F7 bag filters / electronic air filters (Optional)
11. Electric fan (Supply - return)
12. External electric fan
13. Outdoor air damper
14. Access for inspection of coils, filters, heating elements
15. Lifting brackets (removable)
16. Humidifier connections
17. H2O heating coil input Ø 1"1/4 (Optional)
18. H2O heating coil output Ø 1"1/4 (Optional)
19. Exhaust electric fan
20. Exhaust air recovery coil (CCKP version)
21. Power input
22. Fresh air cap (accessory separately supplied)
23. Air exhaust caps (accessory separately supplied)

(ES) Air exhaust
(RO) Horizontal air return
(R3) Downward air return (optional)
(MO) Horizontal air supply
(M3) Downward air supply (Optional)
(M5) Upflow air supply (Optional)
(AE) Fresh air inlet
(H1) Wall with same height as unit on a maximum of three sides
(**) Suggested clearance
(*) Vibration mounts position

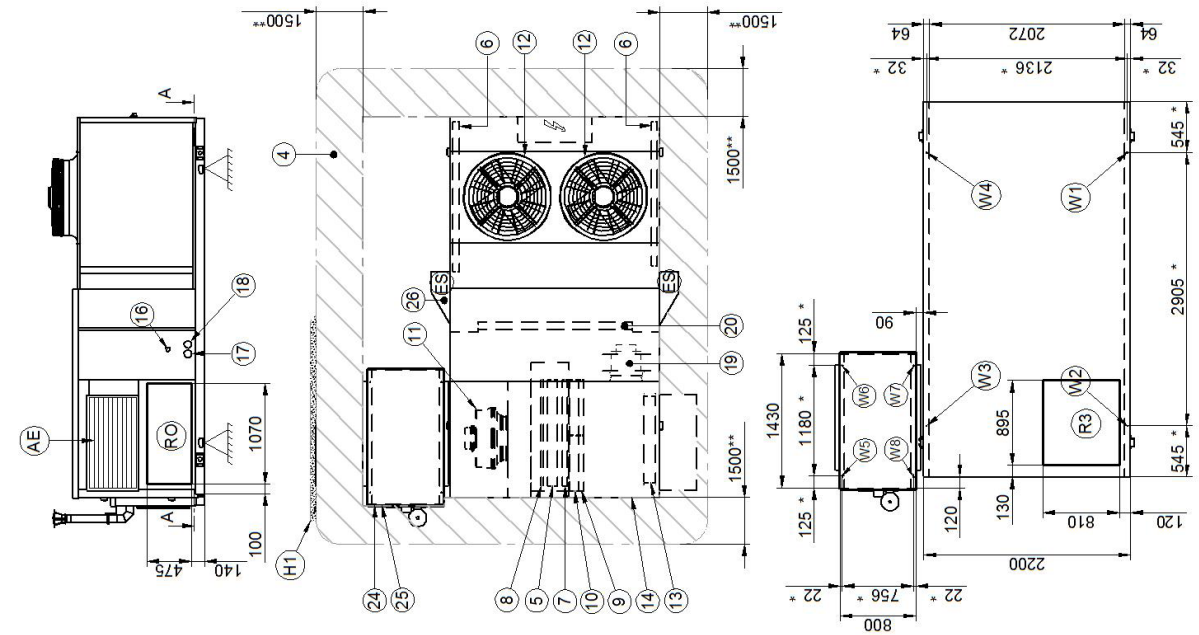
SIZE		16.4	20.4	24.4	16.4	20.4	24.4
Configuration		CCK	CCK	CCK	CCKP	CCKP	CCKP
W1 Supporting point	kg	445	455	475	458	468	488
W2 Supporting point	kg	308	310	312	318	320	322
W3 Supporting point	kg	346	348	350	357	359	361
W4 Supporting point	kg	461	482	492	474	495	505
Operating weight	kg	1560	1595	1629	1607	1642	1676
Shipping weight	kg	1560	1595	1629	1607	1642	1676

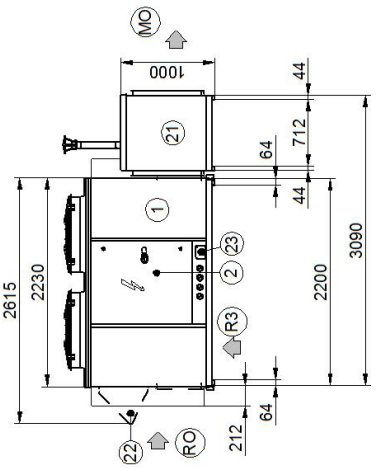
The presence of optional accessories may result in a substantial variation of the weights shown in the table.

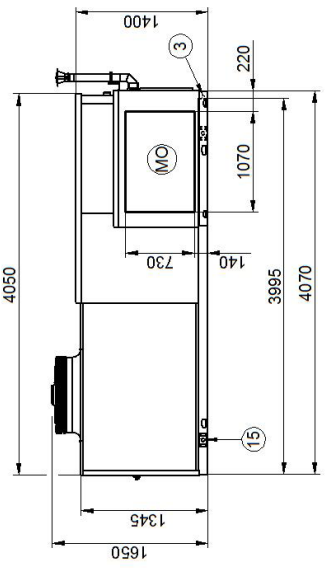
Size 16.4 - 20.4 - 24.4 Combustion module - CCK and CCPK Configuration

DAA7X16.4_20.4_24.4_CCK-CCKP_GC01X-GC10X_01

Date: 09/02/2017







1. Compressor compartment
2. Electrical panel
3. Condensate drain
4. Functional clearances
5. Internal exchanger
6. External exchanger
7. H2O heating coil / Electric heaters (Optional)
8. Re-heating coil (Optional)
9. G4 air filters (Standard)
10. F7 bag filters / electronic air filters (Optional)
11. Electric fan (Supply - return)
12. External electric fan
13. Outdoor air damper
14. Access for inspection of coils, filters, heating elements
15. Lifting brackets (removable)
16. Humidifier connections
17. H2O heating coil input Ø 1"1/4 (Optional)
18. H2O heating coil output Ø 1"1/4 (Optional)
19. Exhaust electric fan
20. Exhaust air recovery coil (CCKP version)
21. Gas module (accessory separately supplied)
22. Fresh air cap (accessory separately supplied)
23. Power input
24. Gas connection (UNI ISO 228/1 - G 3/4")
25. Condensate drain (only for condensation gas heating module)
26. Air exhaust caps (accessory separately supplied)

(ES) Air exhaust
(RO) Horizontal air return
(R3) Downward air return (optional)
(MO) Horizontal air supply
(AE) Fresh air inlet
(H1) Wall with same height as unit on a maximum of three sides
(**) Suggested clearance
(*) Vibration mounts position

GAS MODULE WEIGHT DISTRIBUTION

SIZE		16.4	20.4	24.4	16.4	20.4	24.4	SIZE		16.4-20.4-24.4
Configuration		CCK	CCK	CCK	CCKP	CCKP	CCKP	Configuration		CCK-CCKP
W1 Supporting point	kg	445	455	475	458	468	488	W5 Supporting point	kg	60
W2 Supporting point	kg	308	310	312	318	320	322	W6 Supporting point	kg	50
W3 Supporting point	kg	346	348	350	357	359	361	W7 Supporting point	kg	50
W4 Supporting point	kg	461	482	492	474	495	505	W8 Supporting point	kg	60
Operating weight	kg	1560	1595	1629	1607	1642	1676	Operating weight	kg	220
Shipping weight	kg	1560	1595	1629	1607	1642	1676	Shipping weight	kg	220

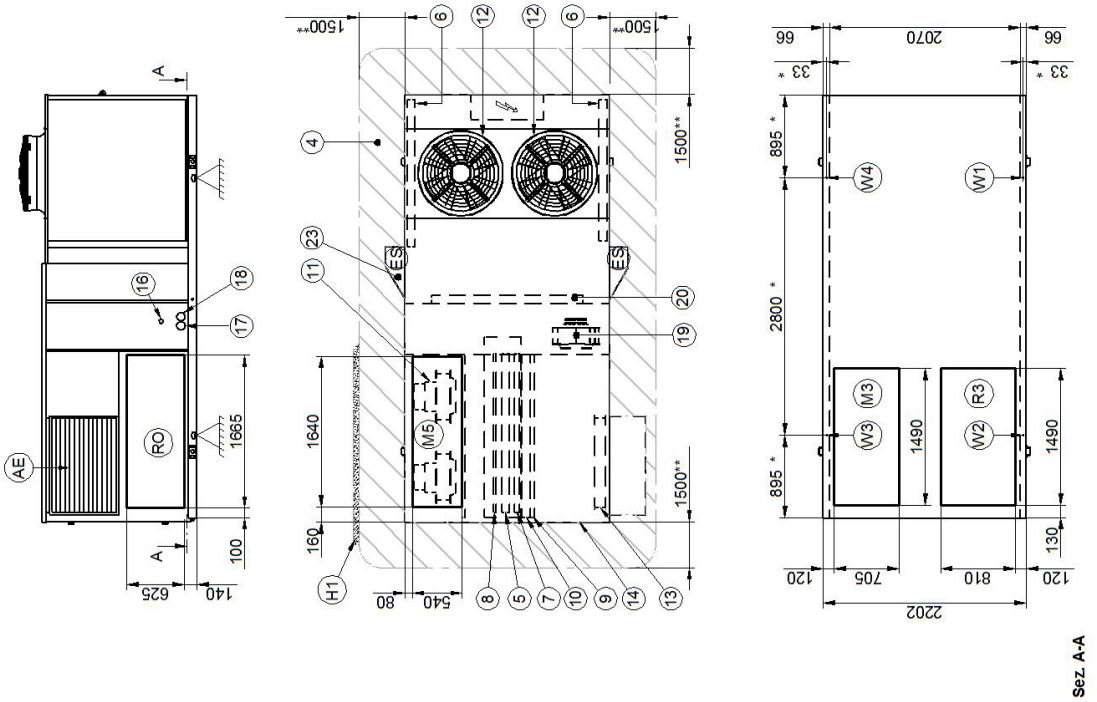
Sez. A-A

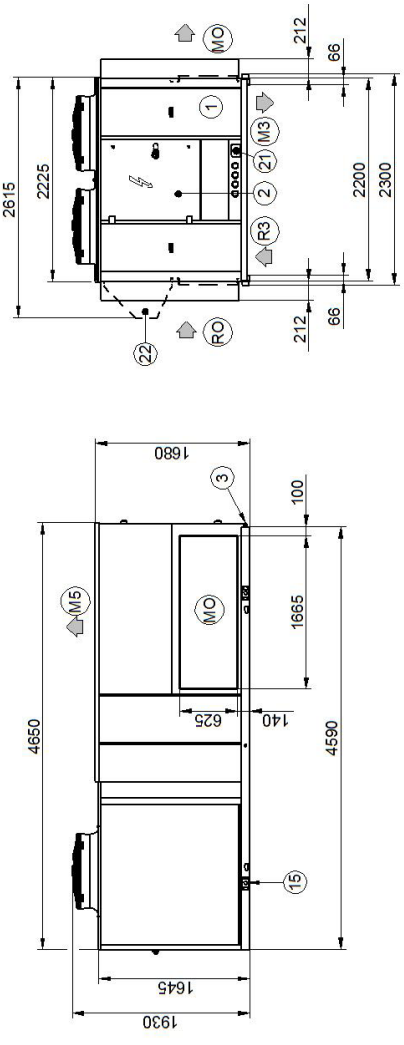
The presence of optional accessories may result in a substantial variation of the weights shown in the table.

Dimensional drawings

Size 33.4-40.4-44.4 - CCK and CCKP Configuration

DAA7X33.4_40.4_44.4_CCK-CCKP_00
Date: 16/12/2015





1. Compressor compartment
2. Electrical panel
3. Condensate drain
4. Functional clearances
5. Internal exchanger
6. External exchanger
7. H2O heating coil / Electric heaters (Optional)
8. Re-heating coil (Optional)
9. G4 air filters (Standard)
10. F7 bag filters /- electronic air filters (Optional)
11. Electric fan (Supply - return)
12. External electric fan
13. Outdoor air damper
14. Access for inspection of coils, filters, heating elements
15. Lifting brackets (removable)
16. Humidifier connections
17. H2O heating coil input Ø 1"1/4 (Optional)
18. H2O heating coil output Ø 1"1/4 (Optional)
19. Exhaust electric fan
20. Exhaust air recovery coil (CCKP version)
21. Power input
22. Fresh air cap (accessory separately supplied)
23. Air exhaust caps (accessory separately supplied)

(ES) Air exhaust
(RO) Horizontal air return
(R3) Downward air return (optional)
(MO) Horizontal air supply
(M3) Downward air supply (Optional)
(M5) Upflow air supply (Optional)
(AE) Fresh air inlet
(H1) Wall with same height as unit on a maximum of three sides
(**) Suggested clearance
(*) Vibration mounts position

SIZE		33.4	40.4	44.4	33.4	40.4	44.4
Configuration		CCK	CCK	CCK	CCKP	CCKP	CCKP
W1 Supporting point	kg	485	492	494	501	508	509
W2 Supporting point	kg	373	381	382	386	394	395
W3 Supporting point	kg	427	436	437	441	450	451
W4 Supporting point	kg	503	511	512	519	527	528
Operating weight	kg	1788	1820	1825	1847	1879	1883
Shipping weight	kg	1788	1820	1825	1847	1879	1883

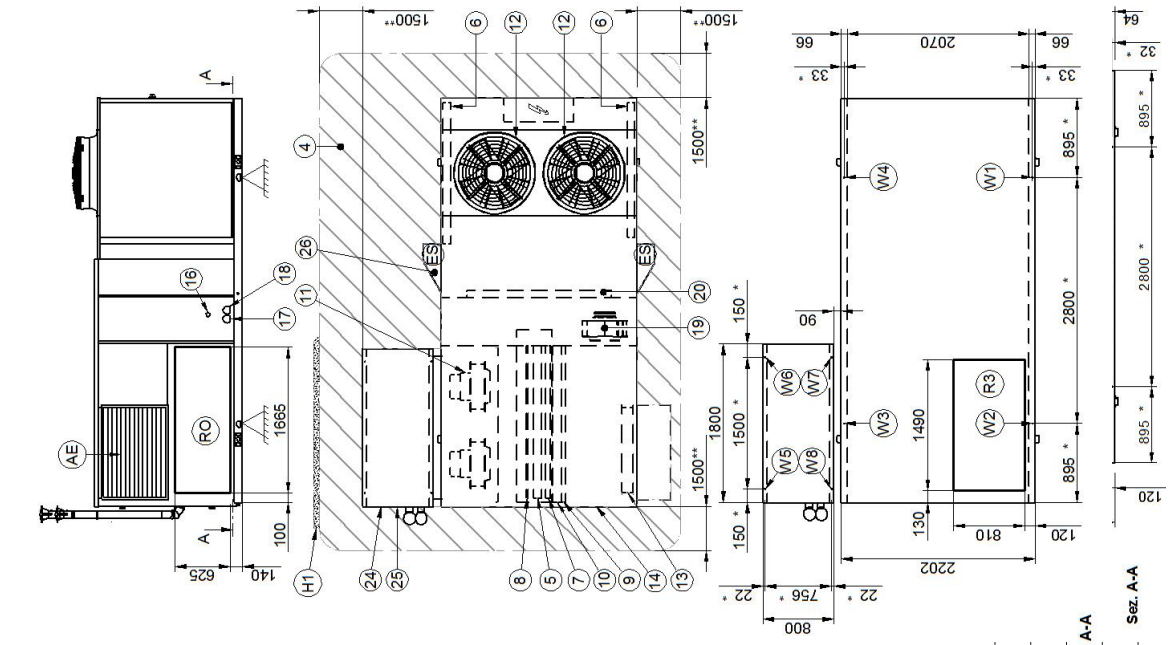
The presence of optional accessories may result in a substantial variation of the weights shown in the table.

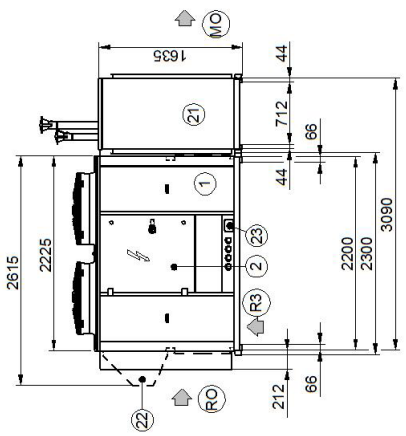
Size 33.4-40.4-44.4 Combustion module - CCK and CCPK Configuration

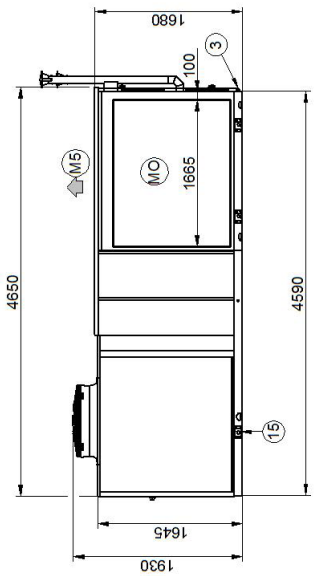
SINGLE CHAMBER

DAA7X33.4_40.4_44.4_CCK-CCKP_GC09X-GC11X_00

Date: 18/12/2015







1. Compressor compartment
2. Electrical panel
3. Condensate drain
4. Functional clearances
5. Internal exchanger
6. External exchanger
7. H2O heating coil / Electric heaters (Optional)
8. Re-heating coil (Optional)
9. G4 air filters (Standard)
10. F7 bag filters / electronic air filters (Optional)
11. Electric fan (Supply - return)
12. External electric fan
13. Outdoor air damper
14. Access for inspection of coils, filters, heating elements
15. Lifting brackets (removable)
16. Humidifier connections
17. H2O heating coil input Ø 1"1/4 (Optional)
18. H2O heating coil output Ø 1"1/4 (Optional)
19. Exhaust electric fan
20. Exhaust air recovery coil (CCKP version)
21. Gas module (accessory separately supplied)
22. Fresh air cap (accessory separately supplied)
23. Power input
24. Gas connection (UNI ISO 228/1 - G 3/4")
25. Condensate drain (only for condensation gas heating module)
26. Air exhaust caps (accessory separately supplied)

(ES) Air exhaust
(RO) Horizontal air return
(R3) Downward air return (optional)
(MO) Horizontal air supply
(AE) Fresh air inlet
(H1) Wall with same height as unit on a maximum of three sides
(**) Suggested clearance
(*) Vibration mounts position

GAS MODULE WEIGHT DISTRIBUTION

SIZE		33.4	40.4	44.4	33.4	40.4	44.4	SIZE	33.4-40.4-44.4
Configuration		CCK	CCK	CCK	CCKP	CCKP	CCKP	Configuration	CCK/CCKP
W1 Supporting point	kg	485	492	494	501	508	509	W5 Supporting point	kg 70
W2 Supporting point	kg	373	381	382	386	394	395	W6 Supporting point	kg 58
W3 Supporting point	kg	427	436	437	441	450	451	W7 Supporting point	kg 58
W4 Supporting point	kg	503	511	512	519	527	528	W8 Supporting point	kg 70
Operating weight	kg	1788	1820	1825	1847	1879	1883	Operating weight	kg 256
Shipping weight	kg	1788	1820	1825	1847	1879	1883	Shipping weight	kg 256

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

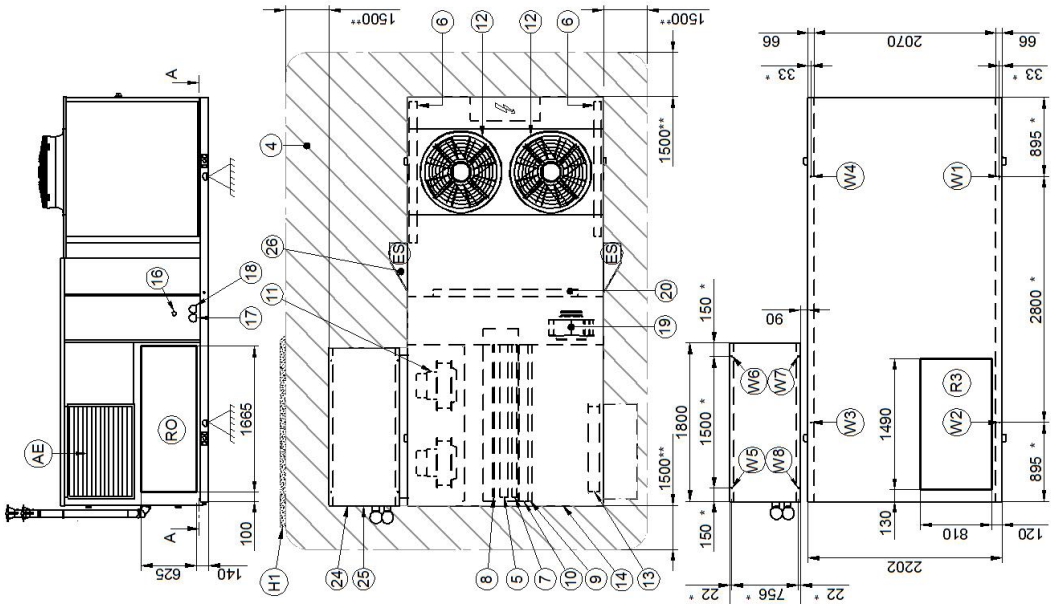
Dimensional drawings

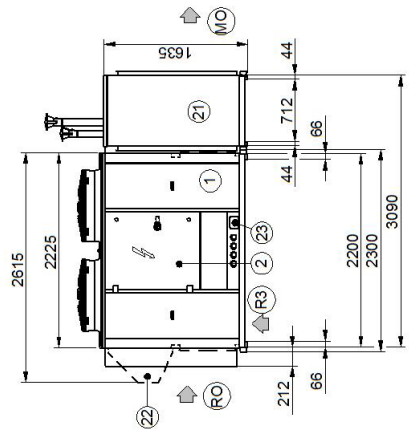
Size 33.4-40.4-44.4 Combustion module - CCK and CCKP configuration.

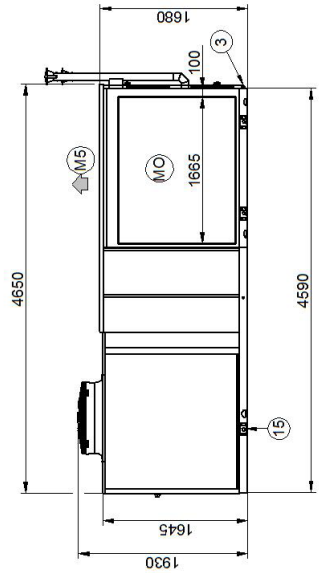
DOUBLE CHAMBER

DAA7X33.4_40.4_44.4_CCK-CCKP_GC12X_00

Date: 18/12/2015







1. Compressor compartment
2. Electrical panel
3. Condensate drain
4. Functional clearances
5. Internal exchanger
6. External exchanger
7. H2O heating coil / Electric heaters (Optional)
8. Re-heating coil (Optional)
9. G4 air filters (Standard)
10. F7 bag filters / electronic air filters (Optional)
11. Electric fan (Supply - return)
12. External electric fan
13. Outdoor air damper
14. Access for inspection of coils, filters, heating elements
15. Lifting brackets (removable)
16. Humidifier connections
17. H2O heating coil input Ø 1"1/4 (Optional)
18. H2O heating coil output Ø 1"1/4 (Optional)
19. Exhaust electric fan
20. Exhaust air recovery coil (CCKP version)
21. Gas module (accessory separately supplied)
22. Fresh air cap (accessory separately supplied)
23. Power input
24. Gas connection UNI ISO 228/1 - G 1 1/2"
25. Condensate drain (only for condensation gas heating module)
26. Air exhaust caps (accessory separately supplied)

(ES) Air exhaust
(RO) Horizontal air return
(R3) Downward air return (optional)
(MO) Horizontal air supply
(AE) Fresh air inlet
(H1) Wall with same height as unit on a maximum of three sides
(***) Suggested clearance
(*) Vibration mounts position

GAS MODULE WEIGHT DISTRIBUTION

SIZE		33.4	40.4	44.4	33.4	40.4	44.4	SIZE	33.4-40.4-44.4
Configuration		CCK	CCK	CCK	CCKP	CCKP	CCKP	Configuration	CCK/CCKP
W1 Supporting point	kg	485	492	494	501	508	509	W5 Supporting point	90
W2 Supporting point	kg	373	381	382	386	394	395	W6 Supporting point	78
W3 Supporting point	kg	427	436	437	441	450	451	W7 Supporting point	78
W4 Supporting point	kg	503	511	512	519	527	528	W8 Supporting point	90
Operating weight	kg	1788	1820	1825	1847	1879	1883	Operating weight	336
Shipping weight	kg	1788	1820	1825	1847	1879	1883	Shipping weight	336

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

Sez. A-A

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